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.

Content last modified 1/10/2025.

Report to the FOMC on Economic Conditions and Monetary Policy

Book A

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

July 19, 2019

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

The information received since the June Tealbook suggests that economic activity expanded at a solid pace of 2¾ percent in the first half of the year, led by strong gains in consumer spending and government purchases.[1] In addition, payroll gains rebounded in June from a weak May reading and posted solid gains, on average, in the second quarter, while the unemployment rate moved lower, on net, last quarter. However, growth of business investment has slowed noticeably, and most indicators of investment spending remain downbeat. We expect GDP growth to step down to a 1¾ percent pace in the second half, as government spending moderates and business investment is held down by trade tensions and concerns about global growth. Relative to the June Tealbook, GDP growth in the first half is revised up nearly ½ percentage point, boosted primarily by better-than-expected retail sales reports, while second-half growth is essentially unrevised.

We expect that real activity will decelerate further after this year, largely reflecting the waning impetus from fiscal policy. In addition, we anticipate that concerns about trade policy and global growth will continue to weigh on the level of aggregate demand throughout the projection period. Specifically, after slowing from 3 percent in 2018 to 2¼ percent this year, GDP growth is projected to be 2 percent in 2020 and 1¾ percent in 2021. With GDP growth outpacing its potential rate through 2020, the output gap is projected to widen a bit to nearly 2½ percent by the end of next year and then narrow slightly to 2¼ percent in 2021, when GDP growth slips below its potential rate. Accordingly, the unemployment rate is projected to edge down from 3.7 percent at the end of this year to 3.6 percent next year, 1 percentage point below our estimate of its natural rate, and then to stay at that level through the end of 2021.

Relative to the June Tealbook, GDP growth is revised up this year, reflecting the incoming spending data. Our financial assumptions are a little more accommodative than in June, and we have revised up our medium-term growth projection slightly in response.

[1] The BEA will release the advance estimate of second-quarter GDP growth and five years of revised NIPA data on July 26. We will incorporate the revised data in our usual pre-FOMC forecast update. On the first day of the FOMC meeting, the BEA will release PCE prices for June.

Comparing the Staff Projection with Other Forecasts

The staff's projection for GDP growth in 2019 is well aligned with the projections from both the Survey of Professional Forecasters (SPF) and the Blue Chip consensus, but it is about ½ percentage point higher than the Blue Chip in 2020. Correspondingly, the staff's unemployment rate forecast is close to the SPF and Blue Chip projections in 2019 but below the Blue Chip forecast in 2020.

With regard to core PCE price inflation, the staff projection is 0.2 percentage point above the SPF projection in 2019. Otherwise, the staff's inflation projections are close to those of the Blue Chip and the SPF.

Comparison of Tealbook and Outside Forecasts

	2019	2020
GDP (Q4/Q4 percent change)		
July Tealbook	2.3	2.1
Blue Chip (7/10/19)	2.2	1.7
SPF median (5/10/19)	2.3	n.a.
Unemployment rate (Q4 level)		
July Tealbook	3.7	3.6
Blue Chip (7/10/19)	3.6	3.8
SPF median (5/10/19)	3.6	n.a.
CPI inflation (Q4/Q4 percent change)		
July Tealbook	1.9	2.1
Blue Chip (7/10/19)	2.0	2.0
SPF median (5/10/19)	1.9	2.1
PCE price inflation (Q4/Q4 percent change)		
July Tealbook	1.7	1.8
SPF median (5/10/19)	1.7	1.9
Core PCE price inflation (Q4/Q4 percent change)		
July Tealbook	1.9	1.9
SPF median (5/10/19)	1.7	2.0

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.

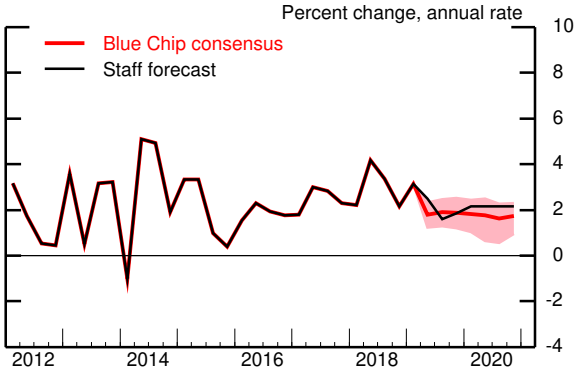
n.a. Not available.

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

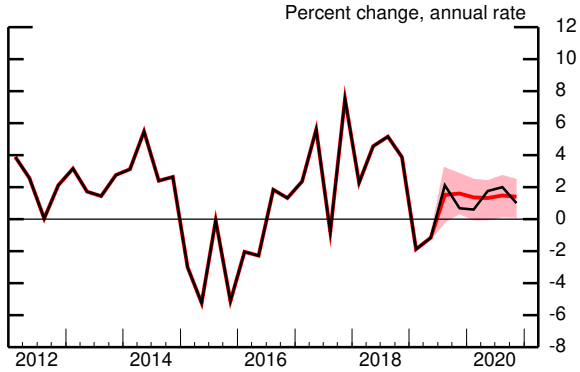
Tealbook Forecast Compared with Blue Chip

(Blue Chip survey released July 10, 2019)

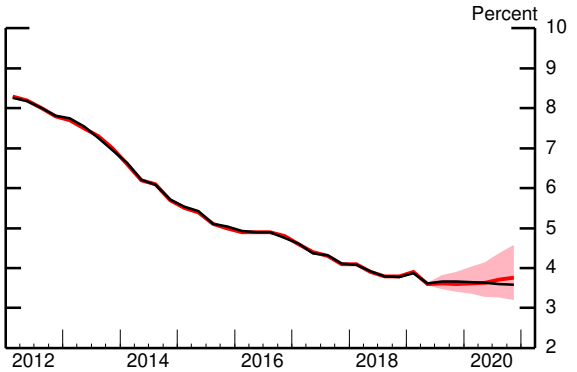
Real GDP



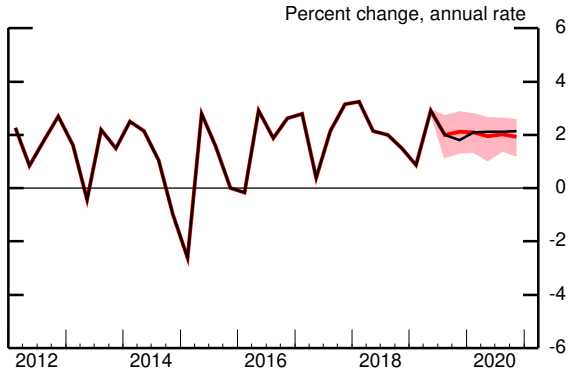
Industrial Production



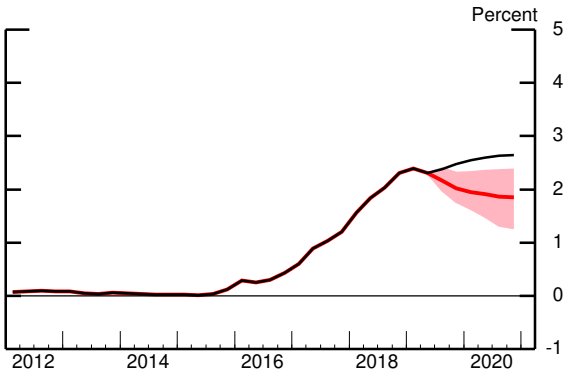
Unemployment Rate



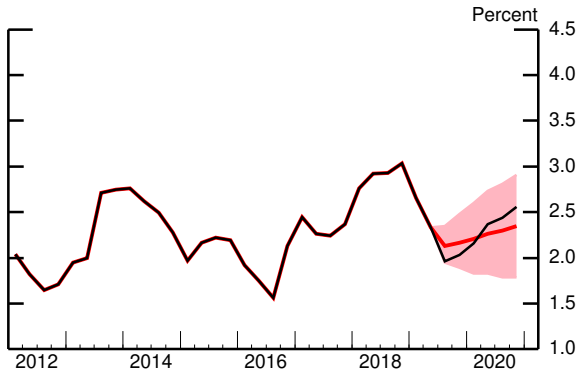
Consumer Price Index



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 15 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.

On average, the output gap is about ¼ percentage point wider than in our previous projection, while the unemployment rate is 0.1 percentage point lower.

