Prefatory Note

The attached document represents the most complete and accurate version available based on original files from the FOMC Secretariat at the Board of Governors of the Federal Reserve System.

Please note that some material may have been redacted from this document if that material was received on a confidential basis. Redacted material is indicated by occasional gaps in the text or by gray boxes around non-text content. All redacted passages are exempt from disclosure under applicable provisions of the Freedom of Information Act.

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Report to the FOMC on Economic Conditions and Monetary Policy

Book A

Economic and Financial Conditions:
Outlook, Risks, and Policy Strategies

January 17, 2020

Prepared for the Federal Open Market Committee
by the staff of the Board of Governors of the Federal Reserve System

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Domestic Economic Developments and Outlook

Economic activity appears to be weathering recent events—including Boeing's woes, the GM strike, ongoing trade tensions, and a variety of geopolitical developments—reasonably well. We now estimate that GDP grew 2.0 percent last quarter, 0.7 percentage point stronger than our projection in the November Tealbook. While the upward revision can arithmetically be explained by unusually weak imports, the estimated pace of growth seems consistent with the solid employment gains posted last quarter. Business investment, though still weak, shows signs of stabilizing, and, given the solid fundamentals supporting household spending, we view the fourth-quarter slowing in consumer spending growth as likely to be transitory. As a result, we project continued moderate GDP growth of 2.3 percent in the first half of this year. Although we still view the risks to our projection as tilting to the downside, recent trade policy developments and two strong employment reports since the previous Tealbook suggest that the downside risks over the next 12 months or so have eased somewhat.

Regarding the medium-term projection, GDP is expected to gradually decelerate from a 2.3 percent pace of growth this year to 1.7 percent in 2022, reflecting the waning boost from fiscal policy, the rising path for interest rates, and a leveling off in stock market wealth. We anticipate that already enacted tariff increases, uncertainty over future trade policy, and concerns over global growth will continue to restrain economic growth this year and, to a lesser extent, in 2021. Relative to the November Tealbook, our projection is a little stronger this year and next due both to more supportive financial conditions—higher equity prices and a weaker dollar—and to our expectation that the phase-one trade deal between the United States and China will boost exports. With GDP growth now expected to noticeably exceed its potential rate this year, we project the labor market to tighten a little further: The unemployment rate edges down to 3.3 percent by the end of this year, 0.2 percentage point below the level in the November Tealbook, and remains there through 2022.

The available data on inflation suggest that core PCE prices rose 1.6 percent over the 12 months ending in December, unchanged from our assessment in the November Tealbook. We expect core inflation to move up to 1.9 percent by March and remain near that level over the medium term. This pace is slightly above our 1.8 percent estimate of the underlying trend in PCE inflation, as the boost to inflation from high resource

Comparing the Staff Projection with Other Forecasts

The staff's projection for GDP growth in 2020 is 0.5 percentage point stronger than both the Survey of Professional Forecasters (SPF) and the Blue Chip consensus, but it is well aligned with the Blue Chip in 2021. The staff's unemployment rate forecast is 0.4 percentage point lower than the SPF and Blue Chip projections in 2020 and 0.5 percentage point below the Blue Chip in 2021.

The staff's forecast of headline CPI inflation for 2020 is weaker than the Blue Chip and SPF forecasts but well aligned with them for 2021. With regard to headline PCE price inflation, the staff projection is lower than the SPF consensus projection in 2020 and 2021. The staff's projection for core PCE price inflation is below the SPF forecast in 2020 and the same as the SPF forecast for 2021.

	2019	2020	2021
GDP (Q4/Q4 percent change)			
January Tealbook	2.3	2.3	2.0
Blue Chip (1/10/20)	2.3	1.8	2.0
SPF median (11/15/19)	2.2	1.8	n.a.
Unemployment rate (Q4 level)			
January Tealbook	3.5	3.3	3.3
Blue Chip (1/10/20)	3.6	3.7	3.8
SPF median (11/15/19)	3.6	3.7	n.a.
CPI inflation (Q4/Q4 percent change)			
January Tealbook	2.0	1.7	2.2
Blue Chip (1/10/20)	2.0	2.1	2.1
SPF median (11/15/19)	1.8	2.1	2.2
PCE price inflation (Q4/Q4 percent change)			
January Tealbook	1.5	1.6	1.9
SPF median (11/15/19)	1.5	1.9	2.0
Core PCE price inflation (Q4/Q4 percent change)			
January Tealbook	1.6	1.9	1.9
SPF median (11/15/19)	1.8	2.0	1.9

Note: SPF is the Survey of Professional Forecasters, CPI is the consumer price index, and PCE is personal consumption expenditures. Blue Chip does not provide results for overall and core PCE price inflation. The Blue Chip consensus forecast includes input from about 50 panelists, and the SPF about 40. Roughly 20 panelists contribute to both surveys.

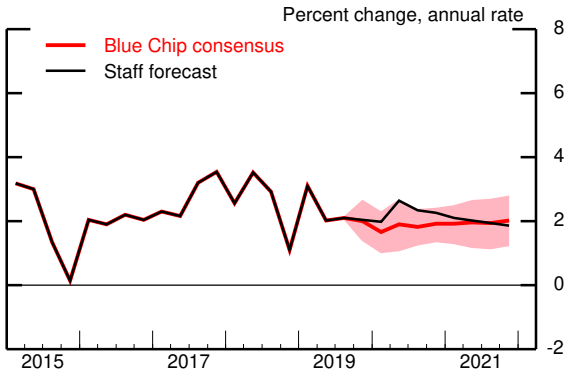
n.a. Not available.

Source: Blue Chip Economic Indicators; Federal Reserve Bank of Philadelphia.

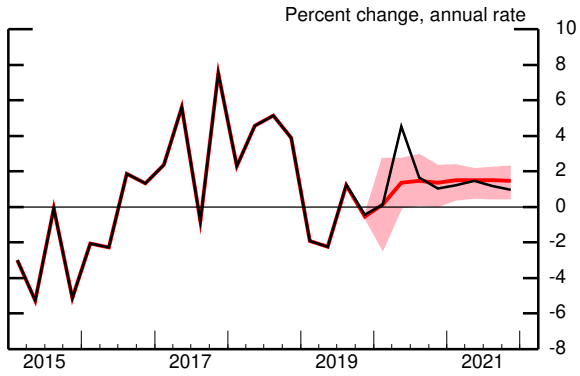
Tealbook Forecast Compared with Blue Chip

(Blue Chip survey released January 10, 2020)

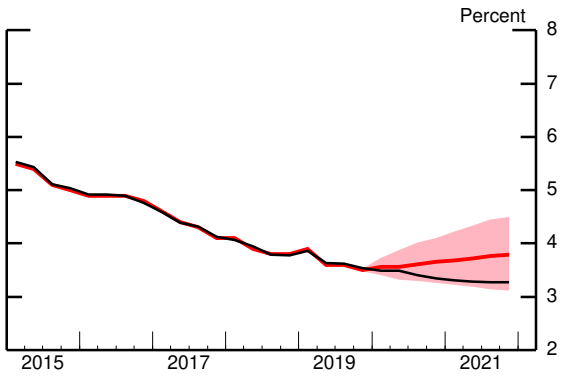
Real GDP



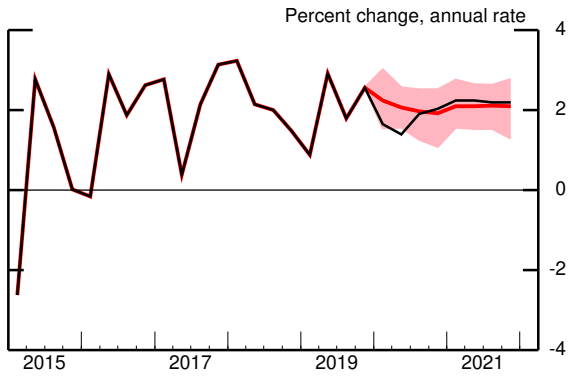
Industrial Production



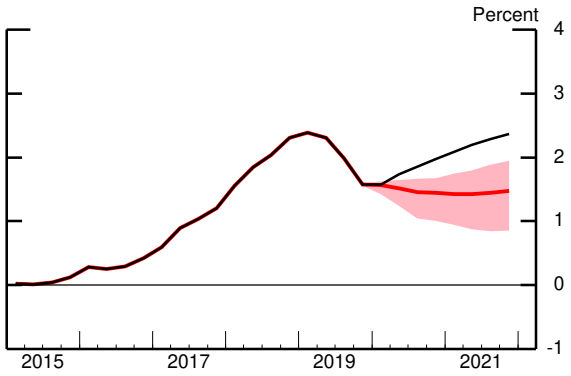
Unemployment Rate



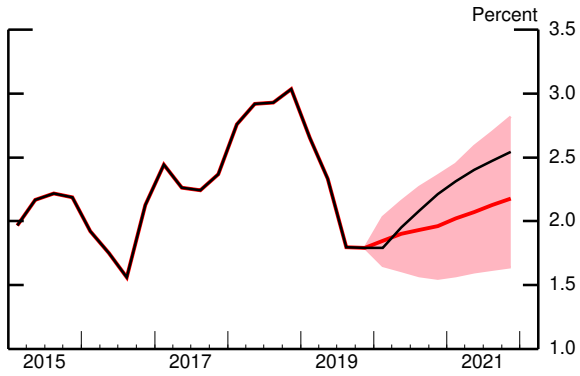
Consumer Price Index



Treasury Bill Rate



10-Year Treasury Yield



Note: The yield is for on-the-run Treasury securities. Over the forecast period, the staff's projected yield is assumed to be 3 basis points below the off-the-run yield.

Note: The shaded area represents the area between the Blue Chip top 10 and bottom 10 averages.

utilization is only partially offset by the drag on import prices from a rising dollar. Total PCE price inflation is projected to run below core inflation this year owing to falling energy prices and then to move in line with core over the remainder of the medium term.

KEY BACKGROUND FACTORS

Investor sentiment was buoyed by the phase-one trade agreement and was broadly resilient to the heightened tensions between the United States and Iran. On net, since the November Tealbook, domestic equity prices have risen markedly and the exchange value of the dollar has decreased, providing additional impetus to aggregate demand.

Monetary Policy

- The baseline policy rule calls for the federal funds rate to move up gradually to 2.6 percent by the end of 2022, just a touch higher than in the November Tealbook due to a tighter economy in this projection. This path starts from a lower level, as market quotes for the federal funds rate so far in the first quarter have been lower than projected by the policy rule in the previous Tealbook.[1] Term-premium-adjusted market quotes suggest that market participants expect the federal funds rate to move up by roughly 25 basis points per year through the medium term, a slightly more gradual increase than in our baseline path.

- Our assumptions for the SOMA portfolio, which will be detailed in Tealbook B, imply that downward pressure on the term premium in Treasury yields gradually diminishes over time.

Other Interest Rates

- We project that the 10-year Treasury yield will rise from an average of 1.8 percent this quarter to 2.8 percent by the end of 2022, mostly reflecting our assumption that the term premium will move up to a more normal level

[1] We calculate the current-quarter value for the federal funds rate as an average of daily trading data and an assumed unchanged value for the rest of the quarter. In the previous Tealbook, this procedure determined the federal funds rate in the fourth quarter of 2019, whereas we have rolled forward to the first quarter of 2020 in this Tealbook. Given that the policy rule had previously prescribed an increase in the federal funds rate in the first quarter, this roll forward mechanically lowered our current-quarter estimate.

over the next few years. This path for the 10-year Treasury yield is nearly unchanged from the projection in the November Tealbook.

- Both corporate bond yields and mortgage rates increase about in line with comparable-maturity Treasury securities over the medium term. Relative to the November Tealbook, we project somewhat narrower spreads of these private rates to the 10-year Treasury yield in the near term, as recent market quotes have been below our expectations.

Equity Prices and House Prices

- Stock prices have increased 5¾ percent since the time of the November Tealbook, notably above our expectations. Going forward, we expect equity prices to be essentially flat through the end of 2022. This stock price projection reflects increased valuation pressures, as the equity premium has dropped further and is currently near the 25th percentile of its historical distribution.

- We project that house prices will rise 3.7 percent per year over the medium term, slower than the average of the past several years, reflecting in large part the rising path for mortgage rates in the projection.

Trade Policy

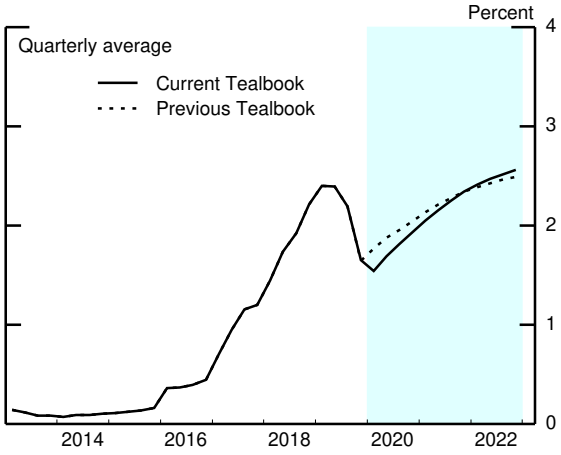
- The United States and China signed a phase-one trade agreement on January 15. China agreed to increase its purchases of U.S. goods and services by $76.7 billion in 2020 and by $123.3 billion in 2021 relative to a 2017 baseline. China also agreed to suspend a planned retaliatory tariff increase on $45 billion of U.S. exports and to pursue economic reforms. In return, the United States agreed to suspend tariff increases that had originally been scheduled for December 15. In addition, starting on February 14, the 15-percentage-point tariff increase on about $100 billion in U.S. imports from China (dating from September 2019) will be cut in half.[2]

- The effects on our forecast from these changes in tariffs are small. Because our November Tealbook projection already assumed no December tariff

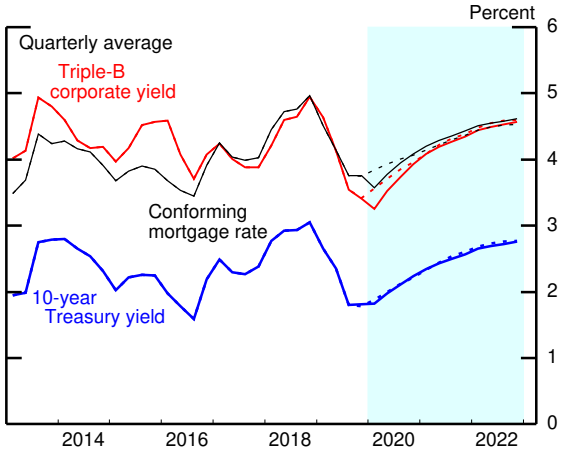
[2] Several of the more contentious issues—particularly those related to Chinese industrial policy, such as government subsidies and state-owned enterprises—will be discussed during the second phase of the U.S.–China trade talks.

Key Background Factors underlying the Baseline Staff Projection

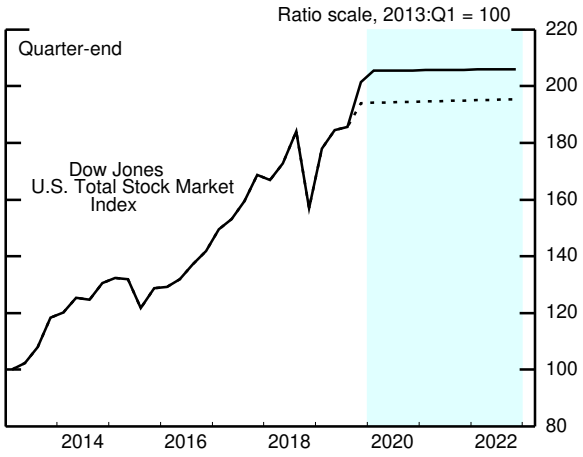
Federal Funds Rate



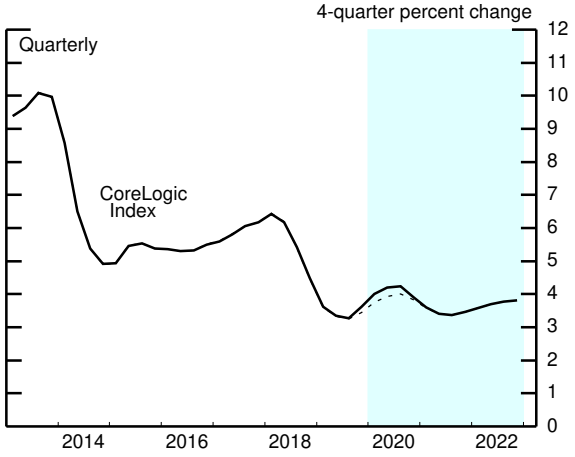
Long-Term Interest Rates



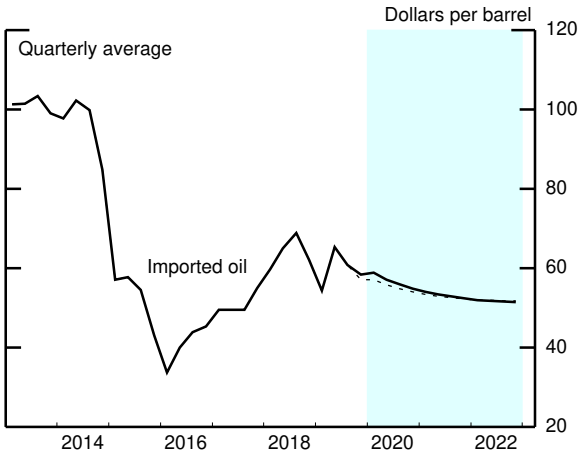
Equity Prices



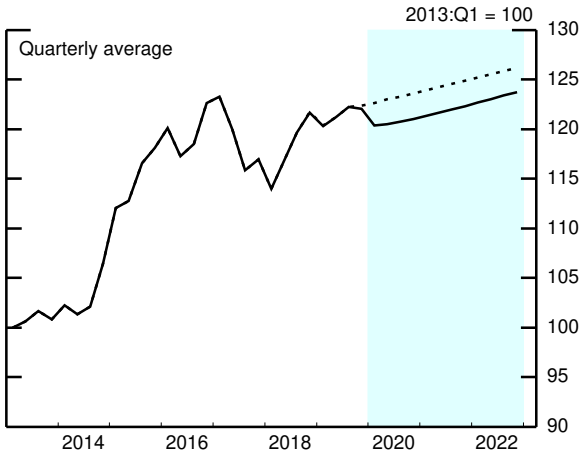
House Prices



Oil Prices



Broad Real Dollar



increase, the direct phase-one tariff effects are limited to the February partial tariff rollback.

- Taken at face value, the agreed phase-one sales provisions would boost the level of U.S. GDP 0.65 percent by the end of 2021, holding everything else fixed. However, the potential for incomplete compliance, supply constraints, reduced exports elsewhere, higher prices for exported goods, and sales out of inventories have led us to moderate the projected boost to GDP to 0.15 percent.

- The boost to GDP from the phase-one sales provisions is more than offset by the effects of the tariffs implemented since early 2018. On net, we estimate that the total effect of these trade actions is to lower the level of U.S. real GDP 0.15 percent by the end of 2021, with most of the effect having already occurred. We also estimate that the tariffs boost the level of core PCE prices 0.3 percent by the end of 2021.

- Notwithstanding the phase-one deal and this week's passage of the USMCA, continued uncertainty over trade policy, including prospective U.S. tariffs on European goods, is still assumed to hold back GDP growth somewhat this year.

Foreign Economic Activity and the Dollar

- We now estimate that foreign real GDP growth stepped down to an annual rate of 1.1 percent in the second half of 2019, well below our estimate of potential growth and a downward revision of 0.2 percentage point from the November Tealbook. Foreign growth has been held down by a number of factors, including the global manufacturing slump, trade tensions, and political unrest, especially in Hong Kong and Chile. We expect the drag from these factors to ease and growth abroad to pick up to a near-potential pace of 2.3 percent later this year. Indeed, in China and the euro area, recent indicators suggest economic activity is stabilizing.

- The broad nominal dollar has depreciated 1.7 percent since the November Tealbook. We continue to expect that the broad real dollar will appreciate at an annual rate of 1 percent through 2022 as market expectations for the federal funds rate move up toward the staff forecast.

Fiscal Policy

- Our fiscal policy assumptions are unchanged from the previous Tealbook.[3] We continue to estimate that the direct fiscal impetus from all levels of government contributed 0.8 percentage point to aggregate demand growth last year, as the 2017 tax cuts continued to provide impetus to private spending, past increases in budget appropriations boosted federal purchases, and state and local infrastructure investment surged. With the support to growth from these factors expected to wane over time, we project the impetus from fiscal policy to taper to 0.4 percentage point this year and to 0.1 percentage point by 2022.

    - Although state and local government purchases rose moderately last year, taking a longer-term view, growth in these purchases has been notably weak since the Great Recession. See the box "State and Local Government Purchases over the Current Expansion."

Oil Prices

- The spot price of Brent crude oil, at $64 per barrel, is about $1 per barrel higher than at the time of the November Tealbook. Farther-dated futures prices are also up slightly. Prices were supported by an OPEC agreement that included larger-than-expected production cuts and by downward revisions to U.S. oil production forecasts. Prices jumped in early January as tensions increased between the United States and Iran, but have since reversed this jump. Consistent with futures prices, we continue to project that the price of imported oil will edge lower over the medium term.

THE OUTLOOK FOR GDP

We currently estimate that GDP rose 2.0 percent last quarter, 0.7 percentage point stronger than assumed in the November Tealbook. This revision can be more than accounted for by a sharp downward revision to imports (which implies higher GDP for a given amount of domestic spending). Although last quarter's growth in private domestic final purchases (PDFP) appears somewhat weaker than in the previous Tealbook, we

[3] Policymakers enacted legislation in late December that appropriated funds for the remainder of fiscal year 2020. Consistent with our projection in the previous Tealbook, fiscal 2020's level of appropriations is modestly above the level in fiscal 2019.

continue to expect PDFP growth to move up in the first half of this year, as some of the factors holding back business investment fade, PCE growth strengthens, and growth in residential investment picks up further. GDP growth edges up to 2.3 percent in the first half of this year, as this projected boost from PDFP more than offsets a smaller expected contribution from net exports.

- Both the GM strike and the suspension by Boeing of production of its 737 MAX aircraft affect the quarterly pattern of growth in the near term.[4] On net, these two factors are expected to boost GDP growth slightly in the first half (after having held down growth in 2019), and our projection of first-half GDP growth excluding these factors is 2.1 percent.

- We estimate that PCE growth slowed to 1.5 percent last quarter, half of its third-quarter pace, reflecting weakness in the retail sales group component of PCE. However, we expect PCE growth to pick up to a solid pace of 2.5 percent in the first half of the year—about the same as last year's pace—supported by solid employment gains, high household net worth, and low interest rates and consistent with the strong recent readings on consumer confidence.

- Residential investment looks to have increased at an average pace of more than 4 percent over the second half of last year after having declined in 2018 and in the first half of 2019. We expect residential investment to rise more than 7 percent in the first half of this year: Permits for single-family homes climbed to a post-housing-crash high in the fourth quarter, and housing starts increased throughout the second half of 2019. We continue to attribute the recovery in housing primarily to the decline in mortgage rates since late 2018.

- BFI is projected to increase at a 1.6 percent rate in the first half of this year after having fallen at a similar pace in the second half of last year. A bit less than half of this swing can be explained by our assumption that Boeing will resume deliveries of 737 MAX aircraft in March.

[4] The resumption of production at GM is expected to add 0.5 percentage point to GDP growth in Q1, while the temporary suspension of production at Boeing subtracts 0.4 percentage point from Q1 and adds 0.4 percentage point to growth in Q2. Boeing paused 737 MAX production in January, and we expect production and deliveries to resume in March. Of course, there is a risk of further delays, and a permanent shutdown of the 737 MAX production line, while unlikely, would have far-ranging effects.

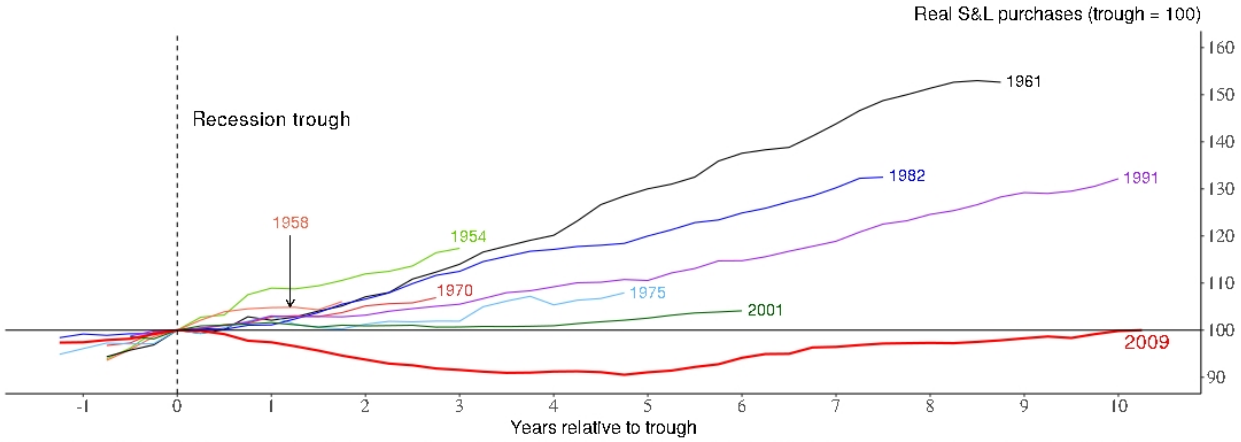
State and Local Government Purchases over the Current Expansion

State and local government purchases of goods and services, which represent 11 percent of GDP, have been unprecedentedly weak. As shown by the red line in figure 1, real state and local purchases have, on net, been flat over the more than 10 years of the current expansion, during which time total real GDP has grown by more than 25 percent. This sluggishness stands in stark contrast to the growth posted by state and local purchases in previous expansions. This discussion explores the causes of the weakness in state and local government purchases since the Great Recession and briefly discusses some of the possible economic consequences.

State and local governments have confronted strained budgets, and, because they operate under relatively binding balanced budget rules, they needed to either raise revenues or reduce expenditures.[1] In practice, most of the budget adjustment has been achieved by restraining purchases. There are three primary causes of the budget strain. First, tax revenues have been sluggish, as historically subdued growth in GDP has restrained growth in the sector's tax bases. Second, nontax revenues have also been weak. In particular, grants from the federal government other than for Medicaid have declined sharply since 2010; as a share of GDP, these grants-in-aid are now roughly 20 percent below their average level from 1995 through 2010. Third, purchases have been crowded out by other state and local spending. The state-financed portion of Medicaid, as a share of GDP, has continued to drift upward. (Transfer payments such as Medicaid are not included in state and local purchases in the national income and product accounts; instead, they are booked as household income.) Moreover, significant concern over the sustainability of state and local government pension funds, which are estimated to be around $4 trillion short of full funding, has induced sponsoring governments to substantially increase their annual contributions: Over the past 10 years, these contributions, as a share of GDP, have increased around 40 percent. The increased spending on pension contributions and on Medicaid has reduced the funds available for the purchase of goods and services.

One additional factor, operating outside the context of the sector's balanced budget rules, has placed further downward pressure on purchases: Although state and local governments can borrow to fund public infrastructure investment, they chose to curtail this borrowing following the Great Recession. Partly as a result, construction spending fell sharply early in the expansion and real outlays for infrastructure investment remain well below their pre-recession peak. Partial explanations for the

Figure 1: State and Local Government Purchases by Expansion



Note: The year labels attached to each line refer to the starting year of the expansion as defined by the National Bureau of Economic Research.
Source: Bureau of Economic Analysis.

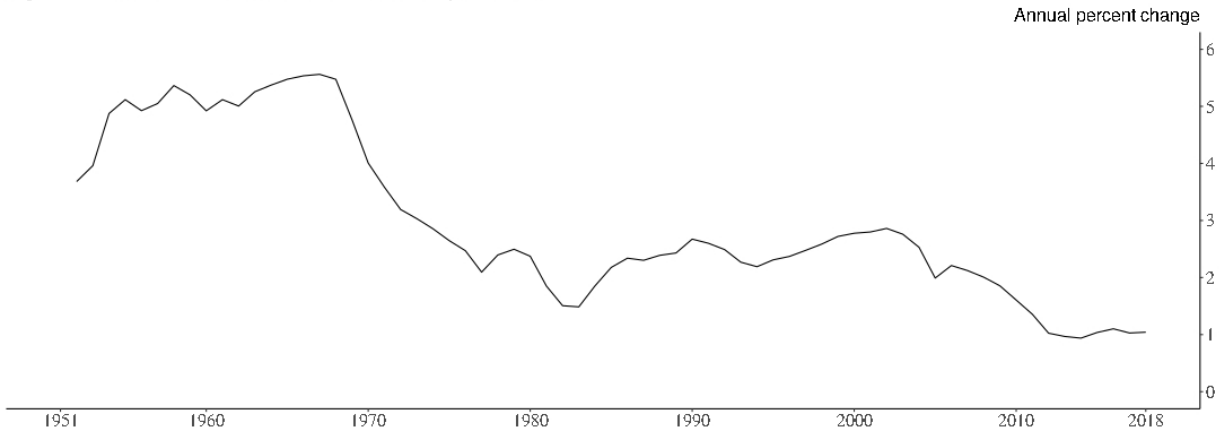
[1] Although state and local governments have some ability to smooth expenditures from year to year, they must broadly balance the noncapital portions of their budgets.

restraint in investment may include demand-side factors such as less need for new school construction due to a stagnation in growth of the school-age population and less need for new infrastructure, such as roads and sewers, due to the reduction in new residential construction. It may also reflect a desire to avoid the operating expenditures associated with new capital—for example, a new school must be staffed. Regardless, these governments clearly chose to engage in significant deleveraging. Indeed, over the past 10 years state and local government debt as a share of GDP has fallen by one-third, from 21 percent to 14 percent.

The subdued rise in state and local purchases has implications for both aggregate demand and aggregate supply. In terms of aggregate demand, the sector has contributed nothing, on net, to real GDP growth over the 10 years of this expansion, and over the past 4 years it has contributed an average of only 0.15 percentage point per year. In contrast, the sector boosted real GDP growth about 0.3 percentage point per year, on average, during the previous three expansions. That said, if the sector had contributed more to GDP growth over the current expansion, additional financing would have been required. Had this additional financing been achieved through higher tax revenue, there would likely have been a substantial offsetting reduction in aggregate demand from the household and business sectors. In contrast, had the financing come through higher grants from the federal government (which has a much looser budget constraint than states and localities), additional borrowing for infrastructure, or lower contributions to pension funds, there would likely have been a much smaller offset to aggregate demand.

Regarding aggregate supply, the bulk of state and local government purchases are for forms of public investment, most prominently education and infrastructure, that influence the long-run productive capacity of the economy. As a result of the decline in infrastructure investment, the growth rate of the state and local government capital stock—which includes most public infrastructure in the United States—has fallen in recent years to a post-1950 low (figure 2). Although the long-run return to public infrastructure is highly uncertain, there is evidence that well-targeted and well-implemented projects can have high returns and that a sustained period of low growth in the stock of public capital may slow potential GDP growth.[2] Outlays for education fell by a lesser, but still notable, amount following the recession, and real expenditures for K–12 education have only now regained their previous peak. Although the long-run growth effects of this reduction in overall education spending are also uncertain, there is strong evidence that many public investments in education have high returns; moreover, this spending also has important implications for a variety of distributional issues.

Figure 2: State and Local Goverment Real Capital Stock



Source: Bureau of Economic Analysis.

[2] See, for example, International Monetary Fund (2014), "Is It Time for an Infrastructure Push? The Macroeconomic Effects of Public Investment," in *World Economic Outlook: Legacies, Clouds, Uncertainties* (Washington: IMF), pp. 75–114.

Domestic Econ Devel & Outlook

Cyclical Position of the U.S. Economy: Near-Term Perspective

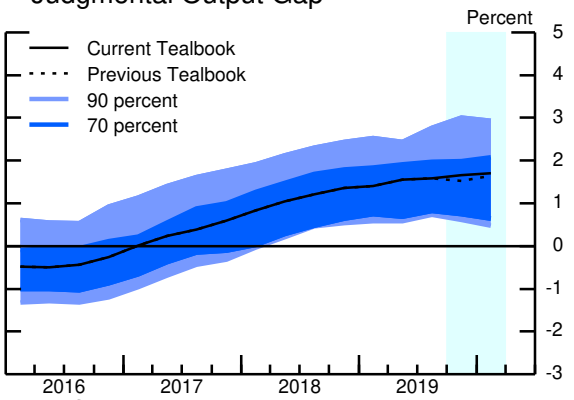
(Percent change at annual rate from final quarter of preceding period except as noted)

Measure	2017	2018	2019	2019 Q3	2019 Q4	2020 Q1
Output gap[1]	**.6**	**1.4**	**1.7**	**1.6**	**1.7**	**1.7**
Previous Tealbook	*.6*	*1.4*	*1.5*	*1.6*	*1.5*	*1.6*
Real GDP	2.8	2.5	2.3	2.1	2.0	2.0
Previous Tealbook	*2.8*	*2.5*	*2.1*	*2.1*	*1.3*	*2.3*
Measurement error in GDP	.1	-.1	.2	.2	.0	.0
Previous Tealbook	*.1*	*-.1*	*.2*	*.2*	*-.2*	*.0*
Potential output	1.8	1.8	1.8	1.8	1.8	1.8
Previous Tealbook	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*

Note: The output gap is the percent difference between actual and potential output; a negative number indicates that the economy is operating below potential. The change in the output gap is equal to real GDP growth less the contribution of measurement error less the growth rate of potential output. For quarterly figures, the growth rates are at an annual rate, and this calculation needs to be multiplied by 1/4 to obtain the quarterly change in the output gap.

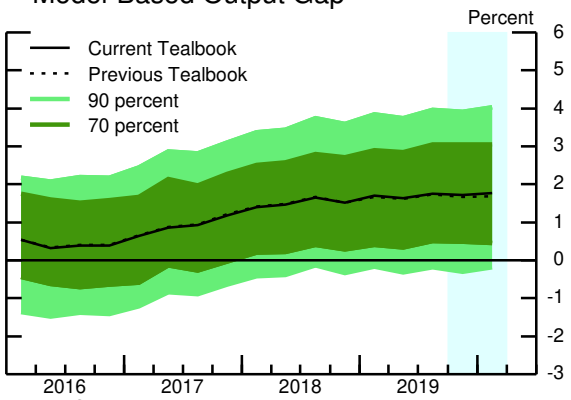
1. Percent, average for the final quarter in the period.

Judgmental Output Gap



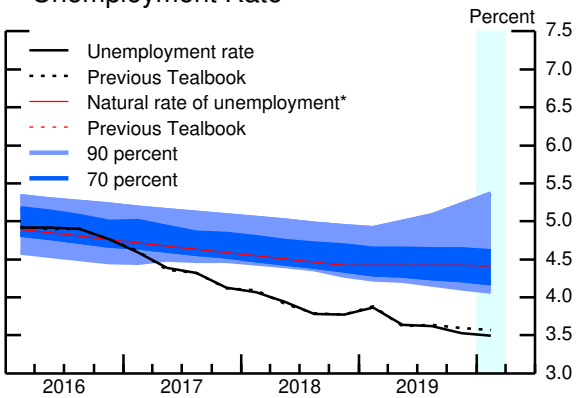
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.

Model-Based Output Gap



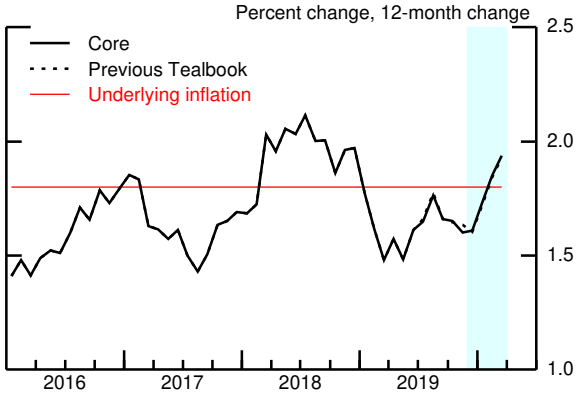
Note: Shaded regions denote model-computed uncertainty bands.
Source: Various macroeconomic data; staff assumptions.

Unemployment Rate



Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the natural rate.
*Staff estimate including the effect of extended and emergency unemployment insurance benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Core PCE Price Inflation



Source: U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.

- E&I is expected to grow 3.4 percent over the first half of the year. This forecast is 1.8 percentage points above our projection in the previous Tealbook, as incoming data on shipments of capital goods excluding aircraft have surprised us to the upside and new orders for capital goods came in slightly above shipments.

- Investment in nonresidential structures is expected to continue to decline over the first half of the year, but at a more moderate rate than over much of last year.

- Available data indicate that U.S. goods imports fell sharply in the fourth quarter of 2019. Almost half of the decline came from falling imports from China, which were weak all year, but imports from other trading partners also declined sharply in the fourth quarter after increasing over the previous three quarters. Even with a decline in exports last quarter, the net export contribution of trade to GDP growth is estimated to have been 1 percentage point. In 2020, we expect a positive net export contribution of about 0.2 percentage point. Imports are projected to return to positive growth at a pace similar to what we had expected in the previous Tealbook, as large one-quarter declines typically are not made up in the near term. Real export growth is expected to be 4.6 percent in 2020, almost 2 percentage points more than in the previous Tealbook, reflecting the weaker dollar and the boost from the phase-one agreement.

- Manufacturing production moved up at the end of the year, in part due to the resumption of production following the strike at GM. In the current quarter, we expect modest monthly gains, as forward-looking indicators of industrial activity remain tepid and as a continued step-up in motor vehicle production is offset by the drag from the curtailment of 737 MAX production. The pace of factory output picks up next quarter with our assumed resumption of 737 MAX assembly. (The box "Manufacturing and the U.S. Business Cycle" provides evidence that last year's weakness in manufacturing was not large enough to have had a major effect on the U.S. economy and that weakness of that magnitude is not unusual in expansionary periods.)

We project GDP growth to step down gradually from 2.3 percent this year to 1.7 percent in 2022, reflecting the waning support from fiscal policy and our assumption

Manufacturing and the U.S. Business Cycle

After increasing about 2 percent in both 2017 and 2018, the industrial production (IP) index for manufacturing fell in each of the first two quarters of 2019—prompting concern about a "manufacturing recession"—and it remained weak through the end of the year. In this note, we argue that the 2019 weakness in manufacturing plus any related curtailments in other sectors were not large enough to have had a major effect on the entire economy. We also show that, after accounting for changing trends in IP growth, weakness of the same magnitude as in 2019 has often occurred during expansionary phases of business cycles. That said, a more pronounced drop in manufacturing IP can signal an economy-wide recession; we find that, as a general rule of thumb, a string of five monthly declines in factory output that average at least 0.5 percent likely indicates an economy-wide recession.

Manufacturing represents a smaller share of the U.S. economy than it did in the middle of the 20th century. Its employment has dropped from about 30 percent of nonfarm employment to less than 9 percent today, and the value added from manufacturing has fallen from more than 25 percent of GDP to a bit under 12 percent. However, these figures understate manufacturing's importance to GDP growth, as the goods that are produced need to be transported and sold; taking into account the contributions from distribution and retailing boosts its effective share to about one-third of GDP.

Over the course of 2019, manufacturing IP decreased 1.3 percent with fairly broad-based declines across both durable and nondurable goods industries. The slump in manufacturing last year is attributable to several factors, including U.S. tariffs affecting the cost of imported intermediate goods, retaliatory tariffs reducing demand for U.S. exports, weak business investment, lower oil prices engendering a cutback in demand by drillers, and the slower production of Boeing's 737 Max due to safety issues.

This weakness in manufacturing has likely spilled over to other sectors. For example, a reduction in auto assemblies affects automakers' demand both for intermediate inputs like steel and for business services like accounting. In turn, the steelmakers need less iron ore, and the accountants need less tech support. The input-output tables for the U.S. economy imply that every dollar of factory output requires 56 cents of input from other domestic sectors.[1] Manufacturing currently accounts for 12 percent of GDP, so its 2019 decline of 1.3 percent is worth about 0.15 percent on GDP; including related upstream production, the drag is a bit more than 0.2 percent. If we add in the downstream activities needed to bring products to market (such as transportation, wholesaling, and retailing), the decline in manufacturing reduced GDP by less than 0.5 percent—not enough to tip an otherwise-expanding economy into recession.

[1] The input-output tables are published by the Bureau of Economic Analysis. Our estimates are from the 2018 sectoral "Domestic Requirements" table, which cumulates both intermediate products used directly by manufacturers and those used further upstream. The tables do not, however, account for broader general equilibrium effects such as the lower spending by workers who may have been laid off when there were cutbacks in auto production.

Nevertheless, manufacturing output may still be a good barometer for the health of the economy when assessed in the context of its changing role over time—that is, when judged relative to its recent trends.

Growth in the U.S. manufacturing sector ain't what it used to be. Measured from business-cycle peak to business-cycle peak, output grew about 3.5 percent per year between 1920 and 1960, as well as from 1960 through 2001. As seen in figure 1, factory production has moved up only about 0.5 percent per year since 2001, and only 2 of those 19 calendar years recorded gains of more than 3.5 percent.

To interpret the recent weakness in manufacturing in this light, figure 2 shows 12-month changes in detrended IP.[2] Notably, even during expansions, there are typically periods of modest below-trend growth. In 2019, growth averaged about 2 percentage points below trend, a slowdown fairly similar to that in the 2015–16 period. Other episodes of modest below-trend growth appear in the expansions of the early 2000s, the 1990s, the mid-1980s, and the 1960s. In contrast, every recession since 1960—but no expansion—includes at least some months when the 12-month change in IP falls at least 7 percentage points below trend (the red line in figure 2).[3]

It is helpful to establish a general rule that associates monthly changes in IP with recessions and that uses a period shorter than a 12-month comparison. We find that stretches of 5 months where detrended IP falls at a pace of 0.5 percent per month occur in all recessions but rarely in expansions. Currently, with trend growth running just above zero, a rule of thumb is that a 5-month stretch of declines in IP averaging 0.5 percent or more is consistent with a recession.

Figure 1: Manufacturing IP

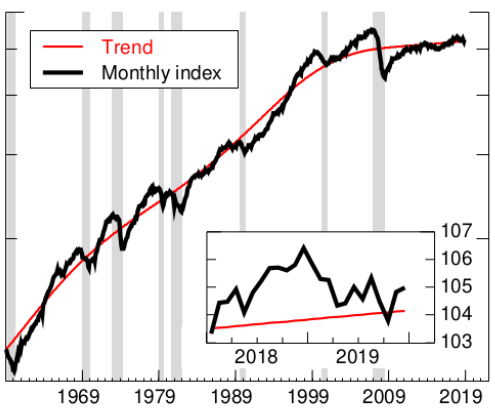
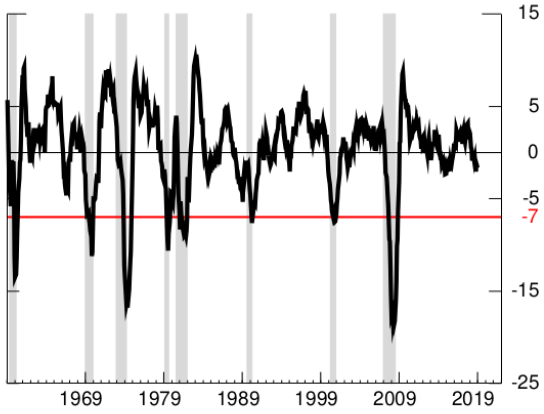


Figure 2: 12-Month Change in Detrended Manufacturing IP



Note: The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.
Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization"; staff estimates of the trend.

[2] The series was detrended using the Hodrick-Prescott filter; the results are robust to a variety of detrending procedures.

[3] At a monthly rate, a 12-month drop of 7 percentage points corresponds to a year of declines averaging about 0.5 percent.

Domestic Econ Devel & Outlook

Summary of the Near-Term Outlook for GDP

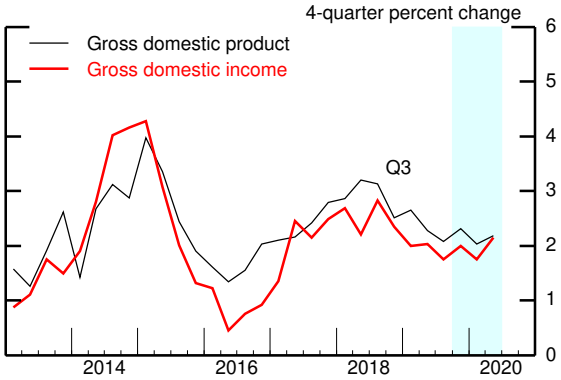
(Percent change at annual rate except as noted)

Measure	2019:Q3		2019:Q4		2020:Q1	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	**2.1**	**2.1**	**1.3**	**2.0**	**2.3**	**2.0**
Private domestic final purchases	2.3	2.3	1.9	1.3	2.1	2.3
Personal consumption expenditures	3.0	3.1	2.1	1.5	2.4	2.4
Residential investment	4.6	4.6	5.9	4.3	7.2	7.0
Nonres. private fixed investment	-2.0	-2.3	-.1	-.8	-.9	.5
Government purchases	1.6	1.7	.8	2.3	1.8	1.2
Contributions to change in real GDP						
Inventory investment[1]	.1	.0	-.4	-.5	-.2	-.4
Net exports[1]	-.1	-.1	-.1	1.0	.4	.2

1. Percentage points.

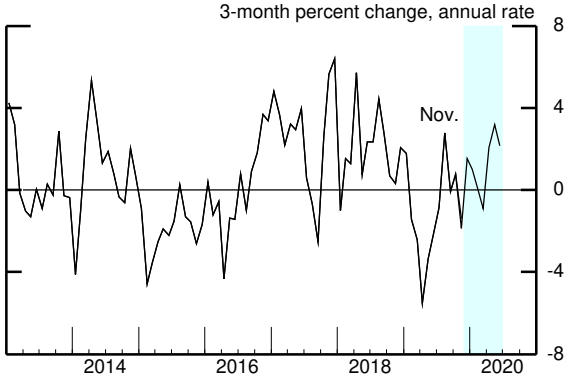
Recent Nonfinancial Developments (1)

Real GDP and GDI



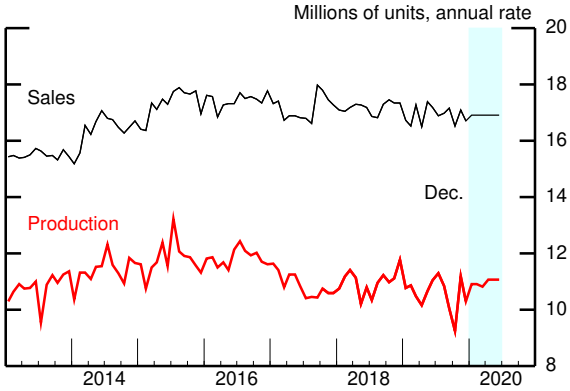
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Manufacturing IP ex. Motor Vehicles and Parts



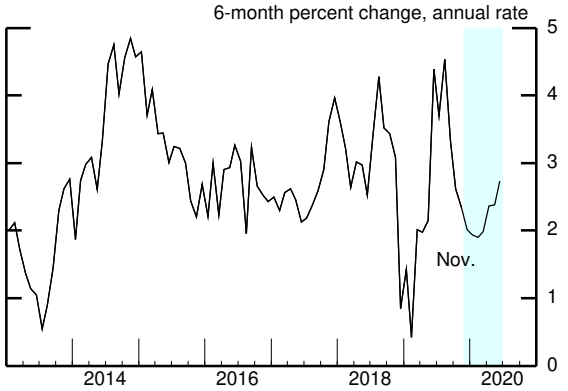
Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."

Sales and Production of Light Motor Vehicles



Source: Ward's Communications; Chrysler; General Motors; FRB seasonal adjustments.

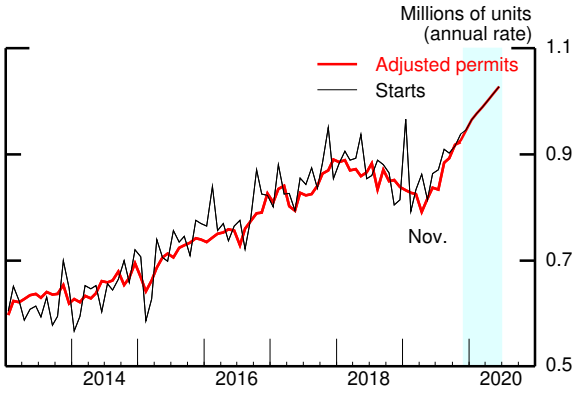
Real PCE Growth



Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

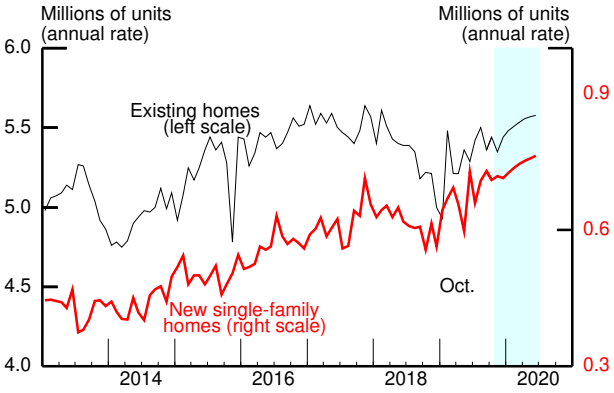
Recent Nonfinancial Developments (2)

Single-Family Housing Starts and Permits



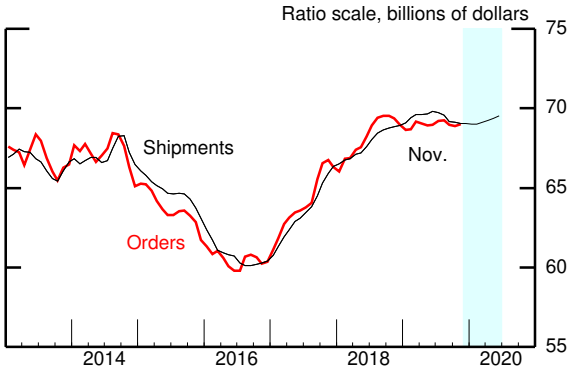
Note: Adjusted permits equal permit issuance plus starts outside of permit-issuing areas.
Source: U.S. Census Bureau.

Home Sales



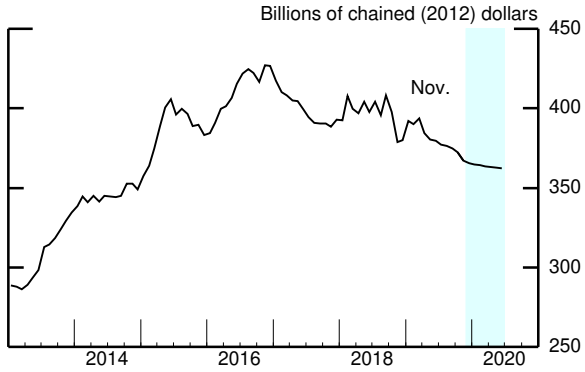
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

Nondefense Capital Goods ex. Aircraft



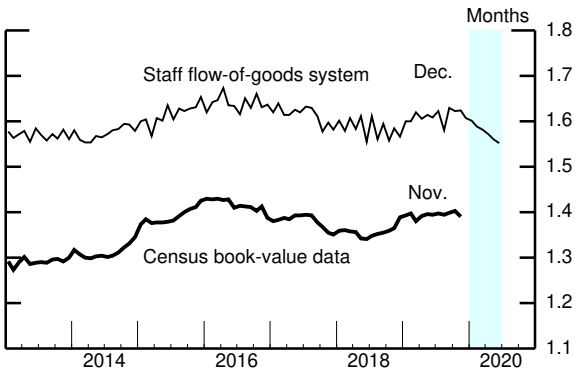
Note: Data are 3-month moving averages.
Source: U.S. Census Bureau.