We now estimate that the 12-month change in core PCE prices rose from 1.5 percent in March to 1.7 percent in June, consistent with our assessment that the weak monthly inflation readings seen earlier this year would be transitory. We expect the 12-month change to rise further and be 1.9 percent at the end of the year. These figures are 0.1 percentage point higher than in the June Tealbook, reflecting incoming data that were, on balance, a little above our expectations. For the medium term, we now expect core PCE inflation to remain at 1.9 percent in 2020 and 2021, as tight resource utilization holds inflation slightly above our estimate of its underlying pace. Total PCE price inflation is forecast to run a bit below core inflation over the forecast period because of the projected downward-sloping path of oil prices.

KEY BACKGROUND FACTORS

Note: The financial assumptions underlying the Tealbook projection are conditioned on financial market data through 5:00 p.m. on Wednesday, July 17. The effects of any subsequent market moves will be incorporated into our usual pre-FOMC forecast update on July 26.

Monetary Policy

- The baseline policy rule calls for the federal funds rate to hold flat at 2.4 percent this year and then edge up to 2.7 percent by the end of 2021. In contrast, term-premium-adjusted market quotes suggest that market participants expect the federal funds rate to decline roughly 50 basis points by the end of 2020, with most of the decline occurring this year.

- Our assumptions for the SOMA portfolio, which will be detailed in the Balance Sheet and Income Projections section of Tealbook B, imply that downward pressure on the term premium in Treasury yields diminishes over time.

Other Interest Rates

- We project that the 10-year Treasury yield will rise from an average of 2.1 percent this quarter to 2.9 percent by the end of 2021, largely reflecting our assumption that the term premium will increase toward a more normal

level during the next few years. On average, the 10-year Treasury yield is 15 basis points lower than we had projected in June, as we now assume that the downward pressure on term premiums from global growth concerns, prospective foreign monetary policy actions, and uncertainty regarding international trade will be more persistent.

- The spread of the triple-B corporate bond yield over the 10-year Treasury yield has decreased more than we had previously assumed, and we revised down the path for the triple-B yield by more than the Treasury yield. By contrast, mortgage rate spreads have widened, and we revised down the path for mortgage rates by a bit less than the 10-year Treasury rate.

Equity Prices

- Stock prices have increased 5.4 percent since the time of the June Tealbook, with some of the gains apparently supported by expectations of more accommodative monetary policy. As market expectations for the federal funds rate are assumed to converge toward our policy path, we expect essentially no further appreciation in stock prices over the medium term, compared with 2 percent per year in our June projection. All told, by the end of 2021, equity prices are little revised.

Trade Policy

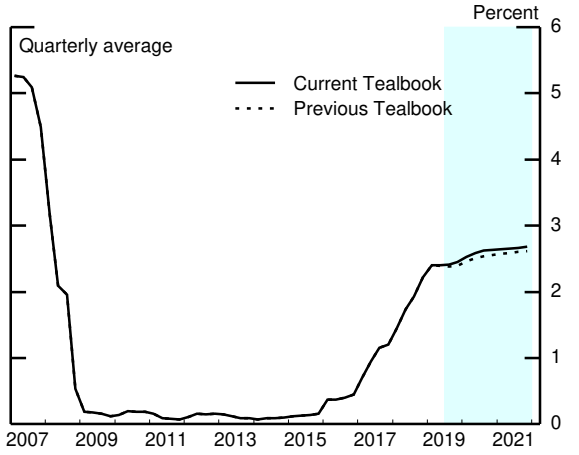
- At the G-20 Leaders Summit at the end of June, Presidents Trump and Xi agreed to restart trade negotiations and to postpone additional broad-based tariff increases indefinitely; however, they did not alter the tariffs already in place, including the 15 percentage point tariff increase on $180 billion of imports from China that occurred on May 10.

- On Friday, June 7, after the close of the June Tealbook, the United States removed the threat of additional tariffs on imports from Mexico after the two countries reached an agreement to limit migration from Central America.

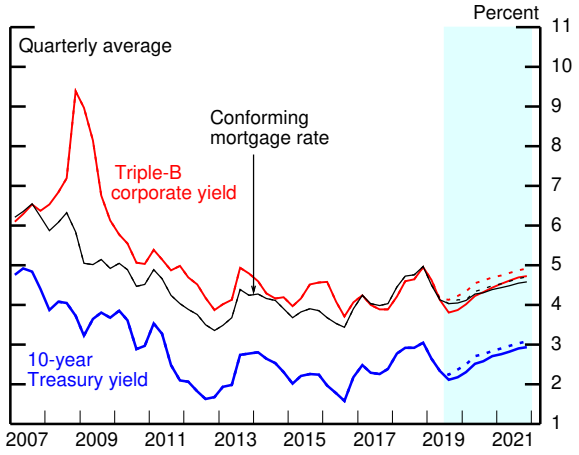
- Notwithstanding these developments, trade policy will likely remain a focus of attention and a significant source of uncertainty for the economic outlook.

Key Background Factors underlying the Baseline Staff Projection

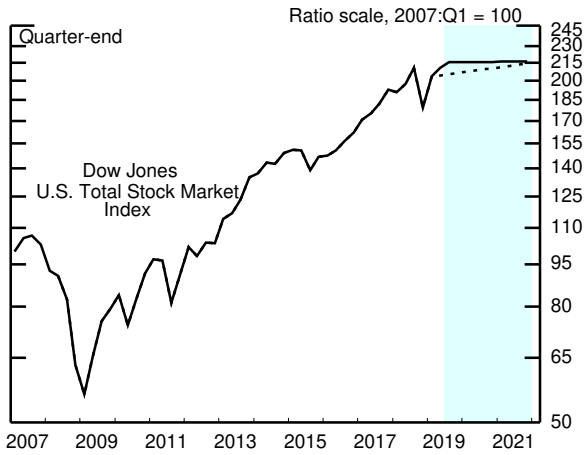
Federal Funds Rate



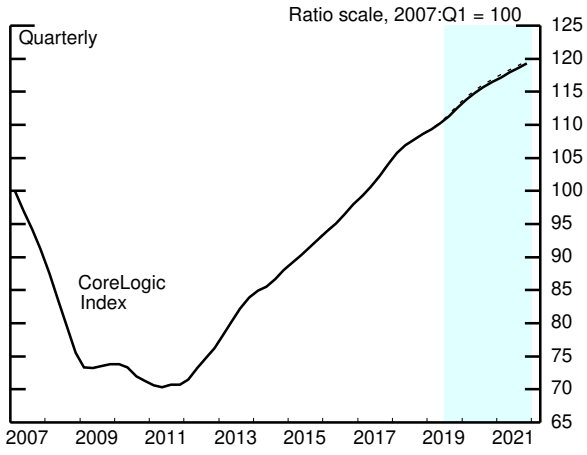
Long-Term Interest Rates



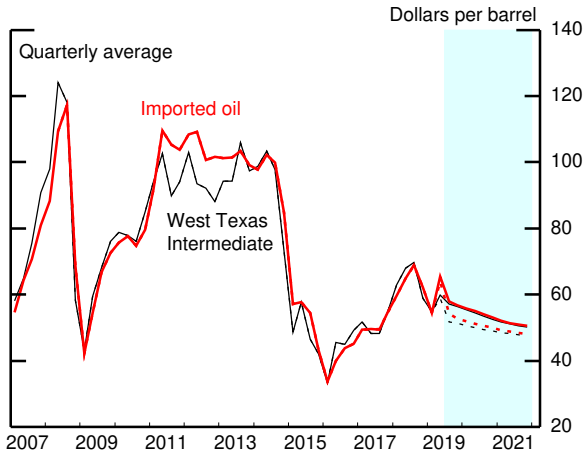
Equity Prices



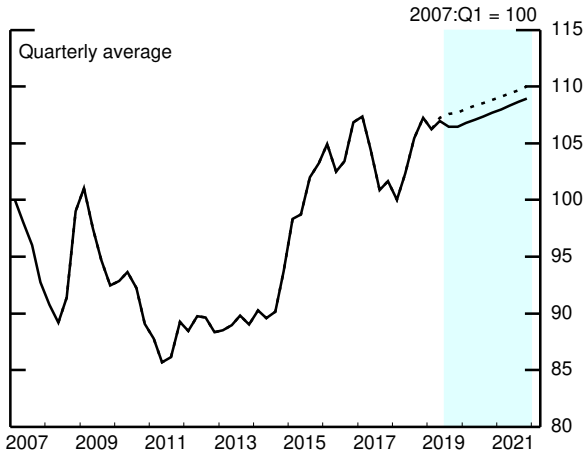
House Prices



Crude Oil Prices



Broad Real Dollar



Foreign Economic Activity and the Dollar

- We estimate that foreign real GDP growth stepped up from 1½ percent in the first quarter to 2 percent in the second quarter, a pace still below our estimate of potential growth. Much of the second-quarter step-up in growth comes from a rebound in Canada and some recovery in Mexico and South America. However, growth in the euro area, the United Kingdom, and China slowed, and our overall estimate of foreign growth has been revised slightly lower in the first half of this year. Although we forecast foreign growth to pick up to about 2½ percent by next year, supported by very accommodative monetary policy, the outlook remains murky.