Nonresidential Construction Put in Place



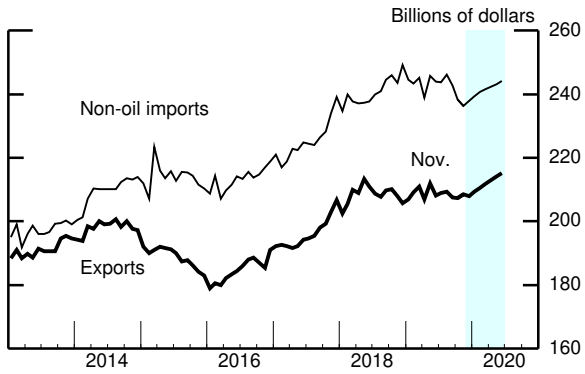
Note: Nominal CPIP deflated by BEA prices through 2019:Q3 and by the staff's estimated deflator thereafter.
Source: U.S. Census Bureau.

Inventory Ratios



Note: Flow-of-goods system inventories include manufacturing and mining industries and are relative to consumption. Census data cover manufacturing and trade, and inventories are relative to sales.
Source: U.S. Census Bureau; staff calculations.

Exports and Non-oil Imports



Note: Forecasts are linear interpolations of quarterly values.
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis; U.S. Census Bureau.

Federal Reserve System Nowcasts of 2019:Q4 Real GDP Growth
(Percent change at annual rate from previous quarter)

Federal Reserve entity	Type of model	Nowcast as of Jan. 15, 2020
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	2.5
New York	• Factor-augmented autoregressive model combination	2.6
	• Factor-augmented autoregressive model combination, financial factors only	2.7
	• Dynamic factor model	1.1
Cleveland	• Bayesian regressions with stochastic volatility	1.5
	• Tracking model	2.5
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	2.3
Chicago	• Dynamic factor model	1.3
	• Bayesian VARs	1.7
St. Louis	• Dynamic factor model	1.7
	• News index model	2.0
	• Let-the-data-decide regressions	2.2
Kansas City	• Accounting-based tracking estimate	2.1
Board of Governors	• Tealbook estimate (judgmental)	2.0
	• Mixed-frequency dynamic factor model (DFM-SM)	1.3
	• Mixed-frequency dynamic factor model (DFM-BM)	2.1
Memo: Median of Federal Reserve System nowcasts		2.1

of less supportive financial conditions going forward. These factors are partially offset by an easing in the negative effects of tariffs on growth and uncertainty about trade policy and the global outlook. Our forecast for medium-term growth is stronger than in the November Tealbook, reflecting the higher projected path for equity prices and weaker exchange value of the dollar, as well as the boost to exports from the phase-one agreement. As a result of the upward revisions to GDP growth last year and this year, the output gap is 0.5 percentage point wider over much of the medium term relative to the November Tealbook.

THE OUTLOOK FOR THE LABOR MARKET

The labor market continued to strengthen at the end of last year, but wage growth has remained moderate. Payrolls expanded at a pace above that consistent with no change in resource utilization, while the unemployment rate remained near half-century lows and labor force participation continued to move up against the backdrop of its declining trend. Looking ahead, with output rising faster than potential this year and next, we expect a further tightening of the labor market.

- The BLS estimates that total nonfarm payroll employment increased 256,000 in November and 145,000 in December. As a result, published monthly payroll gains averaged 190,000 over the second half of 2019, up nearly 30,000 from the first-half pace. The average gains in the fourth quarter were 30,000 above our November Tealbook expectation.[5]
    - As indicated in the table on the next page, we expect next month's BLS benchmark revision to lower total payroll employment growth by 42,000 per month from the second quarter of 2018 through the first quarter of 2019, and we estimate that it will hold down payroll growth by 16,000 per month through the remainder of 2019. (The exhibits

[5] The November employment report was published after the November Tealbook but before the FOMC meeting. Relative to our eve-of-release expectations for the December employment report, the total nonfarm employment gain in December was 40,000 weaker than we expected, and the unemployment rate was as expected.

elsewhere in the Tealbook are based on the currently published BLS data.)

Nonfarm Payroll Employment
(Monthly changes, thousands of employees)

	2018				2019				Annual averages	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2018	2019
1. Currently estimated	228	243	189	233	174	152	193	184	223	176
2. Adjusted for expected revision	228	201	147	191	132	136	177	168	192	153
3. Expected revision	--	-42	-42	-42	-42	-16	-16	-16	-32	-23

- The measure of private nonfarm payrolls we construct using firm-level data from the payroll-processing firm ADP stepped up from a weak average reading of 40,000 per month from August to October to around 190,000 per month in November and December. By comparison, the BLS measure of private payrolls stepped up from a relatively stronger average gain of 170,000 per month from August to October to 190,000 per month in November and December.

- Given the recent strong labor market readings, we have revised up our forecast of average monthly private employment gains over the first half of this year by 20,000 to around 150,000. We expect total employment gains to be noticeably higher than this figure over the first half of the year due to government hiring related to the 2020 census. We also expect total payroll employment gains to step down gradually over the medium term as output decelerates, reaching 75,000 per month in 2022.

- The unemployment rate fell to 3.5 percent in November and held at that level in December; both readings are 0.1 percentage point below our previous Tealbook forecast. In response, we lowered our near-term unemployment rate forecast to 3.5 percent through the middle of this year. With projected output growth above potential in 2020, we expect the unemployment rate to edge down to 3.3 percent by the end of the year and to remain there through the end of 2022; this forecast is 0.2 percentage point lower than in the previous Tealbook and more than 1 percentage point below our estimate of the natural rate.

- The LFPR was 63.2 percent in both November and December. Over the four quarters of 2019, the LFPR increased 0.3 percentage point, a strong outcome given our estimate that population aging subtracts 0.25 percentage point per year from the change in the aggregate LFPR. We continue to expect the LFPR to decline a bit over the next several years, as the cyclical improvement in participation slows and the aging of the population continues to exert a downward pull.

- We estimate that business-sector productivity increased 0.7 percent in the fourth quarter, bringing the change for 2019 as a whole to 1.7 percent, a step-up from the gain of 1.1 percent in 2018. Because productivity growth can vary substantially from year to year, we have taken little signal from last year's reading and continue to expect productivity to rise 1.3 percent per year over the next few years, in line with our estimate of its structural trend and with the average pace of increase over the past five years.

THE OUTLOOK FOR INFLATION

The data on price inflation that we have received since the November Tealbook were, on balance, about as expected. We continue to estimate that the 12-month change in core PCE prices stood at 1.6 percent in December and expect it to pick up to 1.9 percent by March, as the weak readings from the first quarter of last year drop out of the 12-month change calculation.

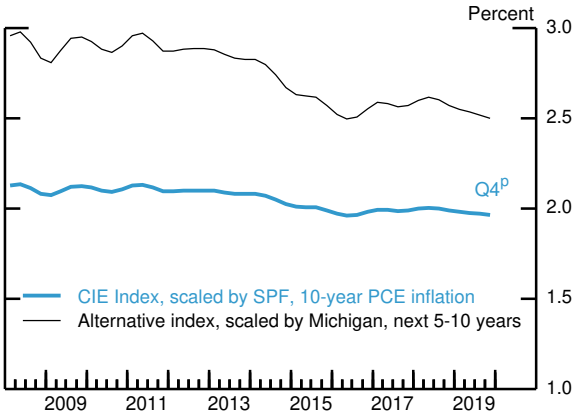
Over the next few years, we expect core PCE price inflation to run at 1.9 percent—a touch higher than our estimate of its underlying trend of 1.8 percent—as the boost to inflation from tight resource utilization is only partially offset by a drag on import prices from the rising dollar.

- Given the projected path of oil prices, energy prices are forecast to fall further this year. As a result, total PCE inflation runs a bit below core inflation in 2020 and then is projected to be in line with core inflation through 2022.

- Turning up the microscope, we view the details of the incoming data on core PCE inflation as, on balance, slightly weaker than anticipated but not sufficient to materially alter our forecast. In particular, market-based core PCE prices—which we typically take more signal from than the more volatile

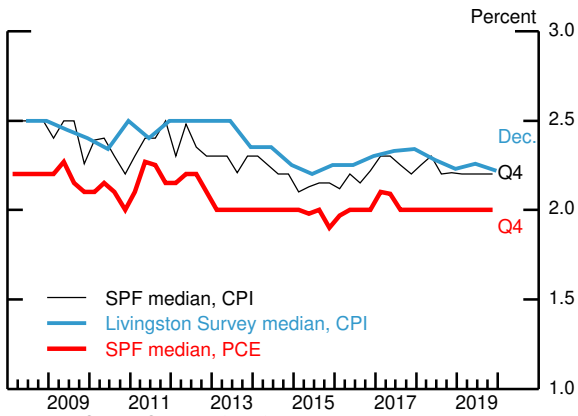
Survey Measures of Longer-Term Inflation Expectations

Index of Common Inflation Expectations



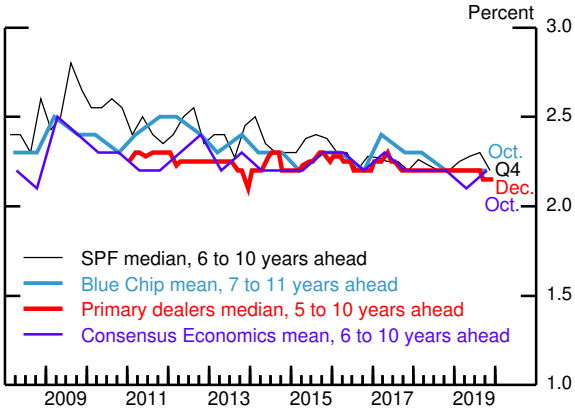
p Preliminary estimate based on data available to date.
Note: Index of 21 inflation expectations indicators.
Source: Staff calculations.

Next 10 Years



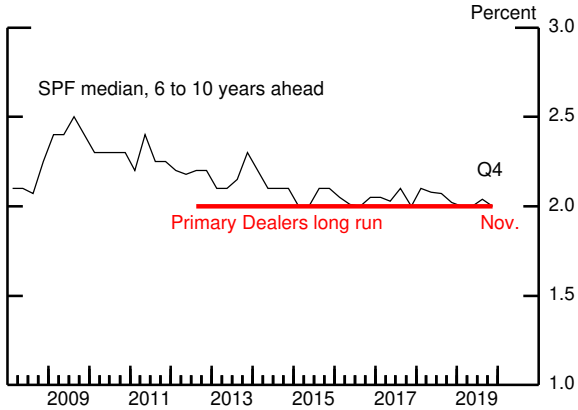
Note: SPF is Survey of Professional Forecasters.
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations



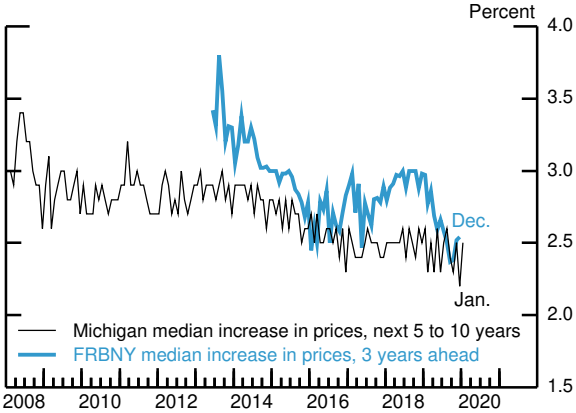
Source: Federal Reserve Bank of Philadelphia; Blue Chip Economic Indicators; Federal Reserve Bank of New York; Consensus Economics.

PCE Forward Expectations



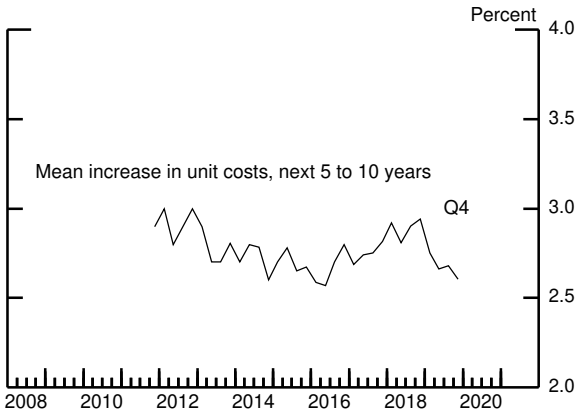
Source: Federal Reserve Bank of Philadelphia; Federal Reserve Bank of New York.

Surveys of Consumers



Note: Federal Reserve Bank of New York (FRBNY) Survey of Consumer Expectations reports expected 12-month inflation rate 3 years from the current survey date. FRBNY data begin in June 2013.
Source: University of Michigan Surveys of Consumers; Federal Reserve Bank of New York Survey of Consumer Expectations.

Survey of Business Inflation Expectations



Note: Survey of businesses in the Sixth Federal Reserve District. Data begin in February 2012.
Source: Federal Reserve Bank of Atlanta.

nonmarket component of core PCE prices—were a bit weaker than expected in October and November. But this weakness was offset by upside surprises from data on nonmarket prices.

- Effective core import prices, which include tariffs, are projected to rise 1.2 percent in the first half of this year. After the first half of this year, effective core import prices are expected to increase at a subdued pace of about 1 percent, reflecting an appreciating dollar and no further assumed tariff changes.

- On balance, the latest data suggest that inflation expectations remain reasonably well anchored. Median inflation expectations over the next 5 to 10 years from the Michigan survey fell to 2.2 percent in December, the lowest value since this question was first introduced in the late 1970s, but they moved back up to 2.5 percent in the preliminary January reading. Meanwhile, the FRBNY Survey of Consumer Expectations measure of median three-year-ahead expected inflation remained near its historical low in December. TIPS-based measures of longer-term inflation compensation have moved up a bit since the time of the previous Tealbook but remain a little below average levels in 2017 and 2018.

    - The staff's common inflation expectations index, which synthesizes these and other measures of inflation expectations, points to expectations as having held fairly steady since 2016 and is essentially unrevised since the previous Tealbook.

- The incoming data suggest that labor compensation continues to rise moderately and roughly in line with what we expected in the November Tealbook. Consistent with only a small tightening in the labor market over the forecast period, we project continued moderate wage growth over the medium term.

THE LONG-TERM OUTLOOK

- The natural rate of unemployment remains at 4.4 percent through the long term. Potential output growth slows to its long-run value of 1.7 percent in 2023, as the boost to potential growth from the 2017 tax cuts wanes.

- The real long-run equilibrium federal funds rate is still assumed to be 0.5 percent, and the nominal yield on 10-year Treasury securities is 3.0 percent in the longer run.

- Given the assumed tightening in monetary policy over the next few years, GDP growth slows from 1.7 percent in 2022 to 1.3 percent in 2025 before rising gradually to its long-run value thereafter. The unemployment rate moves up from 3.3 percent at the end of 2022 toward its assumed natural rate in subsequent years. Core PCE price inflation increases from 1.9 percent at the end of the medium term to its long-run value of 2 percent in 2024.

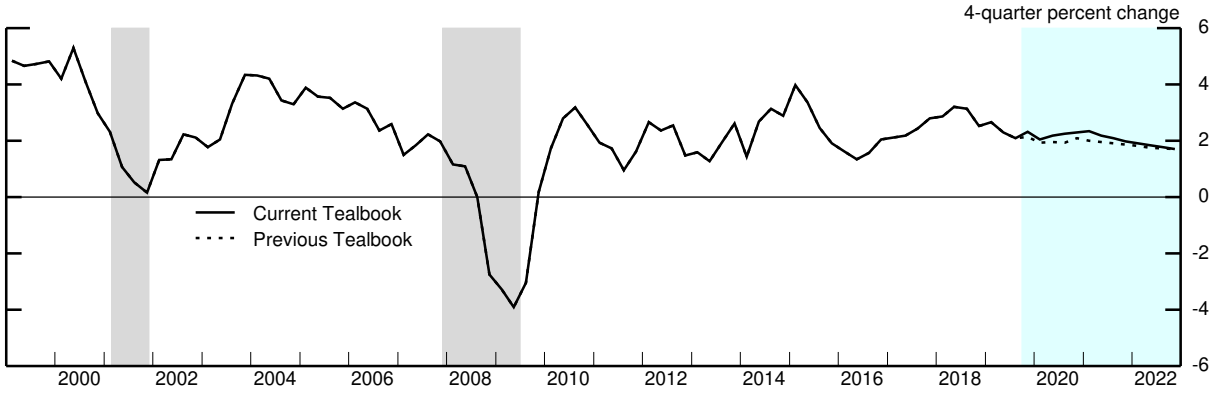
- Given the outlook for inflation and resource utilization, the nominal federal funds rate is 2.6 percent at the end of 2022, reaches 2.7 percent at the end of 2024, and edges down to its assumed long-run value of 2.5 percent thereafter.

Projections of Real GDP and Related Components

(Percent change at annual rate from final quarter of preceding period except as noted)

Measure	2019	2019 H2	2020 H1	2020	2021	2022
Real GDP	**2.3**	**2.1**	**2.3**	**2.3**	**2.0**	**1.7**
Previous Tealbook	*2.1*	*1.7*	*2.2*	*2.1*	*1.9*	*1.7*
Final sales	2.6	2.3	2.7	2.6	1.9	1.7
Previous Tealbook	*2.3*	*1.9*	*2.5*	*2.4*	*1.9*	*1.7*
Personal consumption expenditures	2.6	2.3	2.5	2.5	2.4	2.3
Previous Tealbook	*2.7*	*2.5*	*2.5*	*2.6*	*2.4*	*2.3*
Residential investment	1.2	4.4	7.3	5.0	-3.9	-4.3
Previous Tealbook	*1.6*	*5.2*	*7.0*	*3.9*	*-3.0*	*-3.7*
Nonresidential structures	-7.3	-10.7	-5.0	-2.8	-.1	-1.7
Previous Tealbook	*-7.2*	*-10.4*	*-3.8*	*-2.5*	*-.8*	*-1.8*
Equipment and intangibles	2.2	1.1	3.4	4.1	3.6	1.8
Previous Tealbook	*2.5*	*1.7*	*1.6*	*2.7*	*3.2*	*1.9*
Federal purchases	4.2	3.3	1.9	1.3	.2	.4
Previous Tealbook	*3.8*	*2.4*	*2.7*	*1.7*	*.2*	*.4*
State and local purchases	2.1	1.2	.8	.9	1.0	1.0
Previous Tealbook	*1.8*	*.5*	*1.0*	*1.0*	*1.0*	*1.1*
Exports	-.9	-1.0	4.7	4.6	4.0	3.5
Previous Tealbook	*-.6*	*-.2*	*3.3*	*2.7*	*3.3*	*3.5*
Imports	-2.3	-3.8	1.8	2.3	3.4	3.2
Previous Tealbook	*-.1*	*.6*	*1.5*	*2.0*	*3.1*	*3.2*
	Contributions to change in real GDP (percentage points)					
Inventory change	-.2	-.3	-.4	-.3	.0	.0
Previous Tealbook	*-.2*	*-.2*	*-.3*	*-.3*	*.0*	*.0*
Net exports	.2	.4	.3	.2	.0	.0
Previous Tealbook	*-.1*	*-.1*	*.2*	*.0*	*-.1*	*-.1*

Real GDP

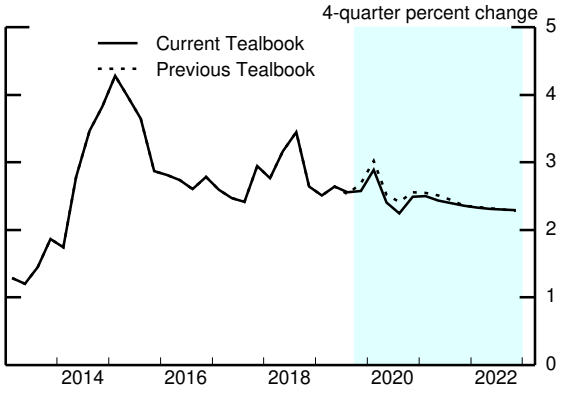


Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

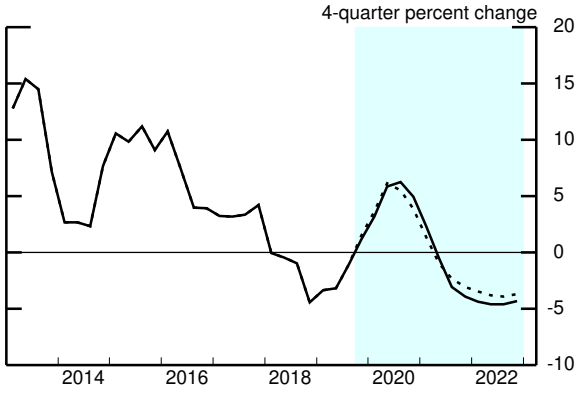
Domestic Econ Devel & Outlook

Components of Final Demand

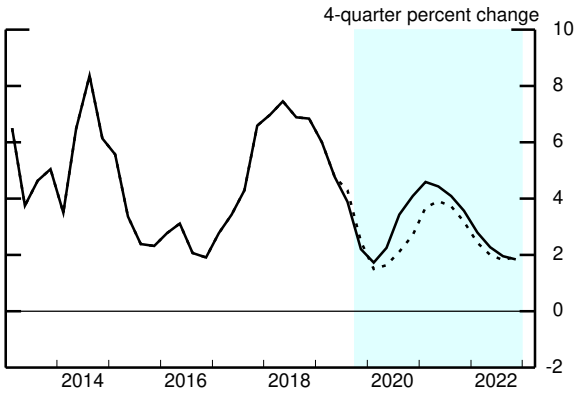
Personal Consumption Expenditures



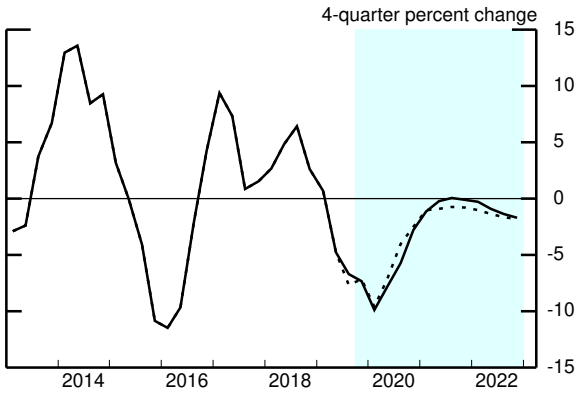
Residential Investment



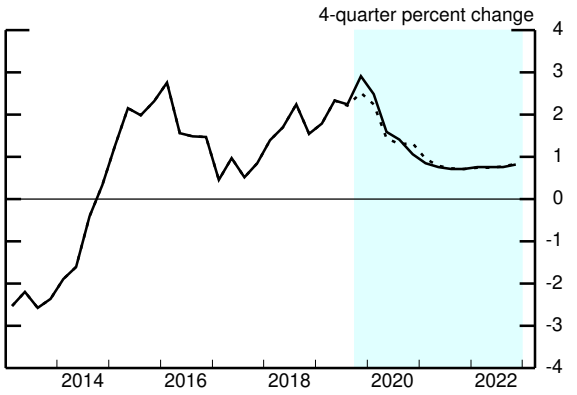
Equipment and Intangibles



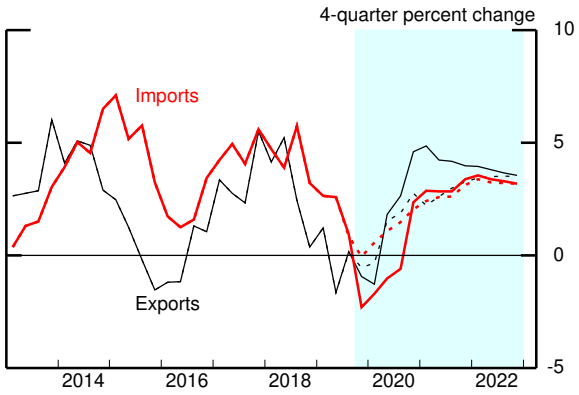
Nonresidential Structures



Government Consumption and Investment



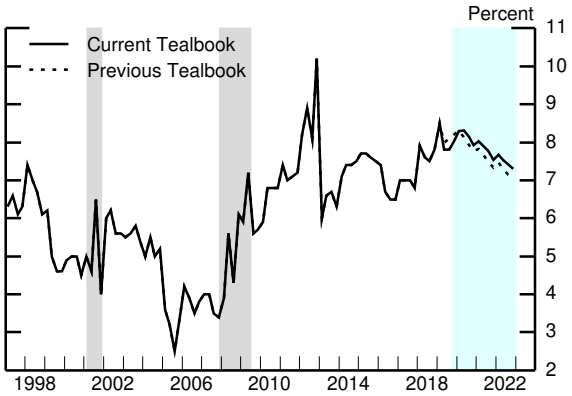
Exports and Imports



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

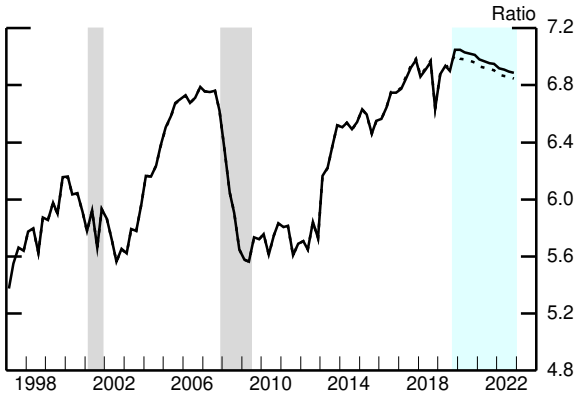
Aspects of the Medium-Term Projection

Personal Saving Rate



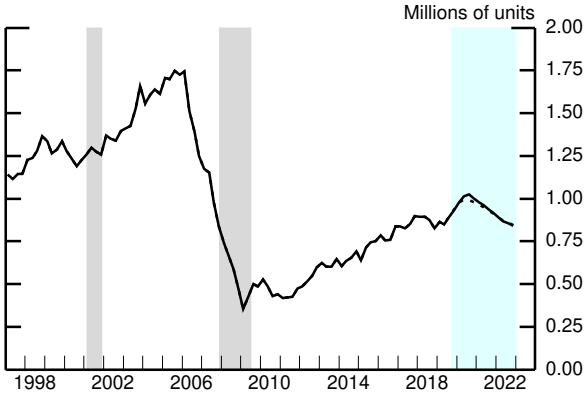
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Wealth-to-Income Ratio



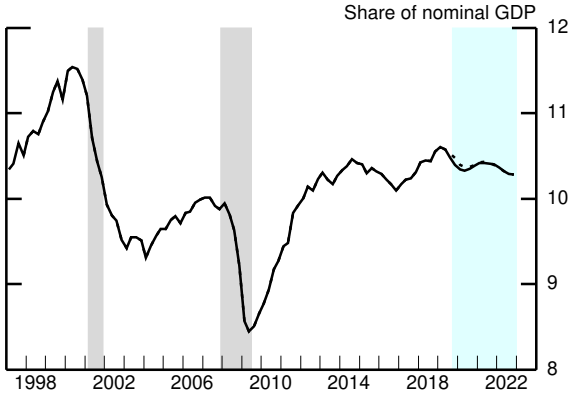
Note: Ratio of household net worth to disposable personal income.
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Single-Family Housing Starts



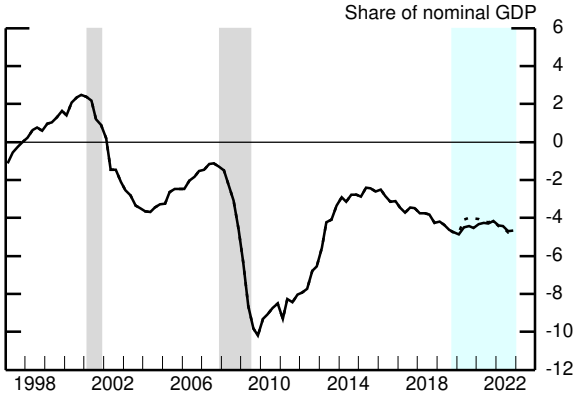
Source: U.S. Census Bureau.

Equipment and Intangibles Spending



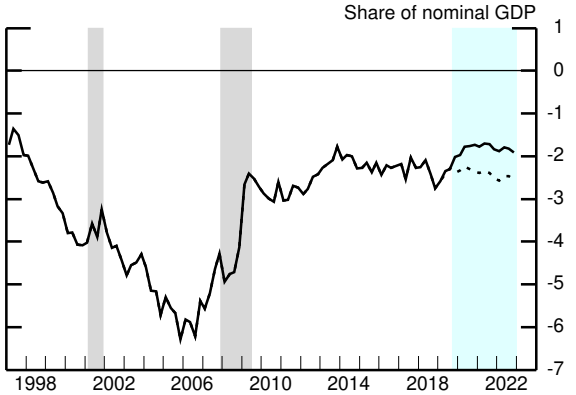
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Federal Surplus/Deficit



Note: 4-quarter moving average.
Source: *Monthly Treasury Statement.*

Current Account Surplus/Deficit



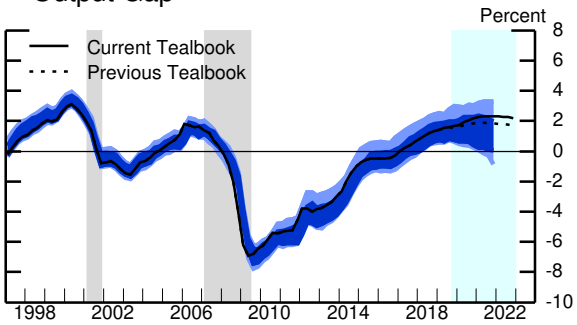
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

Domestic Econ Devel & Outlook

Cyclical Position of the U.S. Economy: Longer-Term Perspective

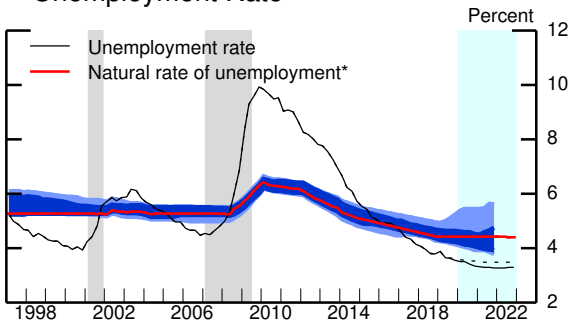
Output Gap



Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the output gap.

Source: Various macroeconomic data; staff assumptions.

Unemployment Rate

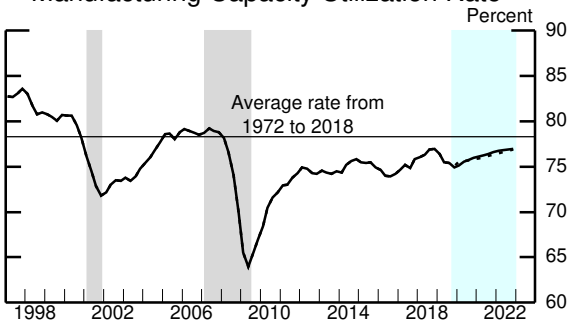


Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the natural rate.

*Staff estimate including the effect of extended and emergency unemployment insurance benefits.

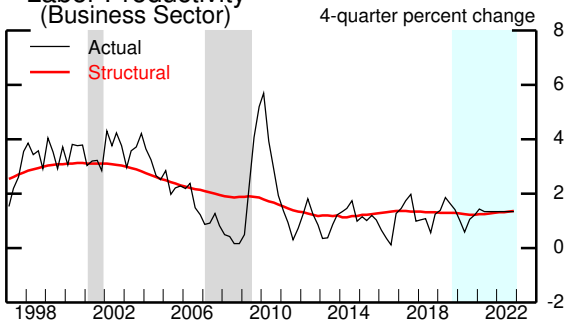
Source: Various macroeconomic data; staff assumptions.

Manufacturing Capacity Utilization Rate



Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."

Labor Productivity (Business Sector)



Source: U.S. Department of Labor, Bureau of Labor Statistics; U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.

Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

Decomposition of Potential Output

(Percent change, Q4 to Q4, except as noted)

Measure	1974-95	1996-2000	2001-07	2008-10	2011-17	2018	2019	2020	2021	2022
Potential output	3.1	3.6	2.7	1.9	1.5	1.8	1.8	1.8	1.8	1.8
Previous Tealbook	*3.1*	*3.6*	*2.7*	*1.9*	*1.5*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*
Selected contributions:[1]										
Structural labor productivity[2]	1.7	2.9	2.7	1.8	1.3	1.3	1.3	1.2	1.3	1.4
Previous Tealbook	*1.7*	*2.9*	*2.7*	*1.8*	*1.3*	*1.3*	*1.3*	*1.2*	*1.3*	*1.4*
Capital deepening	.7	1.4	1.0	.5	.8	.7	.7	.5	.5	.4
Multifactor productivity	.8	1.1	1.4	1.1	.2	.4	.4	.5	.6	.7
Structural hours	1.5	1.3	.8	.5	.4	.9	.3	.6	.6	.5
Previous Tealbook	*1.5*	*1.3*	*.8*	*.5*	*.4*	*.9*	*.3*	*.6*	*.6*	*.5*
Labor force participation	.4	-.1	-.2	-.4	-.4	-.2	-.1	-.2	-.2	-.3
Previous Tealbook	*.4*	*-.1*	*-.2*	*-.4*	*-.4*	*-.2*	*-.1*	*-.2*	*-.2*	*-.3*
Memo:										
Output gap[3]	-1.2	2.5	.3	-5.4	.6	1.4	1.7	2.2	2.3	2.2
Previous Tealbook	*-1.2*	*2.5*	*.3*	*-5.4*	*.6*	*1.4*	*1.5*	*1.8*	*1.8*	*1.7*

Note: For multiyear periods, the percent change is the annual average from Q4 of the year preceding the first year shown to Q4 of the last year shown.

1. Percentage points.
2. Total business sector.
3. Percent difference between actual and potential output in the final quarter of the period indicated. A negative number indicates that the economy is operating below potential.

The Outlook for the Labor Market

Measure	2019	2019 H2	2020 H1	2020	2021	2022
Nonfarm payroll employment[1]	176	189	207	150	103	74
Previous Tealbook	*168*	*172*	*186*	*131*	*95*	*74*
Private employment[1]	162	169	147	140	93	64
Previous Tealbook	*153*	*151*	*128*	*121*	*85*	*64*
Labor force participation rate[2]	63.2	63.2	63.1	63.0	62.9	62.6
Previous Tealbook	*63.2*	*63.2*	*63.1*	*63.0*	*62.8*	*62.6*
Civilian unemployment rate[2]	3.5	3.5	3.5	3.3	3.3	3.3
Previous Tealbook	*3.6*	*3.6*	*3.5*	*3.5*	*3.5*	*3.5*
Employment-to-population ratio[2]	61.0	61.0	60.9	60.9	60.9	60.6
Previous Tealbook	*60.9*	*60.9*	*60.8*	*60.8*	*60.7*	*60.4*

1. Thousands, average monthly changes.
2. Percent, average for the final quarter in the period.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Inflation Projections

Measure	2019	2019 H2	2020 H1	2020	2021	2022
Percent change at annual rate from final quarter of preceding period						
PCE chain-weighted price index	1.5	1.6	1.6	1.6	1.9	1.9
Previous Tealbook	*1.5*	*1.5*	*1.7*	*1.7*	*1.9*	*1.9*
Food and beverages	.9	.1	.8	1.3	2.3	2.3
Previous Tealbook	*1.1*	*.4*	*2.3*	*2.3*	*2.3*	*2.3*
Energy	-.4	-.2	-5.6	-3.8	.1	.7
Previous Tealbook	*-1.7*	*-2.7*	*-4.8*	*-2.8*	*.4*	*1.0*
Excluding food and energy	1.6	1.8	1.9	1.9	1.9	1.9
Previous Tealbook	*1.6*	*1.8*	*1.9*	*1.9*	*1.9*	*1.9*
Prices of core goods imports[1]	-.9	-.7	1.8	1.3	.9	.8
Previous Tealbook	*-.9*	*-.7*	*1.1*	*1.0*	*1.0*	*.9*

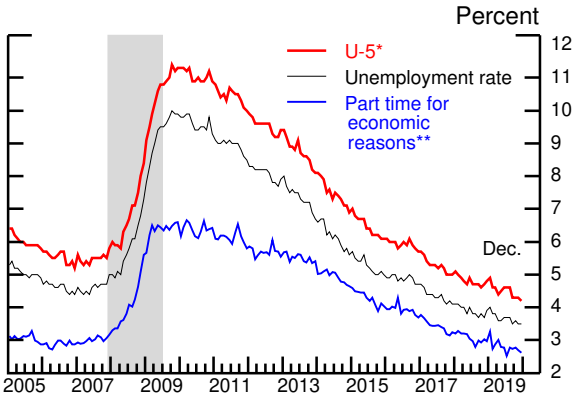
	Dec. 2019[2]	Jan. 2020[2]	Feb. 2020[2]	Mar. 2020[2]	Apr. 2020[2]	May 2020[2]
12-month percent change						
PCE chain-weighted price index	1.6	1.8	1.8	1.7	1.5	1.6
Previous Tealbook	*1.5*	*1.7*	*1.8*	*1.7*	...	...
Excluding food and energy	1.6	1.7	1.8	1.9	1.9	1.9
Previous Tealbook	*1.6*	*1.7*	*1.8*	*1.9*	...	...

... Not applicable.
1. Core goods imports exclude computers, semiconductors, oil, and natural gas.
2. Staff forecast.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Domestic Econ Devel & Outlook

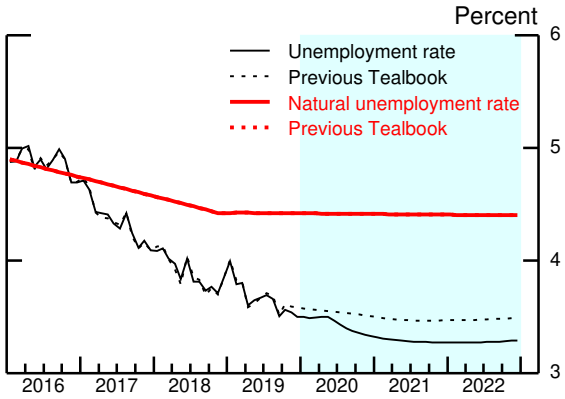
Labor Market Developments and Outlook (1)

Measures of Labor Underutilization



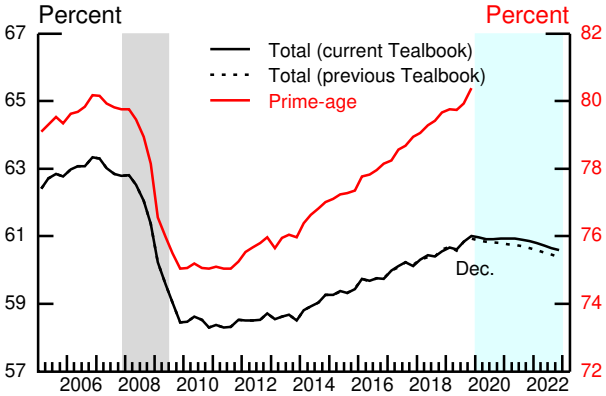
* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.
** Percent of Current Population Survey employment.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Unemployment Rate



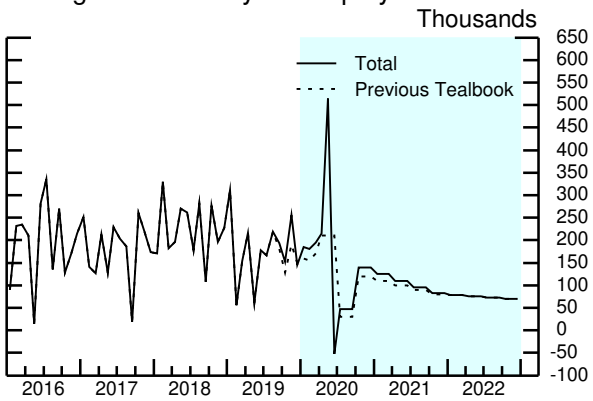
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Employment-to-Population Ratio



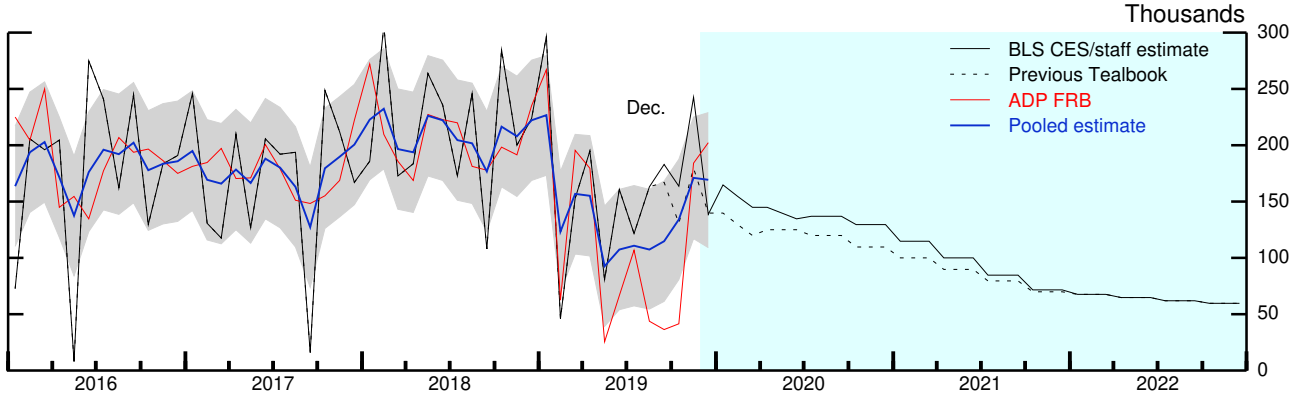
Note: Every curve except the one for the prime-age population corresponds with the left axis.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Change in Total Payroll Employment



Source: U.S. Department of Labor, Bureau of Labor Statistics.

Change in Private Payroll Employment

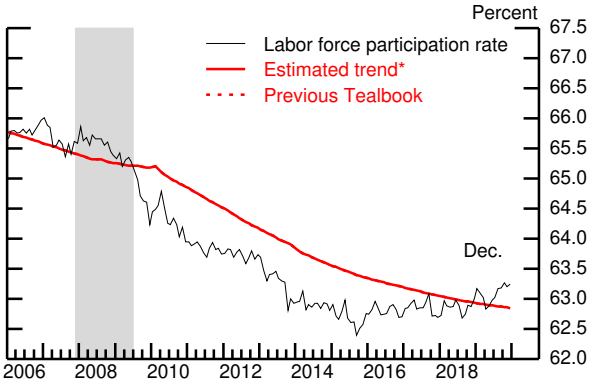


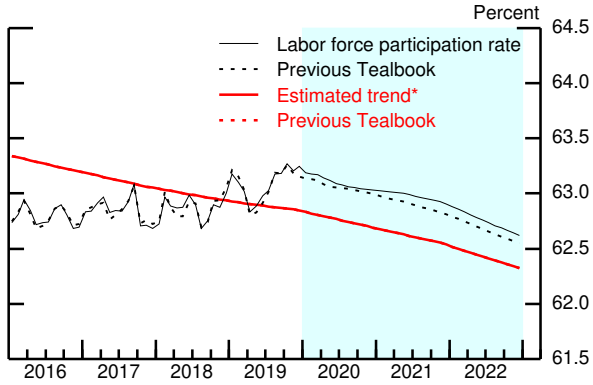
Note: Gray shaded area around blue line is 90 percent confidence interval around pooled estimate.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff calculations using microdata from ADP.

Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

Labor Market Developments and Outlook (2)

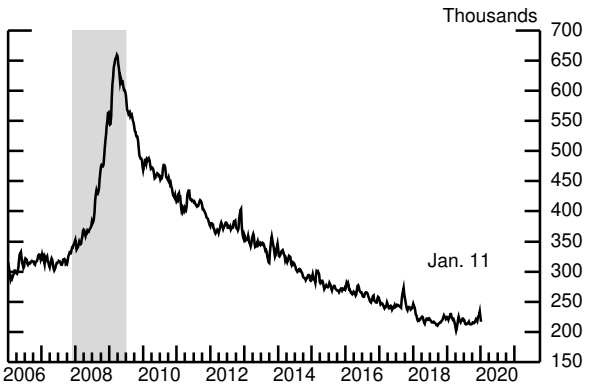
Labor Force Participation Rate





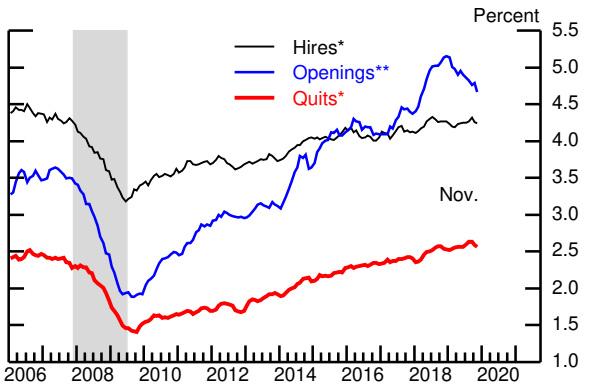
Note: Published data adjusted by staff to account for changes in population weights.
* Includes staff estimate of the effect of extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Initial Unemployment Insurance Claims



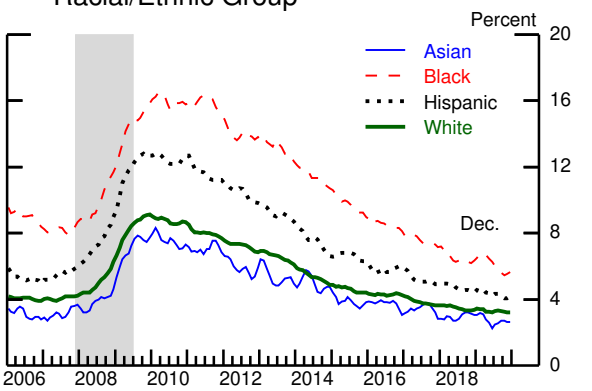
Note: 4-week moving average.
Source: U.S. Department of Labor, Employment and Training Administration.

Hires, Quits, and Job Openings



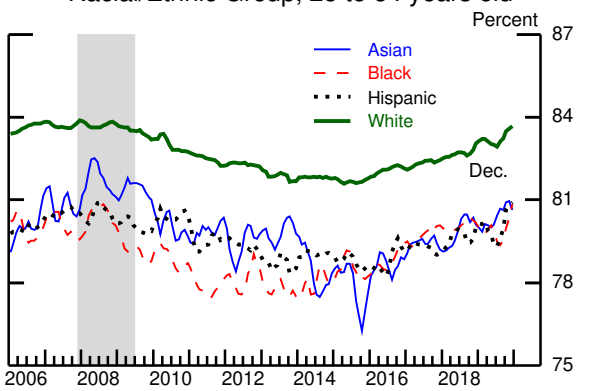
* Percent of private nonfarm payroll employment, 3-month moving average.
** Percent of private nonfarm payroll employment plus unfilled jobs, 3-month moving average.
Source: Job Openings and Labor Turnover Survey.

Unemployment Rate by Racial/Ethnic Group



Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving averages.
Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey.

Labor Force Participation Rate by Racial/Ethnic Group, 25 to 54 years old



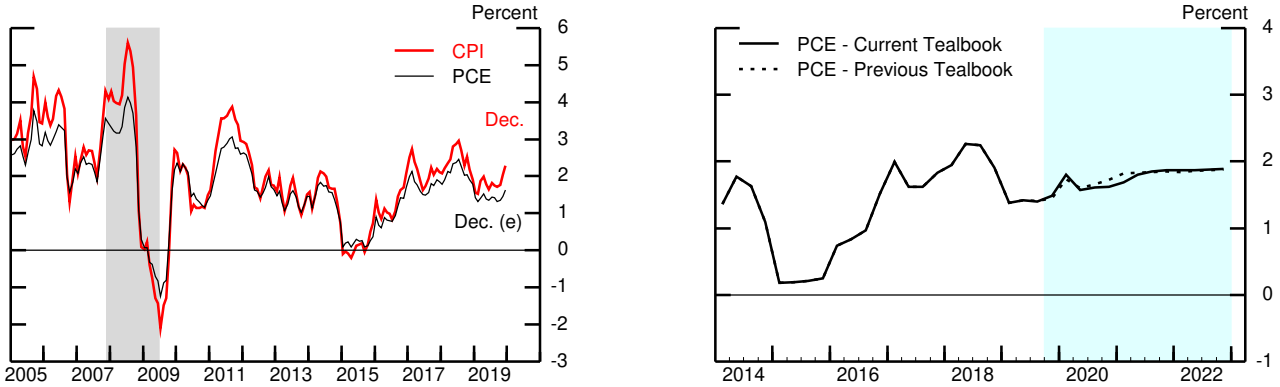
Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving averages.
Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey.

Domestic Econ Devel & Outlook

Inflation Developments and Outlook (1)

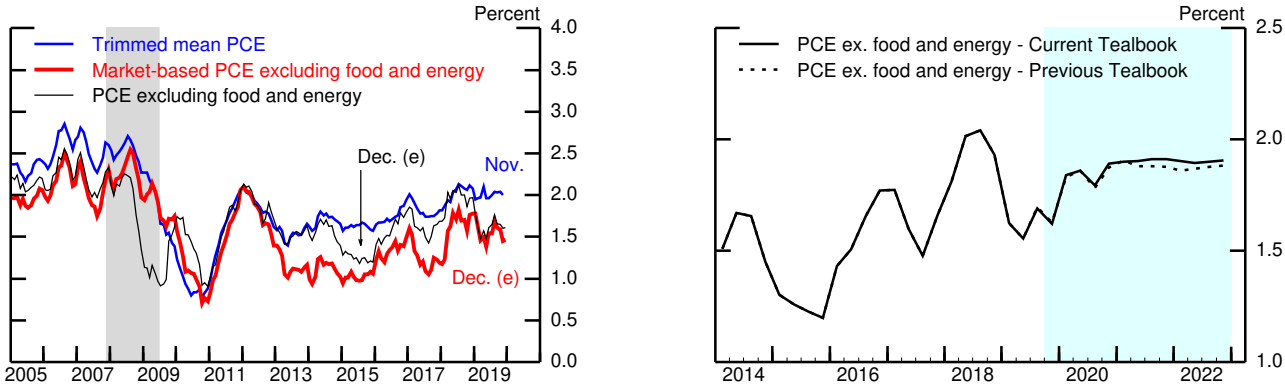
(Percent change from year-earlier period)

Headline Consumer Price Inflation



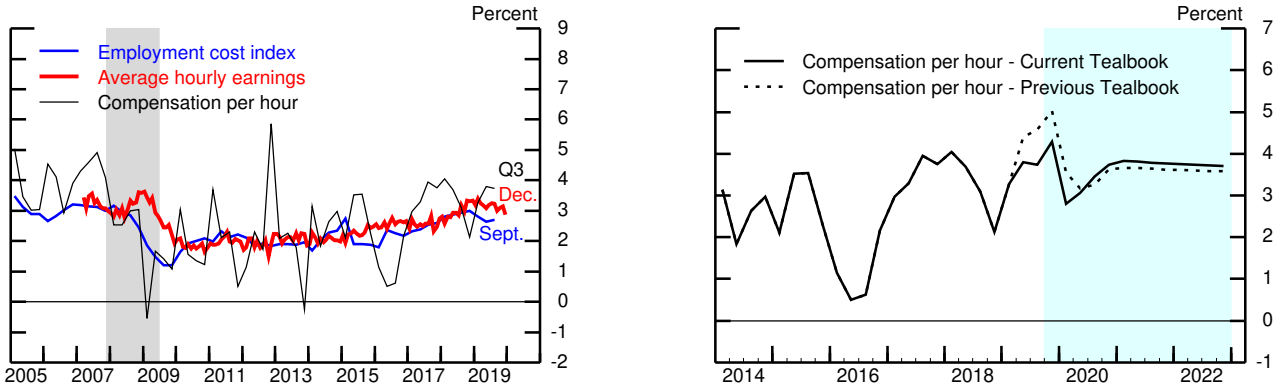
Note: PCE prices from November to December 2019 are staff estimates (e).
Source: For CPI, U.S. Department of Labor, Bureau of Labor Statistics; for PCE, U.S. Department of Commerce, Bureau of Economic Analysis.

Measures of Core PCE Price Inflation



Note: Core PCE prices from November to December 2019 are staff estimates (e).
Source: For trimmed mean PCE, Federal Reserve Bank of Dallas; otherwise, U.S. Department of Commerce, Bureau of Economic Analysis.

Labor Cost Growth



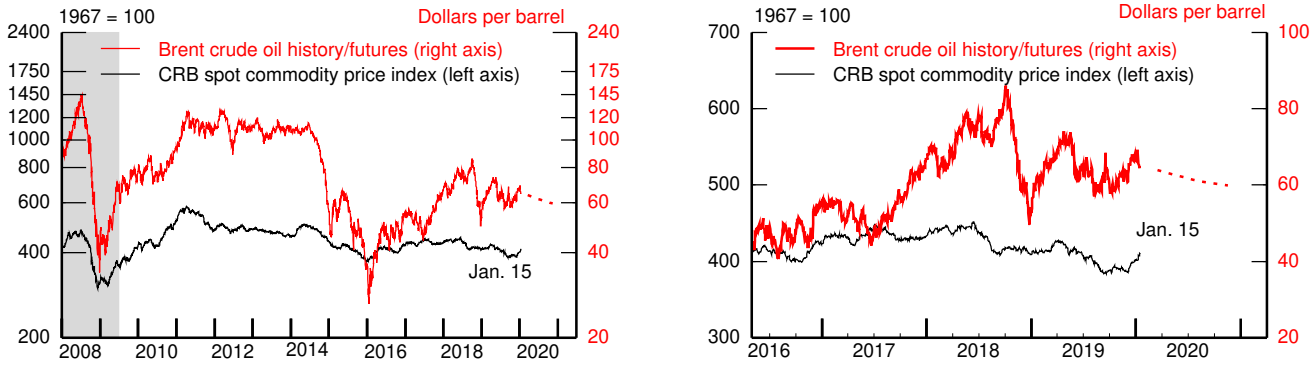
Note: Compensation per hour is for the business sector. Average hourly earnings are for the private nonfarm sector. The employment cost index is for the private sector.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

Inflation Developments and Outlook (2)

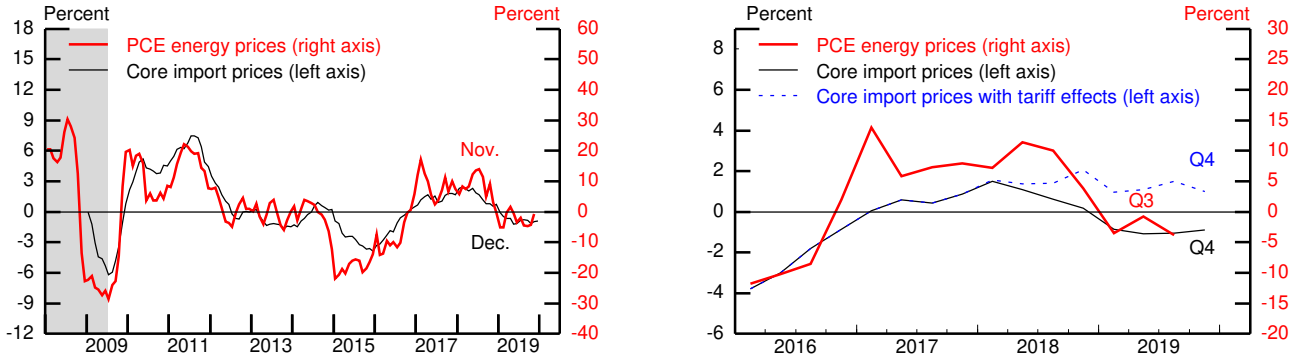
(Percent change from year-earlier period, except as noted)

Commodity and Oil Price Levels



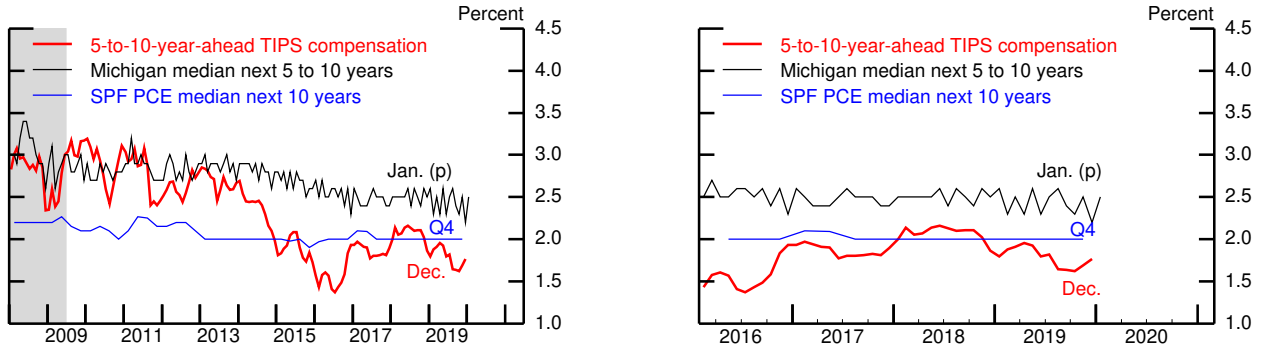
Note: Futures prices (dotted lines) are the latest observations on monthly futures contracts.
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

Energy and Import Price Inflation



Source: For core import prices, U.S. Dept. of Labor, Bureau of Labor Statistics; for PCE, U.S. Dept. of Commerce, Bureau of Economic Analysis. For core import prices with a tariff effect, Federal Reserve Board staff calculations.

Long-Term Inflation Expectations and Compensation



Note: Based on a comparison of an estimated TIPS (Treasury Inflation-Protected Securities) yield curve with an estimated nominal off-the-run Treasury yield curve, with an adjustment for the indexation-lag effect.
(p) Preliminary.
SPF Survey of Professional Forecasters.
Source: For Michigan, University of Michigan Surveys of Consumers; for SPF, Federal Reserve Bank of Philadelphia; for TIPS, Federal Reserve Board staff calculations.

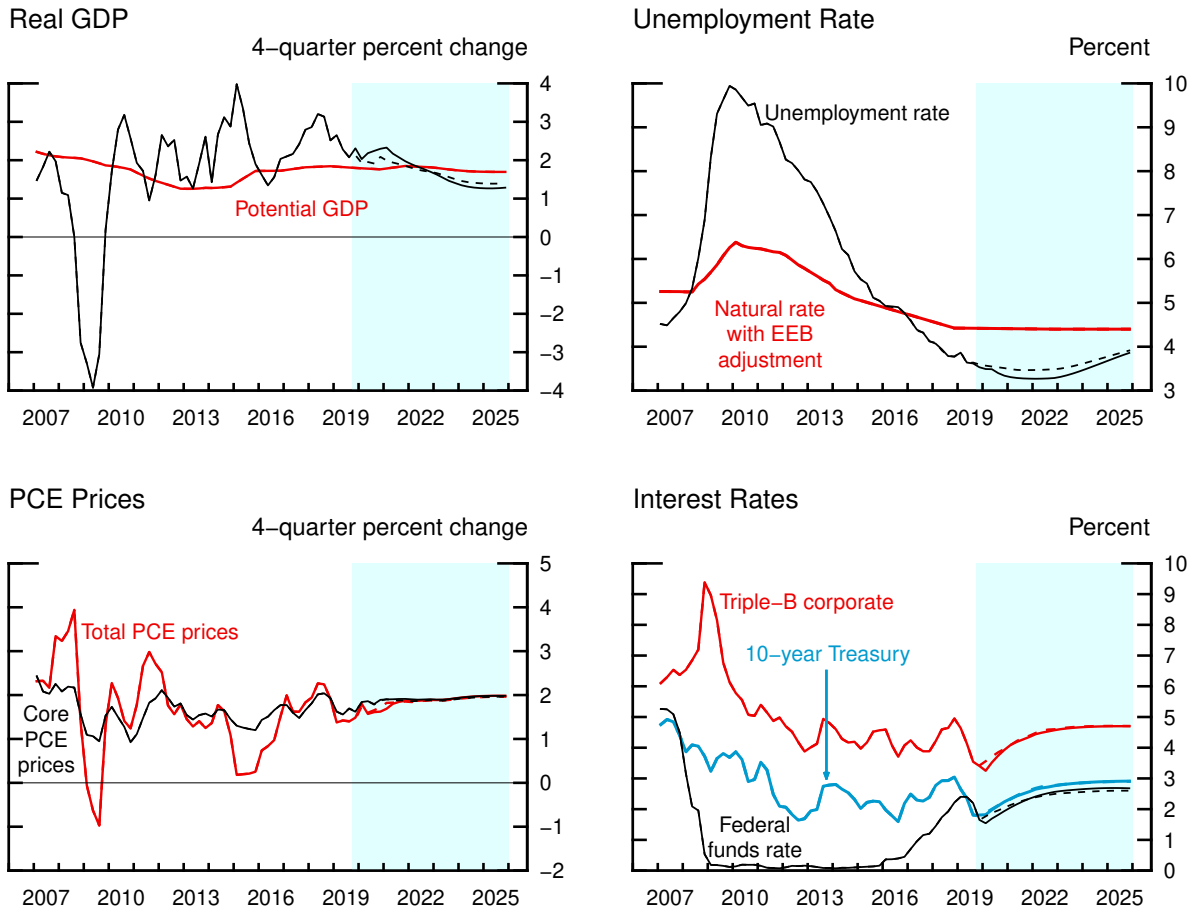
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

The Long–Term Outlook

(Percent change, Q4 to Q4, except as noted)

Measure	2019	2020	2021	2022	2023	2024	2025	Longer run
Real GDP	2.3	2.3	2.0	1.7	1.4	1.3	1.3	1.7
Previous Tealbook	*2.1*	*2.1*	*1.9*	*1.7*	*1.5*	*1.4*	*1.4*	*1.7*
Civilian unemployment rate[1]	3.5	3.3	3.3	3.3	3.4	3.6	3.9	4.4
Previous Tealbook	*3.6*	*3.5*	*3.5*	*3.5*	*3.6*	*3.8*	*3.9*	*4.4*
PCE prices, total	1.5	1.6	1.9	1.9	1.9	2.0	2.0	2.0
Previous Tealbook	*1.5*	*1.7*	*1.9*	*1.9*	*1.9*	*2.0*	*2.0*	*2.0*
Core PCE prices	1.6	1.9	1.9	1.9	1.9	2.0	2.0	2.0
Previous Tealbook	*1.6*	*1.9*	*1.9*	*1.9*	*1.9*	*2.0*	*2.0*	*2.0*
Federal funds rate[1]	1.65	1.94	2.34	2.56	2.64	2.69	2.68	2.50
Previous Tealbook	*1.65*	*2.05*	*2.34*	*2.49*	*2.55*	*2.59*	*2.60*	*2.50*
10-year Treasury yield[1]	1.8	2.2	2.6	2.8	2.9	2.9	2.9	3.0
Previous Tealbook	*1.8*	*2.2*	*2.6*	*2.8*	*2.8*	*2.9*	*2.9*	*3.0*

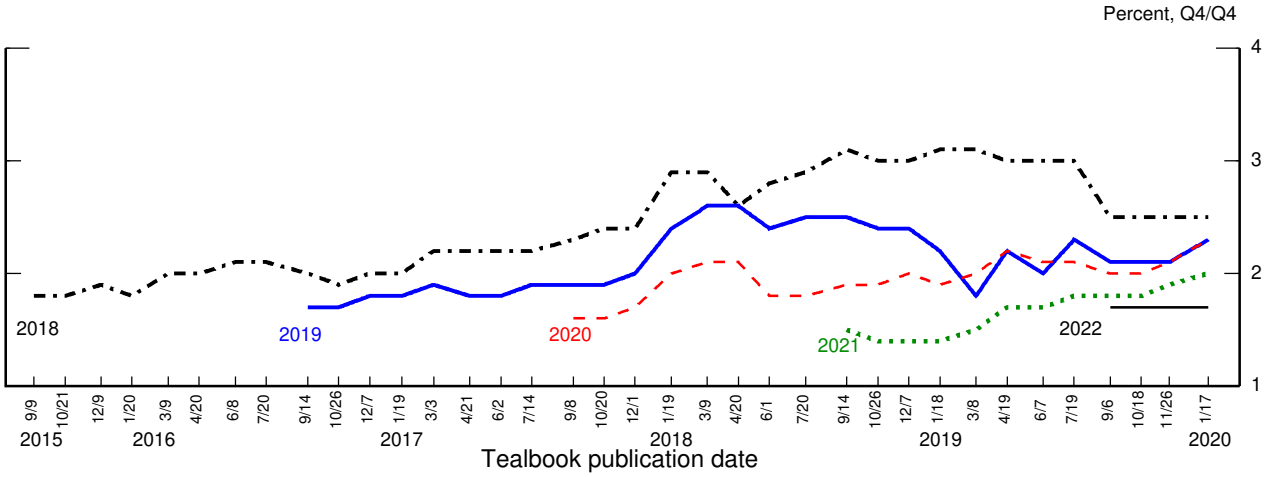
1. Percent, average for the final quarter of the period.



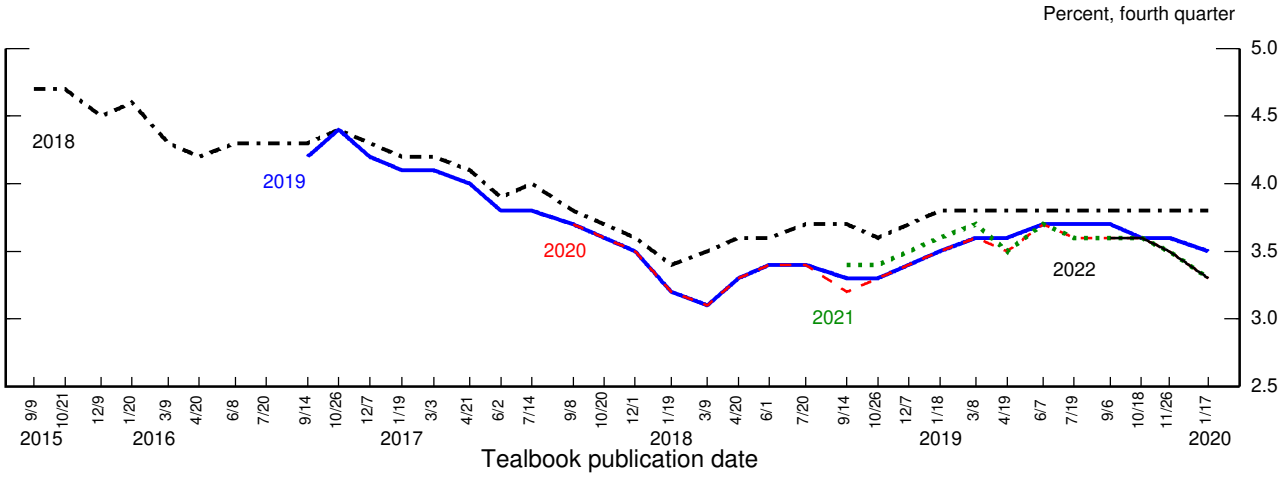
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

Evolution of the Staff Forecast

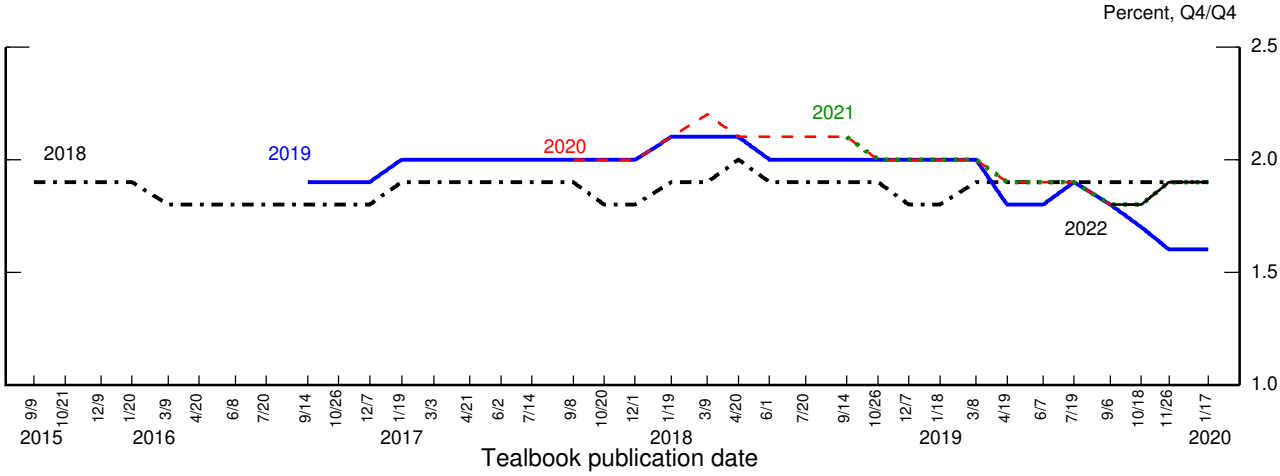
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



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International Economic Developments and Outlook

Incoming data suggest that foreign economic growth remained depressed at the end of last year, with real GDP growth slowing to an annual rate of 0.8 percent in the fourth quarter, its lowest level since the Global Financial Crisis and a bit below our previous forecast. The subdued pace of growth at the end of the year followed an earlier, extended sequence of weak quarters for the global economy, which was held down by a slump in global manufacturing, elevated trade tensions, and political and social unrest in several economies.

Nonetheless, we have reasons to believe that growth abroad will step up in early 2020, albeit to a still-muted pace, before rising to 2.3 percent later this year (about potential) and remaining around that pace further out. First, as we have been anticipating, trade tensions appear to be easing, helped along by the recently signed phase-one U.S.–China agreement. Second, the latest PMIs suggest that global manufacturing activity may have bottomed out, and the high-tech industry continues to rebound in emerging Asia. In addition, euro-area growth has remained stable (though at a subdued pace), which has eased concerns of an imminent recession in the region, and we see signs that Chinese economic activity has gained some momentum. Finally, the effects from several transitory factors that pushed growth down toward the end of the year—the consumption tax hike in Japan, political and social unrest in Hong Kong and Chile, and the effects of the General Motors (GM) strike on the Mexican economy—should dissipate, helping lift foreign economic activity in the near term.

We see both downside and upside risks to our foreign outlook. On the downside, the global manufacturing slump could deepen further despite tentative indications suggesting otherwise, particularly if trade tensions resurge. We discuss this possibility in our "Foreign Slowdown" alternative scenario in the Risks and Uncertainty section. Moreover, although recent tensions in the Middle East have subsided for now, they could reemerge and escalate further. We describe the possible effect of such a development on the global economy in our "Geopolitical Tensions" scenario, with more context provided in the box "Geopolitical Risk in the Middle East." On the upside, improving sentiment and reduced near-term uncertainty around both trade policy and Brexit might provide a greater boost to economic activity than we are anticipating.

Geopolitical Risk in the Middle East

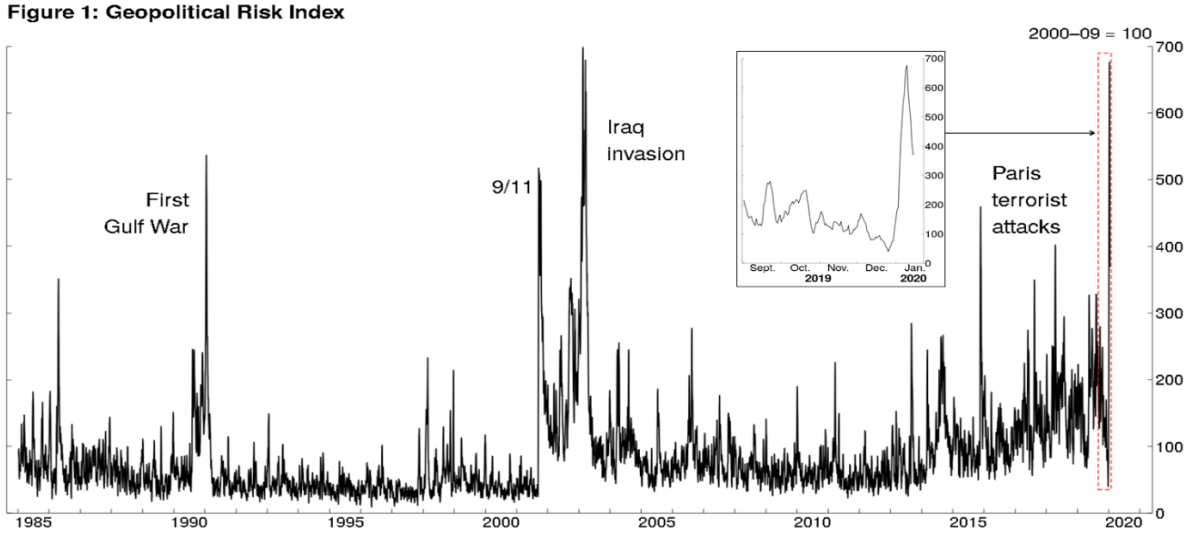
On January 2, a U.S. airstrike killed one of Iran's top military commanders, triggering retaliatory actions in the following days before tensions subsided. This discussion explores the risks to the global economy from a re-escalation of hostilities in the Middle East and provides some context for our "Geopolitical Tensions" alternative scenario in the Risks and Uncertainty section.

The flare-up caused the largest spike in geopolitical risk since the U.S. invasion of Iraq in 2003 (figure 1).[1] Even so, the spike had a limited effect on markets, mainly because tensions were not sustained but also because U.S. sanctions had already sharply curtailed Iranian oil production. Stock prices declined only temporarily, and oil prices jumped nearly 10 percent but quickly retraced (figure 2). The VIX (not shown) experienced a modest and short-lived increase.

Nonetheless, a pronounced re-escalation of hostilities in the region could disrupt oil production and shipments more broadly across the region. If the United States or other oil producers did not offset shortfalls quickly, oil prices could increase substantially, likely reducing household spending and increasing firms' production costs. Additional drag on global activity would likely come from the effect of heightened geopolitical uncertainties on confidence and spending. Recent research shows that, historically, geopolitical tensions have led to a decline in consumer sentiment, elevated economic uncertainty, and a weakening in business investment.

These sentiment effects of geopolitical tensions depend not only on their extent and intensity, but also on their persistence. As highlighted in table 1, the Iraq invasion of Kuwait resulted in a

Figure 1: Geopolitical Risk Index



Note: Data go through January 15, 2020. Seven-day moving average of the Geopolitical risk index. The index is constructed from 11 major newspapers and is based on the share of articles in leading newspapers discussing geopolitical tensions, risks of war, and terrorist threats.
Source: See Caldara and Iacoviello (2018) in note 1.

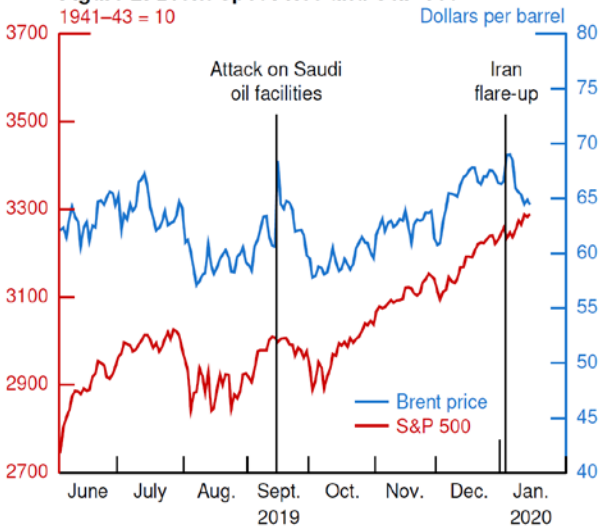
[1] We measure geopolitical risk as the share of articles in leading newspapers discussing geopolitical tensions, risks of war, and terrorist threats. For a detailed description of the geopolitical risk index, see Dario Caldara and Matteo Iacoviello (2018), "Measuring Geopolitical Risk," International Finance Discussion Papers 1222 (Washington: Board of Governors of the Federal Reserve System, February; revised December 2019), https://www.federalreserve.gov/econres/ifdp/files/ifdp1222.pdf.

prolonged rise in geopolitical tensions that had severe macroeconomic consequences. Oil prices nearly doubled over the course of a few months, and economic and geopolitical uncertainty rose amid falling global equity markets. The U.S. economy entered a recession, the dollar depreciated, and the federal funds rate declined. These tensions abated only after the U.S intervention in January 1991. By contrast, although the September 2019 disruption in Saudi oil production also had an effect on geopolitical risk, this effect was only fleeting, as oil production was quickly restored and tensions between Iran and Saudi Arabia did not escalate. The effect of tensions between the United States and Iran earlier this month was similarly short lived.

The Risks and Uncertainty section illustrates a scenario in which a prolonged episode of either outright hostilities in the Middle East or the pronounced threat of such hostilities causes a global economic slowdown amid a surge in oil prices, tight financial conditions, weakened confidence, and an appreciation of the dollar. Such a scenario is partly modeled after the financial responses that followed the 1990 Iraq invasion of Kuwait, although we have adjusted some of our assumptions to reflect changes in the global economy since 1990. In particular, for the United States the share of net oil imports in GDP has declined substantially as U.S. shale oil production has grown so that higher oil prices now redistribute less purchasing power overseas than in the past. Conversely, flight-to-safety flows are likely to cause an appreciation of the dollar, contrary to what happened during the Iraq invasion of Kuwait. Finally, the current fragile state of the global economy, limited policy space in many economies, and greater prospects of cyber warfare are likely to amplify any risk to the global outlook.

All in all, in our scenario oil prices double, the dollar appreciates 7 percent, and equity prices decline more than 10 percent globally. These developments lead to a significant hit to U.S. growth (of about 1¼ percentage points below baseline) and result in lower inflation and a shallower path of the federal funds rate.

Figure 2: Brent Spot Price and S&P 500



Note: Data go through January 15, 2020.
Source: Bloomberg; Standard & Poor's.

Table 1: Macroeconomic and Financial Conditions during the Iraq Invasion of Kuwait

Indicator	Change
Geopolitical risk index	457%
Oil price	93%
S&P 500	-15%
Broad real dollar	-5%
Fed funds rate	-240 bps
U.S. GDP growth	-3 pp

Note: Changes are calculated between July 1990 and the following peak or trough of each variable. For GDP growth, we report the difference between year-on-year growth in 1991:Q2 and 1990:Q2.
Source: Staff calculations.

Int'l Econ Devel & Outlook

Inflation remained soft in the advanced foreign economies (AFEs), in part reflecting previous declines in energy prices. Core inflation also remained subdued in most AFEs, with 12-month changes at 1.3 percent in December in the euro area and 0.4 percent in November in Japan. Amid dormant inflation pressures and a subpar growth outlook, we continue to see monetary policies remaining highly accommodative in the AFEs throughout the forecast period. Moreover, we assume that the Bank of Canada (BOC) and the Bank of England (BOE) will cut their policy rates in the current quarter, with the U.K. cut coming earlier than previously expected on account of disappointing data and dovish communications from BOE officials. Amid benign global financial conditions and slow growth, several emerging market economy central banks—including those of Argentina, Brazil, China, Mexico, Russia, South Africa, and Turkey—eased policy further since the previous Tealbook.

ADVANCED FOREIGN ECONOMIES

- ***Euro Area.*** We estimate that the pace of economic activity remained subdued, but stable, at 0.9 percent in the final quarter of 2019. Data through November indicate that manufacturing output continued to contract in the fourth quarter, but more-recent indicators suggest that the manufacturing slump is nearing an end. In addition, activity in the services sector appears to have continued to expand moderately. We project growth in the region to increase to 1.3 percent this year (about potential) and further to 1.6 percent in 2021 and 2022, supported by accommodative monetary policy, slightly expansionary fiscal policy, and easy financial conditions.

  Twelve-month headline and core inflation both registered at 1.3 percent in December. We expect inflation to rise to 1.5 percent in 2022 as the output gap narrows. Amid unexceptional growth and below-target inflation, we continue to expect the European Central Bank to run its Asset Purchase Programme until the second quarter of 2021 and maintain its deposit rate at the current record low level of negative 0.5 percent until the end of 2021.

- ***Japan.*** Real GDP grew at a robust pace of about 2 percent at an annual rate over the first three quarters of 2019, supported by strong domestic demand—in particular, private consumption. Growth in consumption was driven, in part, by the pulling forward of purchases ahead of the October consumption tax hike. Available indicators suggest that GDP contracted 2.8 percent in the fourth quarter, but we expect this contraction to be followed by 1.1 percent growth in the current quarter, a

pattern consistent with swings in economic activity observed around previous consumption tax hikes. Thereafter, we see GDP growth remaining a bit above its potential pace of 0.7 percent, partially supported by spending related to the 2020 Tokyo Olympics.

With the tax hike boosting prices less than expected, 12-month total inflation was only 0.5 percent in November, while core inflation was 0.4 percent. We forecast that inflation will pick up to 1 percent by 2022, supported by expansionary monetary policy and a persistently positive output gap. We expect the Bank of Japan (BOJ) to keep its deposit rate at negative 0.1 percent and keep long-term yields near 0 percent through 2021, reflecting the BOJ's desire to continue providing stimulus while avoiding the additional pressure on financial institutions that more-negative interest rates might cause.

- ***United Kingdom.*** Incoming data, including monthly GDP through November and PMIs through December, suggest that Brexit-related uncertainty continued to depress economic activity in the final quarter of 2019, with real GDP estimated to have contracted 0.3 percent, below even the meager 0.1 percent expansion we had projected at the time of the November Tealbook. Prime Minister Boris Johnson's Conservative Party won a strong majority in the U.K. general elections, paving the way for the United Kingdom to formally leave the European Union (EU) by the end of this month. However, we expect Brexit uncertainty to persist through 2020 because the negotiations on the future U.K.–EU relationship (especially regarding the new trade arrangements) are likely to be quite contentious. We assume that an agreement will be reached by the end of this year in line with Johnson's commitment to wrap up the negotiations in 2020, though this timeline will prove challenging. Accordingly, we project that growth of only 0.7 percent in 2020 (well below potential of 1.2 percent) will be followed by a pickup to 1.4 percent in 2021 as Brexit uncertainties ease and with the support of accommodative monetary and fiscal policies.

  Twelve-month headline inflation fell to 1.3 percent in December, the lowest level in three years, while core inflation declined to 1.4 percent. As retail energy prices stabilize and temporary factors pushing down core inflation (including the appreciation of the pound since mid-2019) subside, headline inflation should edge up in early 2020. However, we see inflation remaining a bit below the BOE's 2 percent target through the end of the forecast period as some resource slack persists. Given

the gloomier outlook and recent dovish communications from BOE officials, we now assume that the BOE will cut its policy rate from 0.75 percent to 0.5 percent in the current quarter, two quarters earlier than projected in the November Tealbook. Additionally, we now expect the BOE to keep its policy on hold somewhat longer after the projected cut, waiting until 2022 to start raising rates.

- ***Canada.*** We estimate that GDP growth slowed to a modest 0.8 percent in the fourth quarter, held down by spillovers from the GM strike that depressed manufacturing activity. Moreover, recent exports and manufacturing PMI data point to weaker momentum. Consequently, we now see growth moving up to only 1.5 percent in the first half of the year, about 0.25 percentage point less than in the November Tealbook, and lingering around its potential rate of 1.7 percent through the remainder of the forecast period. With inflation close to target and the growth outlook weak, we expect the BOC to cut its policy rate by 25 basis points to 1.5 percent in the first half of this year and wait until the second half of 2021 to resume policy tightening.

EMERGING MARKET ECONOMIES

- ***China.*** Real GDP growth picked up to 6.1 percent in the fourth quarter from 5.4 percent in the third, about 0.5 percentage point above our November forecast. The pickup was driven by a broad-based turnaround in industrial production, with heavy industry recovering from earlier factory shutdowns and high-tech production rebounding, while recent exports data point to external demand stabilizing. Moreover, while the auto sector remains a source of weakness, a pickup in output and sales in December may signal a turnaround in 2020. However, ongoing concerns about the health of China's small banks have left financial conditions tight, especially for smaller private firms that rely disproportionately more on regional lenders. All told, we see growth remaining at just above 6 percent in the first half of the year, supported by reduced trade tensions and some policy stimulus, before slowing gradually in line with potential over the remainder of the forecast period.

  We see the recent signing of the U.S.–China phase-one agreement as having mixed implications for China but being probably positive on net. On the plus side, it should boost Chinese activity through reduced trade uncertainty as well as through some direct positive effects from a reduction in tariffs. On the negative side, the deal also stipulates a substantial increase in Chinese imports from the United States that could

offset this boost, but incomplete compliance and China's ability to substitute imports from other countries to those from the United States should limit the effect.

Inflation remains elevated, almost entirely reflecting the effects of African swine flu on pork prices. We expect 12-month inflation to peak at around 5 percent in the current quarter before falling to 2.5 percent by the end of the year.

- ***Asia ex. China.*** After a flat third quarter, growth in the region is estimated to have increased to a still very weak 0.7 percent in the fourth. The weakness is largely attributable to Hong Kong, where recent indicators point to another double-digit contraction in the fourth quarter amid ongoing social unrest. Growth is also estimated to be exceptionally weak in India, where a slow-burning financial crisis has been met with a plodding policy response. Elsewhere in the region, we continue to see signs of a modest, though uneven, recovery. Manufacturing PMIs have generally picked up in the region in recent months, rising above 50 in many cases, and high-tech production has soared in some economies. We expect a further strengthening of the high-tech cycle, together with easing U.S.–China trade tensions, to support a recovery of growth in much of the region. Our forecast also assumes that the situation in Hong Kong will not deteriorate further, but the recovery will be slow. In India, an easing in financial conditions should eventually help restore growth to its trend pace of around 7 percent. All told, we expect growth in the region to step up to 2.8 percent in the current quarter before rising to about 3.5 percent thereafter.

- ***Mexico.*** The GM strike dealt yet another blow to Mexico's beleaguered economy in the fourth quarter. Mexico's automotive exports, which account for about one-third of total exports, plunged in September and October and remained weak in November, driving steep declines in industrial production. As a result, we estimate that real GDP contracted 0.3 percent in the fourth quarter at an annual rate, capping off a year of equally dismal performance. The disappointing outcome last year largely reflected the weakness in global manufacturing as well as the government's shortfall in fiscal spending and market-unfriendly policies. As the effects of the GM strike dissipate, we expect growth to rise in the current quarter, albeit to a still-meager 1.3 percent. We see growth rising to 2 percent only by mid-2021, supported by the continued expansion of U.S. manufacturing, monetary policy easing, and a gradual turnaround in public investment. That said, we revised down Mexican growth about 0.3 percentage point over the medium term in light of the government's market-unfriendly policies.

Twelve-month inflation declined to 2.8 percent in December, below the 3 percent inflation target, with core inflation edging down to 3.4 percent. Citing the weak economy, low headline inflation, and benign global financial conditions, the Bank of Mexico decreased the policy rate 25 basis points for a fourth time in a row, to 7.25 percent.

- ***Brazil.*** Brazil's recovery continues, with real GDP growing at a 2.5 percent pace in the third quarter, following 2 percent growth in the second. Private investment jumped more than 8 percent, and household demand continued to recover, supported by further reductions in policy interest rates. Recent indicators, including industrial production and retail sales, suggest that the recovery continued in the fourth quarter, albeit at a somewhat more subdued pace, with growth penciled in at 2.2 percent. We see growth picking up to 2.6 percent by the end of 2020, with the help of monetary policy easing and improved business sentiment following the passage of the pension reform late last year. Amid still-high unemployment and quiescent underlying inflation, the Brazilian central bank cut its policy rate another 50 basis points, to 4.5 percent, at its December meeting.

- ***Chile.*** Chile's economy was rocked by massive social protests in the fourth quarter that shut down the capital and led to an estimated 16 percent contraction in real GDP at an annual rate. The protests were triggered by a hike in subway fares against a backdrop of growing social dissatisfaction over the high level of inequality. The government responded to these pressures by retracting the fare hikes and making other concessions, including a plan to draft a new constitution later this year to replace the military-era constitution. Although the protests have diminished in size and intensity, consumer and business confidence remain depressed. Accordingly, we expect a relatively moderate rebound in growth over the next few quarters.

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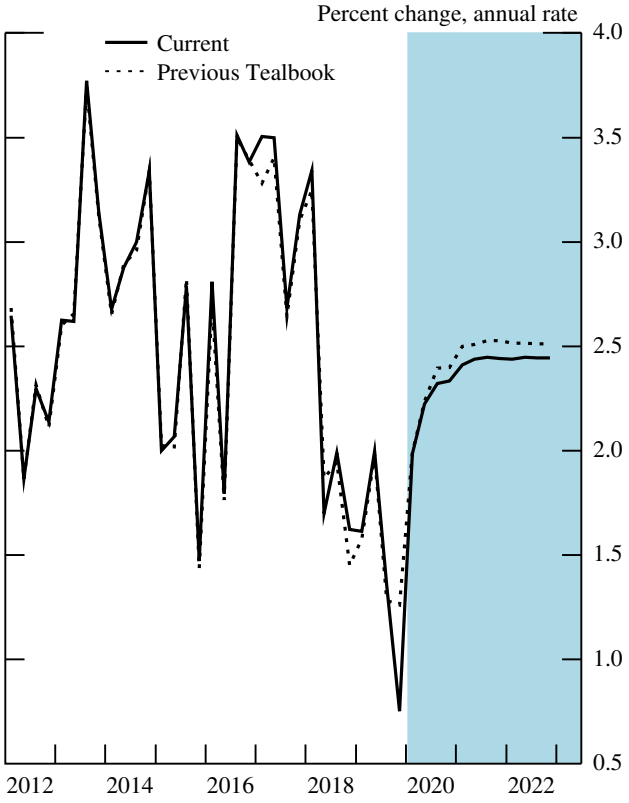
The Foreign GDP Outlook

Real GDP* Percent change, annual rate**

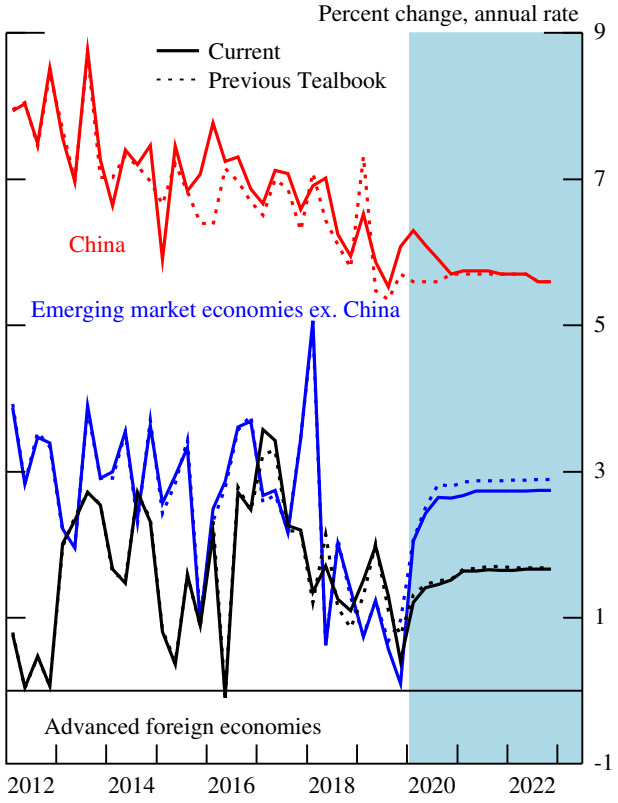
	2018	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020	2021	2022
1. Total foreign	2.2	1.6	2.0	1.4	.8	2.2	2.4	2.4
Previous Tealbook	*2.1*	*1.6*	*2.0*	*1.3*	*1.3*	*2.3*	*2.5*	*2.5*
2. Advanced foreign economies	1.4	1.5	2.0	1.3	.4	1.4	1.6	1.7
Previous Tealbook	*1.3*	*1.3*	*2.0*	*1.1*	*.8*	*1.4*	*1.7*	*1.7*
3. Canada	1.8	.8	3.5	1.3	.8	1.6	1.8	1.8
4. Euro area	1.2	1.8	.7	.9	.9	1.3	1.6	1.6
5. Japan	-.3	2.6	2.0	1.8	-2.8	1.0	.8	.8
6. United Kingdom	1.4	2.5	-.7	1.7	-.3	.7	1.4	1.5
7. Emerging market economies	3.0	1.7	2.0	1.4	1.1	3.0	3.2	3.2
Previous Tealbook	*2.9*	*1.9*	*1.9*	*1.5*	*1.8*	*3.1*	*3.4*	*3.4*
8. China	6.5	6.5	5.9	5.5	6.1	6.0	5.7	5.6
9. Emerging Asia ex. China	3.4	2.2	2.8	.2	.7	3.4	3.5	3.5
10. Mexico	1.4	-.4	-.2	.1	-.3	1.5	1.9	2.0
11. Brazil	1.3	-.0	1.9	2.5	2.2	2.3	2.8	2.8
Memo								
Emerging market economies ex. China	2.3	.7	1.2	.6	.1	2.4	2.7	2.7

* GDP aggregates weighted by shares of U.S. merchandise exports.
** Annual data are Q4/Q4.

Total Foreign GDP



Foreign GDP



The Foreign Inflation Outlook

Consumer Prices* Percent change, annual rate**

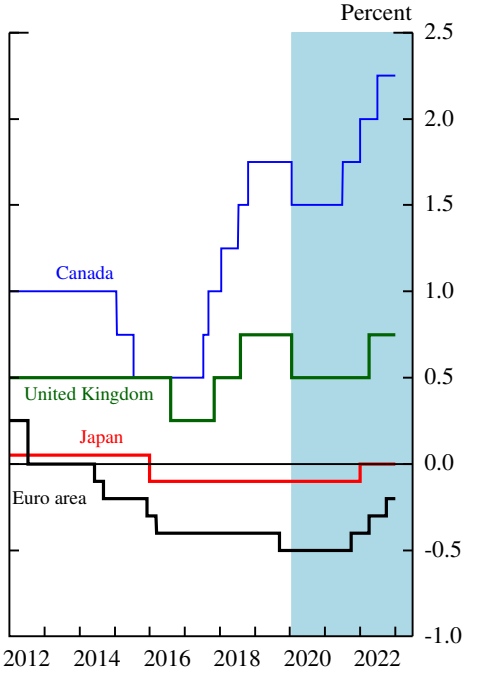
	2018	2019				2020	2021	2022
		Q1	Q2	Q3	Q4			
1. Total foreign	2.4	.9	3.2	2.3	3.5	2.3	2.3	2.3
Previous Tealbook	*2.4*	*.8*	*3.3*	*2.2*	*3.2*	*2.2*	*2.3*	*2.3*
2. Advanced foreign economies	1.7	.8	2.1	1.0	1.0	1.4	1.5	1.6
Previous Tealbook	*1.7*	*.8*	*2.1*	*.9*	*1.3*	*1.4*	*1.5*	*1.6*
3. Canada	2.1	1.6	3.4	1.7	1.7	2.0	2.0	2.0
4. Euro area	1.9	.3	2.0	.7	1.1	1.3	1.4	1.5
5. Japan	.8	.9	.3	.3	.4	.9	.8	1.0
6. United Kingdom	2.3	1.1	2.5	1.8	.2	1.9	1.8	1.8
7. Emerging market economies	2.9	.9	4.0	3.2	5.2	3.0	2.8	2.8
Previous Tealbook	*2.9*	*.8*	*4.1*	*3.1*	*4.5*	*2.8*	*2.8*	*2.8*
8. China	2.2	.6	4.3	4.6	7.6	2.5	2.5	2.5
9. Emerging Asia ex. China	1.8	.5	2.9	1.3	3.2	3.0	2.7	2.7
10. Mexico	4.8	1.1	4.5	2.8	3.4	3.3	3.2	3.2
11. Brazil	4.1	2.9	5.2	2.2	3.2	4.4	3.7	3.5
Memo								
Emerging market economies ex. China	3.4	1.1	3.8	2.1	3.5	3.3	3.0	2.9

* CPI aggregates weighted by shares of U.S. non-oil imports.
** Annual data are Q4/Q4.

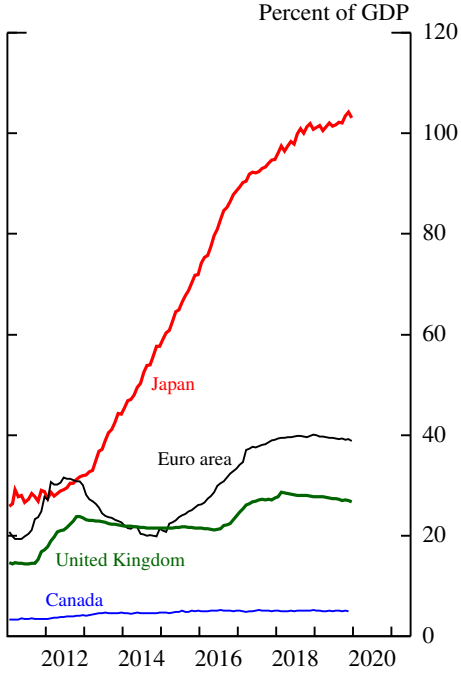
Int'l Econ Devel & Outlook

Foreign Monetary Policy

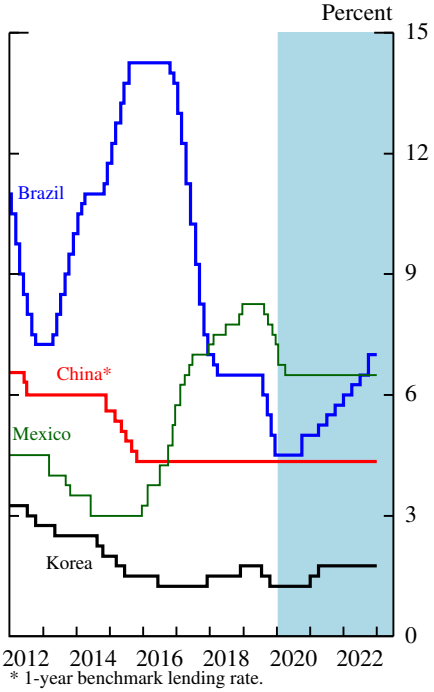
AFE Policy Rates



AFE Central Bank Balance Sheets



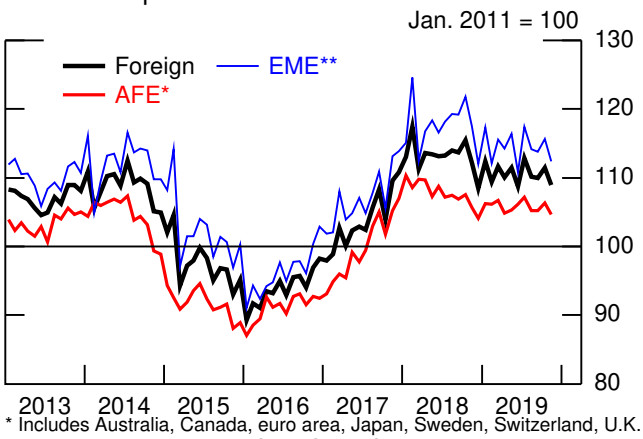
EME Policy Rates



* 1-year benchmark lending rate.

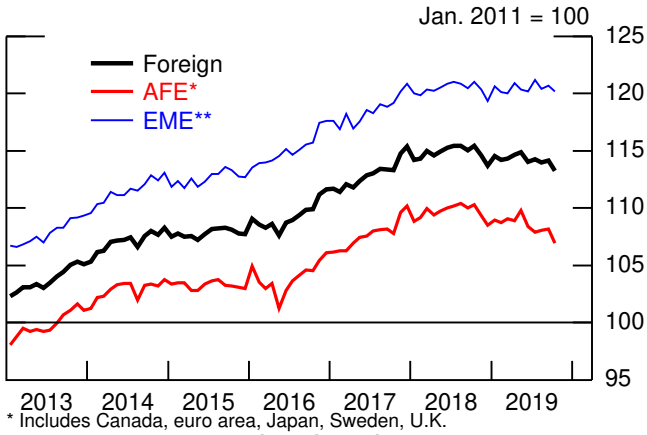
Recent Foreign Indicators

Nominal Exports



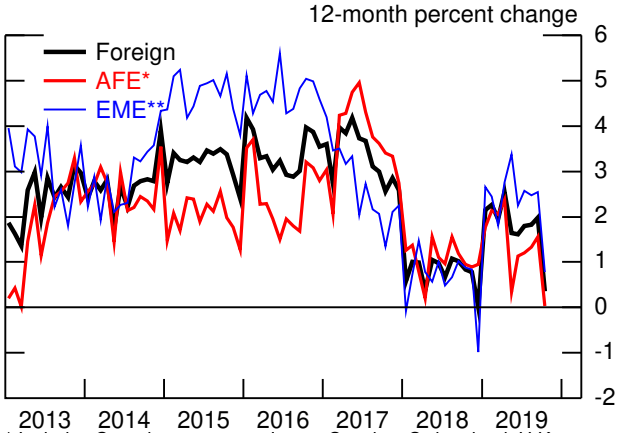
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Singapore, Taiwan, Thailand.

Industrial Production



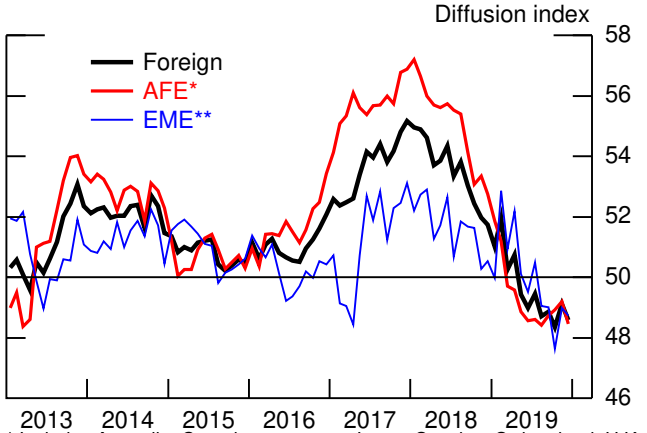
* Includes Canada, euro area, Japan, Sweden, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand.

Retail Sales



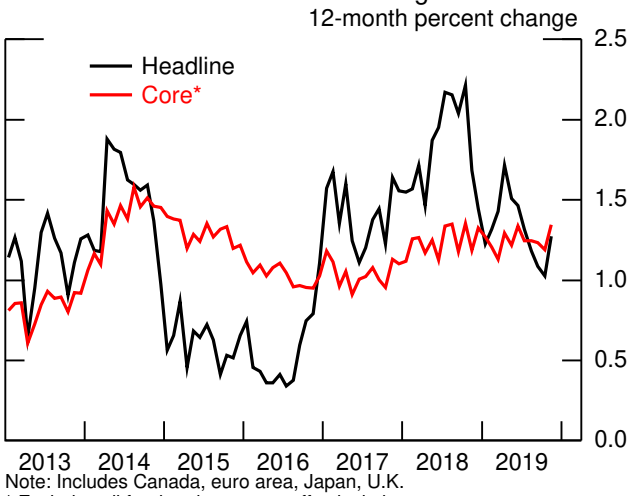
* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, Chile, China, Korea, Mexico, Singapore, Taiwan.

Manufacturing PMI



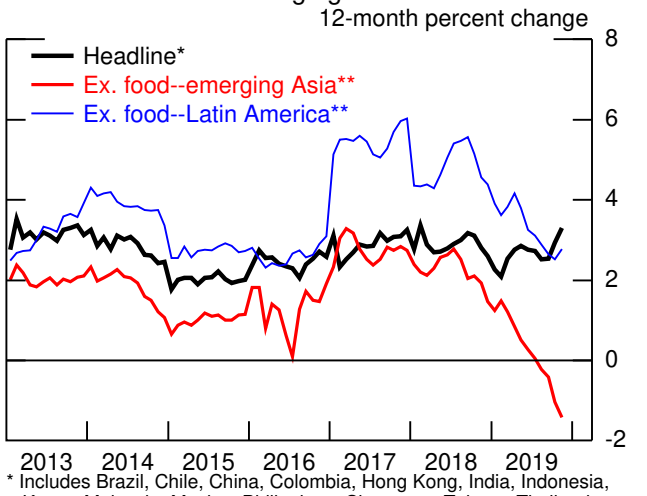
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, China, India, Indonesia, Israel, Korea, Mexico, Russia, Singapore, Taiwan, Turkey.