- Since the June Tealbook, the broad nominal dollar has depreciated about 1 percent, with somewhat more depreciation against EME currencies. From a lower starting point, the broad real dollar is projected to appreciate at an annual rate of 1.2 percent, a bit faster than in the June Tealbook, reflecting our revised expectations for more accommodative monetary policy in the AFEs. All told, the broad real dollar is revised slightly lower by 2021.

Fiscal Policy

- We assume that fiscal policymakers will lift the discretionary spending caps, as they have in recent years, so that the current level of discretionary federal spending will be maintained in real terms through 2021. To lift the caps for fiscal year 2020, policymakers will need to enact legislation before the fiscal year begins on October 1.[2]

- Under these policy assumptions, the direct fiscal impetus from all levels of government contributes 0.7 percentage point to the growth rate in aggregate demand this year—about the same as in 2018—before tapering to 0.4 percentage point in 2020 and 0.2 percentage point in 2021.[3]

[2] The federal government is currently in a debt issuance suspension period. Absent additional borrowing authority, we expect that the debt limit will most likely be breached in the first week of October, although there is a significant risk that the limit could be breached in early September. We continue to assume that policymakers will raise the statutory debt limit before the breach date.

[3] If appropriations were to return to the lower levels of the budget caps later this year, we estimate that the level of GDP would be about ½ percent lower at the end of 2021.

- We expect the federal budget deficit, which was 4 percent of GDP in fiscal 2018, to widen to 4½ percent this fiscal year and to remain at about that level through the end of the medium term. Federal debt held by the public is projected to rise from 78 percent of GDP in fiscal 2018 to 81 percent of GDP by the end of the medium term.

Oil Prices

- The spot price of Brent crude oil is up about $3 per barrel from the June Tealbook, closing most recently at $64 per barrel. Farther-dated futures prices are up by a similar amount, and the futures curve continues to slope down modestly. Tensions with Iran and the nine-month extension of an OPEC agreement to keep production low contributed to the higher oil prices. However, the upward pressure on prices has likely been muted by continued concerns about the outlook for global growth.

THE OUTLOOK FOR REAL GDP

We estimate that real GDP growth slowed from about 3 percent in the first quarter to 2½ percent in the second, reflecting a sharp step-down in the growth of business fixed investment (BFI) and the reversal of substantial boosts to first-quarter growth from net exports and inventory investment. These second-quarter drags more than offset a strong rebound in consumer spending growth and a bounceback in federal purchases following the government shutdown. Compared with the June Tealbook, we have revised up our forecast for second-quarter GDP growth ¾ percentage point, primarily reflecting the positive news on consumption. We project GDP growth to slow from 2¾ percent in the first half to 1¾ percent in the second half, as infrastructure investment by state and local governments declines and business investment remains sluggish amid ongoing concerns about trade tensions and global growth; in contrast, growth in consumer spending is projected to continue at about its first-half pace.[4]

- Growth in consumer spending appears to have picked up in the second quarter by more than we had previously expected, as the May and June readings for retail sales and June data for motor vehicle sales surprised us to the upside. In

[4] We now assume that Midwest flooding has been holding down farm-sector output and will reduce GDP growth this year by 0.1 percentage point. We continue to assume that production disruptions for the Boeing 737 MAX aircraft will deduct less than 0.1 percentage point from GDP growth this year.

the near term, favorable sentiment and gains in labor income should continue to support spending, and we project PCE growth of 2.5 percent in the second half of the year, the same as the average pace in the first half.

- The outlook for BFI remains weak. After rising 7 percent last year and at a 4½ percent pace in the first quarter, BFI is expected to be about unchanged through the end of this year. The box "The Weak Outlook for Business Fixed Investment" discusses our forecast for BFI in more detail.

- We estimate that residential investment continued to contract through the first half of 2019, but we anticipate that the recent decline in mortgage rates will result in a modest upturn in housing activity in the second half. The information received since the June Tealbook is generally supportive of this projection: Sales of new and existing homes have moved up so far this year, and construction permits for single-family houses moved a little higher in May and June after having declined steadily since September of last year.

- Manufacturing production increased in May and June, led by a rebound in the production of motor vehicles and parts. Nevertheless, over the first half of the year, factory output declined at an annual rate of 2¼ percent on net. Looking ahead, we expect some further gains in vehicle production; however, excluding motor vehicles, we anticipate that factory output will remain soft in the second half, as indexes of new orders from manufacturing surveys remain subdued, BFI has decelerated, and trade policy concerns are still elevated.

- We estimate that, on balance, net exports provided a modest positive contribution to U.S. GDP growth in the first half of the year. Although export growth was depressed by the suspension of exports of the Boeing 737 MAX aircraft, goods imports declined following substantial strength in late 2018. We expect that net exports will be neutral for GDP growth in the second half.

- Growth in government purchases was unusually strong in the first half, partly reflecting a blistering 25 percent rate of increase in state and local government infrastructure investment that is expected to partially unwind over the

The Weak Outlook for Business Fixed Investment

Growth of business fixed investment (BFI) slowed from a brisk 7 percent pace in 2018 to an estimated 2 percent annual rate in the first half of this year. At the same time, the tenor of a wide array of indicators that inform our investment outlook has become decidedly more downbeat, leading us to project no growth in BFI over the second half of the year.

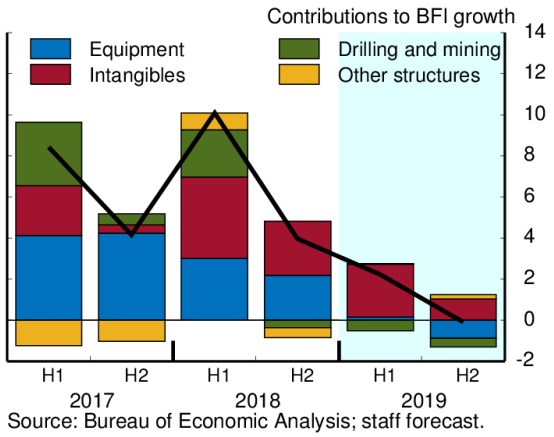
As shown in figure 1, the slowdown in 2019:H1 is centered in equipment investment (blue bars), which appears to have moved sideways over this period: Nominal shipments of nondefense capital goods (excluding aircraft) have been roughly flat since late last year, while capital goods imports have turned down. Moreover, new orders for capital goods have gradually moved down and now stand well below shipments, indicating little impetus to equipment spending in coming months.

Investment in drilling and mining structures (green bars) has declined in response to lower oil prices, and we expect it will decline further, reflecting the staff's projected oil price path. Investment in other nonresidential structures (yellow bars) has also been lackluster, and a recent drop in architectural billings (not shown) points to further weakness ahead. In contrast, investment in intellectual property (red bars) like software and R&D has remained solid.

We expect BFI to be little changed in the second half of the year and then to rise modestly over the medium term. Some slowing in BFI growth this year would be consistent with the staff's outlook for output growth and interest rates.[1] However, our forecast is weaker than what is implied by those two forces alone, as it reflects our reaction to a number of additional factors. Two factors that are modest drags on our projection for BFI are the delayed deliveries of the Boeing 737 Max and the direct effect of currently imposed tariffs.

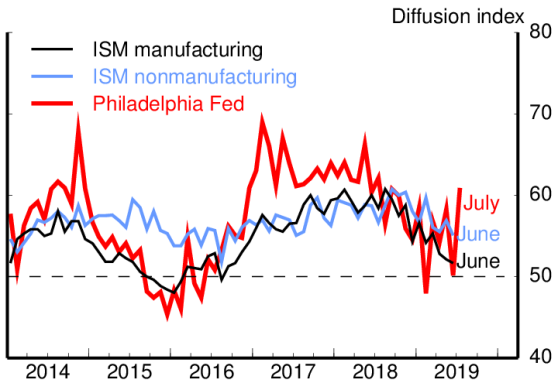
A more significant factor is heightened concern over trade policy, which has likely contributed to softer business sentiment (figure 2) and a pullback in capital spending plans. The ISM

1. Real Business Fixed Investment



Source: Bureau of Economic Analysis; staff forecast.

2. Surveys of Business Conditions



Source: Institute for Supply Management (ISM); Federal Reserve Bank of Philadelphia Business Outlook Survey.