Consumer Prices: Advanced Foreign Economies



Note: Includes Canada, euro area, Japan, U.K.
* Excludes all food and energy; staff calculation.
Source: Haver Analytics.

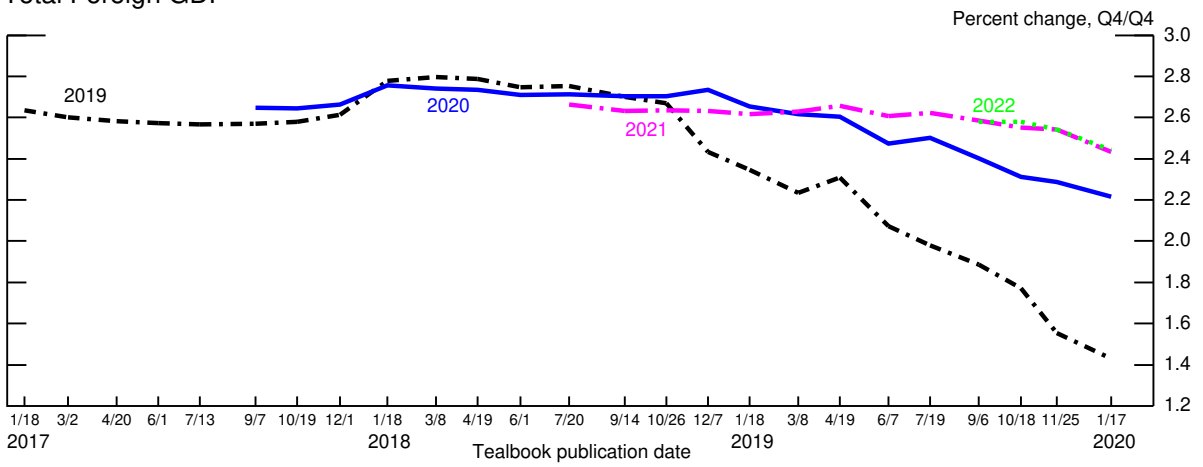
Consumer Prices: Emerging Market Economies



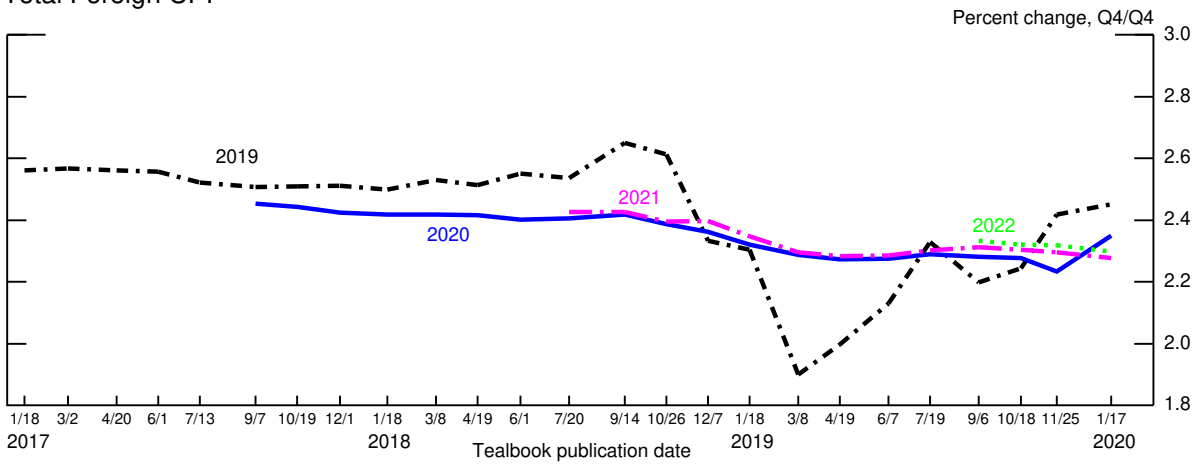
* Includes Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand.
** Excludes all food; staff calculation. Latin America excludes Argentina and Venezuela.

Evolution of Staff's International Forecast

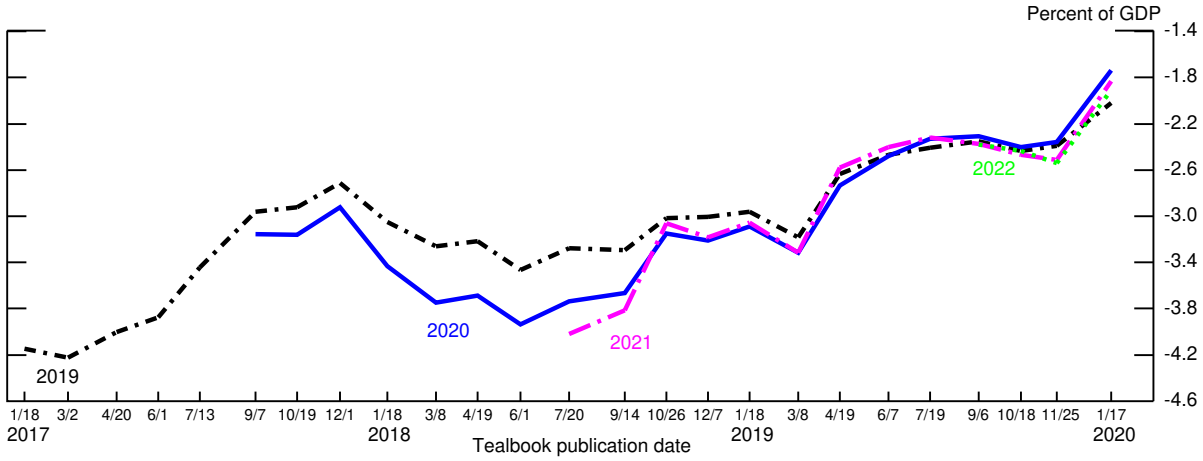
Total Foreign GDP



Total Foreign CPI



U.S. Current Account Balance



Int'l Econ Devel & Outlook

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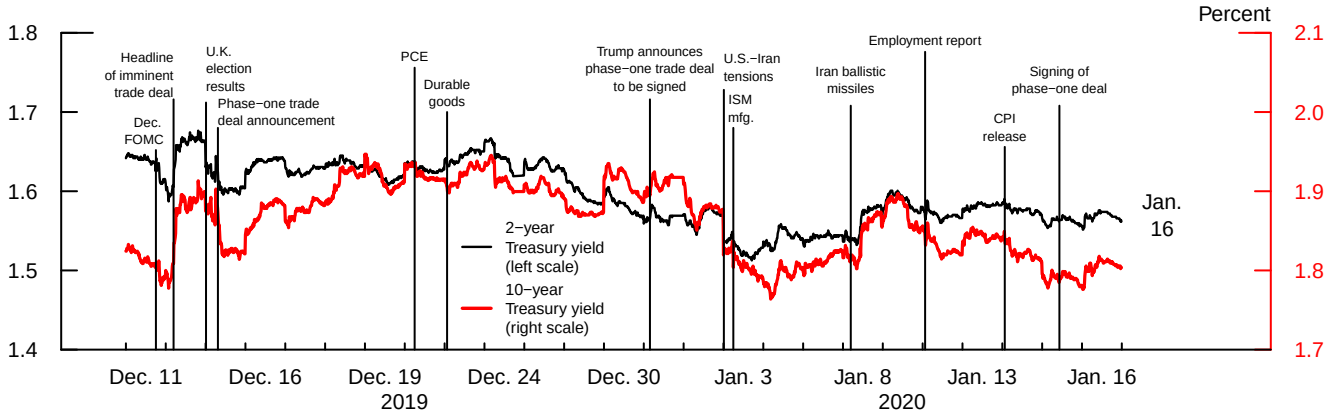
Financial Market Developments

Financial market sentiment toward risky assets improved further over the intermeeting period, reflecting progress related to the phase-one trade deal between the United States and China, the perception that the probability of a disorderly Brexit had declined, and, reportedly, greater certainty that U.S. monetary policy would remain accommodative in the near term. Equity prices moved notably higher, on net, and spreads on corporate bonds narrowed. Tensions between the United States and Iran led to moderate declines in the prices of risky assets shortly after the turn of the year, but these effects largely unwound as the tensions eased. Treasury yields across the maturity spectrum declined somewhat on net. Short-term funding markets were stable over the intermeeting period, including at year-end.

- Broad equity price indexes increased 5.9 percent on net. Spreads on investment-grade corporate bonds narrowed 9 basis points, while spreads on speculative-grade bonds narrowed 28 basis points.
- On net, nominal 2- and 10-year Treasury yields moved down 8 basis points and 3 basis points, respectively.
- Inflation compensation at the 5-year and 5-to-10-year horizons edged up 4 basis points and 2 basis points, respectively.
- A straight read of federal funds futures options quotes implies that investors assign above 90 percent probability to the federal funds target range remaining unchanged following the January FOMC meeting. OIS quotes, unadjusted for term premiums, imply about a 20 basis point decline in the federal funds rate by the end of 2020, while those adjusted for term premiums suggest a flat or slightly increasing path over the next few years.
- Foreign asset price movements were consistent with improved market sentiment: foreign equity indexes increased moderately, and the broad dollar index fell slightly.

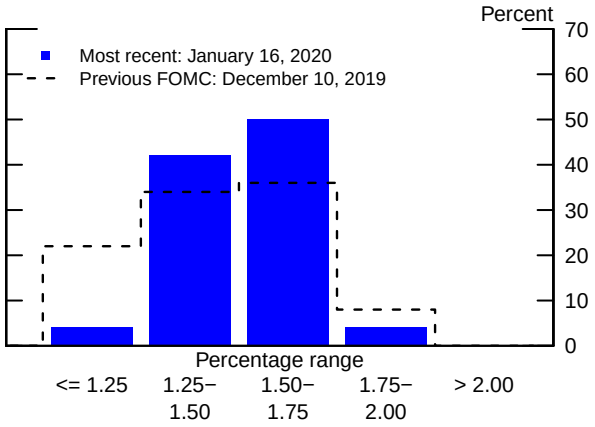
Policy Expectations and Treasury Yields

Intraday Treasury Yields



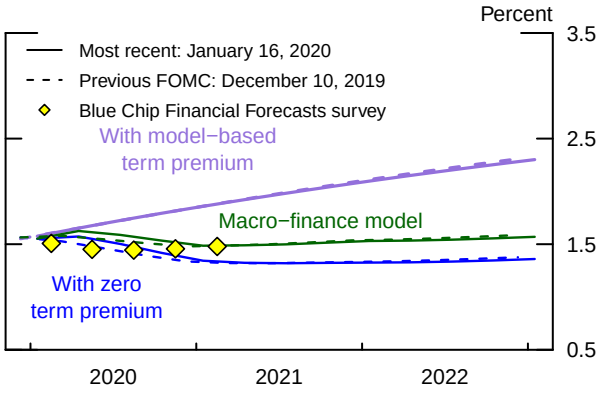
Note: Data are spaced at 5−minute intervals from 8:00 a.m. to 4:00 p.m.
Source: Bloomberg.

Market−Implied Probability Distribution of the Federal Funds Rate after June FOMC



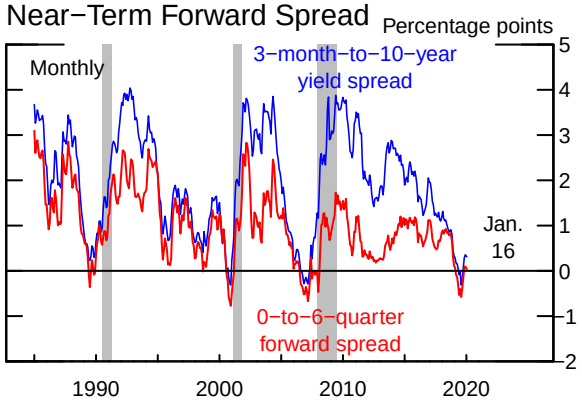
Note: Estimated from federal funds futures options; not adjusted for risk premiums.
Source: CME Group; Board staff calculations.

Implied Federal Funds Rate



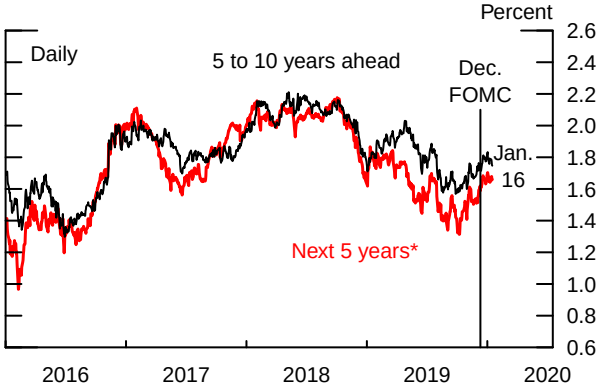
Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of 0 basis points. Model−based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premiums. The Blue Chip path is the average of respondents' expectations for the federal funds rate in the survey published on January 1.
Source: Bloomberg; Wolters Kluwer Legal and Regulatory Solutions U.S.; Board staff calculations.

Long−Term Yield Spread and Near−Term Forward Spread



Note: The 0−to−6−quarter forward spread is the difference between the 3−month Treasury bill yield and the implied forward rate between 6 and 7 quarters ahead based on a smoothed Treasury yield curve. Data through December 2019 are monthly averages. Data for January 2020 are based on values for January 16. Shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.
Source: Federal Reserve Bank of New York; Board staff calculations.

TIPS−Based Inflation Compensation



Note: Estimates based on smoothed nominal and inflation−indexed Treasury yield curves.
* Adjusted for lagged indexation of Treasury Inflation−Protected Securities (TIPS) (carry effect).
Source: Federal Reserve Bank of New York; Board staff calculations.

Financial Markets

DOMESTIC DEVELOPMENTS

Early in the period, nominal Treasury yields increased a bit amid positive news about U.S.–China trade negotiations and a perceived reduction in the probability of a disorderly Brexit following the U.K. election. Later in December, however, yields across the maturity spectrum drifted downwards. Following an increase in tensions between the United States and Iran in early January, yields dropped more sharply but largely retraced their declines as geopolitical tensions eased. On net, since the December FOMC meeting, 2- and 10-year Treasury yields declined 8 basis points and 3 basis points, respectively. Five-year and 5-to-10-year TIPS-based measures of inflation compensation increased a bit over the period; the 5-to-10-year forward measure is now about 15 basis points above its October low of 1.58 percent.

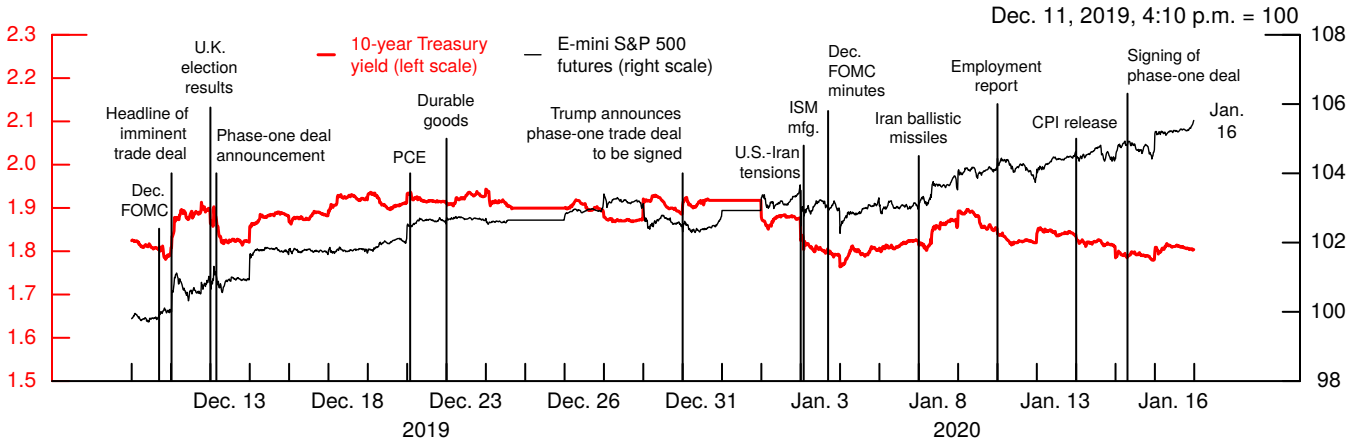
Federal Reserve communications over the period reportedly reinforced investors' beliefs that a change to the target range for the federal funds rate at the January FOMC meeting is unlikely. Indeed, a straight read of the probability distribution for the federal funds rate implied by option prices now suggests that investors assign a probability of more than 90 percent to the target range remaining unchanged at the January FOMC meeting, an increase of more than 10 percentage points since the December FOMC meeting.[1] Moreover, the option-implied distributions for the level of the federal funds rate following each of the FOMC meetings in the first half of this year generally narrowed, suggesting less uncertainty about the near-term path of policy. The expected path of the federal funds rate over the coming year implied by OIS quotes was little changed. Unadjusted for term premiums, the quotes imply about a 20 basis point decline in the federal funds rate by the end of 2020. Market commentary suggests that the probability of reductions in the target range in the medium term is viewed as being higher than that of rate hikes. Moreover, options prices, assuming zero term premiums, imply roughly equal odds of no change to the target range and a 25 basis point cut by mid-2020. However, OIS quotes adjusted for staff term premium estimates from various models suggest a flat or slightly increasing path.[2]

[1] Quotes on federal funds futures contracts, unadjusted for term premiums, imply that investors expect the federal funds rate to be 1.58 percent after the January FOMC meeting, which suggests that market participants attach some odds to a potential technical adjustment to the IOER rate at the January FOMC meeting.

[2] The staff macro-finance model suggests an essentially flat path, whereas the OIS-ZLB model suggests an increase of about 30 basis points in the effective federal funds rate through the end of 2020.

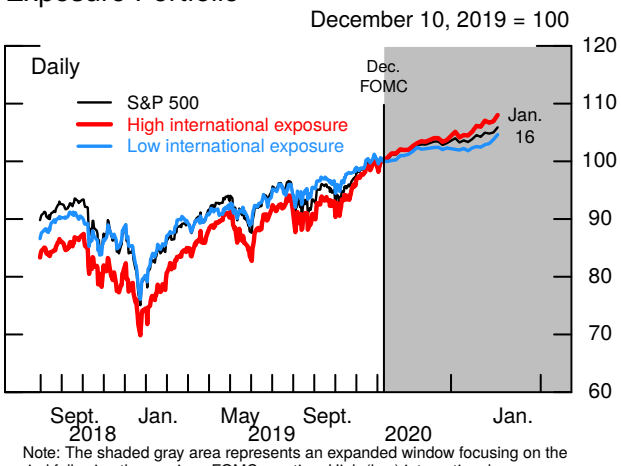
Corporate Asset Market Developments

Intraday S&P 500 Futures and 10-Year Treasury Yield



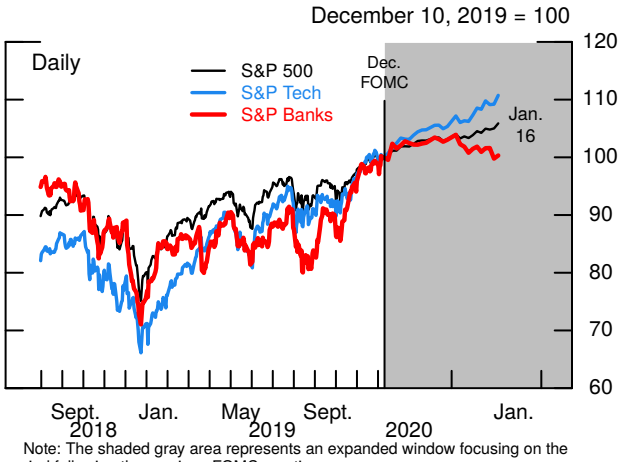
Note: Data are spaced at 5-minute intervals from 9:30 a.m. to 4:10 p.m.
Source: Bloomberg.

S&P 500 Index and International Exposure Portfolio



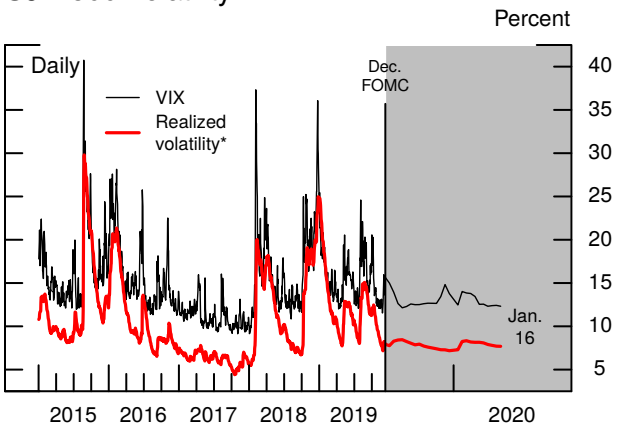
Note: The shaded gray area represents an expanded window focusing on the period following the previous FOMC meeting. High (low) international exposure is measured based on firms with percent of total sales above the 67th (below the 33rd) percentile, excluding energy and financial firms.
Source: Bloomberg; Compustat; Yahoo Finance.

Selected S&P 500 Stock Price Indexes



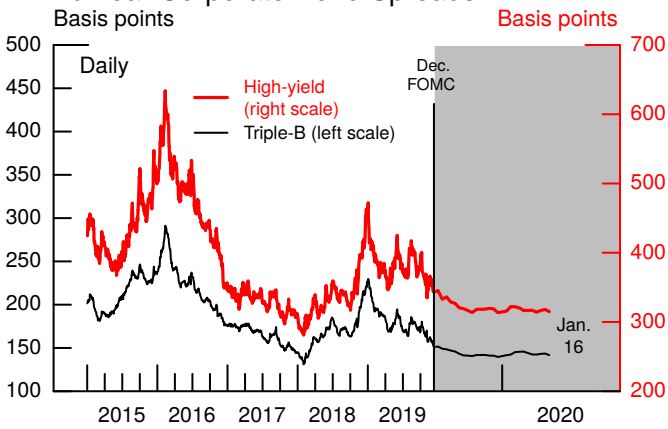
Note: The shaded gray area represents an expanded window focusing on the period following the previous FOMC meeting.
Source: Bloomberg.

S&P 500 Volatility



Note: The shaded gray area represents an expanded window focusing on the period following the previous FOMC meeting.
* 5-minute returns used in exponentially weighted moving average with 75 percent of weight distributed over the most recent 20 days.
Source: Bloomberg.

10-Year Corporate Bond Spreads



Note: The shaded gray area represents an expanded window focusing on the period following the previous FOMC meeting. Spreads over 10-year Treasury yield.
Source: Merrill Lynch; Federal Reserve Bank of New York; Board staff calculations.

Financial Markets

Broad stock price indexes increased notably by about 5.9 percent, on net, since the December FOMC meeting, with reactions to global developments that appeared outsized compared to those of fixed-income markets. Equity prices rose, in part, on improved market sentiment about trade negotiations and a perceived lower probability of a disorderly Brexit. Rising tensions between the United States and Iran briefly caused equity prices to fall, but these moves subsequently retraced. Consistent with improved sentiment about trade, stocks of firms with a greater exposure to international sales (including China) outperformed those of firms with a lower exposure. In addition, stocks of firms in more cyclical sectors, such as information technology and communication services, outperformed those of firms in less cyclical sectors, including consumer staples and real estate. Moreover, bank stocks underperformed amid reported challenges to the 2020 outlook for bank profitability related to expectations of continued low interest rates. One-month option-implied volatility on the S&P 500 index (the VIX) decreased notably, on net, and remained in the low end of its historical distribution. For a longer-term perspective on stock price developments, see the box "Interpreting the Strength in Equities in 2019."

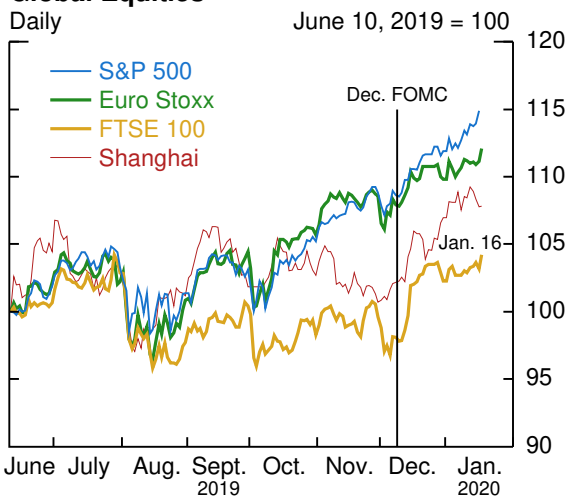
Spreads on investment-grade corporate bonds over comparable-maturity Treasury yields narrowed 9 basis points, while spreads of speculative-grade corporate bonds narrowed 28 basis points on net. Notably, the largest reduction in speculative-grade corporate bond spreads corresponded to the lowest credit ratings (triple-C and below), reversing some of the widening observed since the spring of last year. The box "Bifurcation in the Speculative-Grade Corporate Bond Market" in the Financing Conditions for Businesses and Households section examines this widening in more detail.

FOREIGN DEVELOPMENTS

Progress in the U.S.–China trade negotiations supported sentiment in foreign financial markets over the intermeeting period, despite some volatility amid geopolitical tensions in the Middle East. Contributing to the improved risk sentiment was the general election outcome in the United Kingdom, which considerably reduced the probability of a disorderly Brexit. On net, foreign equity price indexes increased moderately, the dollar weakened against most currencies, and long-term advanced foreign economy (AFE) sovereign yields were mixed. Sentiment toward emerging market assets further improved, and dedicated emerging market economy (EME) bond and equity mutual funds saw notably stronger inflows.

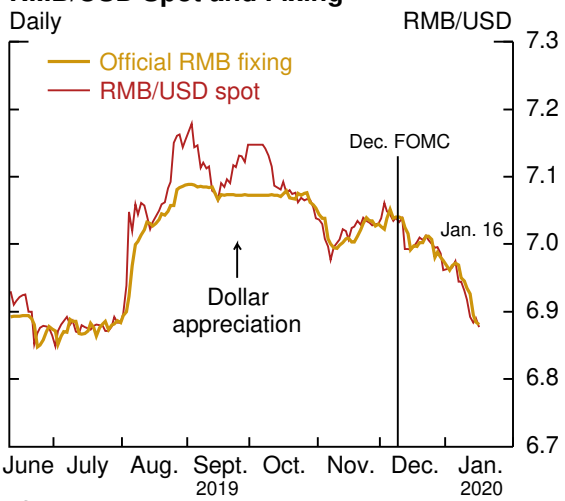
Foreign Developments

Global Equities



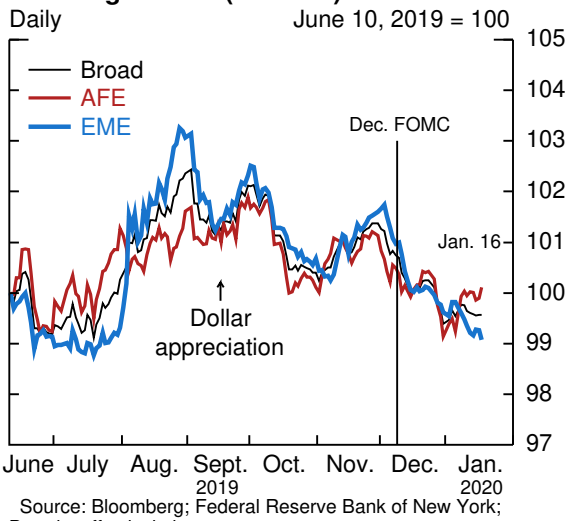
Note: Indexes denominated in local currency.
Source: Bloomberg.

RMB/USD Spot and Fixing



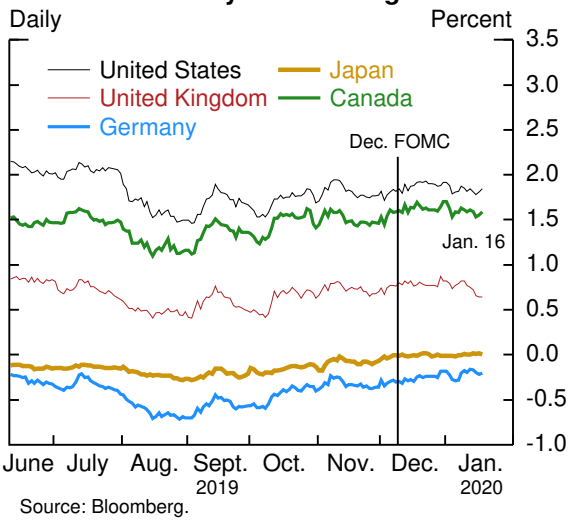
Source: Bloomberg.

Exchange Rates (Indexes)



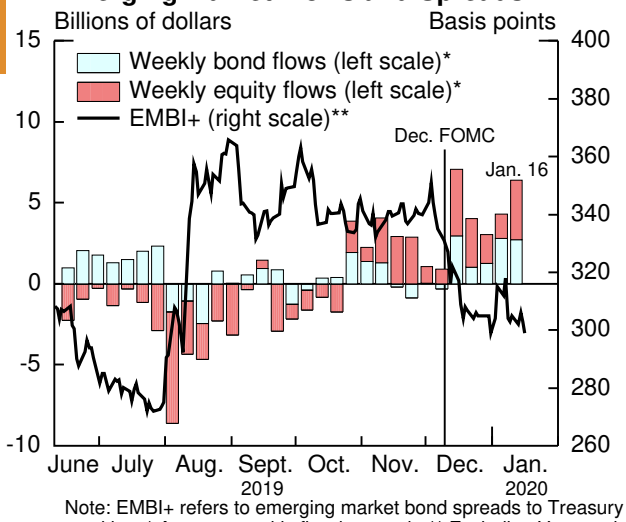
Source: Bloomberg; Federal Reserve Bank of New York; Board staff calculations.

U.S. and AFE 10-year Sovereign Yields



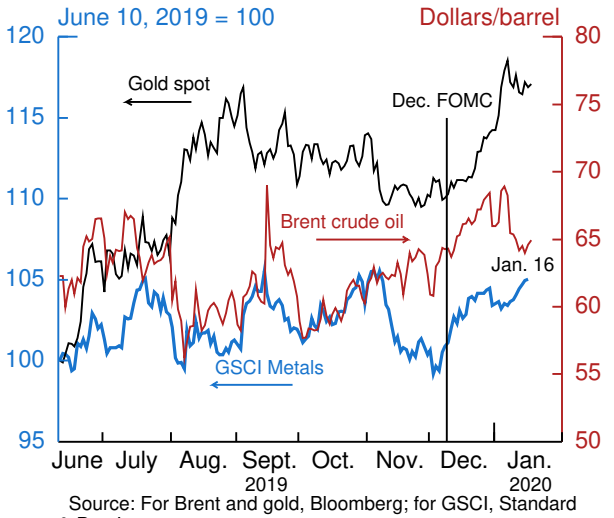
Source: Bloomberg.

Emerging Market Flows and Spreads



Note: EMBI+ refers to emerging market bond spreads to Treasury securities. * Average weekly flow by month. ** Excluding Venezuela.
Source: Emerging Portfolio Fund Research. Excludes intra-China flows.

Commodities



Source: For Brent and gold, Bloomberg; for GSCI, Standard & Poor's.

Interpreting the Strength of Equities in 2019

During 2019, the S&P 500 equity price index rose 29 percent, the second-largest annual increase since 1998. At the same time, the yield on a 10-year Treasury security fell about 75 basis points on net. Such a combination of equity and yield changes is noteworthy because declines in Treasury yields have typically been associated with declines in stock prices over the past 20 years.[1]

This discussion looks at how the staff's dividend discount model for stock prices would parse the outsized net gain over the year into changes in the equity risk premium and other components, and it examines whether the changes in the equity risk premium during different parts of the year were consistent with the observed declines in Treasury yields. We show that much—but not all—of the gains in share prices in 2019 were due to a narrowing of the equity risk premium in the early and late parts of the year that appeared unusually large relative to the historical relationship between the equity risk premium and yields. Given these findings, we conjecture that early in the year, accommodative monetary policy communications may have played a role in an outsized improvement in sentiment among equity investors. Later in the year, various factors seemed plausibly responsible for another outsized improvement in sentiment, including, most importantly, waning concerns about trade negotiations.

We can think of the value of the S&P 500 as the present value of all expected future dividend payments for firms included in the index. The staff's dividend discount model decomposes changes in the index into contributions from changes in the level of future expected dividends and changes in the discount rate. The model further decomposes the contribution from the discount rate into contributions from the risk-free rate—proxied by the 10-year Treasury yield—and an additional equity risk premium, which is computed as a residual in the accounting exercise.[2] Finally, using a separate staff term structure model, we can further decompose the contribution from the risk-free rate into contributions from the expected federal funds rate path over the 10-year valuation window and a term premium.[3]

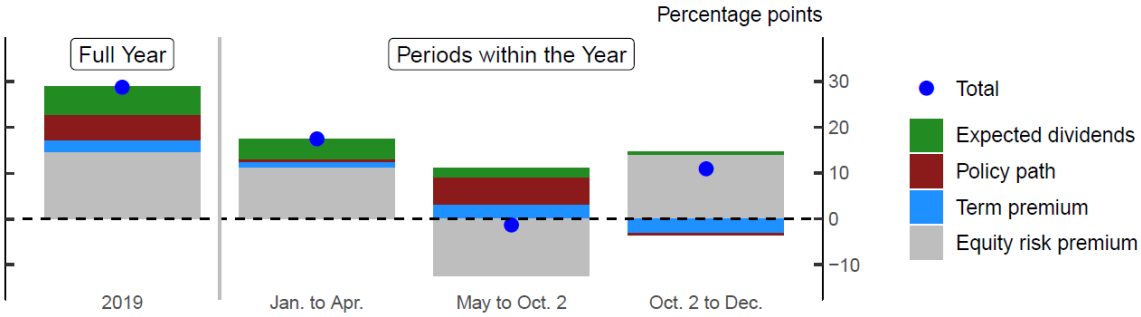
The leftmost column in figure 1 shows the model-based decomposition of the net change in the S&P 500 index during 2019. Higher expected dividends and a lower expected federal

[1] For a discussion of the correlation between equity and bond returns, see Richard H. Clarida (2019), "Monetary Policy, Price Stability, and Equilibrium Bond Yields: Success and Consequences," speech delivered at the High-Level Conference on Global Risk, Uncertainty, and Volatility, cosponsored by the Bank for International Settlements, the Board of Governors of the Federal Reserve System, and the Swiss National Bank, held in Zurich, Switzerland, November 12, https://www.federalreserve.gov/newsevents/speech/files/clarida20191112a.pdf.

[2] The decomposition assumes that the staff projections for earnings growth are equal to investors' expectations and that the appropriate risk-free rate is a 10-year Treasury yield.

[3] We use the term structure model of Don H. Kim and Jonathan H. Wright (2005), "An Arbitrage-Free Three-Factor Term Structure Model and the Recent Behavior of Long-Term Yields and Distant-Horizon Forward Rates," Finance and Economics Discussion Series 2005-33 (Washington: Board of Governors of the Federal Reserve System, August), https://www.federalreserve.gov/pubs/feds/2005/200533/200533pap.pdf.

Figure 1: Contributions to Changes in the S&P 500



Note: Exact periods are Dec. 31, 2018, to Apr. 30, 2019; Apr. 30, 2019, to Oct. 2, 2019; and Oct. 2, 2019, to Dec. 31, 2019. Decomposition based on the staff's dividend discount model.
Source: Staff calculations.

funds rate path each account for a little under one-fourth of the overall increase in the index, while a slight reduction in the Treasury term premium in the 10-year Treasury yield accounts for only a small impetus. Thus, a sizable drop in the implied equity risk premium accounts for about half of the increase in the index.

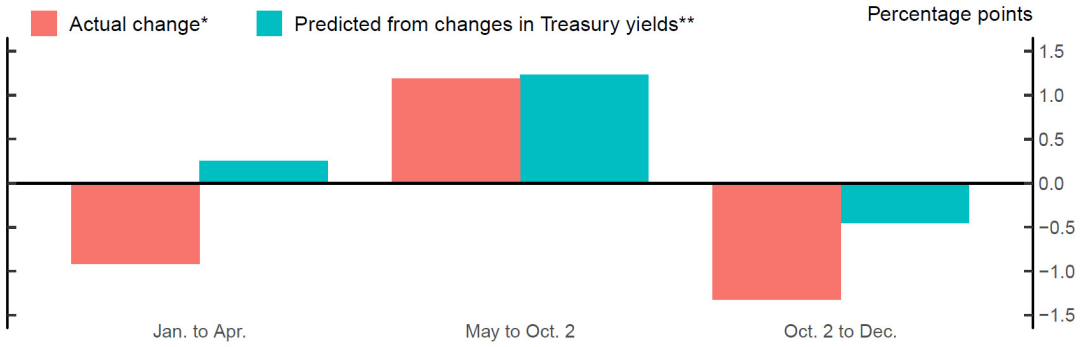
To examine the role played by the equity risk premium in more detail, we split 2019 into three distinct periods: (1) from the start of the year until the peak in the S&P 500 index on April 30, during which the index rose 18 percent on net; (2) from April 30 to the trough on October 2, during which the index was little changed on net; and (3) from October 2 to the end of the year, during which the index rose 11 percent. Model decompositions for each period are shown by the rightmost three bars in figure 1. A falling equity risk premium accounts for the majority of the equity price increases in the first and third periods. In the second period, a large negative contribution from a rise in the equity risk premium roughly offsets positive contributions from the other components, particularly the lower policy path brought about by FOMC accommodation.

Do these contributions from the equity risk premium appear unusual compared with past behavior? Over the past two decades, the equity risk premium has tended to be negatively correlated with Treasury yields; for example, yields have tended to fall and the equity risk premium to rise during economic downturns or periods of deteriorating investor sentiment. Figure 2 compares the changes in the staff's equity risk premium in each period (the red bars) with the changes predicted by the average historical relationship between the equity risk premium and Treasury yields (the green bars).[4]

Between the start of the year and April 30, the equity risk premium fell about 0.9 percentage point, whereas the 0.2 percentage point decline in the 10-year Treasury yield would have predicted a modest increase. Changes in the equity risk premium may depart from this average historical relationship for various reasons. For example, following an accommodative monetary policy surprise, it seems plausible that yields and the equity risk

[4] Calculations are based on a regression of quarterly changes in the equity risk premium on changes in the 10-year Treasury yield, estimated over a sample from 2000 to 2018.

Figure 2: Actual and Predicted Changes in the Equity Risk Premium in 2019



Note: Exact periods are Dec. 31, 2018, to Apr. 30, 2019; Apr. 30, 2019, to Oct. 2, 2019; and Oct. 2, 2019, to Dec 31, 2019.
* Changes in the equity risk premium from the staff's dividend discount model.
** Based on a regression of quarterly changes in the equity risk premium on changes in the 10−year Treasury yield, estimated using a sample from 2000 to 2018.
Source: Federal Reserve Bank of New York and staff calculations.

premium would both fall. Indeed, the decline in the equity risk premium during this period suggests that FOMC communications around the turn of 2019 emphasizing a more "patient approach" to monetary policy may have alleviated some concerns among equity investors about downside risks following sharp falls in equity prices in late 2018.[5]

Between April 30 and October 2, the widening of the equity risk premium amid deteriorating investor sentiment about trade negotiations and growth was broadly in line with what we would have expected based on the 0.9 percentage point decline in the 10-year Treasury yield over this period and the historical relationship between yields and the equity risk premium.

Between October 2 and the end of the year, the equity risk premium fell about 1.3 percentage points. However, based on the 0.3 percentage point rise in the 10-year Treasury yield, we would have expected a much smaller fall in the equity risk premium. Market commentary suggested that investors reacted strongly to progress in trade negotiations and a lower likelihood of a disorderly Brexit. In addition, while the expected policy path did not change materially, sentiment toward equities was reportedly boosted by greater certainty among investors that monetary policy will remain accommodative in the near term. Sentiment was also reportedly boosted by the steps taken by the Federal Reserve over the past few months to mitigate the potential for the repo market stresses observed in September to reemerge.

In conclusion, while firm dividend expectations and a lower policy path supported the S&P 500 during 2019, it appears that a reduction in the equity risk premium accounts for about half of the overall increase in the index. We also find that the narrowing in the equity risk premium was unusually large based on its historical relationship with Treasury yields. This outsized increase in equities may be due, in part, to monetary policy communications early in the year and a few factors, including perceptions of progress on trade negotiations, later in the year.

[5] See, for example, Board of Governors of the Federal Reserve System (2019), "Minutes of the Federal Open Market Committee, January 29–30, 2019," press release, February 20, https://www.federalreserve.gov/newsevents/pressreleases/monetary20190220a.htm. Market commentary suggested that increased optimism about U.S.–China trade negotiations also boosted investor sentiment during the first few months of 2019.

Chinese equity indexes increased more than 5 percent, supported by positive headlines throughout the intermeeting period on the U.S.–China phase-one trade deal. A cut in the reserve requirement ratio by the People's Bank of China in early January, expectations for some further policy stimulus, and better-than-expected economic data also supported the rise in Chinese asset prices. The renminbi appreciated about 2.5 percent against the dollar over the intermeeting period, strengthening to levels observed before the escalation of trade tensions in August. There was no market reaction to the U.S. Treasury's removal of its designation of China as a currency manipulator.

The Conservative Party's general election victory in the United Kingdom diminished odds of a disorderly Brexit, which led to a material appreciation of the British pound against the dollar. This appreciation largely retraced amid investor concerns about the difficulty of reaching a U.K.–European Union trade deal by the end of 2020, as well as remarks by Bank of England (BOE) officials that a weaker economic outlook might require further monetary stimulus. These BOE communications led to a notable decline in U.K. sovereign yields, especially in longer-dated tenors, which fell 16 basis points on net. In contrast, most other long-term AFE sovereign yields edged up, with the German 10-year yield ending the period 8 basis points higher amid better-than-expected economic data from the euro area. U.K. equity price indexes increased about 5 percent and generally outperformed other major European equity markets.

The general risk-positive tone over the intermeeting period contributed to a depreciation of the dollar, in particular against EME currencies. In addition to the strength in Asian currencies—the Chinese renminbi in particular—Latin American currencies generally rose against the dollar as political uncertainty in the region subsided. The Mexican peso appreciated 2.8 percent against the dollar, supported by progress toward the passage of the USMCA trade pact and by monetary policy communications of the Bank of Mexico that were slightly less accommodative than expected. The dollar fluctuated temporarily amid the escalation of U.S.–Iran tensions in early January. The dollar depreciated notably against the Japanese yen, generally viewed as a safe-haven currency, amid these tensions, but the moves retraced as tensions eased. The price of gold increased markedly amid rising geopolitical risks and retraced only part of the increase, ending the intermeeting period 6 percent higher.

SHORT-TERM FUNDING MARKETS AND FEDERAL RESERVE OPERATIONS

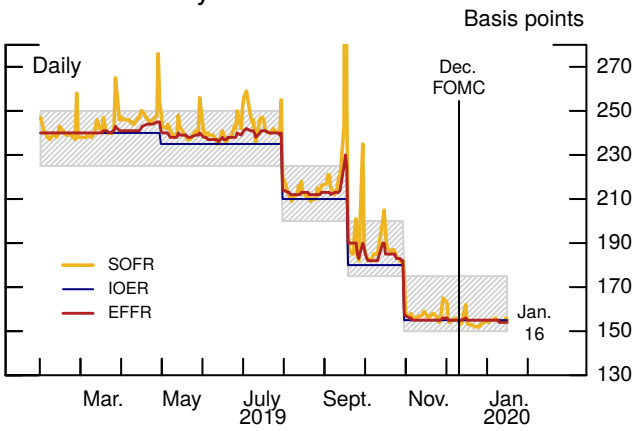
Money markets were stable over the intermeeting period. Rates declined slightly, with the effective federal funds rate (EFFR) printing at the interest on excess reserves (IOER) rate of 1.55 percent on most days, though it declined to 1.54 percent later in the period. The secured overnight financing rate (SOFR) averaged 1.54 percent, 5 basis points lower than the previous intermeeting period. Spreads for term unsecured commercial paper (CP) and negotiable certificates of deposit (CDs) narrowed substantially, particularly after year-end. The softness in rates likely reflects increased liquidity and a higher level of reserves provided by the Desk's open market operations.

Conditions in money markets were very calm around year-end. Secured and unsecured reference rates, including SOFR and EFFR, printed at the IOER rate, while overnight rates on CP and negotiable CDs held steady or declined. FX swap-implied rates for borrowing U.S. dollars over year-end were within the ranges observed at recent year-ends. ON RRP take-up at year-end increased $58 billion to $64 billion before dropping to more normal levels on January 2.

The Desk continued to conduct both temporary and permanent open market operations aimed at maintaining ample reserves and addressing money market pressures that could adversely affect policy implementation. At year-end, outstanding overnight and term repo operations conducted by the Desk totaled $256 billion. Since year-end, a total of $211 billion of Desk term repo operations that spanned year-end has expired. Primary dealers wanting to roll their funding led to some oversubscribed term operations after year-end and increased take-up at overnight repo operations in January relative to December. On January 14, the Desk announced new operations to be conducted through mid-February. On January 17, outstanding repo operations totaled $192 billion.

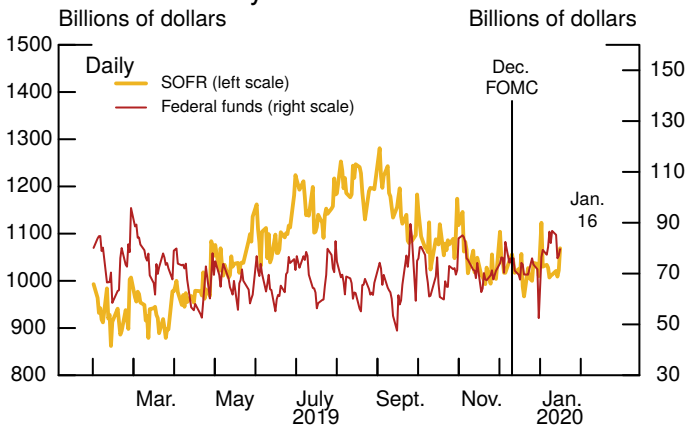
Short-Term Funding Markets

Selected Money Market Rates



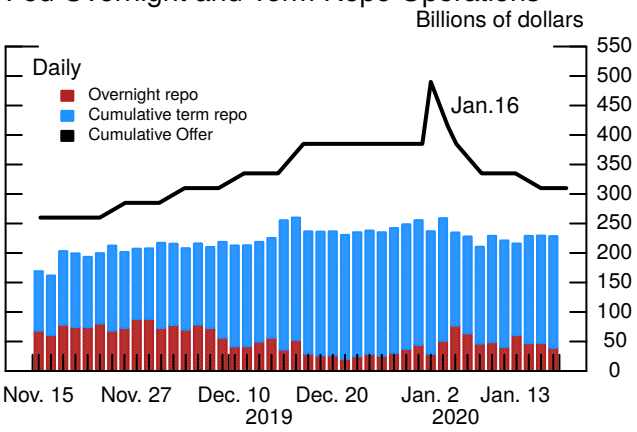
Note: This data point is not shown: SOFR: Sept. 17 = 525 basis points. Shaded area is the target range for the federal funds rate. IOER is interest on excess reserves; SOFR is Secured Overnight Financing Rate.
Source: Federal Reserve Bank of New York; Federal Reserve Board.

Selected Money Market Volumes



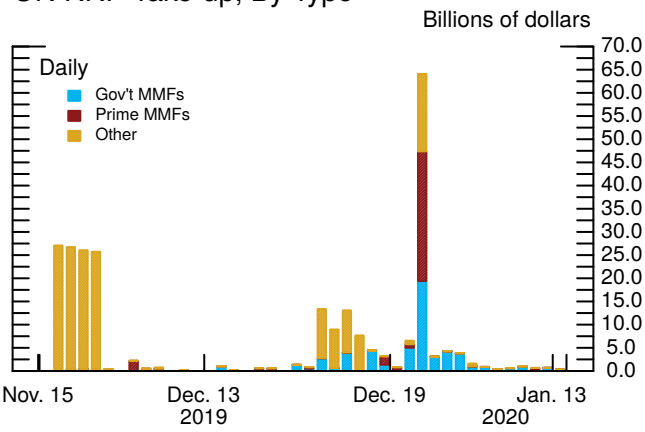
Note: SOFR is Secured Overnight Financing Rate.
Source: Federal Reserve Bank of New York; Federal Reserve Board.

Fed Overnight and Term Repo Operations



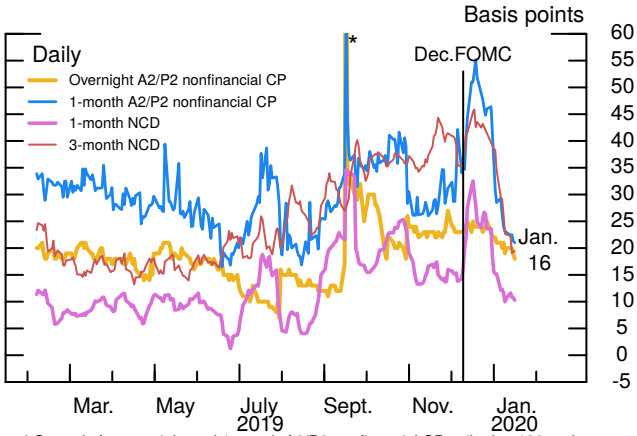
Note: Shows all collateral types, which includes Treasury securities, agency mortgage-backed securities, and agency debt. Repo is repurchase agreement.
Source: Federal Reserve Bank of New York.

ON RRP Take-up, By Type



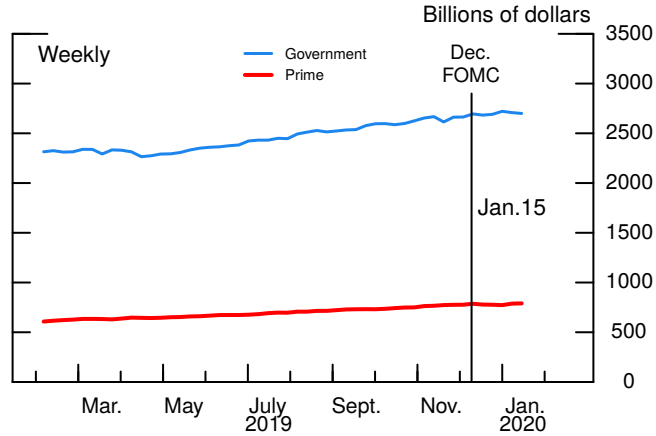
Note: ON RRP is overnight reverse repurchase agreement; MMFs are money market funds.
Source: Federal Reserve Bank of New York.

CP and NCD Spreads



* Spreads for overnight and 1-month A2/P2 nonfinancial CP spiked to 139 and 64 basis points, respectively, on September 17, 2019.
Note: CP is commercial paper; NCD is negotiable certificate of deposit. Overnight CP spreads are to the EFFR. One month CP and NCD spreads are to OIS. NCD spreads are 5-day moving averages.
Source: Depository Trust & Clearing Corporation.

MMF Assets under Management



Note: MMF is money market fund.
Source: Investment Company Institute.

Financial Markets

Financing Conditions for Businesses and Households

Information received over the intermeeting period indicates that financing conditions for businesses and households appear to have eased a bit further, for the most part, and remain broadly supportive of spending and economic activity.

- Total gross issuance of corporate bonds dropped off in December after its November surge, though the slowing was less marked among speculative-grade issuers. Issuance of institutional leveraged loans continued at a solid pace in December.

- C&I loan growth contracted in the fourth quarter, consistent with the continued softening in borrower demand reported by banks in the January SLOOS. However, CRE lending picked up in the fourth quarter.

- Home mortgage rates declined about 25 basis points, on net, and mortgage credit for households remained broadly available. Home-purchase and refinance originations continued at a solid pace in the fourth quarter.

- Consumer credit conditions remained generally supportive of spending, although the supply of credit continued to be fairly tight for nonprime borrowers.

- Financial conditions indexes showed a further easing over the past two months and suggest that financial conditions continued to be notably accommodative by historical standards.

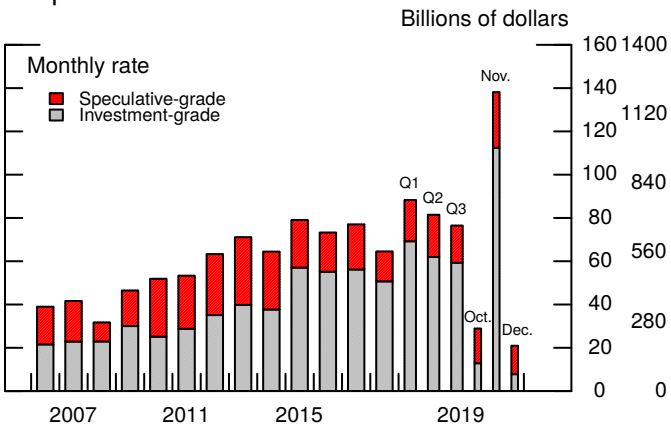
BUSINESS FINANCING CONDITIONS

Nonfinancial Businesses

Financing conditions for nonfinancial firms remained accommodative, on balance, with corporate borrowing costs staying near historical lows. Gross issuance of investment-grade corporate bonds was very slow in December after surging in November but has bounced back in early January. In contrast, issuance of speculative-grade bonds in December and early this month remained about in line with the average pace over December and January in recent years.

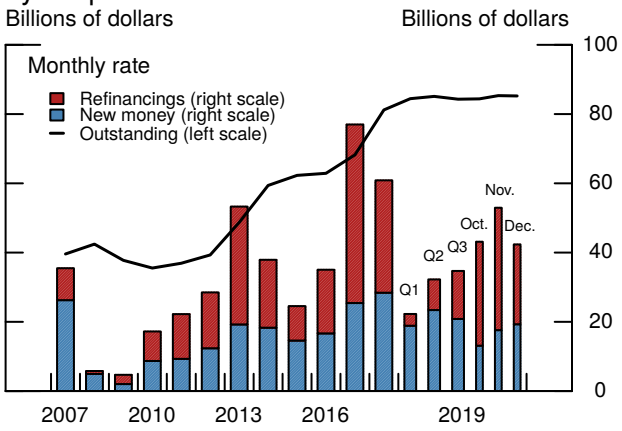
Business Finance

Gross Issuance of Nonfinancial Corporate Bonds



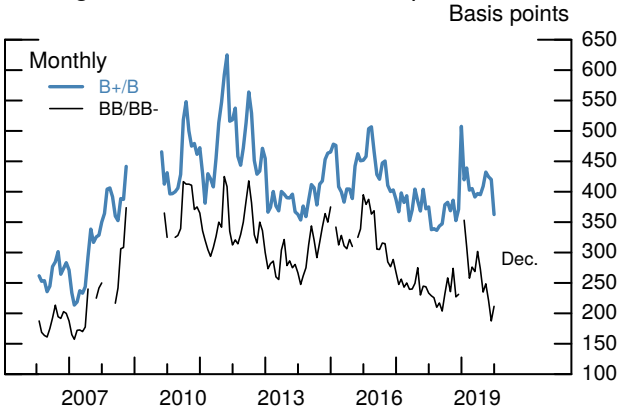
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.
Source: Mergent Fixed Income Securities Database.

Institutional Leveraged Loan Issuance, by Purpose



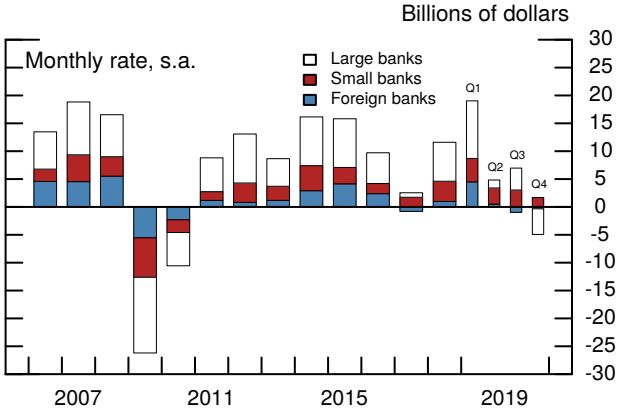
Source: Thomson Reuters LPC LoanConnector.

Average New-Issue Institutional Spreads



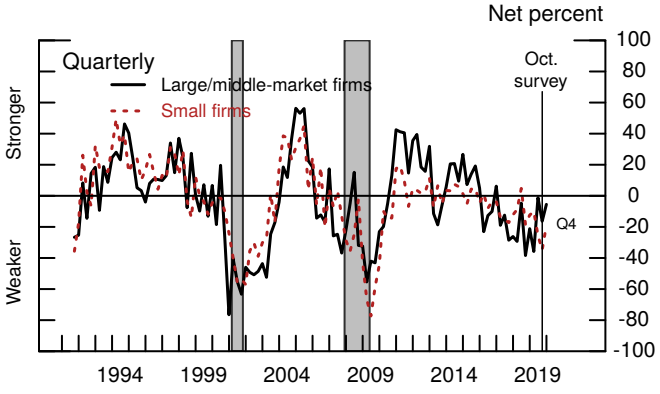
Note: Breaks in the series represent periods with no issuance. Spreads are calculated against 3-month LIBOR. The spreads do not include up-front fees.
Source: S&P LCD.

Commercial and Industrial Loans



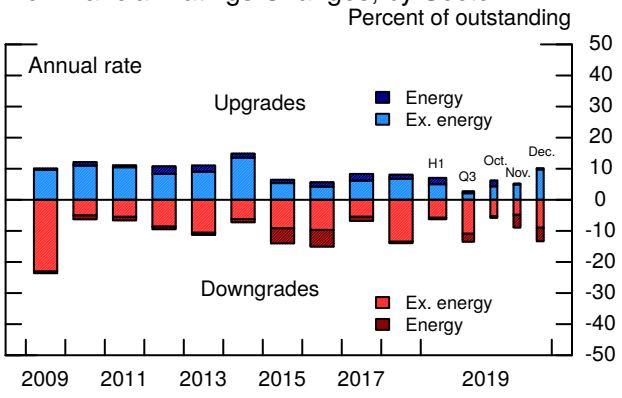
Source: Federal Reserve Board staff calculations; Federal Reserve Board, Form FR 2644, Weekly Report of Selected Assets and Liabilities of Domestically Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks.

Demand for C&I Loans



Note: C&I is commercial and industrial. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Nonfinancial Ratings Changes, by Sector



Note: Computed as a percent of nonfinancial bonds outstanding.
Source: Board staff calculations using Moody's ratings from Mergent Fixed Income Securities Database.

Financing Conditions

Meanwhile, institutional leveraged loan issuance continued to be robust in December due to solid refinancing activity and new money issuance that maintained its recent moderate pace. New issuance spreads for lower-rated institutional loans tightened noticeably, reversing much of their recent widening, while spreads for higher-rated loans remained near their post-crisis lows.

C&I loans on banks' balance sheets contracted in the fourth quarter, driven by net paydowns at large domestic banks coupled with sluggish growth at small banks. In the January SLOOS, banks indicated that, over the fourth quarter, they experienced weaker demand for C&I loans from firms of all size categories, especially from small firms. At the same time, banks reported having slightly eased their lending standards and terms for large and middle-market firms.

The credit quality of nonfinancial corporations and the earnings outlook have remained fairly stable in recent months overall. And while the volume of nonfinancial corporate bond downgrades among speculative-grade energy firms has been sizable, the KMV expected year-ahead default rate for energy firms—and for the overall nonfinancial sector—declined slightly, while corresponding bond yield spreads narrowed. (See the box "Bifurcation in the Speculative-Grade Corporate Bond Market.) Meanwhile, a revisions index of analyst forecasts of earnings per share for S&P 500 firms was little changed in November and December, and forecasts for fourth-quarter earnings now suggest analysts are expecting little growth, on balance, relative to third-quarter results.

Gross equity issuance through seasoned offerings remained robust in December, while initial public offerings continued to be quite light. Still, market reports suggest a healthy pipeline of firms expect to go public in 2020. M&A activity slowed somewhat in the fourth quarter but remained solid, while announced acquisitions rebounded modestly after a sluggish third quarter in 2019.

Small Businesses

Overall, small business credit market conditions remained accommodative. Loan volumes were little changed in November, and indicators of recent loan performance deteriorated slightly but remained strong by historical standards. With respect to the supply of small business credit, the fraction of firms reporting that credit was more difficult to obtain than three months ago stayed at the low end of its historical distribution in December. At the same time, demand for credit by small businesses continued to be

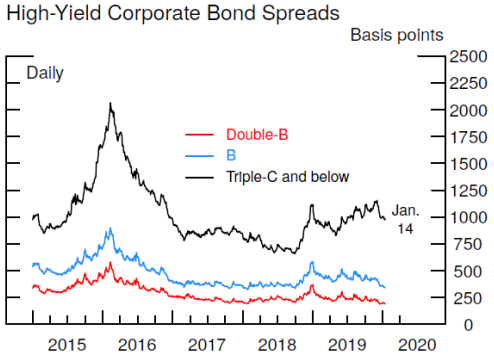
Bifurcation in the Speculative-Grade Corporate Bond Market

Rates on speculative-grade corporate bonds have exhibited a notable bifurcation in recent months, with spreads of bonds rated triple C and below over comparable-maturity Treasury securities—the lowest credit quality group—having widened substantially since last summer while spreads of double-B and B bonds narrowed. This divergence has led to the widest ratio of triple-C to B bond spreads since the early 2000s.[1] Although spreads of both triple-C-and-below and B-rated bonds have declined since early December, the bifurcation has persisted through early 2020.

Movements in corporate bond spreads can typically be attributed to changes in (1) expectations of credit losses, (2) investor credit risk premiums, and (3) liquidity conditions for trading corporate bonds. The widening of spreads rated triple-C and below over the second half of 2019 appears to be largely due to idiosyncratic industry- and firm-specific factors that raised default expectations for certain firms rated triple-C and below. In contrast, narrower double-B- and B-rated spreads appear to be due to some reduction in credit risk for corporate debt more broadly as well as some decline in the risk premium demanded by investors.

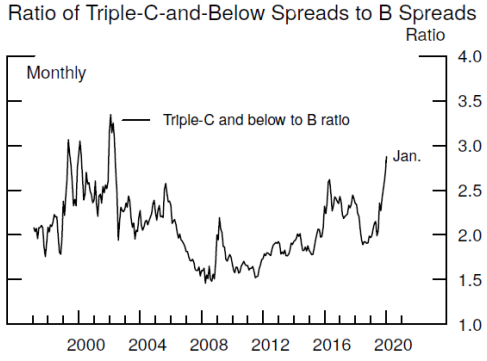
Within bonds rated triple-C and below, a deteriorating credit outlook for energy firms and for several large telecom issuers looks to have helped push spreads higher in this ratings class. A number of indicators pointed to declining credit quality for energy firms generally in the second half of 2019, including reduced earnings prospects amid drops in oil and other energy prices, a rise in the actual and expected number of energy firm defaults, and higher downgrades of speculative-grade energy bonds. In the energy sector, oil field equipment and services firms experienced particular stress as oil prices remained somewhat depressed through early December 2019. These

High-Yield Corporate Bond Spreads



Note: Data are option-adjusted spreads over comparable-maturity Treasury yield.
Source: Merrill Lynch; ICE Data Indices, LLC.

Ratio of Triple-C-and-Below Spreads to B Spreads



Note: Month-end value of business daily data. Data are option-adjusted spreads over comparable-maturity Treasury yield.
Source: Merrill Lynch; ICE Data Indices, LLC.

[1] The leveraged loan market also experienced bifurcation in 2019, with spreads between double-B-rated and B-rated leveraged loans widening from early summer through November, though the bifurcation partially reversed in December. However, factors driving leveraged loan bifurcation appear systematic rather than idiosyncratic and, hence, different from those for corporate bonds. Investors' perceptions of elevated risk in lower-rated loans at least partly drove the bifurcation, consistent with a recent upward trend in downgrades for lower-rated loans. Investor risk sentiment may have also played some role.

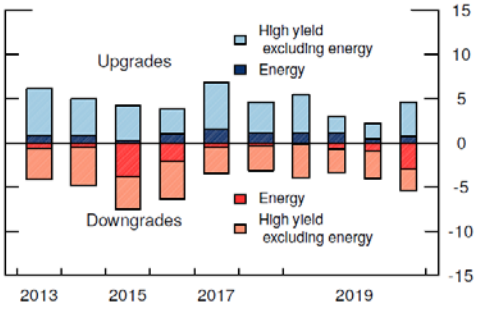
firms make up about 8 percent of the ICE Bank of America Merrill Lynch triple-C-and-below bond index but only about ½ percent of the double-B index and 3 percent of the B index. In addition, the credit outlook for several triple-C-rated telecom issuers with high weights in the ICE index also worsened in 2019, largely because of idiosyncratic factors related to those firms' operations.

Additional evidence that idiosyncratic factors played a key role in the widening in triple-C-and-below spreads is the divergence across bond maturity buckets. Spreads for triple-C-and-below bonds with 3-to-5-year maturity have widened since April 2019, while spreads for triple-C-and-below bonds with 7-to-10-year maturity widened somewhat from April 2019 through June 2019 and have narrowed since. If the overall change in triple-C-and-below spreads was due to reduced appetite for triple-C-rated bonds among investors generally, spreads of all maturities would likely have increased.

In contrast to bonds rated triple-C and below, spreads for double-B- and B-rated corporate bonds have narrowed since last summer. Those movements appear to have been driven by an improved credit outlook broadly as well as some rise in investor risk appetite. Indeed, the Moody's KMV measure of expected year-ahead defaults for nonfinancial firms overall has declined since last summer. Market commentary points to the easing of trade tensions and firming expectations of U.S. economic growth as having improved the outlook for firm performance and reduced double-B- and B-rated corporate bond spreads.

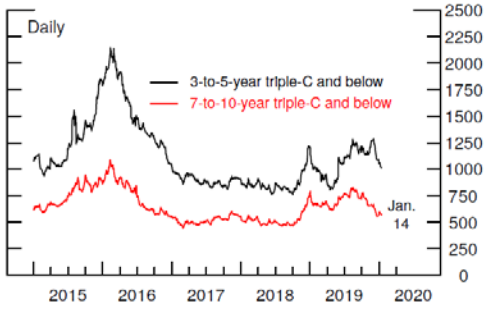
Several indicators also suggest some improvement in risk sentiment over the past several months. The staff estimate of the speculative-grade bond risk premium narrowed in the fourth quarter. In addition, measures of equity risk aversion have declined since summer, including the VIX and the staff estimate of the equity premium. Finally, liquidity conditions do not appear to have had a differential effect on bond spreads across speculative-grade market segments in recent months, as indicators suggest that liquidity conditions remained generally stable.

Nonfinancial High-Yield Rating Changes



Note: Downgrades and upgrades are classified based on the starting rating. Data are at an annual rate.
Source: Moody's reported by Mergent FISD.

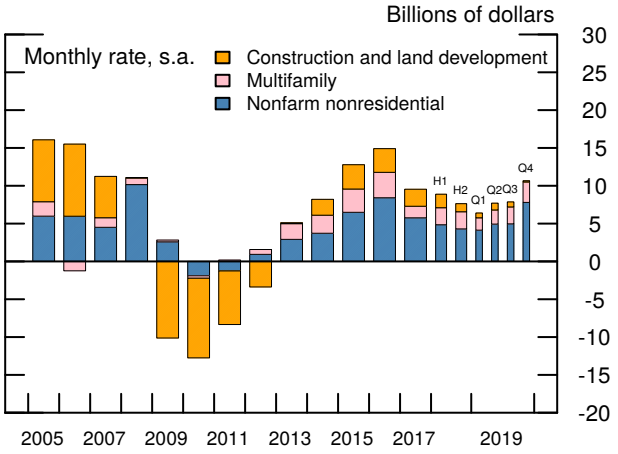
Triple-C Corporate Bond Spreads: Various Maturities



Note: Data are option-adjusted spreads over comparable-maturity Treasury yield.
Source: Merrill Lynch; ICE Data Indices, LLC.

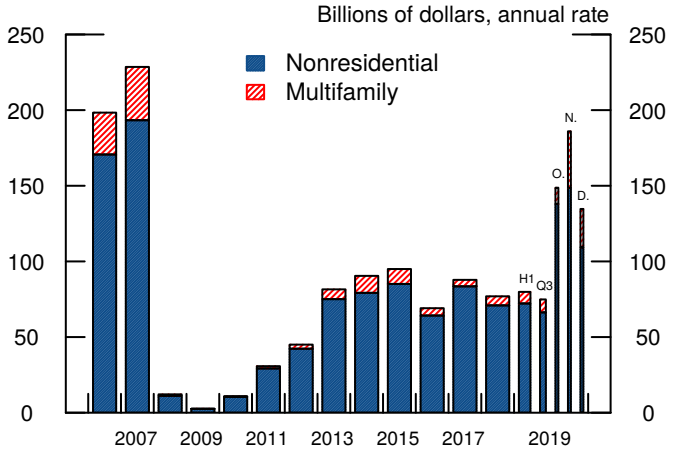
Real Estate Finance

Commercial Real Estate Loans



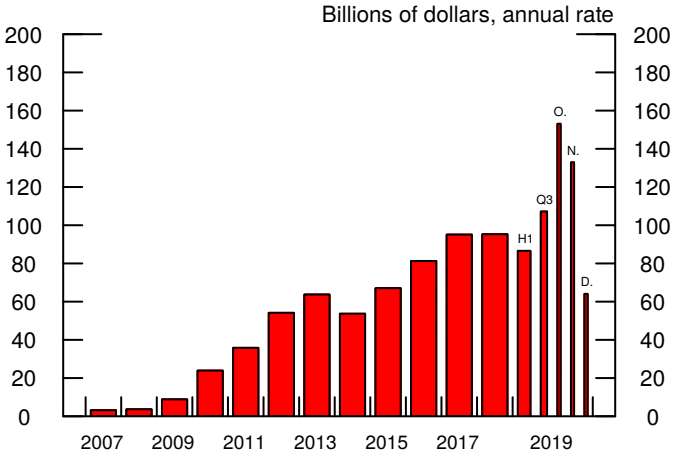
Source: Staff calculations, Federal Reserve Board, Form FR 2644, Weekly Report of Selected Assets and Liabilities of Domestically Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks.

Non-agency CMBS Issuance



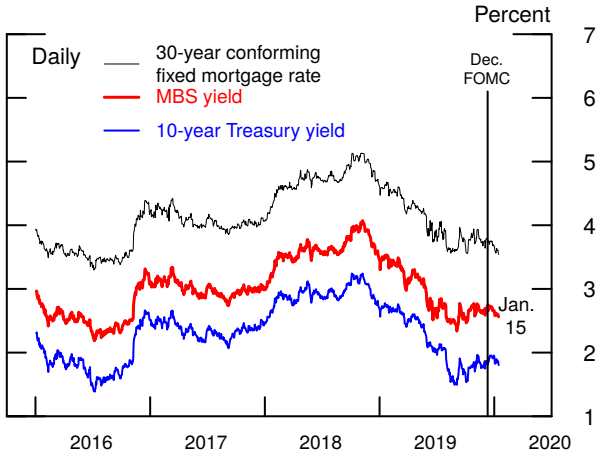
Note: CMBS is commercial mortgage-backed securities.
Source: Commercial Mortgage Alert.

Agency Multifamily CMBS Issuance



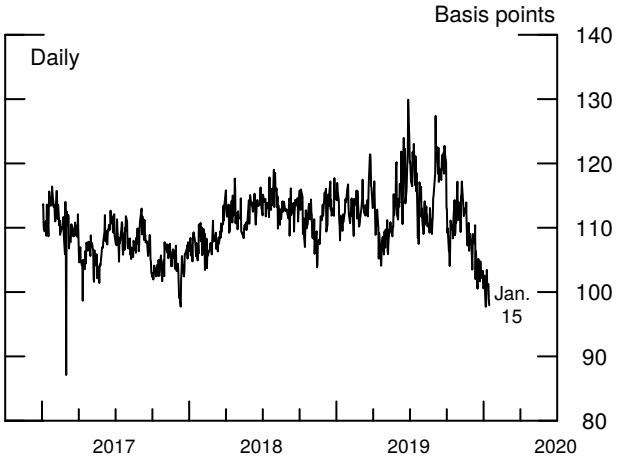
Note: CMBS is commercial mortgage-backed securities.
Source: Commercial Mortgage Alert.

Mortgage Rate and MBS Yield



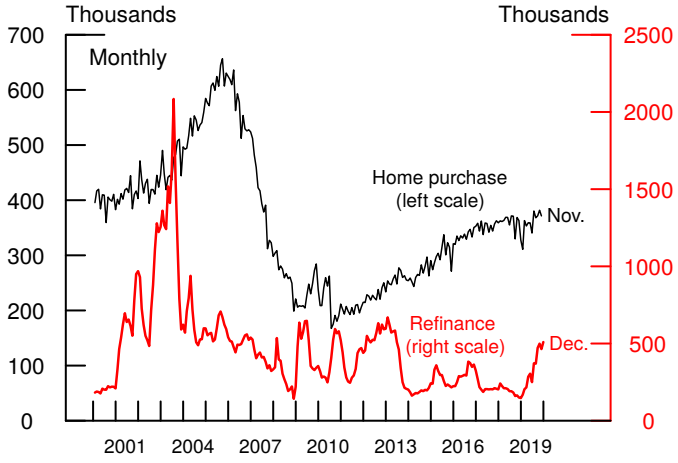
Note: Through May 31, 2019, the mortgage-backed securities (MBS) yield is the Fannie Mae 30-year current-coupon rate. From June 3, 2019, forward, the MBS yield is the uniform MBS 30-year current-coupon rate.
Source: For MBS yield, Barclays; for mortgage rate, Loansifter; for Treasury yield, Federal Reserve Bank of New York and Federal Reserve Board staff calculations.

Spread of 30-Year FRM to Agency MBS



Note: FRM is fixed-rate mortgage; MBS is mortgage-backed securities.
Source: Loansifter; Barclays.

Purchase and Refinance Originations



Note: The data are seasonally adjusted by Federal Reserve Board staff.
Source: For values before 2019, data reported under the Home Mortgage Disclosure Act of 1975; for values in 2019, Federal Reserve Board staff estimates.

Financing Conditions

weak, with the share of firms reporting little or no interest in borrowing still at about 55 percent, a historically high level.

Commercial Real Estate

Financing conditions remain generally accommodative for CRE lending. CMBS spreads edged down during the intermeeting period, and both agency and non-agency CMBS issuance grew notably in the fourth quarter, buoyed by lower interest rates. CRE loans on banks' books picked up in the fourth quarter, boosted by growth in nonfarm nonresidential loans. Consistent with this pattern, banks responding to the SLOOS reported unchanged lending standards and stronger demand for nonfarm nonresidential loans during the fourth quarter.

Municipal Government Financing Conditions

Credit conditions in municipal bond markets have also remained accommodative on balance. Gross issuance of municipal bonds was robust in November and December, with refinancing accounting for the majority of the issuance. Municipal bond yields declined somewhat more than yields on longer-term Treasury securities, causing municipal bond yield ratios to edge lower again, leaving them near the bottom of their past-decade range. The credit quality of general obligation bonds has improved over the past year, with the number of credit rating upgrades outpacing that of downgrades.

HOUSEHOLD FINANCING CONDITIONS

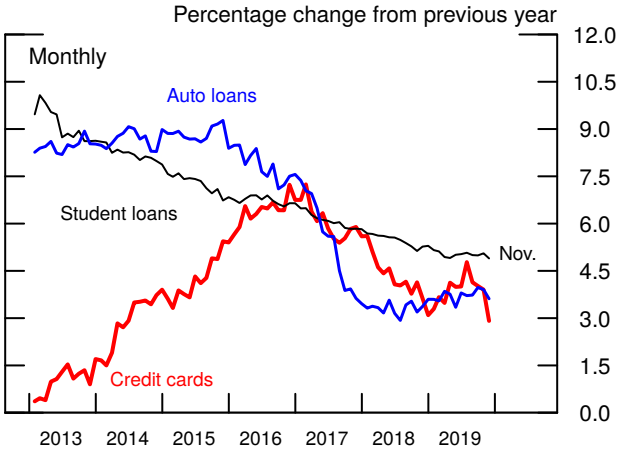
Residential Real Estate

Rates on 30-year conforming mortgages decreased 25 basis points, on net, during the intermeeting period, reversing the rate increase observed in November and leaving the recent level close to its October low. The decline in mortgage rates since the December FOMC meeting is larger than the decline in yields on agency MBS, likely reflecting an easing of capacity constraints at mortgage originators that caused a widening of this spread last summer and fall. In addition, the spread between yields on agency MBS and Treasury securities declined because of a projected slowing in refinancing, thereby reducing the MBS premium for prepayment risk.

Mortgage credit remains broadly available. Credit standards, as measured by lenders' maximum debt-to-income ratios, continued to hover near their three-year averages. In addition, bank and nonbank mortgage lenders reported leaving their lending

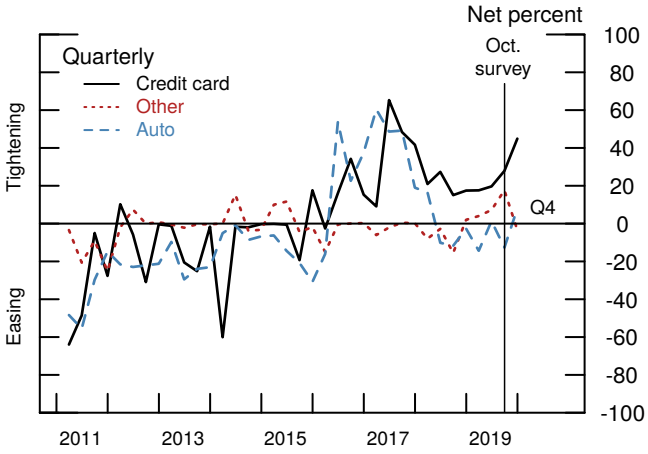
Consumer Finance

Consumer Credit



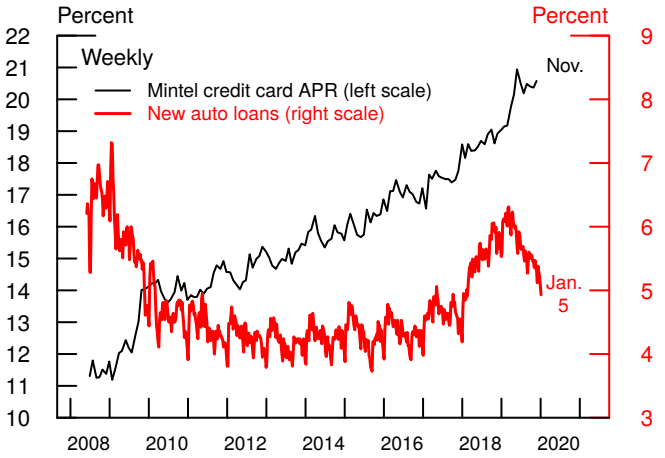
Source: Federal Reserve Board, Statistical Release G.19, "Consumer Credit."

Changes in Standards for Consumer Loans



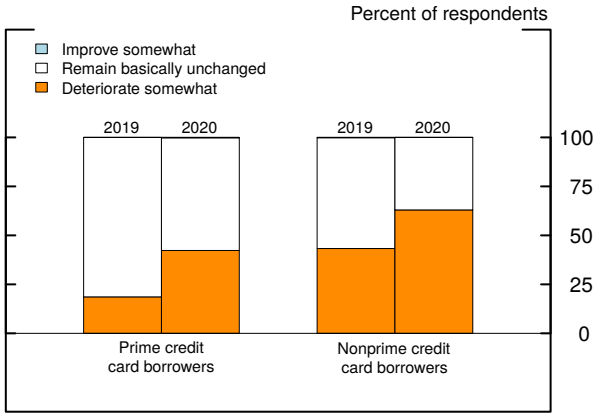
Note: Banks' responses are weighted by the outstanding amounts of the relevant loan categories on their balance sheets at the end of the previous quarter.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Consumer Interest Rates



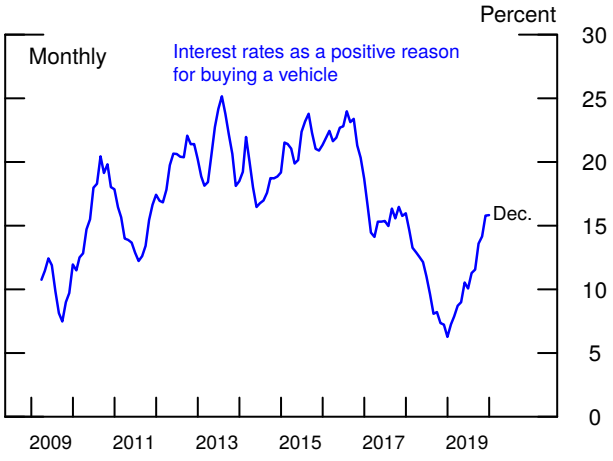
Note: Mintel data are reported monthly.
Source: Mintel; J.D. Power.

Outlook for Asset Quality of Credit Card Loans



Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Buying Conditions for Vehicles



Note: Percent of consumers reporting it is a good time to buy a car due to low interest rates minus the percent of consumers reporting it is a bad time to buy a car due to high interest rates. Data are a 3-month moving average.
Source: Reuters; University of Michigan Survey of Consumers.

standards on residential real estate loans unchanged in the fourth quarter, while credit unions reported modest easing on net. The combination of broadly available credit and lower mortgage rates has supported a robust level of mortgage originations. Home-purchase originations have remained around post-crisis highs through November, while mortgage refinancing activity continued at a strong pace through December.

Consumer Credit

Financing conditions in consumer credit markets on the whole continued to be supportive of growth in consumer spending, although the supply of credit remained fairly tight for nonprime borrowers. Growth of credit card balances appears to have slowed in the fourth quarter, and, in the SLOOS, banks continued to report a tightening of underwriting standards on these loans. That said, limits on credit card accounts for nonprime borrowers, while staying well below their pre-crisis levels, edged up through the third quarter. In addition, total credit card delinquency rates are roughly unchanged and remain low by historical standards. Even so, credit cards stand out as the loan category for which substantial shares of SLOOS respondents expect both tightening in lending standards and deteriorating asset quality in 2020 for both prime and nonprime borrowers, a less sanguine outlook for credit cards than what responses signaled a year ago. Meanwhile, auto loan growth appears to have maintained a solid pace in recent months amid generally accommodative financing conditions and declining interest rates. Responses to the University of Michigan Surveys of Consumers indicate an increasing share of consumers perceiving financing conditions for such loans as favorable.

Financing and Financial Conditions Indexes

A staff index that provides a measure of financing conditions for nonfinancial corporations indicates that financing conditions have eased somewhat as equity prices increased modestly over the intermeeting period, and conditions remain quite accommodative relative to historical standards. As shown in the appendix to this Tealbook section, the average reading of other publicly available financial conditions indexes, which aggregate a large set of financial variables into a summary series, also points to slightly easier financial conditions. Generally, these indexes indicate that broad financial conditions are notably accommodative relative to historical standards and significantly easier than at this time last year.

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Appendix

Technical Note on Financial Conditions Indexes

The table "Overview of Selected FCIs" provides a summary of various financial conditions indexes (FCIs) that have been developed at the Federal Reserve Board and elsewhere. The historical evolution of these indexes is reported in the exhibit "Selected Financial Conditions Indexes."

Overview of Selected FCIs

Index	Frequency	Sample start	Methodology	Components
Staff FCI for nonfinancial corporations	Daily	1973	Difference in equity returns between two portfolios of firms with credit ratings above and just below investment grade	Nonfinancial firms' stock returns and credit ratings; five Fama-French factors, plus momentum and quality minus junk factors
SLOOS Bank Lending Standards Index	Quarterly	1991	Weighted average of the net percentage of domestic banks tightening standards for 11 loan categories, with weights given by the size of each loan category on banks' balance sheets	Lending standards for 11 loan categories
Goldman Sachs Financial Conditions Index	Daily	1990	Weighted average of financial variables with weights pinned down by the contribution of each financial variable on real GDP growth over the following year using a VAR model	5 financial variables: the federal funds rate, the 10-year Treasury yield, the triple-B yield spreads to Treasury, the S&P price-to-earnings ratio, and the broad value of the U.S. dollar
Chicago Fed National Financial Conditions Index	Weekly	1971	Dynamic factor model	100 financial variables related to money markets (28 indicators), debt and equity markets (27 indicators), and the banking system (45 indicators)
St. Louis Fed Financial Stress Index	Weekly	1993	Principal component analysis	18 variables, including short- and long-term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, breakeven inflation rate, and the S&P 500 index
Kancas City Fed Financial Stress Index	Monthly	1990	Principal component analysis	11 financial variables, including short- and long-term interest rates, corporate and consumer yield spreads, the VIX, and the volatility of bank stock prices

Source: CRSP; Yahoo Finance; Moody's Bond Ratings; Ken French website; AQR Capital Management website; Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices; Bloomberg; Federal Reserve Banks of Chicago, St. Louis, and Kansas City.

The first index in the table, the staff FCI for nonfinancial corporations, measures financing conditions for nonfinancial corporations.[1] This index is constructed as the difference in equity returns between two portfolios of firms with credit ratings above and just below investment grade. To the extent that speculative-grade firms are more sensitive to changes in financing conditions than investment-grade firms but have similar exposure to other shocks, movements in this index provide a measure of changes in financing conditions for nonfinancial corporations.

The second index in the table measures the net share of domestic banks reporting tighter lending standards across all core loan categories in the Senior Loan Officer Opinion Survey on Bank Lending Practices. Banks' responses for a given loan category are weighted by banks' holdings of those loans on their balance sheets.[2]

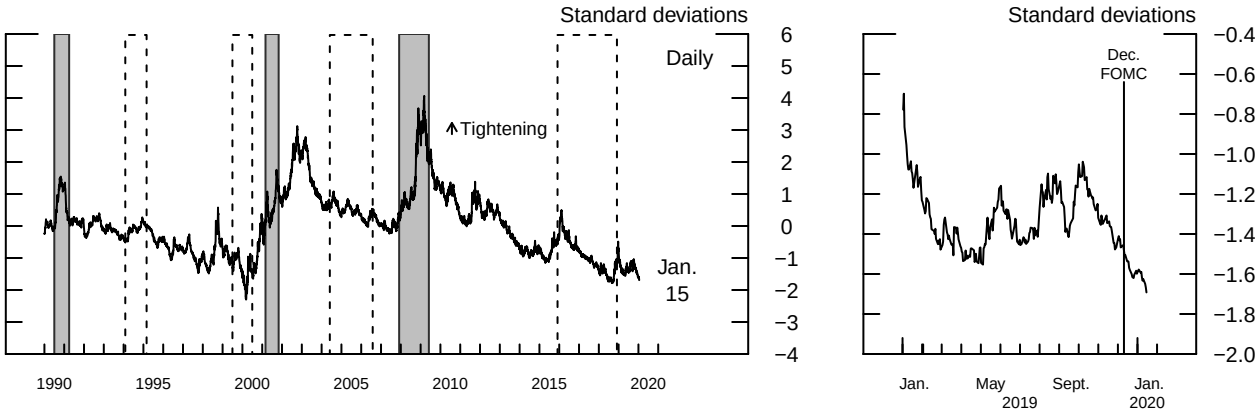
The other FCIs are constructed by aggregating a large set of financial variables into a summary series using various statistical methods. While these indexes provide a useful summary of broad financial market developments, the movements in these indexes may reflect both changes in financing conditions and other shocks to the economy.

[1] This index was first discussed in the box "Financial Conditions Indexes" in the Financing Conditions for Businesses and Households section of the September 2018 Tealbook A.

[2] This index is an updated version of the index developed in William F. Bassett, Mary Beth Chosak, John C. Driscoll, and Egon Zakrajsek (2014), "Changes in Bank Lending Standards and the Macroeconomy," *Journal of Monetary Economics*, vol. 62 (March), pp. 23–40. The current index uses a new weighting approach for each loan category.

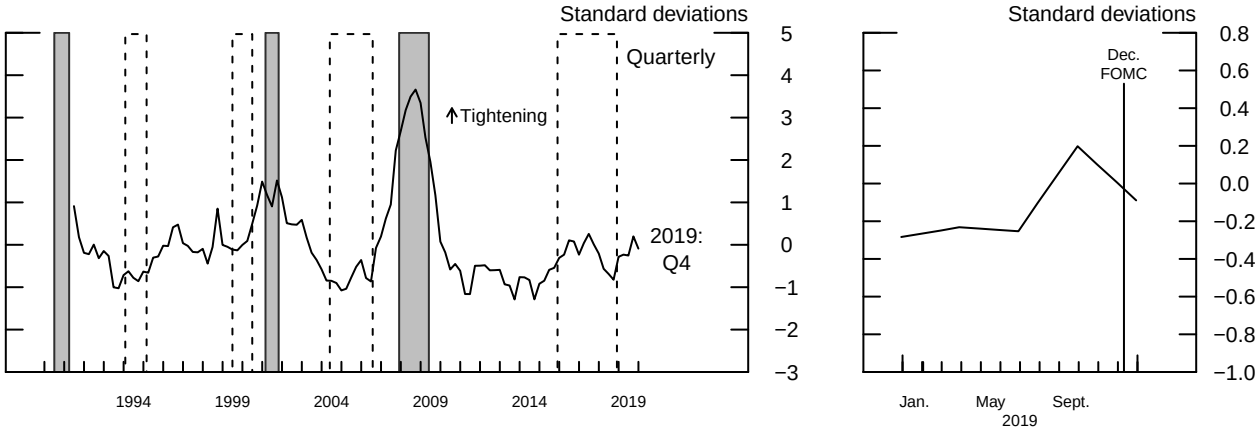
Selected Financial Conditions Indexes

Staff FCI for Nonfinancial Corporations



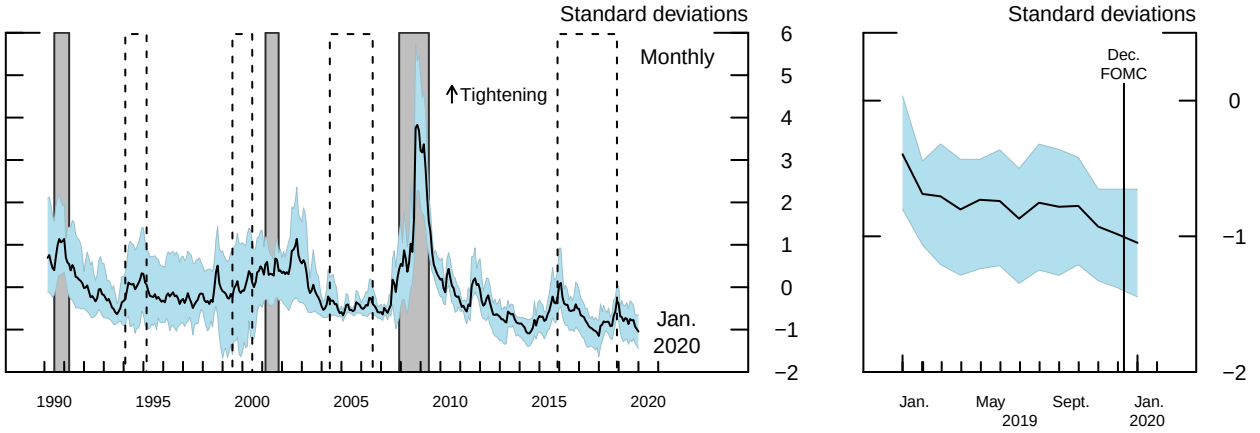
Note: The financial conditions index (FCI) is the deviation from the long−run relation between the systematic components of the cumulative log returns of 2 portfolios of firms with credit ratings above and just below investment grade. The systematic components are derived from the 5−factor Fama−French asset pricing model, augmented with the momentum and quality minus junk factors.
Source: CRSP; Yahoo Finance; Moody's Bond Ratings; Ken French website; AQR Capital Management website.

SLOOS Bank Lending Standards Index



Note: The index is a weighted average of the net percentage of domestic banks tightening standards for 11 loan categories, with weights given by the size of each loan category on banks' balance sheets.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Mean and Range of External FCIs

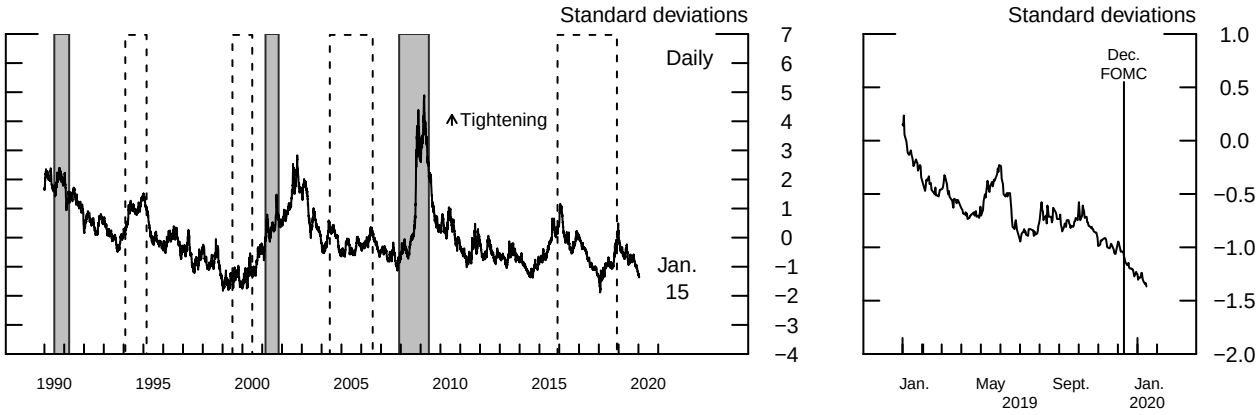


Note: Mean FCI represents the mean of FCIs developed by Goldman Sachs and the Federal Reserve Banks of Chicago, St. Louis, and Kansas City. The blue shaded region represents the range of these 4 standardized FCIs.
Source: Bloomberg; Federal Reserve Banks of Chicago, St. Louis, and Kansas City.

For all panels: Indexes are standardized. Values above (below) zero represent tighter (easier) than average financial conditions. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. The dashed boxes denote monetary policy tightening cycles.

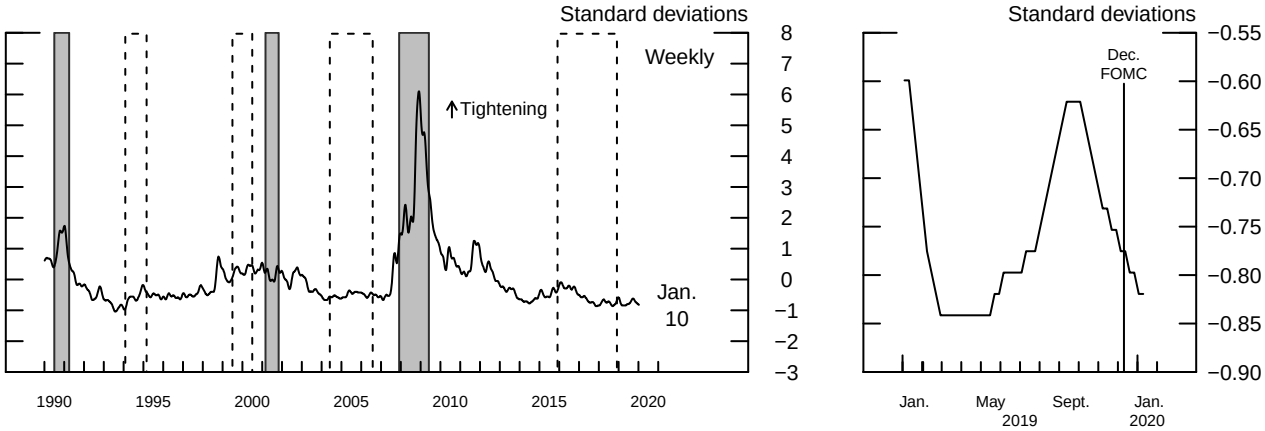
Selected Financial Conditions Indexes (continued)

Goldman Sachs FCI



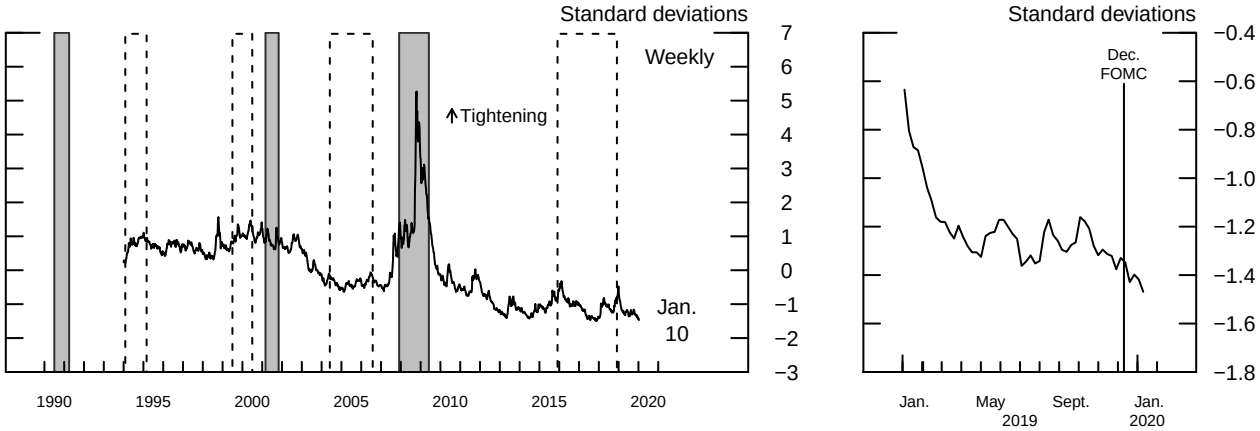
Note: The index is a weighted average of 5 financial variables: the federal funds rate, the 10−year Treasury yield, the triple−B yield spreads to Treasury, the S&P price−to−earnings ratio, and the broad value of the U.S. dollar. Weights are pinned down by the contribution of each financial variable on real gross domestic product growth over the following year using a vector autoregression model.
Source: Bloomberg.

Chicago Fed NFCI



Note: The index is based on 100 financial variables related to money markets (28 indicators), debt and equity markets (27 indicators), and the banking system (45 indicators). The index is weekly and is derived using a dynamic factor model.
Source: Federal Reserve Bank of Chicago.

St. Louis Fed Financial Stress Index

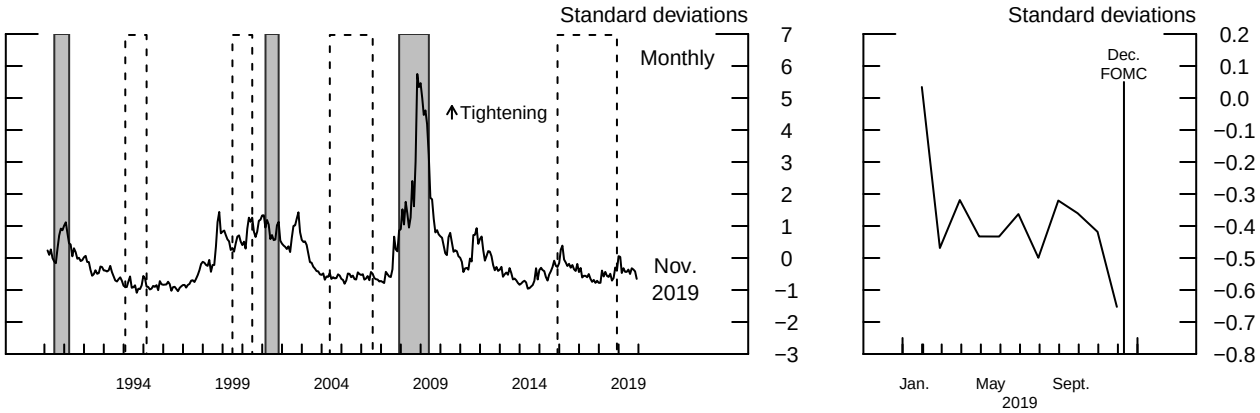


Note: The index is the principal component of 18 variables, including short− and long−term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, breakeven inflation rate, and the S&P 500 index.
Source: Federal Reserve Bank of St. Louis.

For all panels: Indexes are standardized. Values above (below) zero represent tighter (easier) than average financial conditions. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. The dashed boxes denote monetary policy tightening cycles.

Selected Financial Conditions Indexes (continued)

Kansas City Fed Financial Stress Index



Note: The index is the principal component of 11 financial variables, including short− and long−term interest rates, corporate and consumer yield spreads, the VIX, and the volatility of bank stock prices.
Source: Federal Reserve Bank of Kansas City.

For all panels: Indexes are standardized. Values above (below) zero represent tighter (easier) than average financial conditions. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. The dashed boxes denote monetary policy tightening cycles.

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Risks and Uncertainty

Assessment of Risks

We continue to judge that the risks around our baseline projection for GDP are tilted slightly to the downside, though by somewhat less than in recent Tealbooks. We see notably diminished risks of further escalation in the U.S.–China trade dispute and of a disorderly Brexit. Among the remaining risks, foreign economic and geopolitical developments seem more likely to move in directions that would create a significant drag on domestic activity than to resolve more favorably than assumed. In addition, the softness in business investment and manufacturing production last year, as well as the recent weakness in imports, could point to a more substantial slowing in domestic demand than we currently recognize. Among risks to the upside, many of the underlying fundamentals for household spending and business investment remain solid, and financial conditions remain favorable. In these circumstances, spending could expand at a pace faster than in the staff projection. We judge the overall degree of uncertainty as being broadly in line with the average over the past 20 years (the benchmark used by the FOMC); notably, that period includes the most recent two recessions along with many episodes with elevated uncertainty and market volatility.

Model-based measures of recession risks have remained close to estimates at the time of the November Tealbook, although they are notably lower than they were in the middle of 2019. As shown in the bottom table of the "Assessment of Key Macroeconomic Risks" exhibit, the estimated probability of moving into recession over the next year based on a term-spread model is about unchanged at 48 percent. The probability estimate from a model-averaging framework that uses a selection of both real and financial variables is 4 percent, compared with 8 percent in the November Tealbook—still notably lower than the unconditional probability.

Two exhibits provide alternative perspectives on the chance of an adverse outcome in the period ahead. According to the exhibit "Conditional Distributions of Staff Forecast Errors 1 Year Ahead," the projected distribution of misses around the Tealbook forecast over the next four quarters does not appear particularly wide or skewed. In contrast, the exhibit "Conditional Distributions of Macroeconomic Variables 2 Years Ahead" shows that, at the two-year horizon, current conditions suggest that the risks are skewed to the downside for GDP growth and to upside for the unemployment rate, albeit to a lesser extent than in the middle of last year. One

Assessment of Key Macroeconomic Risks

Probability of Inflation Events

(4 quarters ahead)

Probability that the 4-quarter change in total PCE prices will be . . .	Staff	FRB/US	EDO	BVAR
Greater than 3 percent				
Current Tealbook	.05	.05	.01	.02
Previous Tealbook	*.04*	*.04*	*.01*	*.02*
Between 1 3/4 and 2 1/4 percent				
Current Tealbook	.21	.21	.41	.21
Previous Tealbook	*.24*	*.23*	*.41*	*.21*
Less than 1 percent				
Current Tealbook	.24	.24	.02	.27
Previous Tealbook	*.19*	*.18*	*.02*	*.28*

Probability of Unemployment Events

(4 quarters ahead)

Probability that the unemployment rate will . . .	Staff	FRB/US	EDO	BVAR
Increase by 1 percentage point				
Current Tealbook	.03	.08	.20	.03
Previous Tealbook	*.03*	*.03*	*.23*	*.04*
Decrease by 1 percentage point				
Current Tealbook	.10	.03	.00	.07
Previous Tealbook	*.05*	*.03*	*.00*	*.07*

Probability of Recession Over Next 4 Quarters

Probability of transitioning into or remaining in a recession	Staff	FRB/US	MAF	Term Spread	Unconditional
Current Tealbook	.07	.10	.04	.48	.23
Previous Tealbook	*.07*	*.08*	*.08*	*.49*	*.23*

Note: "Staff" represents stochastic simulations in FRB/US around the staff judgmental baseline; baselines for FRB/US, EDO, and BVAR are generated by those models. The "MAF" estimate uses a model averaging framework to infer the probability from a selection of real and financial variables. "Term Spread" shows the probability implied by the spread between the current month's 10-year and 3-month Treasury yields. "Unconditional" is calculated using NBER recession dating from 1973:Q1 to the most recent quarter with a BEA estimate of GDP.

important reason for the different assessments is that the model underlying the two-year-ahead estimate includes the recession probability from the term-spread model as an input.