[1] The staff currently estimates that the 2017 tax cuts boosted BFI growth about ¾ percentage point in 2018 and will contribute a similar amount in 2019. However, the strength in BFI last year and the slowdown this year could suggest more front-loaded effects from the tax cuts than we assumed.

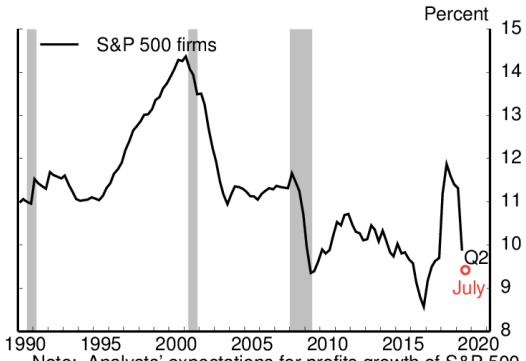
manufacturing (black line) and nonmanufacturing (blue line) composite indexes are down since last year, while the Philadelphia Fed general activity index (red line) has been volatile, dropping in June and popping back up in July. Most other regional Fed manufacturing surveys and indicators from private sources, such as the Markit and Duke CFO surveys, have also weakened somewhat.

Beige Book commentary tying concerns about trade policy to reduced investment plans has become increasingly prevalent. More anecdotes in business surveys have linked a weaker outlook for economic activity and capital expenditures to recent tariff actions and increased trade tensions. And measures of economic policy uncertainty and the staff's trade policy uncertainty index have soared. However, corporate bond spreads and the VIX—which also proxy for business uncertainty—remain historically low, and financing conditions more generally still appear accommodative for businesses.[2]

Finally, analysts' expectations for longer-term profits growth, shown in figure 3, have deteriorated sharply and reversed the run-up that followed the enactment of the 2017 tax cuts. Some of the decline could be related to those tax changes—*growth* expectations should slow once profits reach a permanently higher *level*—but we think such a slowing would unfold more gradually. Instead, we think the recent deterioration in profit expectations more likely reflects other factors like the escalation in trade tensions and concerns about the global outlook.

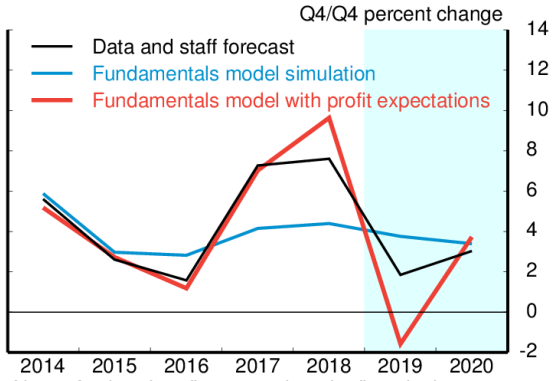
As shown in figure 4, including profit expectations in our workhorse investment model for equipment and intangibles (E&I) improves its fit and implies a more pessimistic investment outlook this year.[3] The model improvement likely reflects the forward-looking nature of profit expectations and their ability to capture unobserved "animal spirits," an influence that is largely absent from our measures of business output and the user cost.[4] All told, the diverse set of factors previously mentioned suggest that BFI will remain anemic this year.

3. Expectations of Longer-Term Profits Growth



Note: Analysts' expectations for profits growth of S&P 500 (ex. oil industry) firms over the next 3 to 5 years. The red circle is an estimate based on data through July 11. Shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.
Source: Staff calculations from I/B/E/S.

4. E&I: Staff and Model Forecasts



Note: Analysts' profit expectations for firms in the S&P 500 (ex. oil industry). Expectations for profits growth are assumed flat over the forecast period.
Source: Bureau of Economic Analysis; staff forecast and calculations.

[2] The uncertainty measures based on news articles or other text sources are more volatile and appear to have less predictive power for BFI than do the uncertainty proxies based on financial markets.

[3] We project E&I investment growth this year to be between the two models, consistent with the experience in 2018.

[4] Our model takes more signal from *changes* in this series than from its level. Large changes may capture major shocks to profitability that are not reflected in other investment fundamentals.

Domestic Econ Devel & Outlook

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

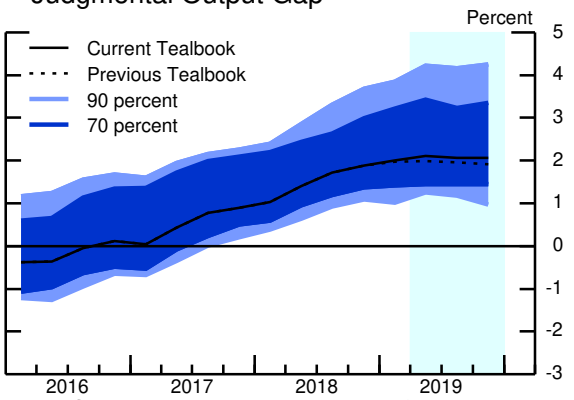
(Percent change at annual rate from final quarter of preceding period except as noted)

Measure	2017	2018	2019	2019 Q1	2019 Q2	2019 Q3
Output gap[1]	**.9**	**1.9**	**2.1**	**2.0**	**2.1**	**2.1**
Previous Tealbook	.9	1.9	1.9	2.0	2.0	2.0
Real GDP	2.5	3.0	2.3	3.1	2.5	1.6
Previous Tealbook	2.5	3.0	2.0	3.0	1.8	1.7
Measurement error in GDP	.0	.2	.3	.8	.3	.0
Previous Tealbook	.0	.2	.2	.8	.0	.0
Potential output	1.7	1.8	1.8	1.8	1.8	1.8
Previous Tealbook	1.7	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.

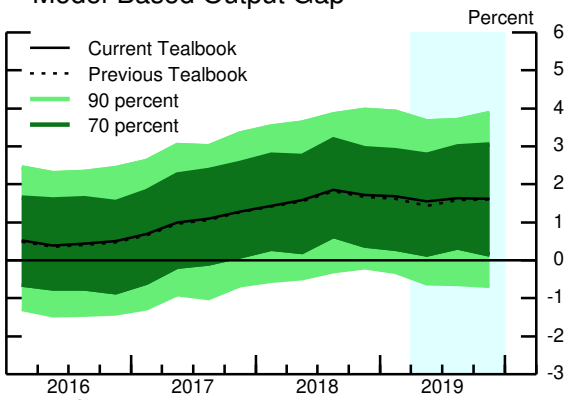
1. Percent, average for the final quarter in the period.

Judgmental Output Gap



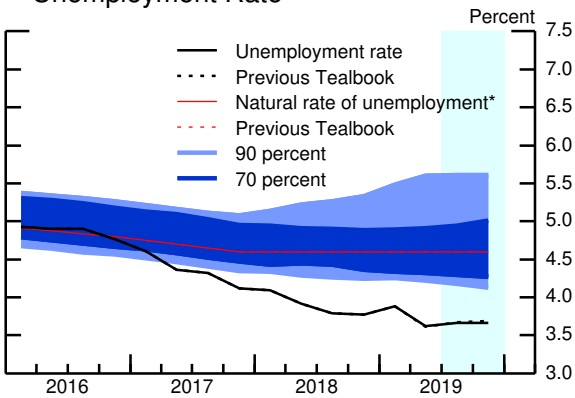
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.

Model-Based Output Gap



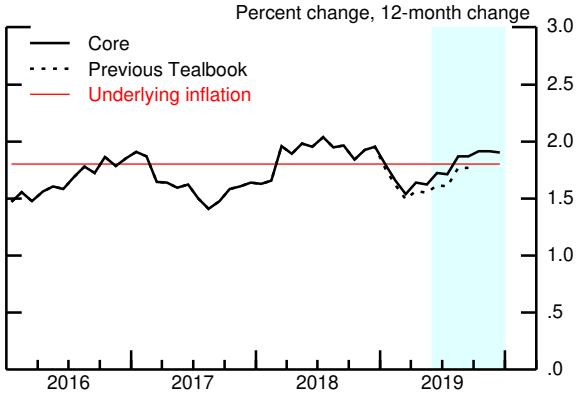
Note: Shaded regions denote model-computed uncertainty bands.
Source: Various macroeconomic data; staff assumptions.

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.