As indicated in the exhibit "Effective Lower Bound Risk Estimate," the estimated probability of returning to the effective lower bound (ELB) over the next three years is 21 percent, a bit lower than the estimate in recent Tealbooks. The probability rises to 34 percent by the end of the medium term as the distribution of outcomes around the baseline naturally widens farther into the future. A return of the federal funds rate to the ELB may leave monetary policy with less capacity to offset significant negative economic shocks than positive ones, contributing to the downside risk of economic outcomes.

With regard to inflation, we view the risks to the projection as slanted to the downside, in part because of the downside risks to economic activity. Moreover, inflation has been running low over the past year, and longer-run inflation expectations could currently be lower than we recognize. Also, if downside risks abroad materialize, the exchange value of the dollar could appreciate more than expected and put downward pressure on inflation. There are also risks to the upside. For example, an extended period with unusually tight resource utilization could lead to greater upward pressure on wages and prices, consistent with the predictions of models that emphasize nonlinear effects of resource utilization on inflation. Also, if tensions in the Middle East were to escalate further, oil prices could spike higher and remain elevated for an extended period.

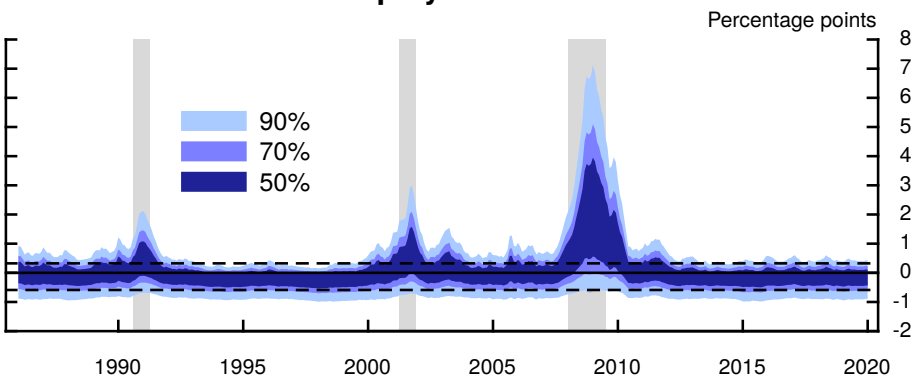
All of these inflation risks would tend to be of modest size as long as inflation expectations remained well anchored. The risks could increase substantially in either direction if expectations were to follow actual inflation up or down. Such movements in expectations could induce changes in inflation to build on themselves and thus lead inflation to deviate significantly and persistently from 2 percent. Notwithstanding these concerns, we judge the overall degree of uncertainty to be about the same as over the past 20 years.

Our view of the risks to the economic outlook is informed by the staff's latest quantitative surveillance assessment, in which the staff continues to judge overall financial vulnerabilities in the U.S. financial system to be at a moderate level. Risk appetite and asset valuation pressures are now judged to be at elevated levels, primarily reflecting continued upward pressures on prices in equity and corporate bond markets. Additionally, borrowing by nonfinancial businesses, as a ratio to nominal GDP, has remained elevated amid indications of weak loan underwriting in leveraged loan markets. We have also raised our assessment of

Risks & Uncertainty

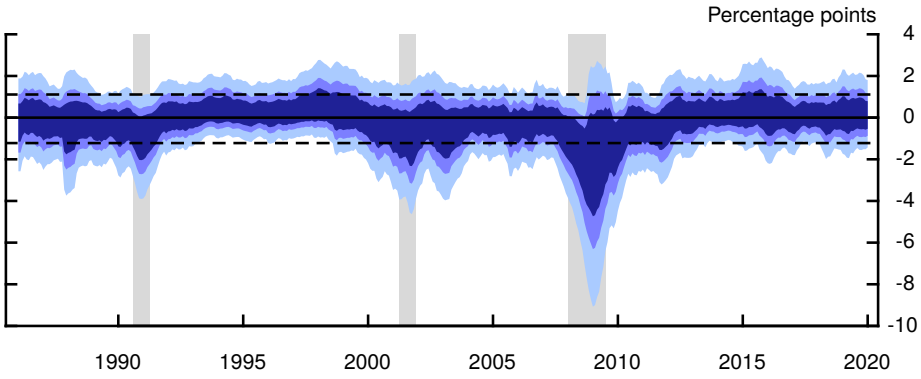
Conditional Distributions of Staff Forecast Errors 1 Year Ahead

Unemployment Rate



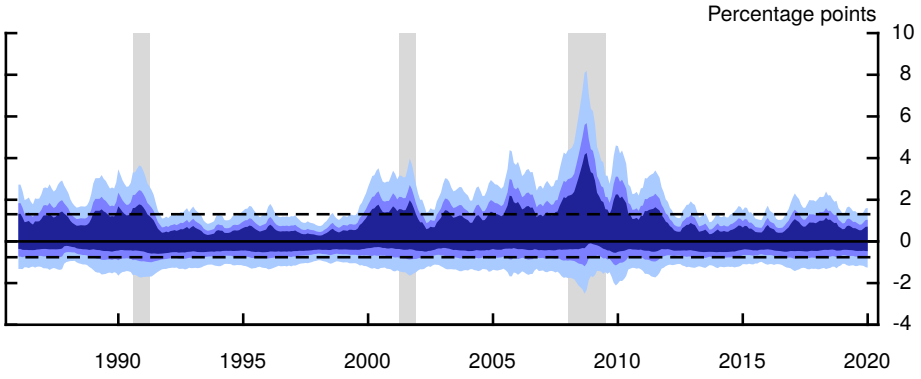
January 2020	
95th	.4
85th	.2
50th	- .1
15th	- .6
5th	- .9

GDP Growth



January 2020	
95th	1.8
85th	1.2
50th	.1
15th	- .9
5th	-1.4

CPI Inflation

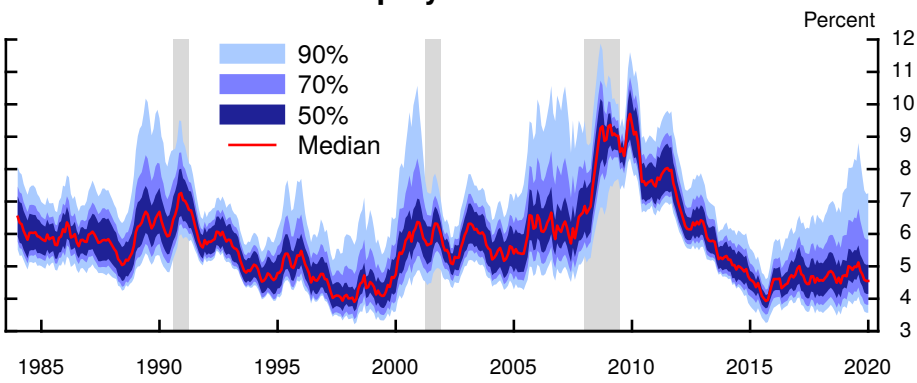


January 2020	
95th	1.6
85th	1.0
50th	.1
15th	- .8
5th	-1.3

Note: The exhibit shows estimates of quantiles of the distribution of errors for 4-quarter-ahead staff forecasts. The estimates are conditioned on indicators of real activity, inflation, financial market strain, and the volatility of high-frequency macroeconomic indicators. The tables show selected quantiles of the predictive distributions for the respective variables as of the current Tealbook. Dashed lines denote the median 15th and 85th percentiles. Gray shaded bars indicate recession periods as defined by the National Bureau of Economic Research.

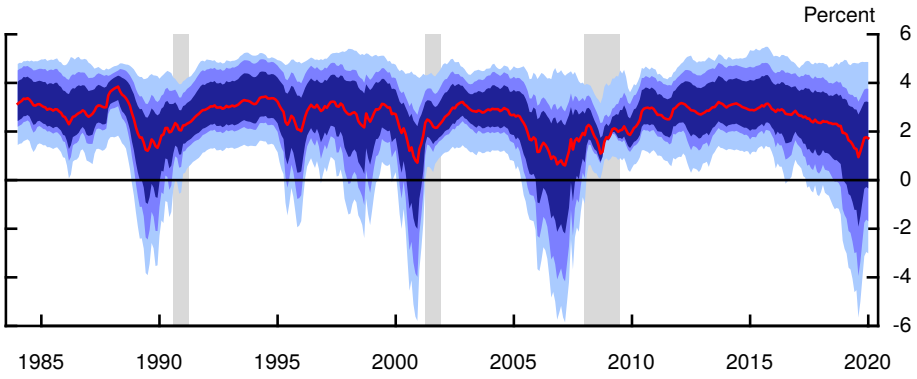
Conditional Distributions of Macroeconomic Variables 2 Years Ahead

Unemployment Rate



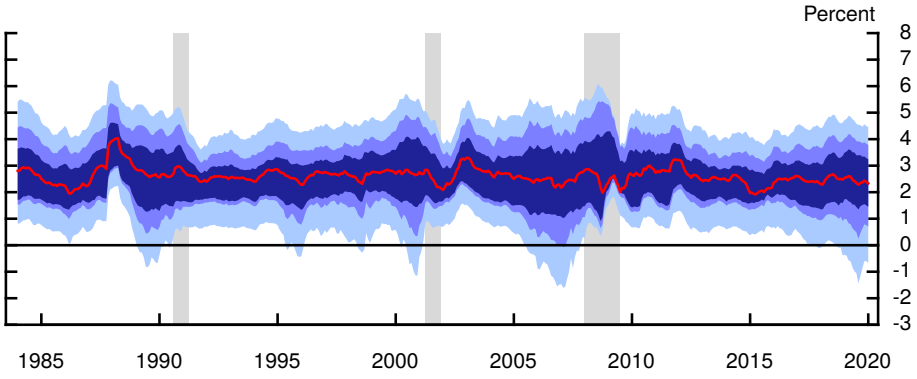
January 2020	
95th	7.3
85th	5.8
50th	4.5
15th	3.8
5th	3.6

GDP Growth



January 2020	
95th	4.9
85th	3.8
50th	1.7
15th	-1.7
5th	-3.0

CPI Inflation



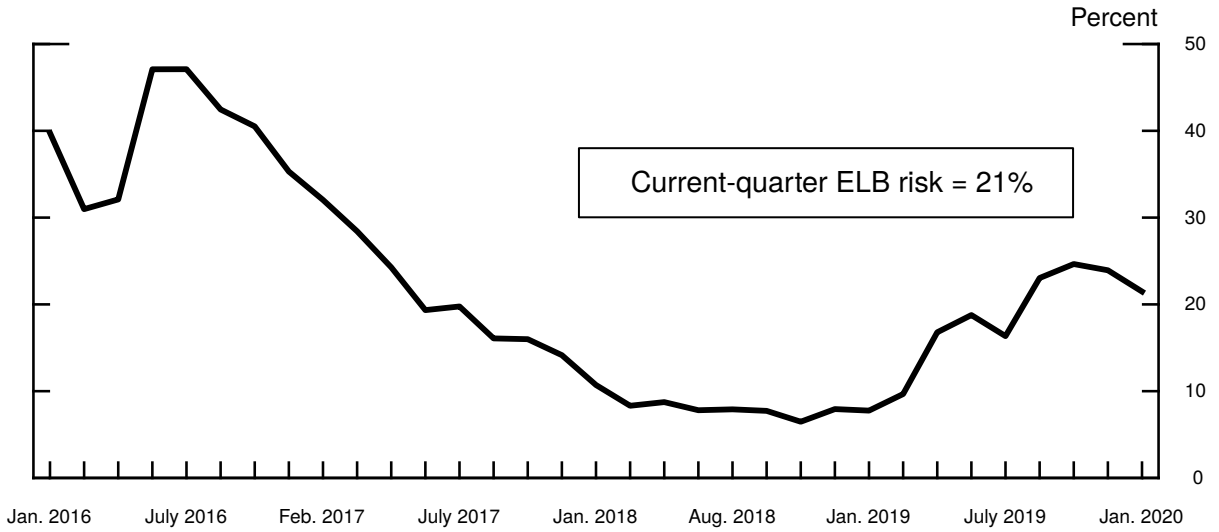
January 2020	
95th	4.5
85th	3.8
50th	2.3
15th	.7
5th	- .7

Note: The exhibit shows estimates of quantiles of the conditional distribution of the respective macro variables 2 years ahead. The estimates are conditioned on indicators of real activity, inflation, financial market strain, the volatility of high-frequency macroeconomic indicators, and a term-spread-based recession probability. The tables show selected quantiles of the predictive distributions for the respective variables as of the current Tealbook. Gray shaded bars indicate recession periods as defined by the National Bureau of Economic Research.

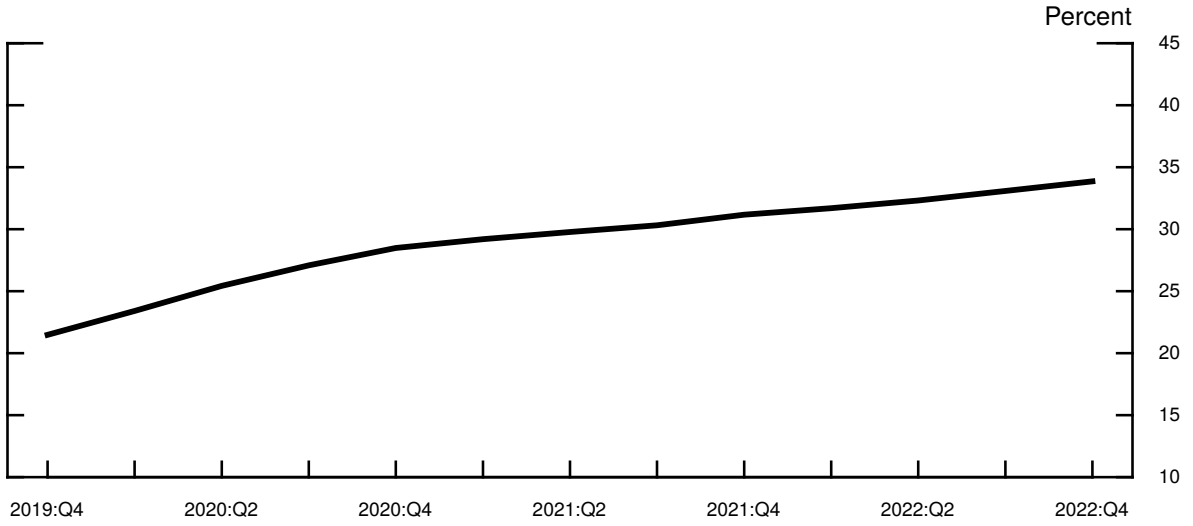
Risks & Uncertainty

Effective Lower Bound Risk Estimate

ELB Risk since Liftoff



ELB Risk over the Projection Period



Note: The figures show the probability that the federal funds rate reaches the effective lower bound (ELB) over the next 3 years starting in the given quarter. Details behind the computation of the ELB risk measure are provided in the box "A Guidepost for Dropping the Effective Lower Bound Risk from the Assessment of Risks" in the Risks and Uncertainty section of the April 2017 Tealbook A. The lower panel computes ELB risk over a forward-looking moving 3-year window using stochastic simulations in FRB/US beginning in the current quarter. The simulations are computed around the Tealbook baseline.

vulnerabilities from maturity and liquidity transformation to the moderate level, reflecting our current assessment of vulnerabilities in short-term funding markets in the aftermath of the volatility episode in mid-September. In contrast, the household-sector credit-to-GDP ratio lies well below an estimate of its trend, and underwriting standards in this sector are generally solid. In addition, the largest U.S. banks continue to have strong capital positions relative to regulatory standards—although a dimmer profitability outlook and declining capital levels point to a modest fall in loss-absorbing capacity over the next year. Putting these factors together, current financial vulnerabilities do not appear likely to intensify shocks to an unusual degree through strains within the financial sector, although the stretched balance sheets in the nonfinancial corporate sector could contribute to an amplification of shocks from either domestic or foreign sources.

ALTERNATIVE SCENARIOS

To illustrate some of the risks to the outlook, we construct alternatives to the baseline projection using simulations of staff models.[1]

Lower Inflation Expectations with Flatter Phillips Curve [FRB/US model]

Some measures of longer-run inflation expectations are at, or near, historically low levels, including the Michigan survey measure of longer-run inflation expectations, which hit an all-time low in December. In the baseline, we assume that underlying trend inflation is 1.8 percent. In this scenario, we consider the possibility that the private sector's longer-run inflation expectations are consistent with underlying trend inflation having been at 1.6 percent—the average of core PCE inflation over the past decade—for many years and remaining at that level going forward.[2] We also assume that the slope of the Phillips curve is half of the baseline value and that policymakers currently recognize the lower underlying inflation trend and the flatter slope of the Phillips curve.[3]

[1] The models used are (1) FRB/US, a large-scale macroeconometric model of the U.S. economy; (2) EDO, an estimated medium-scale DSGE model of the U.S. economy; and (3) SIGMA, a calibrated multicountry DSGE model. All three models were developed by the Board's staff.

[2] For analyses of how the risk of returning to the effective lower bound constraint can push down long-run inflation expectations, see Michael Kiley and John Roberts (2017), "Monetary Policy in a Low Interest Rate World," *Brookings Papers on Economic Activity*, vol. 48 (Spring), pp. 317–396; and Timothy Hills, Taisuke Nakata, and Sebastian Schmidt (2019), "Effective Lower Bound Risk," *European Economic Review*, vol. 120 (November).

[3] This scenario is run with the version of the FRB/US model that assumes model-consistent expectations for the financial markets and wage and price decisions.

Alternative Scenarios

(Percent change, annual rate, from end of preceding period except as noted)

Measure and scenario	2019 H2	2020	2021	2022	2023	2024-25
Real GDP						
Tealbook baseline and extension	2.1	2.3	2.0	1.7	1.4	1.3
Lower inflation expectations with flatter PC	2.1	2.4	2.1	1.9	1.6	1.4
Recession preceded by leverage buildup	2.1	2.4	2.3	-1.4	-1.5	1.6
Positive hysteresis	2.1	2.5	2.2	1.9	1.7	1.5
Stronger aggregate demand	2.1	2.9	2.5	1.8	1.3	1.1
Foreign slowdown	2.1	1.4	1.6	1.8	1.6	1.4
Geopolitical tensions	2.1	1.0	.9	1.4	1.5	1.6
Unemployment rate[1]						
Tealbook baseline and extension	3.5	3.3	3.3	3.3	3.4	3.9
Lower inflation expectations with flatter PC	3.5	3.3	3.2	3.1	3.2	3.5
Recession preceded by leverage buildup	3.5	3.3	3.1	4.4	6.2	6.2
Positive hysteresis	3.5	3.3	3.2	3.1	3.3	3.7
Stronger aggregate demand	3.5	3.0	2.8	2.8	3.0	3.7
Foreign slowdown	3.5	3.6	3.8	3.8	3.9	4.2
Geopolitical tensions	3.5	3.7	4.2	4.4	4.6	4.7
Total PCE prices						
Tealbook baseline and extension	1.6	1.6	1.9	1.9	1.9	2.0
Lower inflation expectations with flatter PC	1.6	1.5	1.6	1.6	1.6	1.7
Recession preceded by leverage buildup	1.6	1.6	1.9	1.8	1.7	1.7
Positive hysteresis	1.6	1.6	1.9	1.9	1.9	2.0
Stronger aggregate demand	1.6	1.7	1.9	1.9	2.0	2.0
Foreign slowdown	1.6	.9	1.5	1.7	1.8	1.9
Geopolitical tensions	1.6	2.4	1.6	1.8	1.8	1.9
Core PCE prices						
Tealbook baseline and extension	1.8	1.9	1.9	1.9	1.9	2.0
Lower inflation expectations with flatter PC	1.8	1.8	1.7	1.6	1.6	1.7
Recession preceded by leverage buildup	1.8	1.9	1.9	1.8	1.7	1.7
Positive hysteresis	1.8	1.9	1.9	1.9	1.9	2.0
Stronger aggregate demand	1.8	1.9	2.0	1.9	2.0	2.0
Foreign slowdown	1.8	1.4	1.6	1.7	1.8	1.9
Geopolitical tensions	1.8	1.5	1.8	1.8	1.9	1.9
Federal funds rate[1]						
Tealbook baseline and extension	1.7	1.9	2.3	2.6	2.6	2.7
Lower inflation expectations with flatter PC	1.7	1.9	2.2	2.3	2.4	2.4
Recession preceded by leverage buildup	1.7	1.9	2.4	.1	.1	.1
Positive hysteresis	1.7	1.9	2.3	2.5	2.6	2.6
Stronger aggregate demand	1.7	2.0	2.5	2.8	2.8	2.8
Foreign slowdown	1.7	1.2	1.1	1.5	1.8	2.2
Geopolitical tensions	1.7	1.1	1.0	1.3	1.3	1.7

Note: PC is Phillips curve.

1. Percent, average for the final quarter of the period.

Under these assumptions, actual inflation averages 1.7 percent over the projection period, 0.2 percentage point lower than in the baseline. Lower realized inflation implies that the federal funds rate stays below its baseline path and is about 30 basis points lower by 2025. GDP growth is slightly higher and the unemployment rate slightly lower than in the baseline, as the long-run nominal interest rates relevant for consumption and investment decisions decline more than one-for-one with inflation, pushing down real interest rates.

Recession Preceded by Corporate Leverage Buildup [FRB/US model]

As indicated in the quantitative surveillance assessment, nonfinancial business-sector debt relative to GDP is historically high amid weak credit standards. In this scenario, after two years of a further buildup in corporate leverage, adverse shocks send an economy with elevated vulnerability into a recession. With leverage high in the nonfinancial business sector, firms and their creditors reduce hiring and investment by more than they would otherwise. We assume that monetary policymakers respond aggressively to the sharp and sustained increase in the unemployment rate in a manner consistent with the FOMC's reaction in previous recessions.

GDP starts to decline in the first quarter of 2022, and the 4-quarter change in GDP turns negative in the third quarter of that year. The federal funds rate drops sharply and becomes constrained by the ELB in the fourth quarter of 2022, thereby prolonging the downturn in the assumed absence of additional monetary policy actions. GDP only begins to recover in 2024, and the unemployment rate peaks at 6.6 percent, an increase of 3.5 percentage points from its pre-recession level.[4] With lower resource utilization, inflation runs 0.2 percentage point below the baseline, on average, from the start of the recession through 2025.

Positive Hysteresis [FRB/US model]

The staff projects that the unemployment rate will edge down further from already very low levels and that the labor force participation rate will remain above its trend. In this scenario, we assume that such elevated levels of labor utilization have persistent positive effects on the productive capacity of the economy, a phenomenon often referred to as "positive hysteresis."[5] In

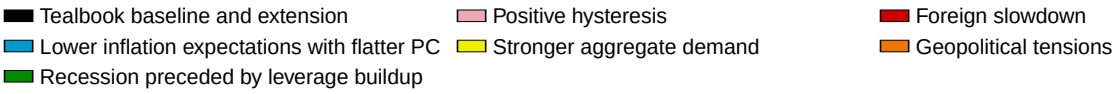
[4] If the effective lower bound on nominal interest rates were not a constraint, the policy rate would fall to negative 3 percent, which would shave 1 percentage point off the increase in the unemployment rate. Alternatively, forward guidance and asset purchases could potentially achieve that same amount of easing.

[5] See, for example, Dave Reifschneider, William L. Wascher, and David Wilcox (2015), "Aggregate Supply in the United States: Recent Developments and Implications for the Conduct of Monetary Policy," *IMF*

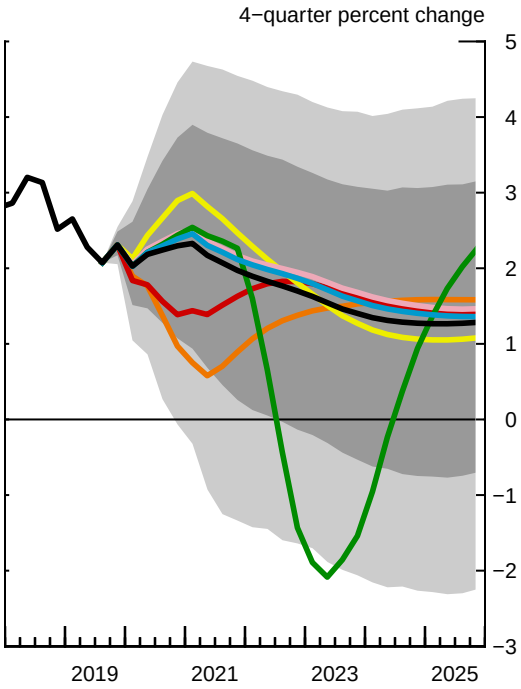
Risks & Uncertainty

Forecast Confidence Intervals and Alternative Scenarios

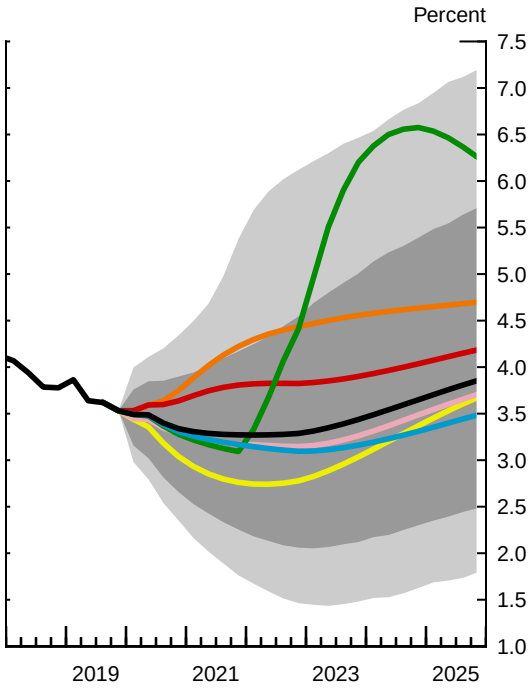
Confidence Intervals Based on FRB/US Stochastic Simulations*



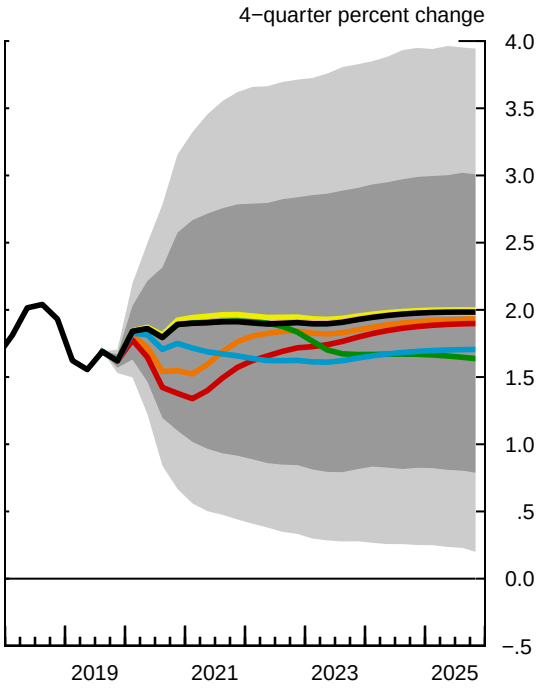
Real GDP



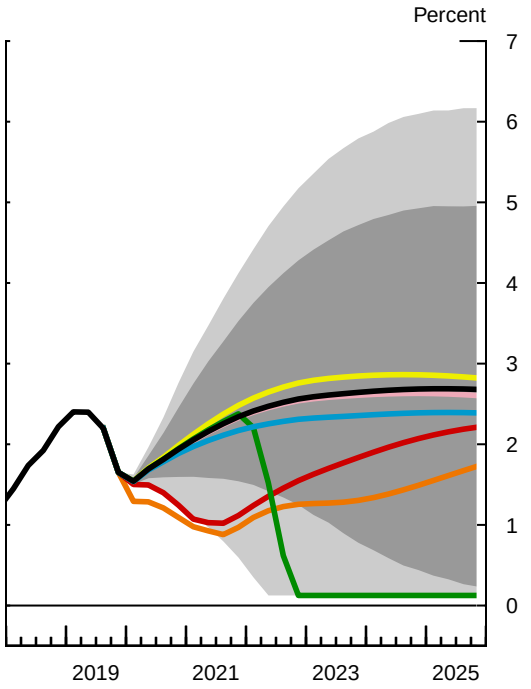
Unemployment Rate



PCE Prices excluding Food and Energy



Federal Funds Rate



Note: PC is Phillips curve.
* The dark gray shaded area is the 70 percent interval, and the light gray shaded area is the 90 percent interval from stochastic simulations around the Tealbook baseline.

particular, a labor market marked by low unemployment could potentially motivate the entry into the labor force of hard-to-employ individuals who had previously been on the sidelines because of a lack of job opportunities, and, in turn, persistently increase their labor force attachment. In this scenario, we assume that the trend labor force participation rate thus rises 1 percentage point above the baseline by the end of 2025 and that the experience that workers gain through greater employment lowers the natural rate of unemployment 0.5 percentage point over that period. Policymakers recognize these favorable developments in real time.

As a result of greater labor supply, potential output rises more than in the baseline, leading GDP to grow, on average, 0.2 percentage point more per year through 2025. Because increases in labor force participation match the greater gains in employment, the unemployment rate follows a trajectory that is only a little lower than the baseline. With inflation roughly at the baseline and with the muted response to the output gap in the staff policy rule, the federal funds rate is similar to its baseline path.

Stronger Aggregate Demand [EDO model]

Many of the underlying fundamentals for household spending remain solid, including strong labor market conditions, low interest rates, and high levels of net wealth. In addition, it is possible that the recent weakness in business investment, which can be quite volatile from quarter to quarter, will turn out to be more transitory than projected in an environment where many investment fundamentals are still solid. In this scenario, we assume that consumer spending and business investment expand at a faster pace than in the baseline.

GDP increases 2.7 percent, on average, in 2020 and 2021, a pace comparable to that over the past three years, and the unemployment rate declines to 2.8 percent by the third quarter of 2021. Because the slope of the Phillips curve is quite flat in the EDO model, inflation is little changed. In response to the stronger economy, the federal funds rate rises relative to the baseline, reaching 2.8 percent in 2023.

Economic Review, vol. 63 (May), pp. 71–109; and Stephanie R. Aaronson, Mary C. Daly, William L. Wascher, and David W. Wilcox (2019) "Okun Revisited: Who Benefits Most from a Strong Economy," Finance and Economics Discussion Series 2019-072 (Washington: Board of Governors of the Federal Reserve System, September), https://doi.org/10.17016/FEDS.2019.072.

Foreign Slowdown [SIGMA]

Foreign growth in 2019 was the weakest since the global financial crisis, held down by trade tensions, a global manufacturing slump, and adverse political developments in a number of economies. In our baseline projection, we see foreign growth picking up as these headwinds ease and monetary policy abroad remains accommodative. However, trade and political tensions could intensify yet again and the global manufacturing weakness could persist further, weighing on consumer and business confidence, restraining activity, and resulting in a deterioration of financial conditions.

This scenario envisions that in both the advanced foreign economies and the emerging market economies (EMEs), aggregate demand weakens, corporate borrowing spreads widen 100 basis points, and equity prices decline sharply. Foreign GDP growth steps down to a meager 0.8 percent in 2020, almost 2 percentage points below baseline. The financial tightening abroad and concerns about the foreign outlook prompt a 50 basis point rise in corporate borrowing spreads in the United States, while flight-to-safety flows lead to a 7 percent appreciation of the dollar.

Weaker foreign demand, the stronger dollar, and the adverse financial spillovers cause U.S. economic activity to slow. In particular, GDP growth falls to 1.4 percent in 2020, 0.9 percentage point below the baseline, and the unemployment rate rises to 3.8 percent by the end of 2022. Lower resource utilization and falling import prices reduce core PCE inflation to 1.4 percent in 2020. In response to modest output growth and muted inflation, the federal funds rate runs about 1 percentage point below the baseline through 2022.

Geopolitical Tensions [SIGMA]

Geopolitical tensions in the Middle East spiked at the turn of the year as discussed in the box "Geopolitical Risk in the Middle East" in the International Economic Developments and Outlook section. Although the tensions eased over the following days, the risk remains of an escalation of hostilities that is considerably more prolonged. This event could push oil prices up, lead to a deterioration in financial conditions, and depress consumer and business confidence, contributing to a significant reduction in global economic activity, as explored in this scenario.

Specifically, we assume that disruptions to oil production and shipments cause oil prices to nearly double, rising to about $120 per barrel. This price hike, in concert with pronounced

uncertainty over the length and the severity of the conflict, causes corporate borrowing spreads to rise 75 basis points in the advanced economies and 150 basis points in the EMEs, while equity prices drop between 10 and 15 percent globally.[6] In addition, flight-to-safety flows lead to a 7 percent appreciation of the dollar. All told, these developments cause foreign GDP growth to slow to 0.9 percent in 2020, more than 1.5 percentage points below baseline.

Weaker foreign demand and the stronger dollar reduce U.S. net exports, while higher oil prices and the deterioration in financial conditions depress U.S. domestic demand. Consequently, U.S. GDP growth falls to 1 percent in 2020, 1.3 percentage points below the baseline, and the unemployment rate rises to 4.4 percent in 2022.[7] Rising oil prices initially push total PCE inflation to 2.4 percent in 2020 before it drops to 1.6 percent in 2021 as a result of lower resource utilization and falling import prices. The latter factors also result in an immediate drop in core inflation to 1.5 percent, 0.4 percentage point below baseline, in 2020. The federal funds rate declines to 1 percent by 2021, 125 basis points below the baseline.

ALTERNATIVE MODEL FORECASTS

As shown in the exhibit "Alternative Model Forecasts," the FRB/US model projects that GDP will grow 1.8 percent, on average, over the current and next two years, a bit less than in the Tealbook baseline outlook.[8] This projection represents a small downward revision relative to the FRB/US projection shown in the previous Tealbook. The FRB/US model projects that consumption growth will move down close to its underlying trend pace, while business investment rebounds from last year's sluggish pace, as low interest rates provide favorable financing conditions to firms. Weighing against private domestic demand is the model's negative outlook for net exports: The model predicts a sizable rebound in imports this year from the very weak reading from last quarter and carries forward some of the recent weakness in exports.

With GDP growth in the FRB/US model's projection averaging slightly less than its potential pace of 2.0 percent, the output gap narrows over the projection period. The unemployment rate moves up gradually and reaches 4.1 percent by the end of 2022, still well

[6] The increase in oil prices and the decline in risky asset prices envisioned in the scenario are broadly consistent with developments observed during the 1990 invasion of Kuwait by Iraq.

[7] The direct effect of the large increase in oil prices is to reduce U.S. GDP growth by about 0.3 percent in 2020, roughly a quarter of the overall drop, as the United States is no longer a significant net oil importer.

[8] We condition the FRB/US forecast on staff projections for federal government spending and tax policies, foreign GDP growth, foreign inflation, and the paths of the U.S. dollar and oil prices. The federal funds rate is governed by the same policy rule as in the baseline.

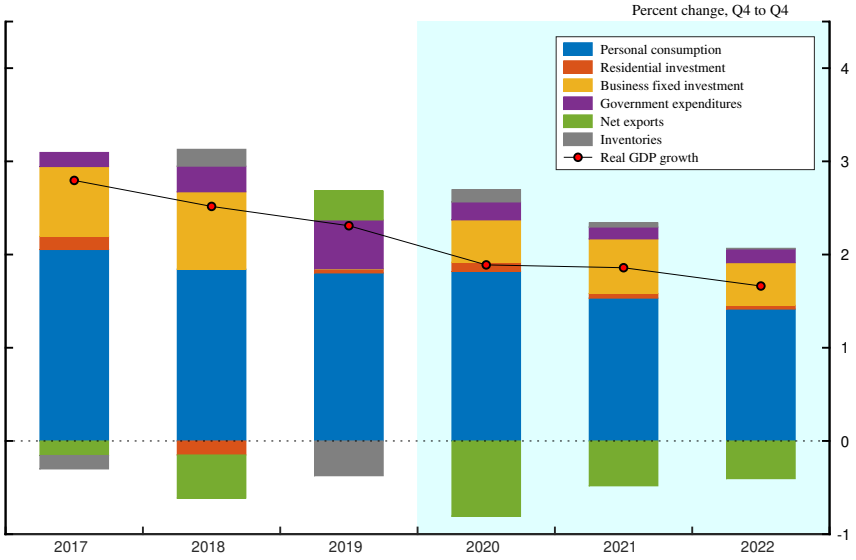
Alternative Model Forecasts

(Percent change, Q4 to Q4, except as noted)

Measure and projection	2020		2021		2022	
	Previous Tealbook	Current Tealbook	*Previous Tealbook*	Current Tealbook	*Previous Tealbook*	Current Tealbook
Real GDP						
Staff	*2.1*	2.3	*1.9*	2.0	*1.7*	1.7
FRB/US	*2.0*	1.9	*1.9*	1.9	*1.7*	1.7
EDO[1]	*1.6*	1.8	*1.7*	1.9	*2.2*	2.3
Unemployment rate[2]						
Staff	*3.5*	3.3	*3.5*	3.3	*3.5*	3.3
FRB/US	*3.7*	3.7	*3.8*	3.8	*4.1*	4.1
EDO[1]	*4.3*	4.1	*4.7*	4.6	*5.0*	4.9
Total PCE prices						
Staff	*1.7*	1.6	*1.9*	1.9	*1.9*	1.9
FRB/US	*1.8*	1.6	*2.1*	2.0	*2.0*	2.0
EDO[1]	*2.2*	2.1	*2.5*	2.4	*2.4*	2.3
Core PCE prices						
Staff	*1.9*	1.9	*1.9*	1.9	*1.9*	1.9
FRB/US	*1.9*	1.9	*2.1*	2.1	*2.0*	2.0
EDO[1]	*2.2*	2.1	*2.5*	2.4	*2.4*	2.3
Federal funds rate[2]						
Staff	*2.0*	1.9	*2.3*	2.3	*2.5*	2.6
FRB/US	*2.0*	2.0	*2.4*	2.4	*2.6*	2.6
EDO[1]	*3.0*	3.0	*3.6*	3.6	*3.9*	3.9

1. The EDO projections labeled "*Previous Tealbook*" and "Current Tealbook" integrate over the posterior distribution of model parameters.
2. Percent, average for Q4.

Decomposition of FRB/US Real GDP Growth Forecast



Note: Shading represents the projection period.
Source: Staff calculations.

below the model's natural rate estimate of 4.6 percent. Core inflation increases from 1.6 percent in 2019 to 2.0 percent, on average, over the current and next two years.

The EDO model projects GDP growth of 1.8 percent, on average, over 2020 and 2021 and 2.3 percent in 2022, below the 2.6 percent average growth rate of potential output over those years. Favorable risk premiums and accommodative monetary policy have boosted the level of aggregate demand over the past few years. The waning support from those factors and the persistent effects of the weakness in investment in recent years cause growth to fall below its potential pace over the medium term.

The EDO model predicts that core inflation will rise to 2.1 percent in 2020 and to average 2.4 percent in 2021 and 2022. From the model's perspective, wage gains have been surprisingly weak given the strength of aggregate demand, and the sluggish wage gains have, in turn, held down inflation. In the forecast, the forces that have been holding down wage growth dissipate. The model also predicts that the weak investment in the outlook will keep the capital stock low, which reduces productivity and raises marginal costs. For both reasons, inflation rises and overshoots its longer-run level of 2 percent.

Selected Tealbook Projections and 70 Percent Confidence Intervals Derived from Historical Tealbook Forecast Errors and FRB/US Simulations

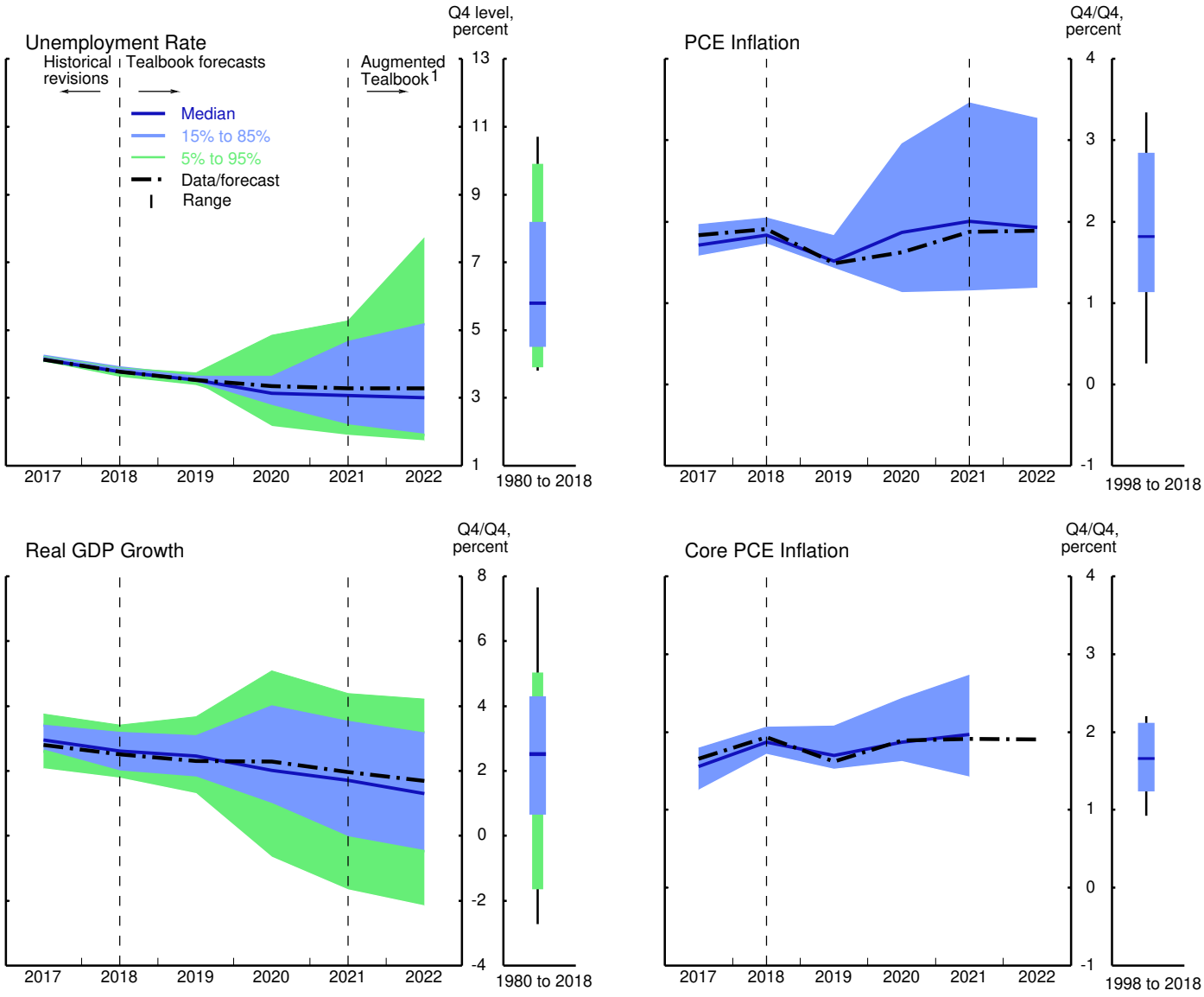
Measure	2019	2020	2021	2022	2023	2024	2025
Real GDP (percent change, Q4 to Q4)							
Projection	2.3	2.3	2.0	1.7	1.4	1.3	1.3
Confidence interval							
Tealbook forecast errors	1.8–3.1	1.0–4.0	-.1–3.5	-.5–3.2	. . .	. . .	. . .
FRB/US stochastic simulations	2.2–2.5	1.1–3.7	.3–3.7	-.1–3.3	-.5–3.1	-.7–3.1	-.7–3.2
Civilian unemployment rate (percent, Q4)							
Projection	3.5	3.3	3.3	3.3	3.4	3.6	3.9
Confidence interval							
Tealbook forecast errors	3.4–3.6	2.7–3.6	2.2–4.7	1.9–5.2	. . .	. . .	. . .
FRB/US stochastic simulations	3.5–3.5	2.7–3.9	2.3–4.2	2.1–4.5	2.1–5.0	2.3–5.4	2.5–5.7
PCE prices, total (percent change, Q4 to Q4)							
Projection	1.5	1.6	1.9	1.9	1.9	2.0	2.0
Confidence interval							
Tealbook forecast errors	1.4–1.8	1.1–3.0	1.1–3.5	1.2–3.3	. . .	. . .	. . .
FRB/US stochastic simulations	1.4–1.6	.7–2.4	.8–2.9	.7–2.9	.7–3.0	.7–3.1	.7–3.1
PCE prices excluding food and energy (percent change, Q4 to Q4)							
Projection	1.6	1.9	1.9	1.9	1.9	2.0	2.0
Confidence interval							
Tealbook forecast errors	1.5–2.1	1.6–2.4	1.4–2.7	. . .	. . .	. . .	. . .
FRB/US stochastic simulations	1.6–1.7	1.1–2.6	.9–2.8	.8–2.8	.8–2.9	.8–3.0	.8–3.0
Federal funds rate (percent, Q4)							
Projection	1.7	1.9	2.3	2.6	2.6	2.7	2.7
Confidence interval							
FRB/US stochastic simulations	1.7–1.7	1.6–2.5	1.5–3.5	1.2–4.3	.8–4.7	.4–4.9	.2–5.0

Note: Shocks underlying FRB/US stochastic simulations are randomly drawn from the 1969–2018 set of model equation residuals. Intervals derived from Tealbook forecast errors are based on projections made from 1980 to 2018 for real GDP and unemployment and from 1998 to 2018 for PCE prices. The intervals for real GDP, unemployment, and total PCE prices are extended into 2022 using information from the Blue Chip survey and forecasts from the CBO and CEA.
. . . Not applicable.

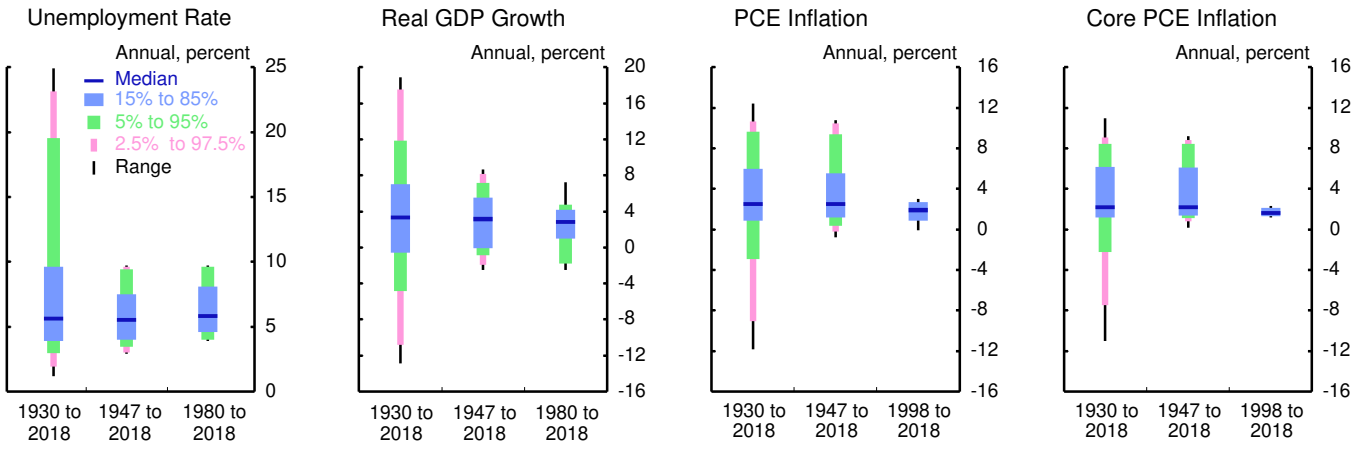
Prediction Intervals Derived from Historical Tealbook Forecast Errors

Forecast Error Percentiles

Historical Distributions



Historical Distributions



Note: See the technical note in the appendix for more information on this exhibit.
1. Augmented Tealbook prediction intervals use 1- and 2-year-ahead forecast errors from Blue Chip, CBO, and CEA to extend the Tealbook prediction intervals through 2022.

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Appendix

Technical Note on "Prediction Intervals Derived from Historical Tealbook Forecast Errors"

This technical note provides additional details about the exhibit "Prediction Intervals Derived from Historical Tealbook Forecast Errors." In the four large fan charts, the black dotted lines show staff projections and current estimates of recent values of four key economic variables: average unemployment rate in the fourth quarter of each year and the Q4/Q4 percent change for real GDP, total PCE prices, and core PCE prices. (The GDP series is adjusted to use GNP for those years when the staff forecast GNP and to strip out software and intellectual property products from the currently published data for years preceding their introduction. Similarly, the core PCE inflation series is adjusted to strip out the "food away from home" component for years before it was included in core.)

The historical distributions of the corresponding series (with the adjustments described above) are plotted immediately to the right of each of the fan charts. The thin black lines show the highest and lowest values of the series during the indicated time period. At the bottom of the page, the distributions over three different time periods are plotted for each series. To enable the use of data for years prior to 1947, we report annual-average data in this section. The annual data going back to 1930 for GDP growth, PCE inflation, and core PCE inflation are available in the conventional national accounts; we used estimates from Lebergott (1957) for the unemployment rate from 1930 to 1946.[1]

The prediction intervals around the current and one-year-ahead forecasts are derived from historical staff forecast errors, comparing staff forecasts with the latest published data. For the unemployment rate and real GDP growth, errors were calculated for a sample starting in 1980, yielding percentiles of the sizes of the forecast errors. For PCE and core PCE inflation, errors based on a sample beginning in 1998 were used. This shorter range reflects both more limited data on staff forecasts of PCE inflation and the staff judgment that the distribution of inflation since the mid-1990s is more appropriate for the projection period than distributions of inflation reaching further back. In all cases, the prediction intervals are computed by adding the percentile bands of the errors onto the forecast. The blue bands encompass 70 percent prediction-interval ranges; adding the green bands expands this range to 90 percent. The dark blue line plots the median of the prediction intervals. There is not enough historical forecast data to calculate meaningful 90 percent ranges for the two inflation series. A median line above the staff forecast means that forecast errors were positive more than half of the time.

[1] Stanley Lebergott (1957), "Annual Estimates of Unemployment in the United States, 1900–1954," in National Bureau of Economic Research, *The Measurement and Behavior of Unemployment* (Princeton, N.J.: Princeton University Press), pp. 213–41.

Because the staff has produced two-year-ahead forecasts for only a few years, the intervals around the two-year-ahead forecasts are constructed by augmenting the staff projection errors with information from outside forecasters: the Blue Chip consensus, the Council of Economic Advisers, and the Congressional Budget Office. Specifically, we calculate prediction intervals for outside forecasts in the same manner as for the staff forecasts. We then calculate the change in the error bands from outside forecasts from one year ahead to two years ahead and apply the average change to the staff's one-year-ahead error bands. That is, we assume that any deterioration in the performance between the one- and two-year-ahead projections of the outside forecasters would also apply to the Tealbook projections. Limitations on the availability of data mean that a slightly shorter sample is used for GDP and unemployment, and the outside projections may only be for a similar series, such as total CPI instead of total PCE prices or annual growth rates of GDP instead of four-quarter changes. In particular, because data on forecasts for core inflation by these outside forecasters are much more limited, we did not extrapolate the staff's errors for core PCE inflation two years ahead.