Federal Reserve System Nowcasts of 2019:Q2 Real GDP Growth

(Percent change at annual rate from previous quarter)

Federal Reserve entity	Type of model	Nowcast as of July 17, 2019
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	2.2
New York	• Factor-augmented autoregressive model combination	2.5
	• Factor-augmented autoregressive model combination, financial factors only	2.3
	• Dynamic factor model	1.0
Cleveland	• Bayesian regressions with stochastic volatility	1.6
	• Tracking model	1.1
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	1.6
Chicago	• Dynamic factor models	.6
	• Bayesian VARs	2.2
St. Louis	• Dynamic factor models	1.5
	• News index model	2.7
	• Let-the-data-decide regressions	2.5
Kansas City	• Accounting-based tracking estimate	1.5
Board of Governors	• Tealbook estimate (judgmental)[1]	2.4
	• Monthly dynamic factor models (DFM-45)	2.3
	• Mixed-frequency dynamic factor model (DFM-BM)	1.9
Memo: Median of Federal Reserve System nowcasts		2.1

[1] The July Tealbook forecast, finalized on July 18, 2019, is 2.5 percent.

Domestic Econ Devel & Outlook

Summary of the Near-Term Outlook for GDP

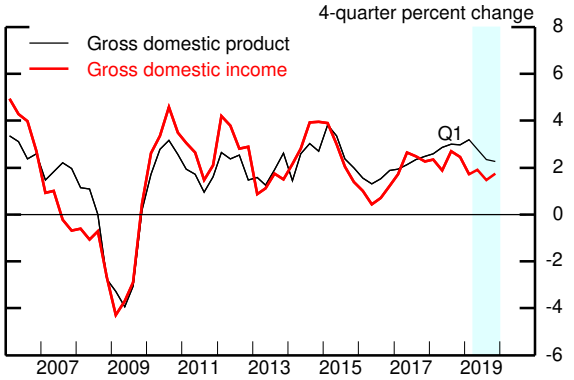
(Percent change at annual rate except as noted)

Measure	2019:Q1		2019:Q2		2019:H2	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	**3.0**	**3.1**	**1.8**	**2.5**	**1.7**	**1.7**
Private domestic final purchases	1.1	1.3	2.2	3.1	2.2	2.2
Personal consumption expenditures	.9	.9	3.0	4.1	2.4	2.5
Residential investment	-3.5	-2.0	-.7	-2.6	5.7	5.8
Nonres. private fixed investment	3.1	4.4	-.7	.0	.0	-.1
Government purchases	2.8	2.8	4.4	6.2	1.2	1.2
Contributions to change in real GDP						
Inventory investment[1]	.6	.6	-.4	-.8	-.4	-.3
Net exports[1]	1.0	.9	-.5	-.3	.0	.0

1. Percentage points.

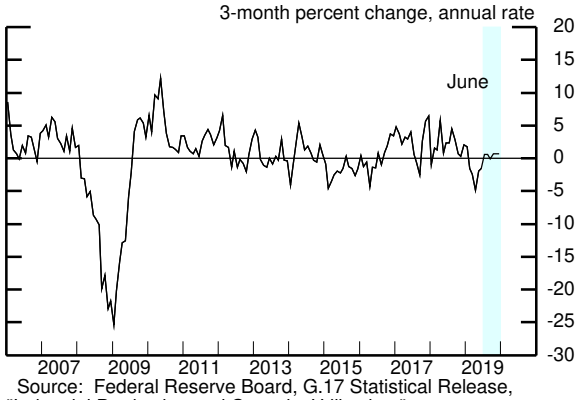
Recent Nonfinancial Developments (1)

Real GDP and GDI



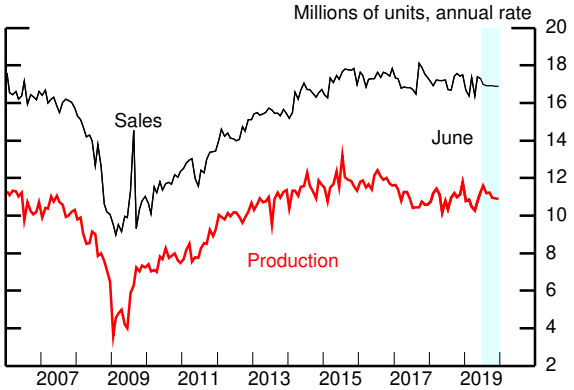
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Manufacturing IP ex. Motor Vehicles and Parts



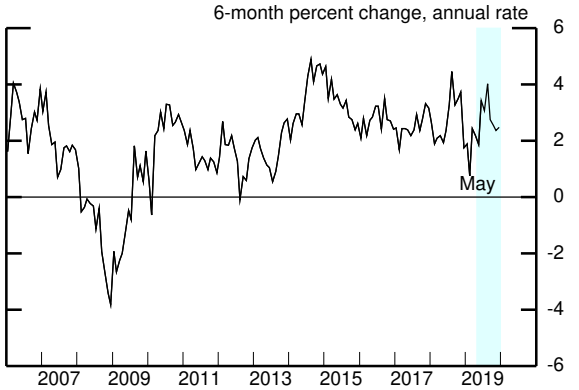
Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."

Sales and Production of Light Motor Vehicles



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

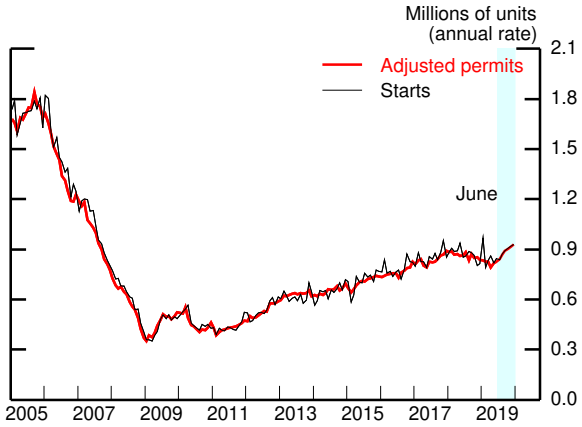
Real PCE Growth



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

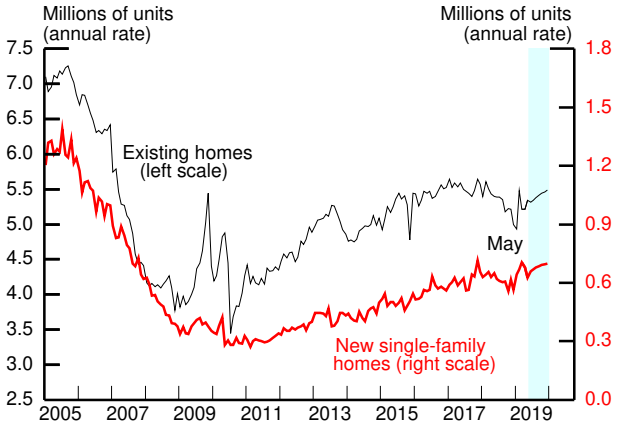
Recent Nonfinancial Developments (2)

Single-Family Housing Starts and Permits



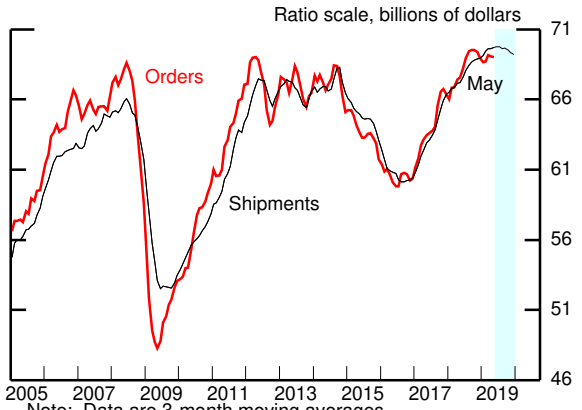
Note: Adjusted permits equal permit issuance plus starts outside of permit-issuing areas.
Source: U.S. Census Bureau.

Home Sales



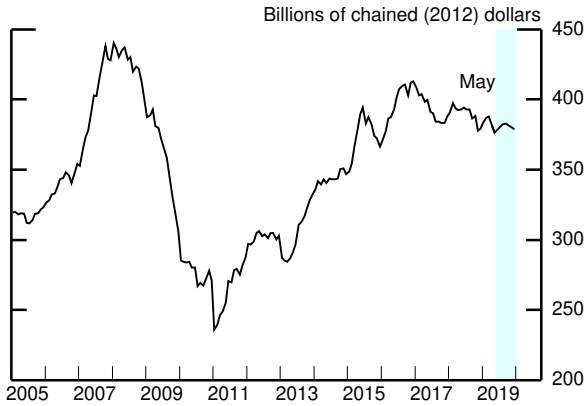
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

Nondefense Capital Goods ex. Aircraft



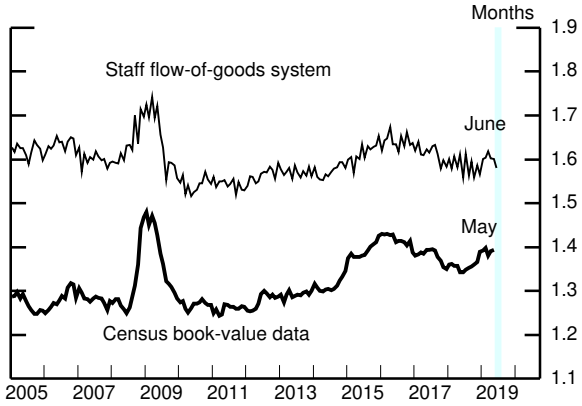
Note: Data are 3-month moving averages.
Source: U.S. Census Bureau.

Nonresidential Construction Put in Place



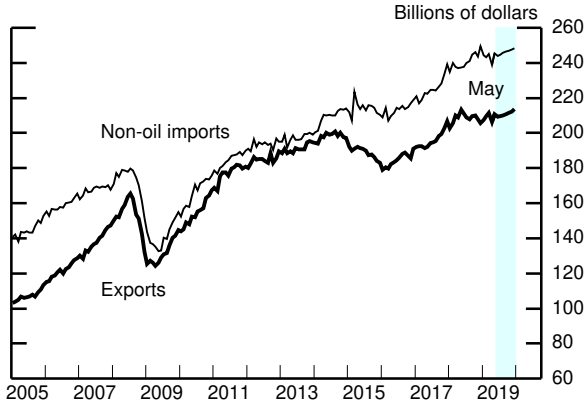
Note: Nominal CPIP deflated by BEA prices through 2019:Q1 and by the staff's estimated deflator thereafter.
Source: U.S. Census Bureau.

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.

remainder of the year.[5] The anticipated slowing in total government spending contributes ½ percentage point to the second-half deceleration in GDP.

After increasing 2¼ percent this year, real GDP growth is projected to slow to 2 percent in 2020 and 1¾ percent in 2021. This gradual deceleration reflects the waning impetus from fiscal policy and, to a lesser extent, the lagged effects of the earlier removal of monetary accommodation. Although this forecast is conditioned on slightly lower interest rates through 2021 due to a downward revision to the projected term premium, we think that some of the factors that have pushed down the term premium recently—most notably, global growth concerns and uncertainty regarding trade policy—will also weigh more persistently on economic activity than we had previously expected. Thus, although we have revised up GDP growth about ¼ percentage point this year in response to incoming data, growth over 2020 and 2021 is revised up just a touch.

THE OUTLOOK FOR THE LABOR MARKET

The labor market has continued to tighten so far this year but at a more gradual pace than in 2018. Job gains have been solid, on average, and the unemployment rate has moved lower, on net, from late last year. Looking ahead, we expect payroll gains to slow further over the medium term and the labor market to tighten only a little further.

- Total nonfarm payrolls rose 224,000 in June following gains of 72,000 in May and 216,000 in April. On average, these readings are a little higher than what we expected in the June Tealbook and well above the monthly gains of 90,000 to 120,000 that we estimate are needed to keep labor utilization constant.[6] With GDP projected to decelerate over the medium term, we expect payroll gains to slow from an average monthly pace of 155,000 in the second half of this year to about 110,000 in 2021.

  - Private nonfarm payrolls, both as reported by the BLS and based on the staff's measure that is derived from microdata from the payroll-processing

[5] The increase in infrastructure investment may reflect latent demand, as these expenditures have been quite subdued for many years. Moreover, in recent years, a majority of states have legislated increases in their motor fuel taxes, which are generally earmarked for transportation infrastructure. However, in part because infrastructure investment tends to be very volatile, we expect it to drop back somewhat over the rest of the year.

[6] This is the range that would be, on average, consistent with no change in the unemployment rate and a decline in the participation rate in line with its trend over the next year.

firm ADP, have decelerated since last year. However, the ADP-based measure was notably weaker than the BLS measure in both May and June.

- The unemployment rate ticked up to 3.7 percent in June from 3.6 percent in May, but it has nonetheless edged down, on balance, since the end of last year. Looking ahead, we expect the unemployment rate to hold steady at 3.7 percent through year-end and then to edge down to 3.6 percent in early 2020. In 2020 and 2021, the unemployment rate is 0.1 percentage point below the June Tealbook projection, reflecting the wider output gap in this projection.

- The LFPR edged up to 62.9 percent in June from 62.8 percent in the previous two months. The LFPR has moved in a wide range over the past year but has been little changed on net. When judged against its aging-related downward trend, an unchanged LFPR represents a modest tightening in labor market utilization. We expect some further tightening along this margin, as the LFPR remains flat through 2020 and then starts to edge down in 2021.

- We estimate that output per hour in the business sector increased at an average annual rate of 3½ percent in the first half of this year after having increased at a 1¾ percent pace in 2018. This recent surge likely overstates the true gains in productivity, as it reflects in large part a steep decline in a poorly measured and volatile component of aggregate hours. Moreover, with GDI growth looking weaker than GDP growth early this year, it is also possible that output growth was overstated. Given these factors, we have not yet taken much signal from the strong readings on productivity for our medium-term projection.[7] With productivity expected to post a small decline in the second half (largely reflecting a partial reversal of the unusual hours movements), we project productivity to rise about 1½ percent this year, about ¼ percentage point faster than both our previous projection and its structural rate. We continue to expect that productivity growth will slow further in 2020 and 2021 to a pace slightly below its structural rate, as the tight labor market continues to draw in workers with lower-than-average skills.

[7] We will revisit our assumptions for structural productivity and other components of the supply side in the September Tealbook after we have digested the implications of the upcoming NIPA annual revisions.

THE OUTLOOK FOR INFLATION

Core PCE inflation is expected to remain at 1.9 percent through the medium term, a little above our estimate of its underlying pace of 1.8 percent, as the effects of tight resource utilization more than offset a slight drag from import prices that emerges after this year. (The box "The Unemployment Rate Consistent with 2 Percent Inflation" provides a simple calculation of the unemployment rate needed to achieve a 2 percent inflation rate given our estimate of underlying inflation.) With energy prices expected to edge down over the forecast period, total PCE inflation is projected to run just a little below core inflation through 2021.

- Monthly increases in core PCE prices stepped up noticeably in the second quarter from their transitorily low first-quarter readings; as a result, the 12-month change in core PCE prices, which had dipped to 1.5 percent in March, is estimated to have moved up to 1.7 percent in June. The 12-month change is then expected to rise to 1.9 percent in August, as last August's particularly weak reading drops out of the calculation, and to remain at 1.9 percent through December. Core inflation in the second half is also boosted by the pass-through of this May's tariff increases.

    - The incoming monthly inflation data, including the CPI and PPI for May and June and PCE prices through May, were, on balance, a little above our expectations in the June Tealbook. However, the upside surprises were concentrated in the volatile nonmarket category of PCE prices, which tends to have little signal for future price changes. Accordingly, we did not materially change our forecast for monthly price increases in the second half of this year; the resulting 12-month changes in core PCE prices are 0.1 percentage point higher than in the June Tealbook.

    - We estimate that total PCE prices rose 1.5 percent over the 12 months ending in June, and we expect this measure of inflation to increase to 1.8 percent in December. In addition to the anticipated step-up in core inflation, we expect food prices to rise more rapidly in the second half of the year, driven by recent increases in livestock and crop commodity prices.

- We estimate that the effective price for imported core goods (which includes the effect of tariffs) rose 0.6 percent in the first half of the year, somewhat less than we expected in the June Tealbook, as falling prices for imported foods and industrial supplies, particularly metals, partially offset a boost from the most recent increase in tariffs on imports from China.[8] For the second half of the year, we expect effective core import price inflation to step up to 2.3 percent as tariff effects continue to be felt and the drag from falling metals prices wanes. After this year, core import price inflation averages 0.9 percent, reflecting moderate foreign inflation and an appreciating dollar.

- The preliminary July reading of median long-run inflation expectations from the University of Michigan moved up to 2.6 percent from 2.3 percent in June. After drifting lower over 2015 and 2016, this measure has moved sideways since then, fluctuating around 2.5 percent.

    - In the current projection, we have maintained our view that underlying inflation is 1.8 percent and that it will hold steady at this level over the medium term. This assumption is informed by estimates of underlying inflation obtained from a variety of statistical models, some of which incorporate information on inflation expectations.

We continue to expect increases in hourly compensation to remain moderate over the medium term. The employment cost index (ECI) is projected to rise 2¾ percent per year, close to the average pace over the past couple of years. In contrast, we project that compensation per hour in the business sector, which is more cyclically sensitive than the ECI (and also noisier), will step up from around 3 percent this year to around 3½ percent next year, as this year's particularly low first-quarter reading is not repeated.