The intervals around the historical data in the four fan charts are based on the history of data revisions for each series. The previous-year, two-year-back, and three-year-back values as of the current Tealbook forecast are subtracted from the corresponding currently published estimates (adjusted as described earlier) to produce revisions, which are then combined into distributions and revision intervals in the same way that the prediction intervals are created.

Monetary Policy Strategies

This section discusses a range of strategies for setting the federal funds rate and compares the associated interest rate paths and macroeconomic outcomes with those in the Tealbook baseline projection. In the near term, the policy prescriptions described below are generally close to those in the November Tealbook. Over the medium term, the policy strategies prescribe somewhat higher policy rates than in the November Tealbook, mainly because of the higher projected levels of resource utilization. In a special exhibit, we examine optimal control simulations using a baseline projection that is consistent with the median responses to the December 2019 Summary of Economic Projections (SEP) rather than the staff forecast.

NEAR-TERM PRESCRIPTIONS OF SELECTED SIMPLE POLICY RULES

The top panel of the first exhibit shows near-term prescriptions for the federal funds rate from four simple policy rules: the inertial version of the Taylor (1999) rule, the Taylor (1993) rule, a first-difference rule, and a flexible price-level targeting (FPLT) rule.[1] These near-term prescriptions take as given the Tealbook baseline projections for the output gap and core inflation, which are shown in the middle panels.[2] The top and middle panels also provide the staff's baseline path for the federal funds rate.

- Reflecting the wider output gap, the near-term prescriptions of the policy rules are slightly higher than in the November Tealbook.

- Compared with the Tealbook baseline, the inertial Taylor (1999) rule prescribes higher policy rates because this policy rule responds more strongly to the high level of resource utilization than the conditional attenuated rule used in the Tealbook baseline projection. For the same reason, the inertial Taylor (1999) rule also prescribes a larger increase in the policy rate next quarter than the Tealbook baseline.

[1] The appendix in this Tealbook section provides technical details on these simple policy rules. Except for the first-difference rule, which has no intercept term, the simple rules examined herein use intercept terms that are consistent with a real federal funds rate of 50 basis points in the longer run.

[2] Because the FPLT rule responds to the gap between the unemployment rate and the natural rate of unemployment, this rule takes as given the Tealbook baseline projections for these variables instead of the projection for the output gap.

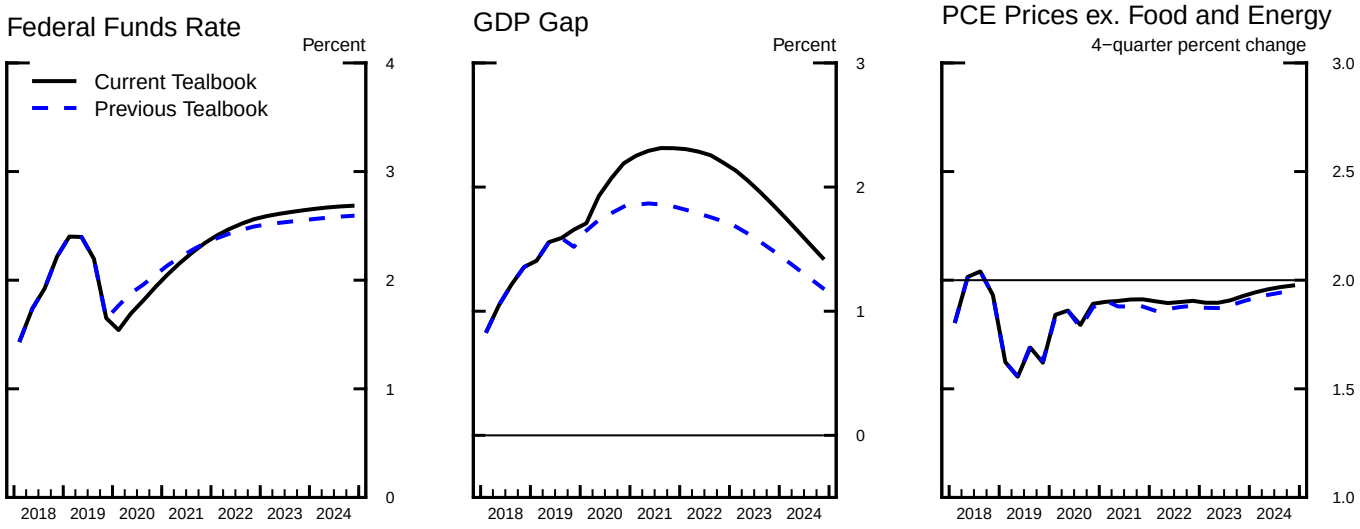
Policy Rules and the Staff Projection

Near−Term Prescriptions of Selected Simple Policy Rules

(Percent)

	2020:Q1	2020:Q2
Inertial Taylor (1999) rule	**1.99**	**2.32**
Previous Tealbook	*1.98*	*2.28*
Taylor (1993) rule	**3.09**	**3.23**
Previous Tealbook	*3.05*	*3.13*
First−difference rule	**1.86**	**2.09**
Previous Tealbook	*1.74*	*1.80*
Flexible price−level targeting rule	**1.45**	**1.28**
Previous Tealbook	*1.43*	*1.25*
Addendum:		
Tealbook baseline	**1.54**	**1.69**

Key Elements of the Staff Projection



A Medium−Term Notion of the Equilibrium Real Federal Funds Rate

(Percent)

	Current Value	*Current−Quarter Estimate Based on Previous Tealbook*	*Previous Tealbook*
Tealbook baseline			
FRB/US *r**	1.48	*1.30*	*1.27*
Average projected real federal funds rate	.28	*.35*	*.30*
SEP−consistent baseline			
FRB/US *r**	.22		
Average projected real federal funds rate	−.13		

Note: The "FRB/US *r**" is the level of the real federal funds rate that, if maintained over a 12−quarter period (beginning in the current quarter) in the FRB/US model, sets the output gap equal to zero in the final quarter of that period given an economic projection. The "SEP−consistent baseline" is consistent with December 2019 median SEP responses. The "Average projected real federal funds rate" is calculated under the Tealbook and SEP−consistent baseline projections over the same 12−quarter period as FRB/US *r**.

- The Taylor (1993) rule, which does not feature an interest rate smoothing term, calls for higher policy rates than all of the other simple policy rules and the Tealbook baseline projection.

- The first-difference rule, which reacts to the expected change in the output gap, prescribes increases in the policy rate in the near term because resource utilization increases over the next year in the staff projection.

- The FPLT rule calls for holding the federal funds rate well below the prescriptions of the other rules in an effort to eliminate a cumulative shortfall in the core PCE price index of almost 3 percent from its target path since the end of 2011.

A MEDIUM-TERM NOTION OF THE EQUILIBRIUM REAL FEDERAL FUNDS RATE

The bottom panel of the first exhibit reports estimates of a medium-term concept of the equilibrium real federal funds rate (r^*) generated under two baselines: the Tealbook baseline and a projection consistent with the medians in the December 2019 SEP.[3] This concept of r^*, labeled "FRB/US r^*," corresponds to the level of the real federal funds rate that, if maintained over a 12-quarter period starting in the current quarter, would bring the output gap to zero in the final quarter of that period in the FRB/US model. This measure is a summary of the projected underlying strength of the real economy and does not take into account considerations such as achieving the inflation objective or avoiding sharp changes in the federal funds rate.

- At 1.48 percent, the current value of the Tealbook-consistent FRB/US r^* is 18 basis points higher than the value consistent with the November Tealbook projection. The upward revision reflects the fact that the staff sees higher projected levels of resource utilization over the medium term than in November.

[3] To construct a baseline projection consistent with median SEP responses for the FRB/US model, the staff interpolated annual SEP information to a quarterly frequency and assumed that, beyond 2022 (the final year reported in the December 2019 SEP), the economy transitions to the longer-run values in a smooth and monotonic way. The staff also posited economic relationships to project variables not covered in the SEP. For example, the staff assumed an Okun's law relationship to recover an output gap from the deviation of the median SEP unemployment rate from the median SEP estimate of its longer-run value.

- At 0.22 percent, the December 2019 SEP-consistent FRB/US *r** is lower than the Tealbook-consistent FRB/US *r** because, even though the two projections contain similar policy rate paths, the staff projects a larger undershooting of the unemployment rate relative to its estimated longer-run value than the undershooting of the unemployment rate associated with the median projection in the December SEP.

- The December 2019 SEP-consistent FRB/US *r** is 11 basis points lower than the value implied by the September 2019 SEP-consistent baseline (not shown). This measure of *r** is lower because, in the December SEP, the median path for the federal funds rate shifted downward, while the outlook for resource utilization and inflation was little changed. The FRB/US model interprets the lower path for real interest rates and the similar path for resource utilization as indicating that aggregate demand in the December SEP baseline is somewhat weaker than that implied by the September SEP baseline.

SIMPLE POLICY RULE SIMULATIONS

The second exhibit reports the Tealbook baseline projection and results from dynamic simulations of the FRB/US model under the inertial Taylor (1999) rule, the Taylor (1993) rule, the first-difference rule, and the FPLT rule. These simulations reflect the endogenous responses of resource utilization and inflation to the different federal funds rate paths implied by the policy rules. The simulations for each rule are carried out under the assumptions that policymakers commit to following that rule in the future and that financial market participants, price setters, and wage setters correctly anticipate that monetary policy will follow through on this commitment and are aware of the implications for interest rates and the economy.

- Under the conditional attenuated policy rule used to construct the Tealbook baseline, the federal funds rate edges up gradually from its current level, reaching 2½ percent by the end of 2022.[4]

[4] In the staff's construction of the baseline forecast for the federal funds rate, the level of the federal funds rate in the current quarter is a weighted average of the realized daily values to date and the expected daily values, inferred from financial market quotes, over the remainder of the quarter. Beyond the current quarter, the conditional attenuated rule is used to project the path of the federal funds rate. By contrast, the prescriptions of the other simple policy rules here are derived from simulations that begin in the current quarter.

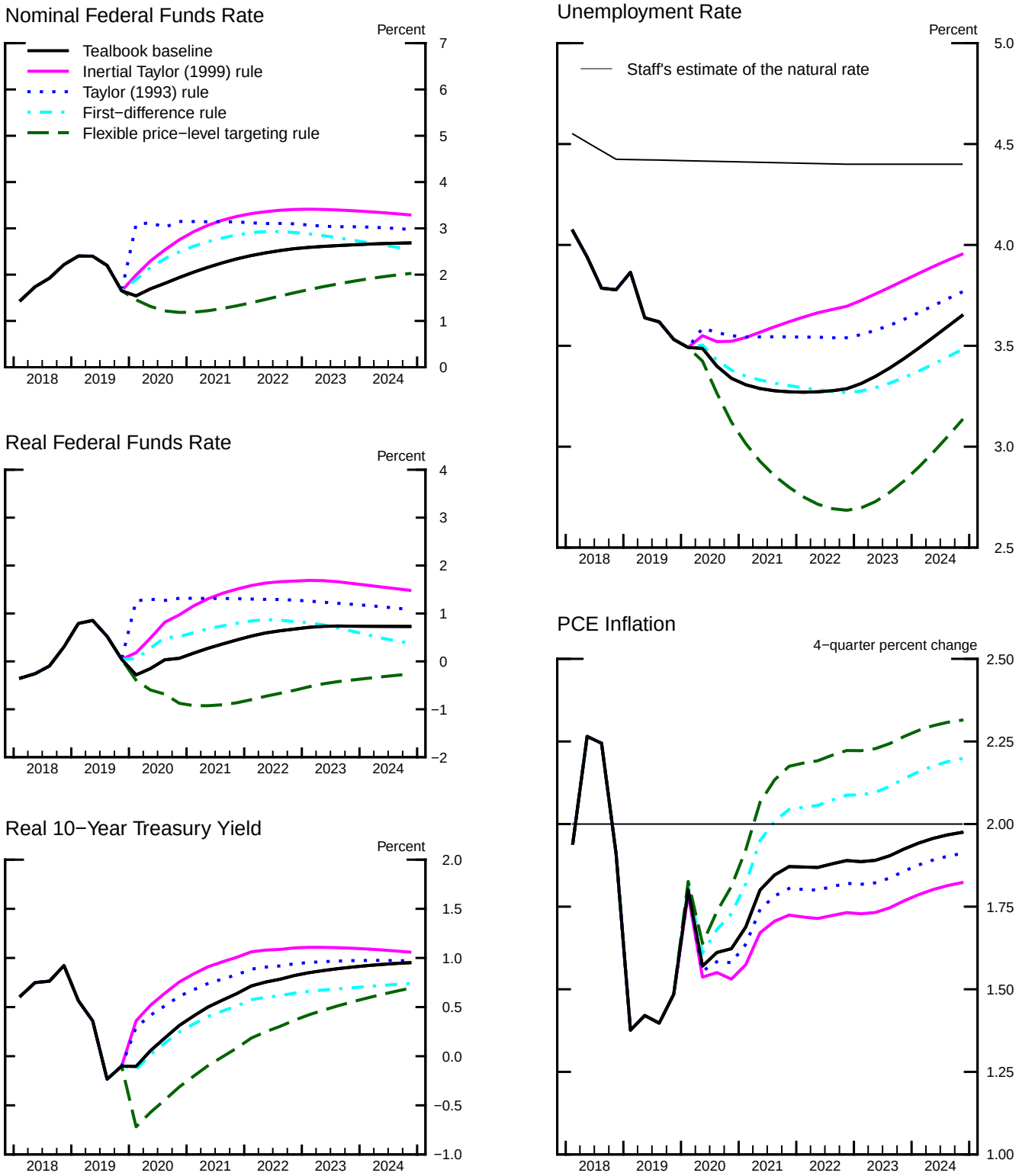
- The inertial Taylor (1999) rule, which embodies the same degree of inertia as the Tealbook baseline rule but responds more strongly to the output gap, calls for the federal funds rate to increase at a faster pace than occurs under the baseline rule. The prescriptions of the inertial Taylor (1999) rule plateau at about 3.4 percent in 2022. These less accommodative monetary conditions result in an unemployment rate path that rises more quickly than the Tealbook baseline path. Under this rule, inflation is lower and the real 10-year Treasury yield is higher than the corresponding values in the Tealbook baseline projection.

- Because the Taylor (1993) rule has no interest rate smoothing term, it calls for increasing the federal funds rate above 3 percent in the current quarter. Thereafter, the prescribed federal funds rate path is roughly flat, and it remains above the corresponding path of the Tealbook baseline rule through the period shown. Under this rule, the unemployment rate path is higher and the path for inflation is slightly lower than the corresponding paths in the Tealbook baseline projection.

- The first-difference rule, which reacts to the expected change in the output gap rather than its level, calls for a gradual increase in the federal funds rate, reaching nearly 3 percent in 2022. Starting in 2024, the path for the federal funds rate runs below the one in the Tealbook baseline for about five years. Because of the forward-looking nature of financial market participants, price setters, and wage setters in the FRB/US model, this strategy generates higher inflation and, eventually, a lower unemployment rate than in the staff projection.

- The FPLT rule responds to, and seeks to eliminate, the cumulative shortfall of the level of core PCE prices from a target path defined by the growth of that price level at an annual rate of 2 percent from the end of 2011 onward. Eliminating the current 3 percent shortfall requires inflation to run above 2 percent in coming years. The simulation embeds the assumptions that policymakers can credibly commit to closing this gap over time and that financial market participants, price setters, and wage setters correctly anticipate the ensuing long period of a low federal funds rate. Consequently, the path of the real 10-year Treasury rate immediately drops to about negative 0.75 percent and remains below the corresponding Tealbook baseline path throughout the period shown. The unemployment rate is substantially lower

Simple Policy Rule Simulations



Note: The policy rule simulations in this exhibit are based on rules that respond to core inflation rather than to headline inflation. This choice of rule specification was made in light of a tendency for current and near−term core inflation rates to outperform headline inflation rates as predictors of the medium−term behavior of headline inflation.

under the FPLT rule than in the Tealbook baseline and all other simulations, dropping below 3 percent next year. Inflation exceeds 2 percent by about 20 basis points, on average, from 2021 through the period shown.

- The current policy rate prescriptions from the simple policy rules are higher than those in the November Tealbook by an average of 10 to 30 basis points over the period shown. This change reflects the staff's upwardly revised projection of levels of resource utilization over the medium term.

OPTIMAL CONTROL SIMULATIONS UNDER COMMITMENT

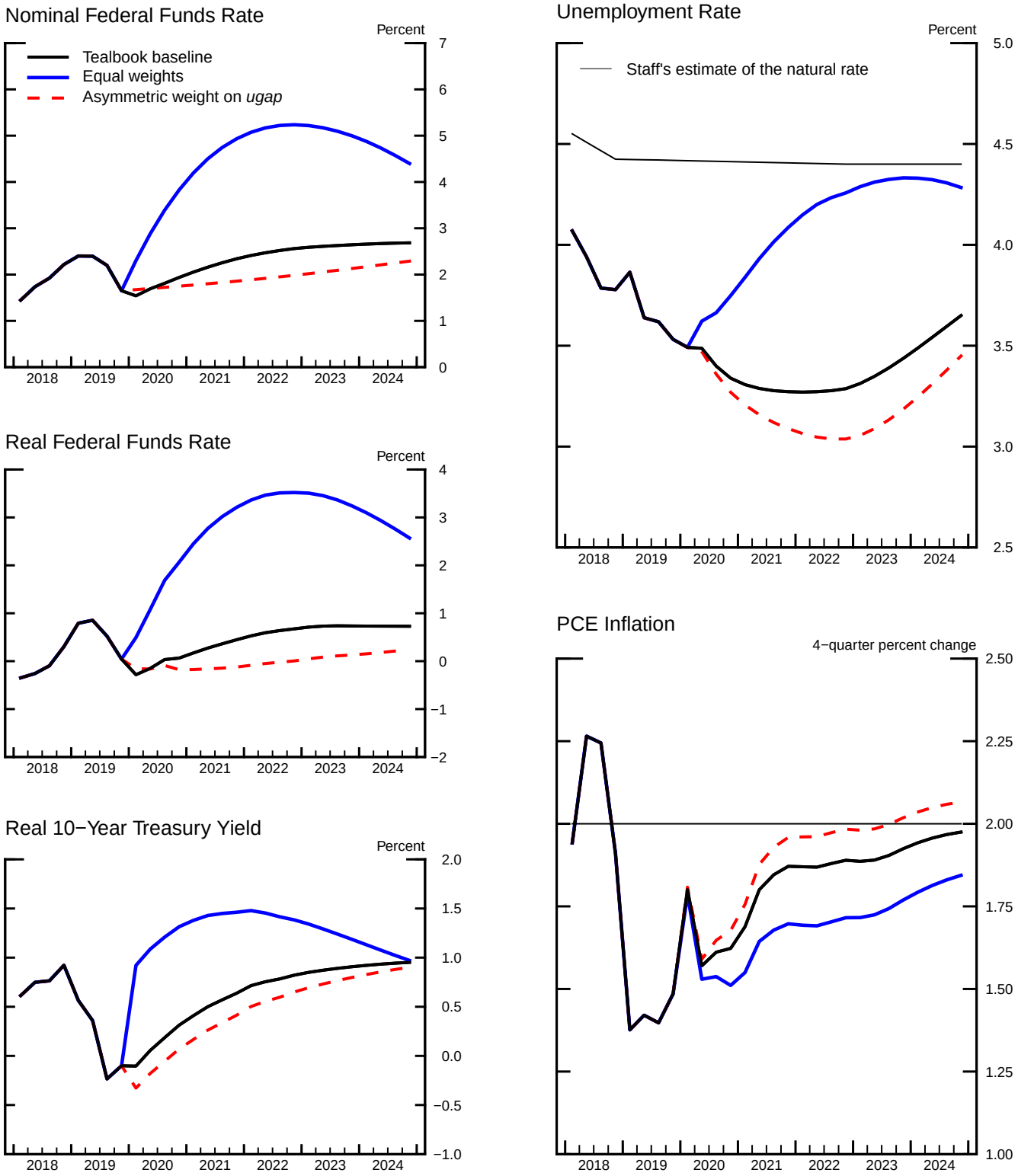
The third exhibit displays optimal control simulations conditional on the Tealbook baseline under two different assumptions about policymakers' preferences, as captured by alternative specifications of the loss function.[5] The concept of optimal control employed here is one in which current policymakers are able to commit future policymakers to their plans; such a commitment, when feasible, may lead to improved economic outcomes.[6]

- The simulation labeled "Equal weights" presents the case in which policymakers are assumed to place equal weights on keeping headline PCE inflation close to the Committee's objective of 2 percent, on keeping the unemployment rate close to the staff's estimate of the natural rate of unemployment, and on keeping the federal funds rate close to its previous value. Under this strategy, the federal funds rate runs significantly higher than the Tealbook baseline path, reaching a peak of nearly 5¼ percent in 2022. By design, this strategy seeks to counter the projected persistent undershooting by the unemployment rate of its natural rate that occurs in the Tealbook baseline—an outcome that policymakers who use the equal-weights loss function judge to be undesirable. The narrower unemployment rate gap implies only a modestly lower path for inflation because, in the FRB/US model, the response of inflation to the level of resource utilization is small.

[5] The box "Optimal Control and the Loss Function" in the Monetary Policy Strategies section of Tealbook B for June 2016 offers motivations for these specifications. The appendix to this Tealbook section provides technical details on the optimal control simulations.

[6] Under the optimal control policies, policymakers achieve the displayed economic outcomes by making promises that bind future policymakers to take actions that may not be optimal from the perspective of those future policymakers (that is, the promises are time inconsistent). It is assumed that these promises are taken as credible by wage and price setters and by financial market participants.

Optimal Control Simulations under Commitment



Note: Each set of lines corresponds to an optimal control policy under commitment in which policymakers minimize a discounted weighted sum of squared deviations of 4−quarter headline PCE inflation from the Committee's 2 percent objective, of squared deviations of the unemployment rate from the staff's estimate of the natural rate, and of squared changes in the federal funds rate. The weights vary across simulations. See the appendix for technical details and the box "Optimal Control and the Loss Function" in the June 2016 Tealbook B for a motivation.

- The simulation labeled "Asymmetric weight on *ugap*" uses a loss function that assigns no cost to deviations of the unemployment rate from the natural rate when the unemployment rate is below the natural rate, but is otherwise identical to the specification with equal weights. Under this strategy, the path for the federal funds rate is lower than the Tealbook baseline because policymakers' desire to raise inflation to 2 percent does not have to be balanced against a desire to prevent the unemployment rate from running below its natural rate in the next few years. Nonetheless, policymakers choose a modestly increasing policy rate path in anticipation of the inflation overshoot of 2 percent that starts in late 2023.

- Because the inflation outlook in the January Tealbook is little changed from November, the federal funds rate prescriptions arising from the asymmetric specification conditional on the current Tealbook projection are similar to corresponding prescriptions based on the November Tealbook. By contrast, under the equal-weights specification, the tighter resource utilization in the current projection induces a path for the federal funds rate that is 0.4 percentage point higher, on average, over the next five years.

OPTIMAL CONTROL USING A PROJECTION CONSISTENT WITH THE SEP

The next exhibit compares optimal control policy rate prescriptions and outcomes conditional on the Tealbook baseline (discussed earlier and reproduced in the left column) with those conditional on the SEP-consistent projection (shown in the right column).

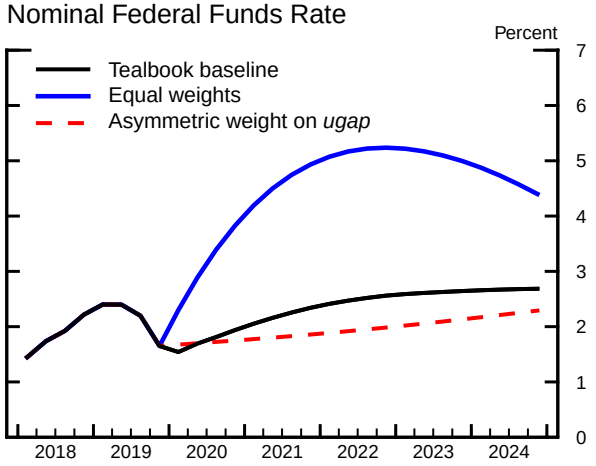
- Overall, the paths for the federal funds rate and the inflation rate in the Tealbook baseline are similar to those in the SEP-consistent baseline. The Tealbook baseline projection features a tighter labor market than is implicit in the SEP-consistent projection for two reasons. First, the path for the unemployment rate is somewhat lower in the Tealbook baseline projection than in the SEP-consistent baseline. Second, the staff's estimate of the natural rate of unemployment is above the median value of the longer-run normal level of the unemployment rate in the December SEP.[7]

[7] In the construction of the SEP-consistent baseline, the natural rate of unemployment over the projection period is assumed to coincide with the median SEP estimate of the unemployment rate in the longer run.

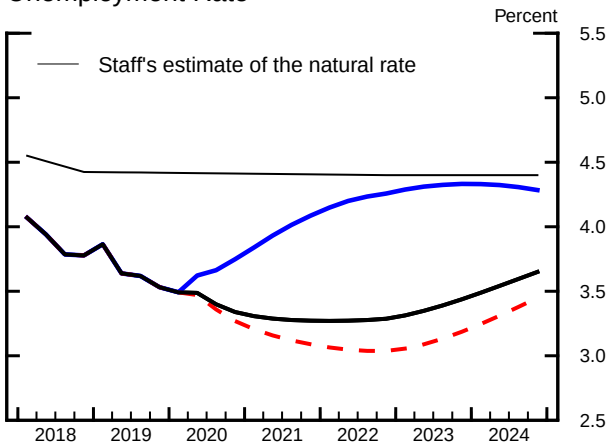
Optimal Control Using a Projection Consistent with the SEP

Tealbook Baseline

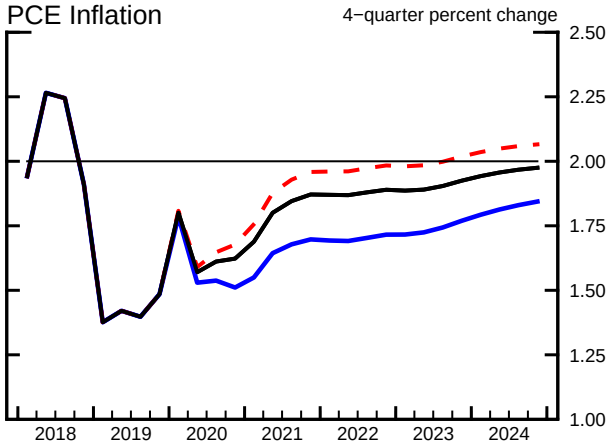
Nominal Federal Funds Rate



Unemployment Rate

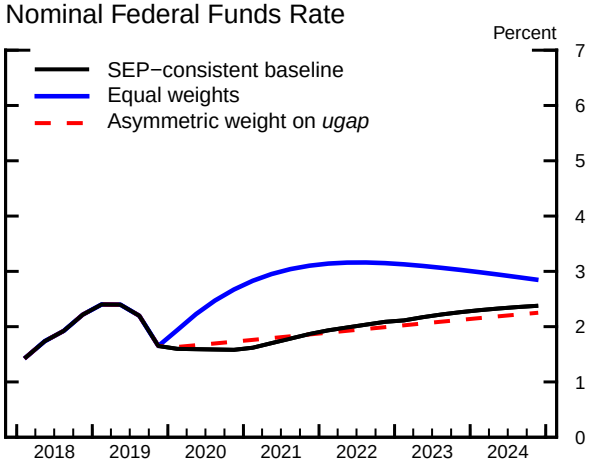


PCE Inflation

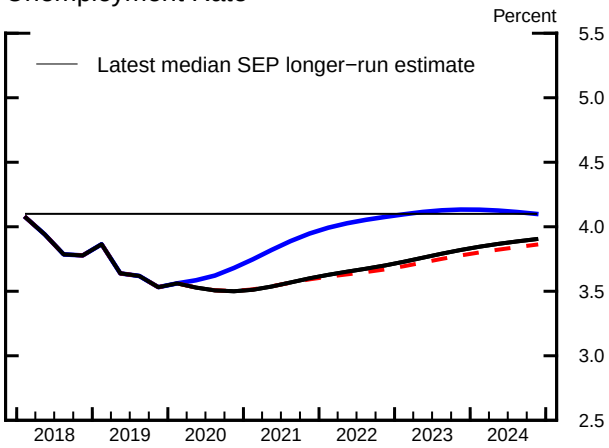


SEP−Consistent Baseline

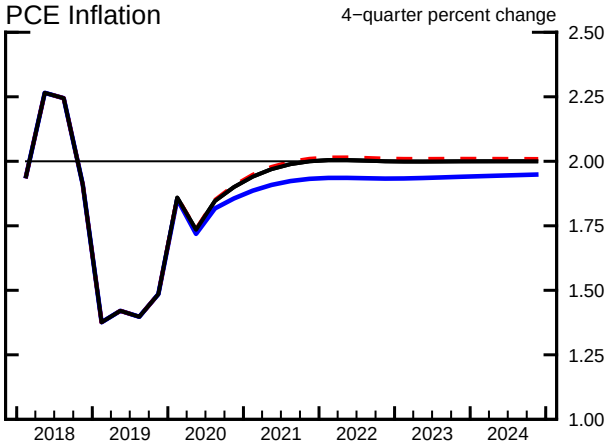
Nominal Federal Funds Rate



Unemployment Rate



PCE Inflation



Note: Each set of lines corresponds to an optimal control policy under commitment in which policymakers minimize a discounted weighted sum of squared deviations of 4−quarter headline PCE inflation from the Committee's 2 percent objective, of squared deviations of the unemployment rate from the staff's estimate of the natural rate, and of squared changes in the federal funds rate. The weights vary across simulations. See the appendix for technical details and the box "Optimal Control and the Loss Function" in the June 2016 Tealbook B for a motivation.

- Under the equal-weights specification, the path of the federal funds rate peaks at 3.2 percent in 2022 when conditioning on the SEP-consistent baseline, about 2 percentage points below the federal funds rate prescribed under this loss function when conditioning on the Tealbook baseline. This lower path for the policy rate arises because, under the SEP-consistent baseline, the unemployment gap that policymakers aim to close is smaller than in the Tealbook baseline.

- Under the asymmetric specification and conditioning on the SEP-consistent baseline, the prescriptions for the federal funds rate, the unemployment rate, and the inflation rate are similar to those in the SEP-consistent baseline. This similarity arises because inflation is near or at 2 percent over the next several years in the SEP baseline, and the asymmetric specification attaches no loss to unemployment undershooting the natural rate. Thus, from the perspective of this loss function, the SEP baseline policy rate path is already nearly optimal.

- The similarity between the paths for the federal funds rate in the SEP baseline and under the asymmetric loss function does not imply that policymakers are acting according to this asymmetric loss function. Much of the similarity is due to the interest rate smoothing term in the loss function. In a simulation using the asymmetric loss function without this interest rate smoothing term (not shown), the federal funds rate increases to about 2¼ percent in the current quarter and remains near that level through the period shown. Additionally, policymakers' assessments of appropriate policy may incorporate elements, such as risk-management considerations and uncertainty about the natural rate of unemployment or *r**, that are not captured in the simulation.[8]

The final four exhibits tabulate the simulation results under the Tealbook baseline for key variables under the policy rules shown in the exhibit "Simple Policy Rule Simulations" and optimal control simulations shown in the exhibit "Optimal Control Simulations under Commitment."

[8] More generally, in constructing the SEP-consistent baseline as well as in performing the simulations, the staff makes assumptions about the underlying economic relationships that need not imply the same economic tradeoffs as those perceived by SEP respondents.

Outcomes of Simple Policy Rule Simulations

(Percent change, annual rate, from end of preceding period, except as noted)

Outcome and strategy	2019 H2	2020	2021	2022	2023	2024
Nominal federal funds rate[1]						
Inertial Taylor (1999)	1.7	2.8	3.3	3.4	3.4	3.3
Taylor (1993)	1.7	3.1	3.1	3.1	3.0	3.0
First-difference	1.7	2.5	2.9	2.9	2.7	2.6
Flexible price-level targeting	1.7	1.2	1.3	1.6	1.9	2.0
Extended Tealbook baseline	1.7	1.9	2.3	2.6	2.6	2.7
Real GDP						
Inertial Taylor (1999)	2.1	1.9	1.6	1.5	1.4	1.4
Taylor (1993)	2.1	1.9	1.8	1.7	1.5	1.4
First-difference	2.1	2.2	2.0	1.8	1.6	1.4
Flexible price-level targeting	2.1	2.8	2.5	2.0	1.4	1.2
Extended Tealbook baseline	2.1	2.3	2.0	1.7	1.4	1.3
Unemployment rate[1]						
Inertial Taylor (1999)	3.5	3.5	3.6	3.7	3.8	4.0
Taylor (1993)	3.5	3.6	3.5	3.5	3.6	3.8
First-difference	3.5	3.4	3.3	3.3	3.3	3.5
Flexible price-level targeting	3.5	3.1	2.8	2.7	2.8	3.1
Extended Tealbook baseline	3.5	3.3	3.3	3.3	3.4	3.6
Total PCE prices						
Inertial Taylor (1999)	1.6	1.5	1.7	1.7	1.8	1.8
Taylor (1993)	1.6	1.6	1.8	1.8	1.9	1.9
First-difference	1.6	1.7	2.0	2.1	2.1	2.2
Flexible price-level targeting	1.6	1.8	2.2	2.2	2.3	2.3
Extended Tealbook baseline	1.6	1.6	1.9	1.9	1.9	2.0
Core PCE prices						
Inertial Taylor (1999)	1.8	1.8	1.8	1.7	1.8	1.8
Taylor (1993)	1.8	1.8	1.8	1.8	1.9	1.9
First-difference	1.8	2.0	2.1	2.1	2.1	2.2
Flexible price-level targeting	1.8	2.1	2.2	2.2	2.3	2.3
Extended Tealbook baseline	1.8	1.9	1.9	1.9	1.9	2.0

1. Percent, average for the final quarter of the period.

Outcomes of Simple Policy Rule Simulations, Quarterly

(4-quarter percent change, except as noted)

Outcome and strategy	2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Nominal federal funds rate[1]								
Inertial Taylor (1999)	2.0	2.3	2.5	2.8	2.9	3.1	3.2	3.3
Taylor (1993)	3.1	3.1	3.0	3.1	3.1	3.1	3.1	3.1
First-difference	1.9	2.2	2.3	2.5	2.6	2.7	2.8	2.9
Flexible price-level targeting	1.5	1.3	1.2	1.2	1.2	1.2	1.3	1.3
Extended Tealbook baseline	1.5	1.7	1.8	1.9	2.1	2.2	2.3	2.3
Real GDP								
Inertial Taylor (1999)	2.0	2.1	2.0	1.9	1.8	1.7	1.6	1.6
Taylor (1993)	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8
First-difference	2.0	2.2	2.2	2.2	2.3	2.2	2.1	2.0
Flexible price-level targeting	2.0	2.3	2.6	2.8	3.0	2.8	2.7	2.5
Extended Tealbook baseline	2.0	2.2	2.2	2.3	2.3	2.2	2.1	2.0
Unemployment rate[1]								
Inertial Taylor (1999)	3.5	3.6	3.5	3.5	3.5	3.6	3.6	3.6
Taylor (1993)	3.5	3.6	3.6	3.6	3.5	3.5	3.5	3.5
First-difference	3.5	3.5	3.4	3.4	3.3	3.3	3.3	3.3
Flexible price-level targeting	3.5	3.4	3.3	3.1	3.0	2.9	2.9	2.8
Extended Tealbook baseline	3.5	3.5	3.4	3.3	3.3	3.3	3.3	3.3
Total PCE prices								
Inertial Taylor (1999)	1.8	1.5	1.6	1.5	1.6	1.7	1.7	1.7
Taylor (1993)	1.8	1.6	1.6	1.6	1.6	1.7	1.8	1.8
First-difference	1.8	1.6	1.7	1.7	1.8	1.9	2.0	2.0
Flexible price-level targeting	1.8	1.6	1.7	1.8	1.9	2.1	2.1	2.2
Extended Tealbook baseline	1.8	1.6	1.6	1.6	1.7	1.8	1.8	1.9
Core PCE prices								
Inertial Taylor (1999)	1.8	1.8	1.7	1.8	1.8	1.8	1.8	1.8
Taylor (1993)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
First-difference	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1
Flexible price-level targeting	1.9	1.9	1.9	2.1	2.1	2.2	2.2	2.2
Extended Tealbook baseline	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.9

1. Percent, average for the quarter.

Outcomes of Optimal Control Simulations under Commitment

(Percent change, annual rate, from end of preceding period, except as noted)

Outcome and strategy	2019 H2	2020	2021	2022	2023	2024
Nominal federal funds rate[1]						
Equal weights	1.7	3.8	4.9	5.2	5.0	4.4
Asymmetric weight on *ugap*	1.7	1.7	1.9	2.0	2.1	2.3
Extended Tealbook baseline	1.7	1.9	2.3	2.6	2.6	2.7
Real GDP						
Equal weights	2.1	1.4	1.1	1.3	1.5	1.8
Asymmetric weight on *ugap*	2.1	2.5	2.2	1.8	1.4	1.2
Extended Tealbook baseline	2.1	2.3	2.0	1.7	1.4	1.3
Unemployment rate[1]						
Equal weights	3.5	3.7	4.1	4.3	4.3	4.3
Asymmetric weight on *ugap*	3.5	3.3	3.1	3.0	3.2	3.4
Extended Tealbook baseline	3.5	3.3	3.3	3.3	3.4	3.6
Total PCE prices						
Equal weights	1.6	1.5	1.7	1.7	1.8	1.8
Asymmetric weight on *ugap*	1.6	1.7	2.0	2.0	2.0	2.1
Extended Tealbook baseline	1.6	1.6	1.9	1.9	1.9	2.0
Core PCE prices						
Equal weights	1.8	1.8	1.7	1.7	1.8	1.8
Asymmetric weight on *ugap*	1.8	1.9	2.0	2.0	2.0	2.1
Extended Tealbook baseline	1.8	1.9	1.9	1.9	1.9	2.0

1. Percent, average for the final quarter of the period.

Outcomes of Optimal Control Simulations under Commitment, Quarterly

(4-quarter percent change, except as noted)

Outcome and strategy	2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Nominal federal funds rate[1]								
Equal weights	2.3	2.9	3.4	3.8	4.2	4.5	4.7	4.9
Asymmetric weight on *ugap*	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.9
Extended Tealbook baseline	1.5	1.7	1.8	1.9	2.1	2.2	2.3	2.3
Real GDP								
Equal weights	2.0	1.9	1.7	1.4	1.2	1.1	1.0	1.1
Asymmetric weight on *ugap*	2.0	2.2	2.3	2.5	2.6	2.4	2.3	2.2
Extended Tealbook baseline	2.0	2.2	2.2	2.3	2.3	2.2	2.1	2.0
Unemployment rate[1]								
Equal weights	3.5	3.6	3.7	3.7	3.8	3.9	4.0	4.1
Asymmetric weight on *ugap*	3.5	3.5	3.4	3.3	3.2	3.2	3.1	3.1
Extended Tealbook baseline	3.5	3.5	3.4	3.3	3.3	3.3	3.3	3.3
Total PCE prices								
Equal weights	1.8	1.5	1.5	1.5	1.5	1.6	1.7	1.7
Asymmetric weight on *ugap*	1.8	1.6	1.6	1.7	1.8	1.9	1.9	2.0
Extended Tealbook baseline	1.8	1.6	1.6	1.6	1.7	1.8	1.8	1.9
Core PCE prices								
Equal weights	1.8	1.8	1.7	1.8	1.8	1.7	1.7	1.7
Asymmetric weight on *ugap*	1.8	1.9	1.8	1.9	2.0	2.0	2.0	2.0
Extended Tealbook baseline	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.9

1. Percent, average for the quarter.

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Appendix

Implementation of the Simple Rules and Optimal Control Simulations

The monetary policy strategies considered in this section of Tealbook A typically fall into one of two categories. Under simple policy rules, policymakers set the federal funds rate according to a reaction function that includes a small number of macroeconomic factors. Under optimal control policies, policymakers compute a path for the federal funds rate that minimizes a loss function meant to capture policymakers' preferences over macroeconomic outcomes. Both approaches recognize the Federal Reserve's dual mandate. Unless otherwise noted, the simulations embed the assumption that policymakers will adhere to the policy strategy in the future and that financial market participants, price setters, and wage setters not only believe that policymakers will follow through with their strategy, but also fully understand the macroeconomic implications of policymakers doing so. Such policy strategies are described as commitment strategies.

The two approaches have different merits and limitations. The parsimony of simple rules makes them relatively easy to communicate to the public, and, because they respond only to variables that are central to a range of models, proponents argue that they may be more robust to uncertainty about the structure of the economy. However, simple rules omit, by construction, other potential influences on policy decisions; thus, strict adherence to such rules may, at times, lead to unsatisfactory outcomes. By comparison, optimal control policies respond to a broader set of economic factors; their prescriptions optimally balance various policy objectives. And, although this section focuses on policies under commitment, optimal control policies can more generally be derived under various assumptions about the degree to which policymakers can commit. That said, optimal control policies assume substantial knowledge on the part of policymakers and are sensitive to the assumed loss function and the specifics of the particular model.

Given the different strengths and weaknesses of the two approaches, they are probably best considered together as a means to assess the various tradeoffs policymakers may face when pursuing their mandated objectives.

POLICY RULES USED IN THE MONETARY POLICY STRATEGIES SECTION

The table "Simple Rules" that follows gives expressions for four simple policy rules reported in the first two exhibits of the Monetary Policy Strategies section. It also reports the expression for the conditional attenuated rule that the staff uses in the construction of the Tealbook baseline projection.[1] R_t denotes the nominal federal funds rate prescribed by a strategy

[1] In the staff's construction of the baseline forecast for the federal funds rate, the level of the federal funds rate in the current quarter is a weighted average of the realized daily values to date and the expected daily values, inferred from financial market quotes, over the remainder of the quarter. Beyond the current quarter, the conditional attenuated rule is used to project the path of the federal funds rate. The box

for quarter *t;* for quarters before the projection period under consideration, R_t corresponds to the historical data in the economic projection. The right-hand-side variables of the first four rules include the staff's projection of trailing four-quarter core PCE price inflation for the current quarter and three quarters ahead (π_t and $\pi_{t+3|t}$), the output gap estimate for the current period ($ygap_t$), and the forecast of the three-quarter-ahead annual change in the output gap ($ygap_{t+3|t} - ygap_{t-1}$). The value of policymakers' longer-run inflation objective, denoted π^{LR}, is 2 percent. In the case of the flexible price-level targeting rule, the right-hand-side variables include an unemployment rate gap and a price gap. The unemployment gap is defined as the difference between the unemployment rate, u_t, and the staff's estimate of its natural rate, u_t^*, which currently stands at 4.4 percent. The price gap is defined as 100 times the difference between the log of the core PCE price level, p_t, and the log of the target price-level path, p_t^*. The 2011:Q4 value of p_t^* is set to the 2011:Q4 value of the core PCE price index, and, subsequently, p_t^* is assumed to grow at a 2 percent annual rate.

Simple Rules

Taylor (1993) rule	$R_t = r^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 0.5ygap_t$
Inertial Taylor (1999) rule	$R_t = 0.85R_{t-1} + 0.15(r^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + ygap_t)$
Conditional attenuated rule	$R_t = 0.85R_{t-1} + 0.15(r^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 0.2ygap_t)$
First-difference rule	$R_t = R_{t-1} + 0.5(\pi_{t+3\|t} - \pi^{LR}) + 0.5\Delta^4 ygap_{t+3\|t}$
Flexible price-level targeting rule	$R_t = 0.85R_{t-1} + 0.15(r^{LR} + \pi_t + (p_t - p_t^*) - (u_t - u_t^*))$

The first rule in the table was studied by Taylor (1993). The inertial Taylor (1999) rule features more inertia and a stronger response to resource slack over time compared with the Taylor (1993) rule. The inertial Taylor (1999) rule and rules that depend on a price gap, like the FPLT rule, have been featured prominently in analysis by Board staff.[2] The conditional attenuated rule has the same form as the inertial Taylor (1999) rule but responds less strongly to the output gap. Where applicable, the intercepts of the simple rules, denoted r^{LR}, are constant and chosen so that they are consistent with a 2 percent longer-run inflation objective and an equilibrium real federal funds rate in the longer run of 0.5 percent. The prescriptions of the first-difference rule do not depend on the level of the output gap or the longer-run real interest rate; see Orphanides (2003).

NEAR-TERM PRESCRIPTIONS OF SELECTED POLICY RULES

The "Near-Term Prescriptions of Selected Policy Rules" reported in the first exhibit are calculated taking as given the Tealbook projections for inflation and the output gap. When the

"A New Conditional Baseline Policy Rule" in the Domestic Economic Developments and Outlook section of the April 2019 Tealbook A describes this policy rule in detail.

[2] For applications, see, for example, Erceg and others (2012). An FPLT rule similar to the one above is also analyzed by Chung and others (2015).

Tealbook is published early in a quarter, the prescriptions are shown for the current and next quarters. When the Tealbook is published late in a quarter, the prescriptions are shown for the next two quarters. Rules that include a lagged policy rate as a right-hand-side variable are conditioned on the lagged federal funds rate in the Tealbook projection for the first quarter shown and then conditioned on their simulated lagged federal funds rate for the second quarter shown.

A MEDIUM-TERM NOTION OF THE EQUILIBRIUM REAL FEDERAL FUNDS RATE

The bottom panel of the exhibit "Policy Rules and the Staff Projection" provides estimates of one notion of the equilibrium real federal funds rate that uses alternative baselines: the Tealbook baseline and another one consistent with median responses to the latest Summary of Economic Projections (SEP). The simulations are conducted using the FRB/US model, the staff's large-scale econometric model of the U.S. economy. "FRB/US *r**" is the real federal funds rate that, if maintained over a 12-quarter period (beginning in the current quarter), makes the output gap equal to zero in the final quarter of that period, given either the Tealbook or the SEP-consistent economic projection. This measure depends on a broad array of economic factors, some of which take the form of projected values of the model's exogenous variables.[3] The measure is derived under the assumption that agents in the model form VAR-based expectations—that is, agents use small-scale statistical models so that their expectations of future variables are determined solely by historical relationships.

The "Average projected real federal funds rate" for the Tealbook baseline and the SEP-consistent baseline reported in the panel are the corresponding averages of the real federal funds rate under the Tealbook baseline projection and SEP-consistent projection, respectively, calculated over the same 12-quarter period as the Tealbook-consistent and SEP-consistent FRB/US *r**. For a given economic projection, the average projected real federal funds rates and the FRB/US *r** may be associated with somewhat different macroeconomic outcomes even when their values are identical. The reason is that, in the FRB/US *r** simulation, the real federal funds rate is held constant over the entire 12-quarter period, whereas, in the economic projection, the real federal funds rate can vary over time.

FRB/US MODEL SIMULATIONS

The results presented in the exhibits "Simple Policy Rule Simulations" and "Optimal Control Simulations under Commitment" are derived from dynamic simulations of the FRB/US model. Each simulated policy strategy is assumed to be in force over the whole period covered by the simulation; this period extends several decades beyond the time horizon shown in the exhibits. The simulations are conducted under the assumption that market participants as well as price and wage setters form model-consistent expectations and are predicated on the staff's extended Tealbook projection, which includes the macroeconomic effects of the Committee's large-scale asset purchase programs. When the Tealbook is published early in a quarter, all of the simulations begin in that quarter; when the Tealbook is published late in a quarter, all of the simulations begin in the subsequent quarter.

[3] For a discussion of the equilibrium real federal funds rates in the longer run and other concepts of equilibrium interest rates, see Gust and others (2016).

COMPUTATION OF OPTIMAL CONTROL POLICIES UNDER COMMITMENT

The optimal control simulations posit that policymakers choose a path for the federal funds rate to minimize a discounted weighted sum of squared inflation gaps (measured as the difference between four-quarter headline PCE price inflation, π_t^{PCE}, and the Committee's 2 percent objective), squared unemployment gaps ($ugap_t$, measured as the difference between the unemployment rate and the staff's estimate of the natural rate), and squared changes in the federal funds rate. In the following equation, the resulting loss function embeds the assumption that policymakers discount the future using a quarterly discount factor, $\beta = 0.9963$:

$$\boldsymbol{L_t} = \sum_{\boldsymbol{\tau=0}}^{T} \boldsymbol{\beta^{\tau}} \left\{ \lambda_{\pi} \left(\pi_{t+\tau}^{PCE} - \pi^{LR} \right)^{\mathbf{2}} + \lambda_{u,t+\tau} (ugap_{t+\tau})^{\mathbf{2}} + \lambda_R (R_{t+\boldsymbol{\tau}} - R_{t+\boldsymbol{\tau-1}})^{\mathbf{2}} \right\}.$$

The exhibit "Optimal Control Simulations under Commitment" considers two specifications of the weights on the inflation gap, the unemployment gap, and the rate change components of the loss function. The box "Optimal Control and the Loss Function" in the Monetary Policy Strategies section of the June 2016 Tealbook B provides motivations for the specifications of the loss function. The table "Loss Functions" shows the weights used in the two specifications.

Loss Functions

	λ_{π}	$\lambda_{u,t+\tau}$		λ_R
		$ugap_{t+\tau} < 0$	$ugap_{t+\tau} \geq 0$	
Equal weights	1	1	1	1
Asymmetric weight on *ugap*	1	0	1	1

The first specification, "Equal weights," assigns equal weights to all three components at all times. The second specification, "Asymmetric weight on *ugap*," uses the same weights as the equal-weights specification whenever the unemployment rate is above the staff's estimate of the natural rate, but it assigns no penalty to the unemployment rate falling below the natural rate. The optimal control policy and associated outcomes depend on the relative (rather than the absolute) values of the weights.

For each of these specifications of the loss function, the optimal control policy is subject to the effective lower bound constraint on nominal interest rates. Policy tools other than the federal funds rate are taken as given and subsumed within the Tealbook baseline. The path chosen by policymakers today is assumed to be credible, meaning that the public sees this path as a binding commitment on policymakers' future decisions; the optimal control policy takes as given the initial lagged value of the federal funds rate but is otherwise unconstrained by policy decisions made before the simulation period.