- Average hourly earnings rose 3.1 percent over the 12 months ending in June, about as projected in the June Tealbook, and we expect the 12-month change will remain between 3 and 3¼ percent over the coming months.[9]

[8] The estimated boost to effective import price inflation from the May 10 increase in tariffs is spread over the second and third quarters.

[9] The BLS will release the June estimate of the ECI on the second day of the FOMC meeting.

The Unemployment Rate Consistent with 2 Percent Inflation

The staff assesses that underlying inflation—the rate of inflation that will prevail when the unemployment rate is equal to its natural rate, when relative prices of imports and energy remain unchanged, and when there are no other price shocks—is currently 1.8 percent. If underlying inflation were to remain unchanged at this level, what unemployment rate would be consistent with PCE price inflation running at the Committee's 2 percent objective?[1]

To answer this question, we use a stylized Phillips curve model that closely mimics the staff's judgmental inflation framework. This framework is summarized by equation (1), which relates core inflation (π_t) to its own lag, underlying inflation (π^*_{t-1}), the difference between the unemployment rate and the natural rate ($U_t - U^*_t$), changes in core import prices and energy prices relative to core PCE prices, and other shocks (ε_t):

$$\pi_t = \alpha\pi_{t-1} + (1-\alpha)\pi^*_{t-1} - \beta(U_t - U^*_t) + relative\ price\ changes + \varepsilon_t. \quad (1)$$

For any given rate of underlying inflation (π^*) and no changes in relative prices or other shocks, we can calculate the unemployment rate consistent with 2 percent inflation as

$$U^*_t - \frac{1-\alpha}{\beta}(2-\pi^*). \quad (2)$$

The factors that determine the difference between the unemployment rate consistent with 2 percent and the natural rate are α, which captures the persistence of inflation; β, the "slope" of the Phillips curve; and the wedge between the underlying rate of inflation and 2 percent. Setting the parameters in equation (2) to be consistent with those in the staff's judgmental forecast—α is 0.3; β is 0.12—the resulting unemployment rate is 3.4 percent, noticeably below the staff's natural rate of 4.6 percent.[2]

Of course, this estimate must be viewed with caution, given the uncertainty around the true inflation process and the fact that this process could change over time, particularly if unemployment were to remain persistently very low. For example, some model estimates suggest that the Phillips curve could be flatter than we have assumed. If we assumed that β were 0.06, the unemployment rate would need to be even lower—around 2¼ percent—to achieve 2 percent inflation. Alternatively, the Phillips curve could be nonlinear, with a slope at low levels of unemployment that is considerably steeper than we have assumed, which would raise the required unemployment rate. Or underlying inflation could move up or down, pushing the required unemployment rate up or down at the same time.[3]

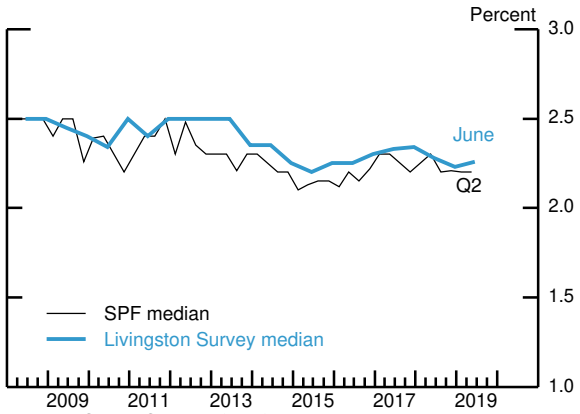
[1] In the staff's projection, underlying inflation holds at 1.8 percent through 2021 but eventually moves up to 2 percent.

[2] In the staff projection, import prices are expected to rise more slowly than core PCE prices, on average, in 2020 and 2021, exerting about a 0.1 percentage point drag on core PCE price inflation. Thus, in our medium-term projection, the unemployment rate consistent with 2 percent PCE price inflation is lower than 3.4 percent.

[3] In fact, if underlying inflation became more sensitive to past inflation, as in an accelerationist Phillips curve, then the inflation objective could be sustainably achieved only with the unemployment rate equal to the natural rate, as holding the unemployment rate below the natural rate would lead to persistently rising inflation.

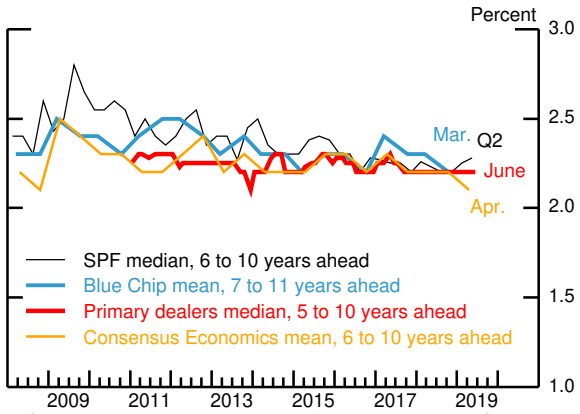
Survey Measures of Longer-Term Inflation Expectations

CPI Next 10 Years



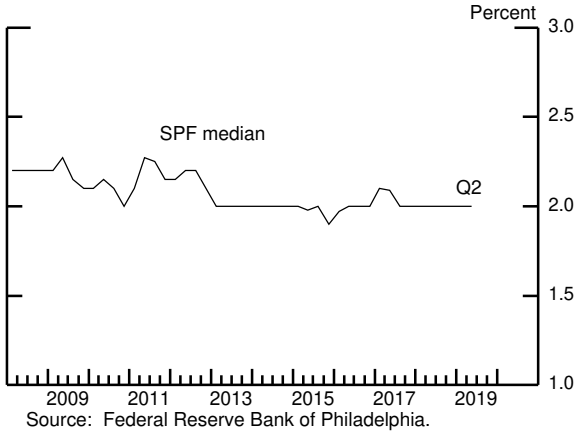
Note: SPF is Survey of Professional Forecasters.
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations



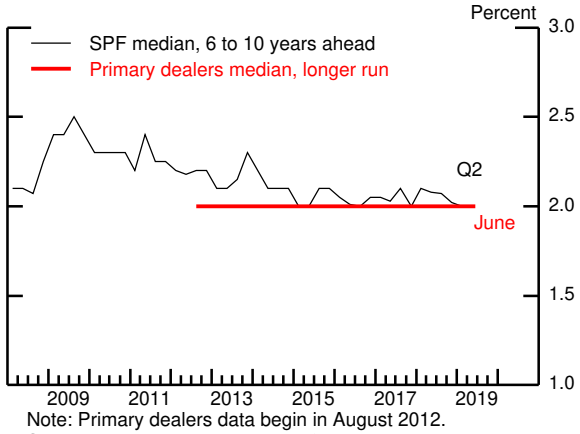
Source: Federal Reserve Bank of Philadelphia; Blue Chip Economic Indicators; Federal Reserve Bank of New York; Consensus Economics.

PCE Next 10 Years



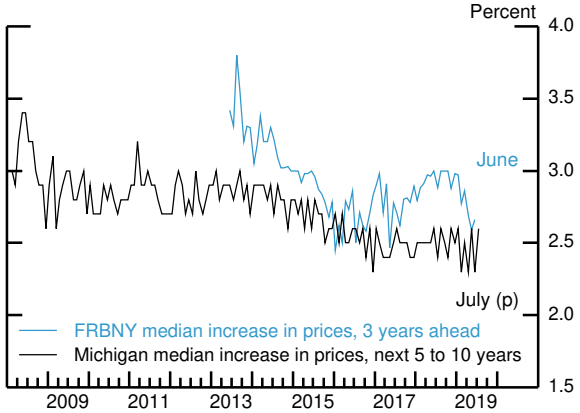
Source: Federal Reserve Bank of Philadelphia.

PCE Forward Expectations



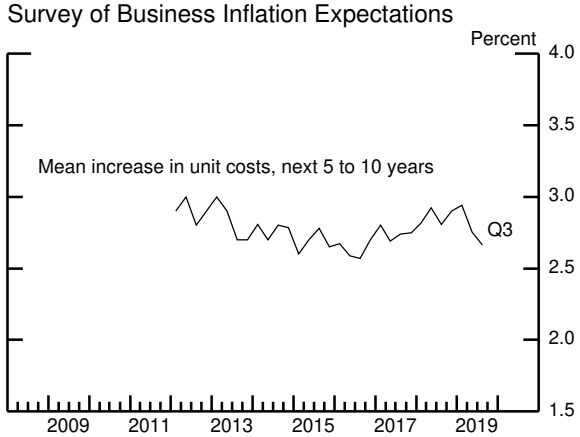
Note: Primary dealers data begin in August 2012.
Source: Federal Reserve Bank of Philadelphia; Federal Reserve Bank of New York.