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Changes in GDP, Prices, and Unemployment
(Percent, annual rate except as noted)

	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate[1]	
Interval	11/26/19	01/16/20	11/26/19	01/16/20	11/26/19	01/16/20	11/26/19	01/16/20	11/26/19	01/16/20
Quarterly										
2019:Q1	3.9	3.9	3.1	3.1	.4	.4	1.1	1.1	3.9	3.9
Q2	4.7	4.7	2.0	2.0	2.4	2.4	1.9	1.9	3.6	3.6
Q3	3.8	3.8	2.1	2.1	1.5	1.5	2.1	2.1	3.6	3.6
Q4	2.8	3.7	1.3	2.0	1.5	1.7	1.5	1.5	3.6	3.5
2020:Q1	3.7	3.5	2.3	2.0	1.5	1.6	1.9	1.9	3.6	3.5
Q2	4.2	4.4	2.1	2.6	1.8	1.5	2.0	1.9	3.5	3.5
Q3	3.9	4.4	2.0	2.3	1.7	1.7	1.8	1.8	3.5	3.4
Q4	3.9	4.2	2.0	2.2	1.8	1.7	1.8	1.8	3.5	3.3
2021:Q1	3.9	4.1	1.9	2.1	1.9	1.9	2.0	2.0	3.5	3.3
Q2	4.0	4.2	1.9	2.0	1.8	1.9	1.9	2.0	3.5	3.3
Q3	3.8	4.0	1.8	1.9	1.8	1.8	1.8	1.9	3.5	3.3
Q4	3.7	3.8	1.8	1.8	1.8	1.8	1.8	1.9	3.5	3.3
Two-quarter[2]										
2019:Q2	4.3	4.3	2.6	2.6	1.4	1.4	1.5	1.5	-.2	-.2
Q4	3.3	3.7	1.7	2.1	1.5	1.6	1.8	1.8	.0	-.1
2020:Q2	4.0	3.9	2.2	2.3	1.7	1.6	1.9	1.9	-.1	.0
Q4	3.9	4.3	2.0	2.3	1.8	1.7	1.8	1.8	.0	-.2
2021:Q2	3.9	4.1	1.9	2.1	1.9	1.9	1.9	2.0	.0	.0
Q4	3.7	3.9	1.8	1.9	1.8	1.8	1.8	1.9	.0	.0
Four-quarter[3]										
2018:Q4	4.9	4.9	2.5	2.5	1.9	1.9	1.9	1.9	-.3	-.3
2019:Q4	3.8	4.0	2.1	2.3	1.5	1.5	1.6	1.6	-.2	-.3
2020:Q4	3.9	4.1	2.1	2.3	1.7	1.6	1.9	1.9	-.1	-.2
2021:Q4	3.8	4.0	1.9	2.0	1.9	1.9	1.9	1.9	.0	.0
2022:Q4	3.7	3.7	1.7	1.7	1.9	1.9	1.9	1.9	.0	.0
Annual										
2018	5.4	5.4	2.9	2.9	2.1	2.1	1.9	1.9	3.9	3.9
2019	4.1	4.1	2.3	2.3	1.4	1.4	1.6	1.6	3.7	3.7
2020	3.7	4.0	2.0	2.2	1.7	1.7	1.8	1.8	3.5	3.4
2021	3.9	4.1	1.9	2.1	1.8	1.8	1.9	1.9	3.5	3.3
2022	3.7	3.8	1.7	1.8	1.9	1.9	1.9	1.9	3.5	3.3

1. Level, except for two-quarter and four-quarter intervals.
2. Percent change from two quarters earlier; for unemployment rate, change is in percentage points.
3. Percent change from four quarters earlier; for unemployment rate, change is in percentage points.

Changes in Real Gross Domestic Product and Related Items
(Percent, annual rate except as noted)

Item	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2019[1]	2020[1]	2021[1]	2022[1]
Real GDP	2.0	2.1	2.0	2.0	2.6	2.3	2.2	2.1	2.0	1.9	1.8	2.3	2.3	2.0	1.7
Previous Tealbook	*2.0*	*2.1*	*1.3*	*2.3*	*2.1*	*2.0*	*2.0*	*1.9*	*1.9*	*1.8*	*1.8*	*2.1*	*2.1*	*1.9*	*1.7*
Final sales	3.0	2.1	2.5	2.3	3.0	2.5	2.6	2.0	2.1	1.9	1.7	2.6	2.6	1.9	1.7
Previous Tealbook	*3.0*	*2.1*	*1.7*	*2.5*	*2.4*	*2.2*	*2.3*	*2.0*	*2.0*	*1.8*	*1.6*	*2.3*	*2.4*	*1.9*	*1.7*
Priv. dom. final purch.	3.3	2.3	1.3	2.3	2.9	2.8	2.6	2.3	2.2	2.1	2.0	2.1	2.6	2.1	1.8
Previous Tealbook	*3.3*	*2.3*	*1.9*	*2.1*	*2.6*	*2.6*	*2.6*	*2.3*	*2.2*	*2.0*	*1.9*	*2.3*	*2.5*	*2.1*	*1.8*
Personal cons. expend.	4.6	3.1	1.5	2.4	2.6	2.5	2.5	2.4	2.4	2.3	2.3	2.6	2.5	2.4	2.3
Previous Tealbook	*4.6*	*3.0*	*2.1*	*2.4*	*2.5*	*2.6*	*2.6*	*2.4*	*2.4*	*2.3*	*2.3*	*2.7*	*2.6*	*2.4*	*2.3*
Durables	13.0	8.1	2.1	6.3	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.7	5.3	5.0	5.0
Nondurables	6.5	3.9	-.4	2.3	3.3	2.9	2.7	2.5	2.3	2.5	2.4	3.0	2.8	2.4	2.5
Services	2.8	2.2	2.0	1.8	2.1	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	1.9	1.9
Residential investment	-3.0	4.6	4.3	7.0	7.6	6.2	-.7	-3.3	-3.9	-4.2	-4.2	1.2	5.0	-3.9	-4.3
Previous Tealbook	*-3.0*	*4.6*	*5.9*	*7.2*	*6.8*	*2.4*	*-.6*	*-2.7*	*-2.7*	*-3.3*	*-3.4*	*1.6*	*3.9*	*-3.0*	*-3.7*
Nonres. priv. fixed invest.	-1.0	-2.3	-.8	.5	2.7	3.4	4.0	3.5	3.0	2.6	2.1	.0	2.6	2.8	1.1
Previous Tealbook	*-1.0*	*-2.0*	*-.1*	*-.9*	*1.8*	*2.4*	*3.1*	*3.4*	*2.6*	*2.0*	*1.4*	*.3*	*1.6*	*2.3*	*1.1*
Equipment & intangibles	2.1	-.1	2.3	2.6	4.2	4.6	5.0	4.6	3.6	3.3	2.8	2.2	4.1	3.6	1.8
Previous Tealbook	*2.1*	*1.5*	*1.8*	*.6*	*2.6*	*3.5*	*4.2*	*4.5*	*3.4*	*2.8*	*2.0*	*2.5*	*2.7*	*3.2*	*1.9*
Nonres. structures	-11.1	-9.9	-11.5	-7.1	-2.8	-1.3	.2	-.7	.9	-.1	-.6	-7.3	-2.8	-.1	-1.7
Previous Tealbook	*-11.1*	*-13.6*	*-7.0*	*-6.5*	*-1.1*	*-1.4*	*-.9*	*-.8*	*-.6*	*-.8*	*-1.1*	*-7.2*	*-2.5*	*-.8*	*-1.8*
Net exports[2]	-981	-990	-926	-916	-899	-902	-891	-892	-889	-893	-905	-960	-902	-895	-914
Previous Tealbook[2]	*-981*	*-989*	*-994*	*-973*	*-980*	*-994*	*-996*	*-1001*	*-1005*	*-1011*	*-1024*	*-977*	*-986*	*-1010*	*-1037*
Exports	-5.7	1.0	-3.0	2.8	6.7	4.3	4.7	3.8	4.1	4.1	3.9	-.9	4.6	4.0	3.5
Imports	.0	1.8	-9.1	.9	2.8	3.5	2.2	2.9	2.7	3.5	4.4	-2.3	2.3	3.4	3.2
Gov't. cons. & invest.	4.8	1.7	2.3	1.2	1.2	1.0	.9	.4	.9	.8	.8	2.9	1.1	.7	.8
Previous Tealbook	*4.8*	*1.6*	*.8*	*1.8*	*1.5*	*1.0*	*.9*	*.4*	*.9*	*.8*	*.8*	*2.5*	*1.3*	*.7*	*.8*
Federal	8.3	3.3	3.2	1.9	1.9	.8	.6	-.7	.6	.3	.5	4.2	1.3	.2	.4
Defense	3.3	2.2	4.7	1.5	1.4	1.0	.7	.1	.3	.4	.0	4.4	1.2	.2	.6
Nondefense	16.1	5.0	1.0	2.5	2.6	.5	.4	-1.9	.9	.2	1.3	3.9	1.5	.1	.2
State & local	2.7	.7	1.7	.8	.8	1.0	1.0	1.0	1.0	1.0	1.0	2.1	.9	1.0	1.0
Change in priv. inventories[2]	69	69	43	24	5	-7	-24	-21	-26	-24	-15	75	-1	-21	-1
Previous Tealbook[2]	*69*	*75*	*55*	*41*	*26*	*16*	*-3*	*-8*	*-14*	*-14*	*-4*	*79*	*20*	*-10*	*3*

1. Change from fourth quarter of previous year to fourth quarter of year indicated.
2. Billions of chained (2012) dollars; annual values show annual averages.

Changes in Real Gross Domestic Product and Related Items
(Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise noted)

Item	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Real GDP	2.6	2.9	1.9	2.0	2.8	2.5	2.3	2.3	2.0	1.7
Previous Tealbook	*2.6*	*2.9*	*1.9*	*2.0*	*2.8*	*2.5*	*2.1*	*2.1*	*1.9*	*1.7*
Final sales	2.0	3.2	1.8	2.2	2.9	2.2	2.6	2.6	1.9	1.7
Previous Tealbook	*2.0*	*3.2*	*1.8*	*2.2*	*2.9*	*2.2*	*2.3*	*2.4*	*1.9*	*1.7*
Priv. dom. final purch.	2.6	4.5	2.5	2.8	3.4	2.8	2.1	2.6	2.1	1.8
Previous Tealbook	*2.6*	*4.5*	*2.5*	*2.8*	*3.4*	*2.8*	*2.3*	*2.5*	*2.1*	*1.8*
Personal cons. expend.	1.9	3.8	2.9	2.8	2.9	2.6	2.6	2.5	2.4	2.3
Previous Tealbook	*1.9*	*3.8*	*2.9*	*2.8*	*2.9*	*2.6*	*2.7*	*2.6*	*2.4*	*2.3*
Durables	5.0	9.2	5.8	7.3	7.7	3.8	5.7	5.3	5.0	5.0
Nondurables	2.8	3.2	2.8	1.8	3.7	2.5	3.0	2.8	2.4	2.5
Services	1.1	3.2	2.5	2.4	2.0	2.5	2.0	2.0	1.9	1.9
Residential investment	7.1	7.7	9.1	3.9	4.2	-4.4	1.2	5.0	-3.9	-4.3
Previous Tealbook	*7.1*	*7.7*	*9.1*	*3.9*	*4.2*	*-4.4*	*1.6*	*3.9*	*-3.0*	*-3.7*
Nonres. priv. fixed invest.	5.4	6.9	-.9	2.4	5.4	5.9	.0	2.6	2.8	1.1
Previous Tealbook	*5.4*	*6.9*	*-.9*	*2.4*	*5.4*	*5.9*	*.3*	*1.6*	*2.3*	*1.1*
Equipment & intangibles	5.1	6.1	2.3	1.9	6.6	6.8	2.2	4.1	3.6	1.8
Previous Tealbook	5.1	6.1	2.3	1.9	6.6	6.8	2.5	2.7	3.2	1.9
Nonres. structures	6.7	9.3	-10.9	4.3	1.5	2.6	-7.3	-2.8	-.1	-1.7
Previous Tealbook	*6.7*	*9.3*	*-10.9*	*4.3*	*1.5*	*2.6*	*-7.2*	*-2.5*	*-.8*	*-1.8*
Net exports[1]	-533	-577	-722	-784	-850	-920	-960	-902	-895	-914
Previous Tealbook[1]	*-533*	*-577*	*-722*	*-784*	*-850*	*-920*	*-977*	*-986*	*-1010*	*-1037*
Exports	6.0	2.9	-1.5	1.1	5.5	.4	-.9	4.6	4.0	3.5
Imports	3.0	6.5	3.2	3.4	5.6	3.2	-2.3	2.3	3.4	3.2
Gov't. cons. & invest.	-2.4	.3	2.3	1.5	.8	1.5	2.9	1.1	.7	.8
Previous Tealbook	*-2.4*	*.3*	*2.3*	*1.5*	*.8*	*1.5*	*2.5*	*1.3*	*.7*	*.8*
Federal	-6.1	-1.1	1.1	.1	1.7	2.7	4.2	1.3	.2	.4
Defense	-6.5	-3.4	-.4	-.8	1.9	4.0	4.4	1.2	.2	.6
Nondefense	-5.5	2.7	3.4	1.5	1.4	.7	3.9	1.5	.1	.2
State & local	.2	1.2	3.0	2.3	.4	.9	2.1	.9	1.0	1.0
Change in priv. inventories[1]	109	86	132	23	32	48	75	-1	-21	-1
Previous Tealbook[1]	*109*	*86*	*132*	*23*	*32*	*48*	*79*	*20*	*-10*	*3*

1. Billions of chained (2012) dollars; annual values show annual averages.

Contributions to Changes in Real Gross Domestic Product
(Percentage points, annual rate except as noted)

Item	2019			2020				2021				2019[1]	2020[1]	2021[1]	2022[1]
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Real GDP	2.0	2.1	2.0	2.0	2.6	2.3	2.2	2.1	2.0	1.9	1.8	2.3	2.3	2.0	1.7
Previous Tealbook	*2.0*	*2.1*	*1.3*	*2.3*	*2.1*	*2.0*	*2.0*	*1.9*	*1.9*	*1.8*	*1.8*	*2.1*	*2.1*	*1.9*	*1.7*
Final sales	2.9	2.1	2.5	2.3	3.0	2.5	2.5	2.1	2.1	1.9	1.7	2.5	2.6	1.9	1.7
Previous Tealbook	*2.9*	*2.1*	*1.7*	*2.5*	*2.4*	*2.2*	*2.3*	*2.0*	*2.0*	*1.8*	*1.6*	*2.3*	*2.4*	*1.9*	*1.7*
Priv. dom. final purch.	2.8	2.0	1.1	1.9	2.4	2.4	2.2	2.0	1.8	1.8	1.7	1.8	2.2	1.8	1.5
Previous Tealbook	*2.8*	*1.9*	*1.6*	*1.8*	*2.2*	*2.2*	*2.2*	*2.0*	*1.9*	*1.7*	*1.6*	*1.9*	*2.1*	*1.8*	*1.6*
Personal cons. expend.	3.0	2.1	1.0	1.6	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.8	1.7	1.6	1.6
Previous Tealbook	*3.0*	*2.0*	*1.4*	*1.7*	*1.7*	*1.8*	*1.8*	*1.6*	*1.6*	*1.6*	*1.6*	*1.8*	*1.7*	*1.6*	*1.6*
Durables	.9	.6	.2	.4	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3
Nondurables	.9	.5	.0	.3	.5	.4	.4	.3	.3	.3	.3	.4	.4	.3	.3
Services	1.3	1.0	.9	.8	1.0	1.0	1.0	.9	.9	.9	.9	.9	.9	.9	.9
Residential investment	-.1	.2	.2	.3	.3	.2	.0	-.1	-.2	-.2	-.2	.0	.2	-.2	-.2
Previous Tealbook	*-.1*	*.2*	*.2*	*.3*	*.3*	*.1*	*.0*	*-.1*	*-.1*	*-.1*	*-.1*	*.1*	*.1*	*-.1*	*-.1*
Nonres. priv. fixed invest.	-.1	-.3	-.1	.1	.4	.4	.5	.5	.4	.3	.3	.0	.3	.4	.1
Previous Tealbook	*-.1*	*-.3*	*.0*	*-.1*	*.2*	*.3*	*.4*	*.4*	*.3*	*.3*	*.2*	*.0*	*.2*	*.3*	*.1*
Equipment & intangibles	.2	.0	.2	.3	.4	.5	.5	.5	.4	.3	.3	.2	.4	.4	.2
Previous Tealbook	*.2*	*.2*	*.2*	*.1*	*.3*	*.4*	*.4*	*.5*	*.4*	*.3*	*.2*	*.3*	*.3*	*.3*	*.2*
Nonres. structures	-.4	-.3	-.3	-.2	-.1	.0	.0	.0	.0	.0	.0	-.2	-.1	.0	.0
Previous Tealbook	*-.4*	*-.4*	*-.2*	*-.2*	*.0*	*.0*	*.0*	*.0*	*.0*	*.0*	*.0*	*-.2*	*-.1*	*.0*	*.0*
Net exports	-.7	-.1	1.0	.2	.4	.0	.2	.0	.1	.0	-.1	.2	.2	.0	.0
Previous Tealbook	*-.7*	*-.1*	*-.1*	*.4*	*-.1*	*-.2*	*.0*	*.0*	*.0*	*-.1*	*-.2*	*-.1*	*.0*	*-.1*	*-.1*
Exports	-.7	.1	-.3	.3	.8	.5	.5	.4	.5	.5	.5	-.1	.5	.5	.4
Imports	.0	-.3	1.4	-.1	-.4	-.5	-.3	-.4	-.4	-.5	-.6	.3	-.3	-.5	-.4
Gov't. cons. & invest.	.8	.3	.4	.2	.2	.2	.2	.1	.2	.1	.1	.5	.2	.1	.1
Previous Tealbook	*.8*	*.3*	*.1*	*.3*	*.3*	*.2*	*.2*	*.1*	*.2*	*.1*	*.1*	*.4*	*.2*	*.1*	*.1*
Federal	.5	.2	.2	.1	.1	.1	.0	.0	.0	.0	.0	.3	.1	.0	.0
Defense	.1	.1	.2	.1	.1	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0
Nondefense	.4	.1	.0	.1	.1	.0	.0	-.1	.0	.0	.0	.1	.0	.0	.0
State & local	.3	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1	.2	.1	.1	.1
Change in priv. inventories	-.9	.0	-.5	-.4	-.3	-.2	-.3	.0	-.1	.0	.2	-.2	-.3	.0	.0
Previous Tealbook	*-.9*	*.1*	*-.4*	*-.2*	*-.3*	*-.2*	*-.4*	*-.1*	*-.1*	*.0*	*.2*	*-.2*	*-.3*	*.0*	*.0*

1. Change from fourth quarter of previous year to fourth quarter of year indicated.

Changes in Prices and Costs
(Percent, annual rate except as noted)

Item	2019			2020				2021				2019[1]	2020[1]	2021[1]	2022[1]
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
GDP chain-wt. price index	2.4	1.8	1.6	1.5	1.7	2.0	1.9	1.9	2.1	2.0	1.9	1.7	1.8	2.0	2.0
Previous Tealbook	*2.4*	*1.7*	*1.5*	*1.4*	*2.1*	*1.9*	*1.8*	*1.9*	*2.0*	*1.9*	*1.9*	*1.7*	*1.8*	*1.9*	*2.0*
PCE chain-wt. price index	2.4	1.5	1.7	1.6	1.5	1.7	1.7	1.9	1.9	1.8	1.8	1.5	1.6	1.9	1.9
Previous Tealbook	*2.4*	*1.5*	*1.5*	*1.5*	*1.8*	*1.7*	*1.8*	*1.9*	*1.8*	*1.8*	*1.8*	*1.5*	*1.7*	*1.9*	*1.9*
Energy	18.4	-8.2	8.6	-3.0	-8.1	-2.7	-1.4	-.1	.1	.1	.4	-.4	-3.8	.1	.7
Previous Tealbook	*18.4*	*-8.2*	*3.2*	*-7.0*	*-2.6*	*-1.1*	*-.5*	*.2*	*.3*	*.4*	*.6*	*-1.7*	*-2.8*	*.4*	*1.0*
Food	.6	-.5	.6	.7	.9	1.7	1.9	2.3	2.3	2.3	2.3	.9	1.3	2.3	2.3
Previous Tealbook	*.6*	*-.5*	*1.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*1.1*	*2.3*	*2.3*	*2.3*
Ex. food & energy	1.9	2.1	1.5	1.9	1.9	1.8	1.8	2.0	2.0	1.9	1.9	1.6	1.9	1.9	1.9
Previous Tealbook	*1.9*	*2.1*	*1.5*	*1.9*	*2.0*	*1.8*	*1.8*	*2.0*	*1.9*	*1.8*	*1.8*	*1.6*	*1.9*	*1.9*	*1.9*
Ex. food & energy, market based	1.4	1.8	1.1	1.7	1.9	1.7	1.7	1.8	1.8	1.7	1.7	1.5	1.7	1.8	1.8
Previous Tealbook	*1.4*	*1.9*	*1.5*	*1.8*	*1.8*	*1.7*	*1.7*	*1.8*	*1.7*	*1.7*	*1.7*	*1.6*	*1.7*	*1.7*	*1.7*
CPI	2.9	1.8	2.6	1.6	1.4	1.9	2.0	2.3	2.2	2.2	2.2	2.0	1.7	2.2	2.3
Previous Tealbook	*2.9*	*1.8*	*2.3*	*1.6*	*2.0*	*2.1*	*2.1*	*2.3*	*2.2*	*2.2*	*2.2*	*2.0*	*2.0*	*2.2*	*2.3*
Ex. food & energy	1.8	3.0	2.1	2.0	2.2	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.2	2.4	2.4
Previous Tealbook	*1.8*	*3.0*	*2.1*	*2.2*	*2.4*	*2.3*	*2.3*	*2.4*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.4*
ECI, hourly compensation[2]	2.1	3.3	2.8	2.7	2.7	2.7	2.7	2.8	2.8	2.7	2.7	2.7	2.7	2.8	2.7
Previous Tealbook[2]	*2.1*	*3.3*	*2.8*	*2.7*	*2.7*	*2.7*	*2.7*	*2.7*	*2.7*	*2.7*	*2.7*	*2.7*	*2.7*	*2.7*	*2.7*
Business sector															
Output per hour	2.8	-.3	.7	.5	1.6	1.4	1.4	1.3	1.3	1.4	1.4	1.7	1.2	1.3	1.3
Previous Tealbook	*2.8*	*-.1*	*-.6*	*1.4*	*1.4*	*1.2*	*1.3*	*1.4*	*1.3*	*1.4*	*1.3*	*1.4*	*1.3*	*1.3*	*1.4*
Compensation per hour	2.8	2.3	2.7	3.4	3.8	3.9	3.8	3.8	3.8	3.8	3.8	4.3	3.7	3.8	3.7
Previous Tealbook	*5.2*	*3.3*	*2.3*	*3.5*	*3.6*	*3.7*	*3.7*	*3.6*	*3.6*	*3.6*	*3.6*	*5.0*	*3.6*	*3.6*	*3.6*
Unit labor costs	.1	2.5	2.0	2.9	2.2	2.5	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.3
Previous Tealbook	*2.3*	*3.3*	*2.9*	*2.1*	*2.2*	*2.5*	*2.4*	*2.2*	*2.3*	*2.2*	*2.3*	*3.6*	*2.3*	*2.3*	*2.2*
Core goods imports chain-wt. price index[3]	-.6	-1.0	-.4	1.7	1.9	.8	.9	1.0	.8	.8	.8	-.9	1.3	.9	.8
Previous Tealbook[3]	*-.6*	*-.9*	*-.5*	*1.1*	*1.0*	*.8*	*.9*	*1.1*	*1.0*	*.9*	*1.0*	*-.9*	*1.0*	*1.0*	*.9*

1. Change from fourth quarter of previous year to fourth quarter of year indicated.
2. Private-industry workers.
3. Core goods imports exclude computers, semiconductors, oil, and natural gas.

Changes in Prices and Costs

(Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise noted)

Item	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
GDP chain-wt. price index	1.8	1.5	.9	1.5	2.0	2.3	1.7	1.8	2.0	2.0
Previous Tealbook	*1.8*	*1.5*	*.9*	*1.5*	*2.0*	*2.3*	*1.7*	*1.8*	*1.9*	*2.0*
PCE chain-wt. price index	1.2	1.1	.3	1.5	1.8	1.9	1.5	1.6	1.9	1.9
Previous Tealbook	*1.2*	*1.1*	*.3*	*1.5*	*1.8*	*1.9*	*1.5*	*1.7*	*1.9*	*1.9*
Energy	-2.9	-7.1	-16.4	2.0	8.0	3.9	-.4	-3.8	.1	.7
Previous Tealbook	*-2.9*	*-7.1*	*-16.4*	*2.0*	*8.0*	*3.9*	*-1.7*	*-2.8*	*.4*	*1.0*
Food	.7	2.8	.3	-1.8	.7	.5	.9	1.3	2.3	2.3
Previous Tealbook	*.7*	*2.8*	*.3*	*-1.8*	*.7*	*.5*	*1.1*	*2.3*	*2.3*	*2.3*
Ex. food & energy	1.6	1.5	1.2	1.8	1.7	1.9	1.6	1.9	1.9	1.9
Previous Tealbook	*1.6*	*1.5*	*1.2*	*1.8*	*1.7*	*1.9*	*1.6*	*1.9*	*1.9*	*1.9*
Ex. food & energy, market based	1.1	1.1	1.1	1.4	1.2	1.7	1.5	1.7	1.8	1.8
Previous Tealbook	*1.1*	*1.1*	*1.1*	*1.4*	*1.2*	*1.7*	*1.6*	*1.7*	*1.7*	*1.7*
CPI	1.2	1.2	.4	1.8	2.1	2.2	2.0	1.7	2.2	2.3
Previous Tealbook	*1.2*	*1.2*	*.4*	*1.8*	*2.1*	*2.2*	*2.0*	*2.0*	*2.2*	*2.3*
Ex. food & energy	1.7	1.7	2.0	2.2	1.8	2.2	2.3	2.2	2.4	2.4
Previous Tealbook	*1.7*	*1.7*	*2.0*	*2.2*	*1.8*	*2.2*	*2.3*	*2.3*	*2.3*	*2.4*
ECI, hourly compensation[1]	2.0	2.3	1.9	2.2	2.6	3.0	2.7	2.7	2.8	2.7
Previous Tealbook[1]	*2.0*	*2.3*	*1.9*	*2.2*	*2.6*	*3.0*	*2.7*	*2.7*	*2.7*	*2.7*
Business sector										
Output per hour	1.8	.3	.6	1.4	1.1	1.1	1.7	1.2	1.3	1.3
Previous Tealbook	*1.8*	*.3*	*.6*	*1.4*	*1.1*	*1.1*	*1.4*	*1.3*	*1.3*	*1.4*
Compensation per hour	-.2	3.0	2.3	2.2	3.7	2.1	4.3	3.7	3.8	3.7
Previous Tealbook	*-.2*	*3.0*	*2.3*	*2.2*	*3.7*	*2.1*	*5.0*	*3.6*	*3.6*	*3.6*
Unit labor costs	-2.0	2.7	1.7	.8	2.6	1.0	2.5	2.5	2.4	2.3
Previous Tealbook	*-2.0*	*2.7*	*1.7*	*.8*	*2.6*	*1.0*	*3.6*	*2.3*	*2.3*	*2.2*
Core goods imports chain-wt. price index[2]	-2.2	-.4	-4.3	-.9	.9	.2	-.9	1.3	.9	.8
Previous Tealbook[2]	*-2.2*	*-.4*	*-4.3*	*-.9*	*.9*	*.2*	*-.9*	*1.0*	*1.0*	*.9*

1. Private-industry workers.
2. Core goods imports exclude computers, semiconductors, oil, and natural gas.

Other Macroeconomic Indicators

Item	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2019[1]	2020[1]	2021[1]	2022[1]
Employment and production															
Nonfarm payroll employment[2]	152	193	184	187	226	47	140	125	110	95	82	176	150	103	74
Unemployment rate[3]	3.6	3.6	3.5	3.5	3.5	3.4	3.3	3.3	3.3	3.3	3.3	3.5	3.3	3.3	3.3
Previous Tealbook[3]	*3.6*	*3.6*	*3.6*	*3.6*	*3.5*	*3.5*	*3.5*	*3.5*	*3.5*	*3.5*	*3.5*	*3.6*	*3.5*	*3.5*	*3.5*
Natural rate of unemployment[3]	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Previous Tealbook[3]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
Employment-to-Population Ratio[3]	60.6	60.8	61.0	61.0	60.9	60.9	60.9	60.9	60.9	60.9	60.9	61.0	60.9	60.9	60.6
Employment-to-Population Trend[3]	60.1	60.1	60.1	60.0	60.0	60.0	59.9	59.9	59.9	59.8	59.8	60.1	59.9	59.8	59.6
Output gap[4]	1.6	1.6	1.7	1.7	1.9	2.1	2.2	2.3	2.3	2.3	2.3	1.7	2.2	2.3	2.2
Previous Tealbook[4]	*1.6*	*1.6*	*1.5*	*1.6*	*1.7*	*1.8*	*1.8*	*1.9*	*1.9*	*1.9*	*1.8*	*1.5*	*1.8*	*1.8*	*1.7*
Industrial production[5]	-2.3	1.2	-.5	.1	4.5	1.6	1.0	1.2	1.4	1.2	1.0	-.9	1.8	1.2	.7
Previous Tealbook[5]	*-2.3*	*1.4*	*.0*	*3.2*	*1.4*	*.7*	*.5*	*1.2*	*1.0*	*.9*	*1.0*	*-.7*	*1.4*	*1.0*	*.8*
Manufacturing industr. prod.[5]	-3.3	.8	-1.0	1.5	2.9	1.5	1.4	1.1	1.0	1.0	1.1	-1.3	1.8	1.1	.6
Previous Tealbook[5]	*-3.3*	*1.1*	*-.5*	*2.9*	*1.1*	*.9*	*1.0*	*.9*	*1.0*	*.9*	*1.0*	*-1.1*	*1.5*	*.9*	*.8*
Capacity utilization rate - mfg.[3]	75.5	75.4	74.9	75.1	75.6	75.8	75.9	76.1	76.3	76.4	76.6	74.9	75.9	76.6	77.0
Previous Tealbook[3]	*75.5*	*75.4*	*75.1*	*75.5*	*75.6*	*75.7*	*75.8*	*75.9*	*76.1*	*76.2*	*76.3*	*75.1*	*75.8*	*76.3*	*76.9*
Housing starts[6]	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.4	1.3	1.2
Light motor vehicle sales[6]	17.0	17.0	16.8	16.9	16.9	16.9	16.9	16.9	16.8	16.8	16.8	17.0	16.9	16.8	16.7
Income and saving															
Nominal GDP[5]	4.7	3.8	3.7	3.5	4.4	4.4	4.2	4.1	4.2	4.0	3.8	4.0	4.1	4.0	3.7
Real disposable pers. income[5]	1.5	2.9	2.3	3.5	2.7	1.8	1.5	2.9	1.8	1.9	1.2	2.8	2.3	1.9	2.1
Previous Tealbook[5]	*2.4*	*3.1*	*2.5*	*2.9*	*1.6*	*1.7*	*2.0*	*2.6*	*1.7*	*1.6*	*1.7*	*3.1*	*2.0*	*1.9*	*2.0*
Personal saving rate[3]	7.8	7.8	8.0	8.3	8.3	8.2	7.9	8.0	7.9	7.8	7.5	8.0	7.9	7.5	7.3
Previous Tealbook[3]	*8.0*	*8.1*	*8.2*	*8.3*	*8.1*	*7.9*	*7.8*	*7.8*	*7.7*	*7.5*	*7.3*	*8.2*	*7.8*	*7.3*	*7.1*
Corporate profits[7]	16.0	-.9	4.1	2.8	1.7	4.6	.7	3.0	3.1	1.8	.9	.7	2.4	2.2	2.0
Profit share of GNP[3]	9.6	9.5	9.5	9.5	9.4	9.5	9.4	9.4	9.3	9.3	9.2	9.5	9.4	9.2	9.1
Gross national saving rate[3]	17.9	17.7	17.7	17.7	17.7	17.8	17.7	17.7	17.7	17.7	17.6	17.7	17.7	17.6	17.3
Net national saving rate[3]	2.3	2.1	2.5	2.5	2.6	2.5	2.5	2.4	2.4	2.3	2.1	2.5	2.5	2.1	1.6

1. Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise indicated.
2. Average monthly change, thousands.
3. Percent; annual values are for the fourth quarter of the year indicated.
4. Percent difference between actual and potential output; a negative number indicates that the economy is operating below potential. Annual values are for the fourth quarter of the year indicated.
5. Percent change, annual rate.
6. Level, millions; annual values are annual averages.
7. Percent change, annual rate, with inventory valuation and capital consumption adjustments.

Other Macroeconomic Indicators

(Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise noted)

Item	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Employment and production										
Nonfarm payroll employment[1]	192	251	227	193	179	223	176	150	103	74
Unemployment rate[2]	7.0	5.7	5.0	4.8	4.1	3.8	3.5	3.3	3.3	3.3
Previous Tealbook[2]	*7.0*	*5.7*	*5.0*	*4.8*	*4.1*	*3.8*	*3.6*	*3.5*	*3.5*	*3.5*
Natural rate of unemployment[2]	5.4	5.1	4.9	4.8	4.6	4.4	4.4	4.4	4.4	4.4
Previous Tealbook[2]	*5.4*	*5.1*	*4.9*	*4.8*	*4.6*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
Employment-to-Population Ratio[2]	58.5	59.3	59.4	59.7	60.1	60.6	61.0	60.9	60.9	60.6
Employment-to-Population Trend[2]	60.4	60.3	60.2	60.2	60.2	60.2	60.1	59.9	59.8	59.6
Output gap[3]	-3.0	-1.0	-.5	-.3	.6	1.4	1.7	2.2	2.3	2.2
Previous Tealbook[3]	*-3.0*	*-1.0*	*-.5*	*-.3*	*.6*	*1.4*	*1.5*	*1.8*	*1.8*	*1.7*
Industrial production	2.3	3.4	-3.4	-.3	3.6	4.0	-.9	1.8	1.2	.7
Previous Tealbook	*2.3*	*3.4*	*-3.4*	*-.3*	*3.6*	*4.0*	*-.7*	*1.4*	*1.0*	*.8*
Manufacturing industr. prod.	1.1	1.4	-1.7	.3	2.5	2.2	-1.3	1.8	1.1	.6
Previous Tealbook	*1.1*	*1.4*	*-1.7*	*.3*	*2.5*	*2.2*	*-1.1*	*1.5*	*.9*	*.8*
Capacity utilization rate - mfg.[2]	74.5	75.8	74.9	74.2	75.8	77.0	74.9	75.9	76.6	77.0
Previous Tealbook[2]	*74.5*	*75.8*	*74.9*	*74.2*	*75.8*	*77.0*	*75.1*	*75.8*	*76.3*	*76.9*
Housing starts[4]	.9	1.0	1.1	1.2	1.2	1.2	1.3	1.4	1.3	1.2
Light motor vehicle sales[4]	15.5	16.5	17.4	17.5	17.1	17.2	17.0	16.9	16.8	16.7
Income and saving										
Nominal GDP	4.4	4.5	2.8	3.5	4.9	4.9	4.0	4.1	4.0	3.7
Real disposable pers. income	-2.5	5.3	3.0	1.6	3.4	3.9	2.8	2.3	1.9	2.1
Previous Tealbook	*-2.5*	*5.3*	*3.0*	*1.6*	*3.4*	*3.9*	*3.1*	*2.0*	*1.9*	*2.0*
Personal saving rate[2]	6.3	7.5	7.5	6.5	6.8	7.8	8.0	7.9	7.5	7.3
Previous Tealbook[2]	*6.3*	*7.5*	*7.5*	*6.5*	*6.8*	*7.8*	*8.2*	*7.8*	*7.3*	*7.1*
Corporate profits[5]	3.9	6.7	-10.8	3.3	-.6	4.2	.7	2.4	2.2	2.0
Profit share of GNP[2]	11.8	12.1	10.5	10.5	9.9	9.9	9.5	9.4	9.2	9.1
Gross national saving rate[2]	19.2	20.3	19.6	18.1	18.0	17.9	17.7	17.7	17.6	17.3
Net national saving rate[2]	4.0	5.3	4.5	2.7	2.7	2.4	2.5	2.5	2.1	1.6

1. Average monthly change, thousands.
2. Percent; values are for the fourth quarter of the year indicated.
3. Percent difference between actual and potential output; a negative number indicates that the economy is operating below potential. Values are for the fourth quarter of the year indicated.
4. Level, millions; values are annual averages.
5. Percent change, with inventory valuation and capital consumption adjustments.

Staff Projections of Government-Sector Accounts and Related Items

Item	2017	2018	2019	2020	2021	2022	2019 Q3	2019 Q4	2020 Q1	2020 Q2
Unified federal budget[1]				Nominal dollars, billions						
Receipts	3,316	3,330	3,462	3,637	3,852	4,035	853	807	775	1,170
Outlays	3,982	4,109	4,447	4,610	4,834	5,157	1,091	1,163	1,176	1,160
Surplus/deficit	-665	-779	-984	-973	-982	-1,122	-237	-357	-401	11
				Percent of GDP						
Surplus/deficit	-3.5	-3.8	-4.6	-4.4	-4.3	-4.7	-4.5	-6.7	-7.4	.2
Previous Tealbook	*-3.5*	*-3.8*	*-4.6*	*-4.0*	*-4.2*	*-4.8*	*-4.5*	*-6.8*	*-6.8*	*1.5*
Primary surplus/deficit	-2.1	-2.2	-2.9	-2.7	-2.5	-2.8	-3.2	-4.8	-5.6	2.4
Net interest	1.4	1.6	1.8	1.7	1.8	1.9	1.3	1.9	1.8	2.2
Cyclically adjusted surplus/deficit	-3.5	-4.2	-5.3	-5.2	-5.3	-5.8	-5.2	-7.4	-8.2	-.7
Federal debt held by public	76.0	77.5	79.2	81.0	82.5	84.6	79.2	80.0	81.3	80.4
Government in the NIPA[2]				Real percent change, annual rate						
Purchases	.8	1.5	2.9	1.1	.7	.8	1.7	2.3	1.2	1.2
Consumption	.6	1.6	2.2	.8	.4	.5	1.9	1.4	1.1	1.1
Investment	2.0	1.5	6.1	2.0	1.8	1.9	1.0	6.2	1.8	1.7
State and local construction	-1.8	-1.5	7.1	.0	.9	.9	-5.6	5.0	-1.0	-1.0
Real disposable personal income	3.5	3.9	2.8	2.3	1.9	2.1	2.9	2.3	3.5	2.7
Contribution from transfers[3]	.2	.4	1.1	.5	.6	.8	.6	.6	.8	.4
Contribution from taxes[3]	-.9	.4	-.9	-.6	-.6	-.6	.5	-.4	-.5	-.7
Government employment				Average net change in monthly payrolls, thousands						
Federal	-2	0	2	0	1	1	10	-7	23	77
State and local	9	8	11	9	9	9	27	9	9	9
Fiscal indicators[2]				Percentage point contribution to change in real GDP, annual rate						
Fiscal effect (FE)[4]	.2	.4	1.0	.5	.4	.4	.8	.8	.6	.6
Discretionary policy actions (FI)	.3	.6	.8	.4	.2	.1	.5	.6	.5	.4
Previous Tealbook	*.3*	*.6*	*.7*	*.4*	*.1*	*.1*	*.5*	*.4*	*.5*	*.5*
Federal purchases	.1	.2	.3	.1	.0	.0	.2	.2	.1	.1
State and local purchases	.0	.1	.2	.1	.1	.1	.1	.2	.1	.1
Taxes and transfers	.1	.3	.3	.2	.0	.0	.2	.2	.2	.2
Cyclical	-.1	-.1	-.1	-.1	-.1	.0	-.1	-.1	-.1	-.1
Other	.0	-.1	.3	.2	.3	.2	.3	.3	.2	.2

1. Annual values stated on a fiscal year basis. Quarterly values not seasonally adjusted.
2. Annual values refer to the change from fourth quarter of previous year to fourth quarter of year indicated.
3. Percentage point contribution to change in real disposable personal income, annual basis.
4. The FE measure captures the total contribution of the government sector to the growth of aggregate demand (excluding any multiplier effects and financial offsets). It equals the sum of the direct contributions to aggregate demand growth from all changes in federal purchases and state and local purchases, plus the estimated contribution to real household consumption and business investment that is induced by changes in transfer and tax policies. FI (fiscal impetus) is the portion of FE attributable to discretionary fiscal policy actions (for example, a legislated change in tax revenues).

Foreign Real GDP and Consumer Prices: Selected Countries
(Quarterly percent changes at an annual rate)

Measure and country	2019 Q1	2019 Q2	2019 Q3	2019 Q4	Projected 2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4
***Real GDP*[1]**												
Total foreign	1.6	2.0	1.4	.8	2.0	2.2	2.3	2.3	2.4	2.4	2.4	2.4
Previous Tealbook	*1.6*	*2.0*	*1.3*	*1.3*	*2.0*	*2.3*	*2.4*	*2.4*	*2.5*	*2.5*	*2.6*	*2.6*
Advanced foreign economies	1.5	2.0	1.3	.4	1.2	1.4	1.5	1.5	1.6	1.6	1.7	1.6
Canada	.8	3.5	1.3	.8	1.3	1.6	1.7	1.8	1.8	1.8	1.8	1.8
Japan	2.6	2.0	1.8	-2.8	1.1	1.2	1.0	.8	.8	.8	.8	.8
United Kingdom	2.5	-.7	1.7	-.3	.7	.7	.7	.7	1.4	1.4	1.4	1.4
Euro area	1.8	.7	.9	.9	1.1	1.3	1.3	1.5	1.7	1.7	1.6	1.6
Germany	1.9	-1.0	.3	.5	1.1	1.2	1.2	1.4	1.5	1.6	1.5	1.5
Emerging market economies	1.7	2.0	1.4	1.1	2.8	3.1	3.2	3.2	3.2	3.2	3.2	3.2
Asia	3.7	3.8	2.0	2.5	4.0	4.4	4.5	4.3	4.3	4.3	4.3	4.3
Korea	-1.5	4.2	1.7	2.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
China	6.5	5.9	5.5	6.1	6.3	6.1	5.9	5.7	5.8	5.8	5.8	5.7
Latin America	-.2	.2	.6	-.6	1.5	1.7	1.9	1.9	2.0	2.2	2.2	2.2
Mexico	-.4	-.2	.1	-.3	1.3	1.4	1.5	1.7	1.8	2.0	2.0	2.0
Brazil	.0	1.9	2.5	2.2	2.0	2.3	2.5	2.6	2.8	2.8	2.8	2.8
Addendum												
Emerging market economies ex. China	.7	1.2	.6	.1	2.0	2.4	2.6	2.6	2.7	2.7	2.7	2.7
***Consumer prices*[2]**												
Total foreign	.9	3.2	2.3	3.5	2.8	2.1	2.3	2.3	2.3	2.3	2.3	2.3
Previous Tealbook	*.8*	*3.3*	*2.3*	*3.3*	*2.4*	*2.0*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*
Advanced foreign economies	.8	2.1	1.0	1.0	1.5	1.4	1.4	1.5	1.5	1.5	1.5	1.5
Canada	1.6	3.4	1.7	1.7	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Japan	.9	.3	.3	.4	1.0	.8	.8	.8	.7	.8	.8	.8
United Kingdom	1.1	2.5	1.8	.2	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8
Euro area	.3	2.0	.7	1.1	1.4	1.3	1.2	1.3	1.4	1.4	1.4	1.4
Germany	.2	2.4	.3	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9
Emerging market economies	.9	4.0	3.2	5.2	3.7	2.5	2.8	2.8	2.8	2.8	2.8	2.8
Asia	.5	3.8	3.3	5.8	3.6	2.1	2.6	2.6	2.6	2.6	2.6	2.6
Korea	-2.0	1.9	-.5	1.7	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1
China	.6	4.3	4.6	7.6	3.4	1.7	2.5	2.5	2.5	2.5	2.5	2.5
Latin America	1.6	4.8	3.2	3.9	4.2	3.3	3.4	3.3	3.3	3.3	3.3	3.3
Mexico	1.1	4.5	2.8	3.4	3.8	3.1	3.2	3.2	3.2	3.2	3.2	3.2
Brazil	2.9	5.2	2.2	3.2	6.1	3.8	3.8	3.8	3.7	3.7	3.7	3.7
Addendum												
Emerging market economies ex. China	1.1	3.8	2.1	3.5	3.9	3.0	3.1	3.0	3.0	3.0	3.0	3.0

1. Foreign GDP aggregates calculated using shares of U.S. exports.
2. Foreign CPI aggregates calculated using shares of U.S. non-oil imports.

Foreign Real GDP and Consumer Prices: Selected Countries
(Percent change, Q4 to Q4)

Measure and country	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
							----------Projected----------			
Real GDP[1]										
Total foreign	3.0	3.0	2.1	2.9	3.2	2.2	1.4	2.2	2.4	2.4
Previous Tealbook	*3.0*	*3.0*	*2.1*	*2.8*	*3.1*	*2.2*	*1.6*	*2.3*	*2.5*	*2.5*
Advanced foreign economies	2.4	2.0	.9	1.8	2.9	1.4	1.3	1.4	1.6	1.7
Canada	3.4	2.8	-.4	1.7	3.2	1.8	1.6	1.6	1.8	1.8
Japan	2.8	-.4	1.0	1.1	2.5	-.3	.9	1.0	.8	.8
United Kingdom	2.7	2.5	2.4	1.8	1.6	1.4	.8	.7	1.4	1.5
Euro area	.7	1.6	2.0	2.1	3.0	1.2	1.1	1.3	1.6	1.6
Germany	1.5	2.3	1.3	1.9	3.4	.6	.4	1.2	1.5	1.6
Emerging market economies	3.7	3.9	3.2	3.9	3.5	3.0	1.6	3.0	3.2	3.2
Asia	5.5	5.1	4.7	5.4	5.3	4.5	3.0	4.3	4.3	4.2
Korea	3.7	2.6	3.4	2.7	2.8	3.0	1.6	2.4	2.4	2.3
China	7.6	7.2	6.8	7.3	6.9	6.5	6.0	6.0	5.7	5.6
Latin America	1.7	2.8	1.9	2.5	1.8	1.3	.0	1.7	2.1	2.2
Mexico	1.2	3.4	2.8	3.3	1.6	1.4	-.2	1.5	1.9	2.0
Brazil	2.6	-.1	-5.5	-2.2	2.4	1.3	1.6	2.3	2.8	2.8
Addendum										
Emerging market economies ex. China	2.7	3.1	2.4	3.2	2.8	2.3	.7	2.4	2.7	2.7
Consumer prices[2]										
Total foreign	2.4	2.0	1.4	1.9	2.5	2.4	2.5	2.3	2.3	2.3
Previous Tealbook	*2.4*	*2.0*	*1.4*	*1.9*	*2.5*	*2.4*	*2.4*	*2.2*	*2.3*	*2.3*
Advanced foreign economies	1.0	1.2	.5	.9	1.5	1.7	1.2	1.4	1.5	1.6
Canada	1.0	2.0	1.3	1.4	1.8	2.1	2.1	2.0	2.0	2.0
Japan	1.4	2.6	.1	.3	.6	.8	.5	.9	.8	1.0
United Kingdom	2.1	.9	.1	1.2	3.0	2.3	1.4	1.9	1.8	1.8
Euro area	.8	.2	.3	.7	1.4	1.9	1.0	1.3	1.4	1.5
Germany	1.4	.4	.5	1.0	1.6	2.1	1.2	1.8	1.9	2.0
Emerging market economies	3.4	2.6	2.0	2.6	3.2	2.9	3.3	3.0	2.8	2.8
Asia	3.2	1.8	1.5	2.1	2.0	2.0	3.3	2.7	2.6	2.6
Korea	1.1	1.0	.9	1.4	1.4	1.7	.3	2.0	2.1	2.1
China	2.9	1.5	1.4	2.1	1.8	2.2	4.3	2.5	2.5	2.5
Latin America	4.0	4.7	3.2	4.0	6.4	5.0	3.4	3.6	3.3	3.2
Mexico	3.6	4.2	2.3	3.3	6.6	4.8	2.9	3.3	3.2	3.2
Brazil	5.8	6.5	10.4	7.1	2.8	4.1	3.4	4.4	3.7	3.5
Addendum										
Emerging market economies ex. China	3.8	3.5	2.4	3.0	4.2	3.4	2.6	3.3	3.0	2.9

1. Foreign GDP aggregates calculated using shares of U.S. exports.
2. Foreign CPI aggregates calculated using shares of U.S. non-oil imports.

U.S. Current Account

Quarterly Data

	2019				2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	Billions of dollars, s.a.a.r.											
U.S. current account balance	**-544.8**	**-500.8**	**-496.4**	**-439.3**	**-432.7**	**-394.3**	**-395.7**	**-393.0**	**-404.5**	**-392.4**	**-401.3**	**-430.7**
Previous Tealbook	*-544.8*	*-512.8*	*-493.7*	*-518.9*	*-509.9*	*-494.0*	*-514.2*	*-530.6*	*-545.0*	*-538.0*	*-553.3*	*-588.3*
Current account as percent of GDP	-2.6	-2.3	-2.3	-2.0	-2.0	-1.8	-1.8	-1.7	-1.8	-1.7	-1.7	-1.8
Previous Tealbook	*-2.6*	*-2.4*	*-2.3*	*-2.4*	*-2.3*	*-2.2*	*-2.3*	*-2.4*	*-2.4*	*-2.3*	*-2.4*	*-2.5*
Net goods & services	-625.9	-636.4	-629.4	-569.0	-562.2	-529.7	-517.1	-499.5	-499.4	-483.5	-479.9	-490.3
Investment income, net	240.4	279.6	288.5	294.7	292.6	286.3	276.9	271.4	258.0	241.9	234.0	224.6
Direct, net	312.9	343.5	348.3	359.1	367.6	372.4	370.7	375.1	371.9	366.6	370.3	372.6
Portfolio, net	-72.5	-63.9	-59.8	-64.5	-75.0	-86.1	-93.8	-103.7	-113.9	-124.7	-136.3	-148.0
Other income and transfers, net	-159.3	-144.0	-155.4	-164.9	-163.1	-150.8	-155.4	-164.9	-163.1	-150.8	-155.4	-164.9

Annual Data

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	Billions of dollars									
U.S. current account balance	**-348.8**	**-365.2**	**-407.8**	**-428.3**	**-439.6**	**-491.0**	**-495.3**	**-403.9**	**-407.2**	**-446.4**
Previous Tealbook	*-348.8*	*-365.2*	*-407.8*	*-428.3*	*-439.6*	*-491.0*	*-517.5*	*-512.2*	*-556.2*	*-600.5*
Current account as percent of GDP	-2.1	-2.1	-2.2	-2.3	-2.3	-2.4	-2.3	-1.8	-1.8	-1.9
Previous Tealbook	*-2.1*	*-2.1*	*-2.2*	*-2.3*	*-2.3*	*-2.4*	*-2.4*	*-2.3*	*-2.4*	*-2.5*
Net goods & services	-461.1	-489.6	-498.5	-503.0	-550.1	-627.7	-615.2	-527.1	-488.3	-489.7
Investment income, net	215.4	228.9	214.7	211.1	238.7	266.9	275.8	281.8	239.6	201.9
Direct, net	283.3	284.2	284.6	278.0	304.0	330.3	341.0	371.4	370.3	376.9
Portfolio, net	-67.9	-55.3	-70.0	-66.9	-65.3	-63.4	-65.1	-89.7	-130.7	-174.9
Other income and transfers, net	-103.1	-104.6	-123.9	-136.4	-128.2	-130.2	-155.9	-158.6	-158.6	-158.6

Abbreviations

AFE	advanced foreign economy
BFI	business fixed investment
BLS	Bureau of Labor Statistics
BOC	Bank of Canada
BOE	Bank of England
BOJ	Bank of Japan
CD	certificate of deposit
C&I	commercial and industrial
CMBS	commercial mortgage-backed securities
CP	commercial paper
CPI	consumer price index
CRE	commercial real estate
DSGE	dynamic stochastic general equilibrium
EFFR	effective federal funds rate
E&I	equipment and intellectual property products
ELB	effective lower bound
EME	emerging market economy
EU	European Union
FCI	financial conditions index
FOMC	Federal Open Market Committee; also, the Committee
FPLT	flexible price-level targeting
FRBNY	Federal Reserve Bank of New York
FRB/US	A large-scale macroeconometric model of the U.S. economy
FX	foreign exchange
GDP	gross domestic product

GM	General Motors
GNP	gross national product
HICP	Harmonised Index of Consumer Prices
ICE	Intercontinental Exchange
IOER	interest on excess reserves
IP	industrial production
LFPR	labor force participation rate
M&A	mergers and acquisitions
MBS	mortgage-backed securities
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
PDFP	private domestic final purchases
PMI	purchasing managers index
SEP	Summary of Economic Projections
SIGMA	A calibrated multicountry DSGE model
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SOFR	secured overnight financing rate
SOMA	System Open Market Account
S&P	Standard & Poor’s
SPF	Survey of Professional Forecasters
TIPS	Treasury Inflation-Protected Securities
USMCA	U.S.-Mexico-Canada Agreement
VAR	vector autoregression
VIX	one-month-ahead option-implied volatility on the S&P 500 index