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.
(p) Preliminary.
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.

THE LONG-TERM OUTLOOK

- We continue to assume that the natural rate of unemployment will remain at 4.6 percent. We also still assume that potential output growth will slow after 2021 to 1.7 percent per year in the longer run, as the boost to potential growth from the 2017 tax cuts wanes.

- We have maintained our assumption that the real long-run equilibrium federal funds rate will be 0.5 percent. The nominal yield on 10-year Treasury securities is 3.4 percent in the longer run.

    - We continue to assume that fiscal policymakers will eventually start to gradually reduce primary deficits by an amount sufficient to stabilize the debt-to-GDP ratio. We expect this ratio to level off at around 105 percent, 20 percentage points higher than would have occurred in the absence of the 2017–18 federal tax and discretionary spending changes and our assumption that the spending caps will not go back in place this year. We also still assume that this 20 percentage point increment to the debt-to-GDP ratio will push up the term premium on 10-year Treasury yields 50 basis points in the long run.

- GDP growth slows from 1.8 percent in 2021 to 1.3 percent in 2024, as monetary policy provides some restraint and the contribution from fiscal policy fades a little further. The unemployment rate moves up gradually from 3.6 percent at the end of 2021 toward its assumed natural rate in subsequent years. Core PCE price inflation moves up from 1.9 percent in 2021 to 2.0 percent by 2023.

- Given the outlook for inflation and resource utilization, the nominal federal funds rate remains around 2.7 percent from the end of the medium term through 2024, and it declines slowly to its 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)

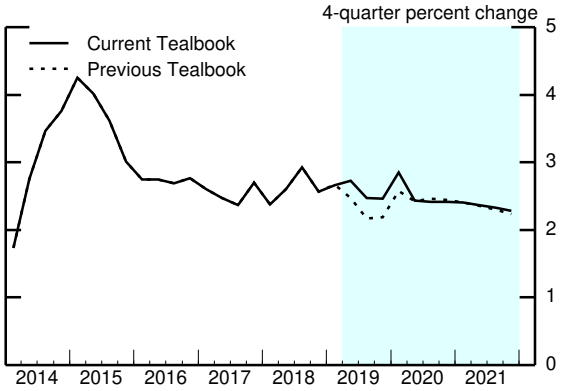
Measure	2018	2019 H1	2019 H2	2019	2020	2021
Real GDP	**3.0**	**2.8**	**1.7**	**2.3**	**2.1**	**1.8**
Previous Tealbook	3.0	2.4	1.7	2.0	2.1	1.7
Final sales	2.6	3.0	2.0	2.5	2.2	1.8
Previous Tealbook	2.6	2.3	2.1	2.2	2.2	1.7
Personal consumption expenditures	2.6	2.5	2.5	2.5	2.4	2.3
Previous Tealbook	2.6	2.0	2.4	2.2	2.4	2.2
Residential investment	-3.3	-2.3	5.8	1.6	2.8	-3.6
Previous Tealbook	-3.3	-2.1	5.7	1.7	2.5	-3.4
Nonresidential structures	4.9	-2.2	-1.1	-1.6	-1.9	-.8
Previous Tealbook	4.9	-.9	-.4	-.6	-1.8	-1.3
Equipment and intangibles	7.6	3.5	.2	1.9	3.0	2.7
Previous Tealbook	7.6	1.8	.1	1.0	2.8	2.3
Federal purchases	2.7	5.3	3.7	4.5	1.7	.8
Previous Tealbook	2.7	4.5	3.0	3.7	2.5	.8
State and local purchases	.8	4.0	-.4	1.8	.9	1.0
Previous Tealbook	.8	3.1	.1	1.6	.9	1.0
Exports	2.3	1.3	1.8	1.5	3.0	3.5
Previous Tealbook	2.3	1.3	1.7	1.5	2.8	3.1
Imports	3.4	-.9	1.7	.4	2.3	3.2
Previous Tealbook	3.4	-.5	1.4	.4	2.6	3.0
	Contributions to change in real GDP (percentage points)					
Inventory change	.4	-.2	-.3	-.2	-.1	.0
Previous Tealbook	.4	.1	-.4	-.1	-.1	.0
Net exports	-.2	.3	.0	.1	.0	-.1
Previous Tealbook	-.2	.2	.0	.1	-.1	-.1

Real GDP

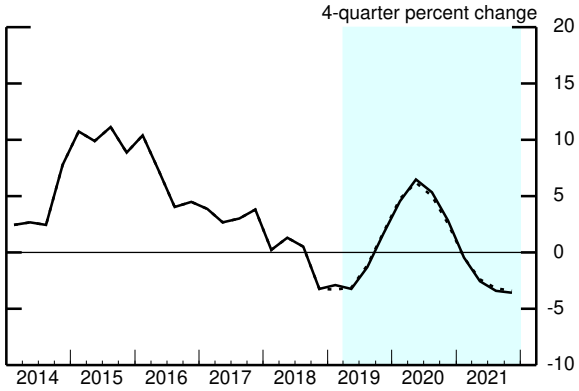
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Components of Final Demand

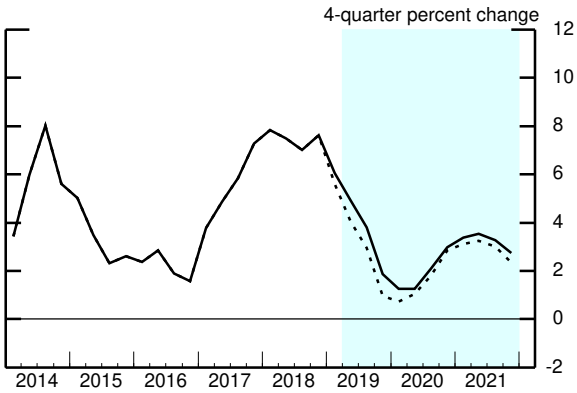
Personal Consumption Expenditures



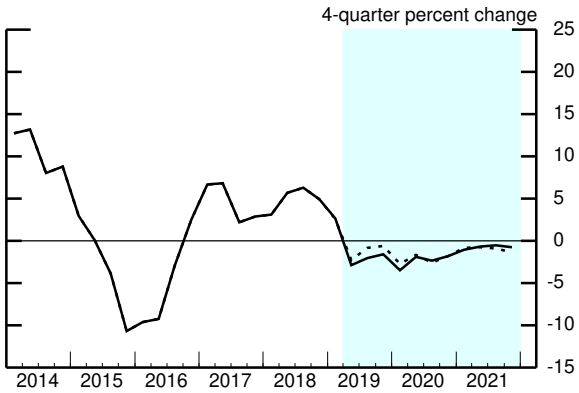
Residential Investment



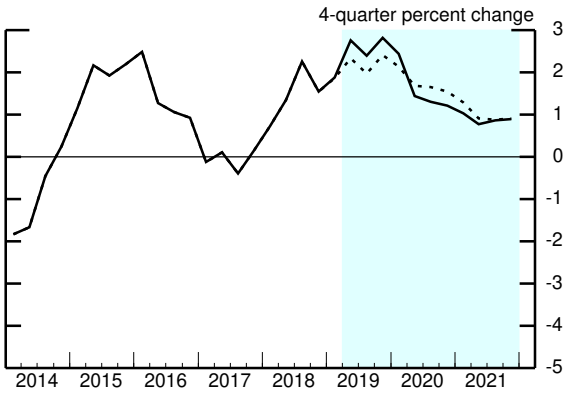
Equipment and Intangibles



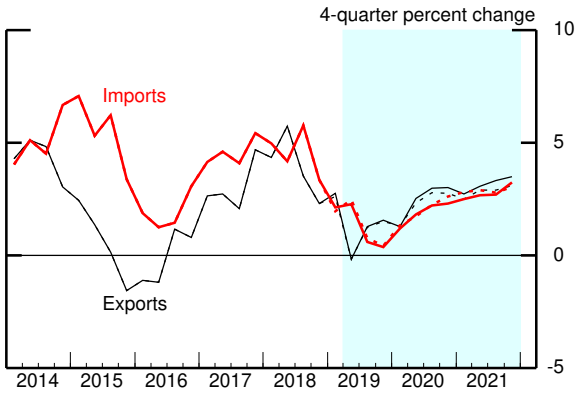
Nonresidential Structures



Government Consumption and Investment



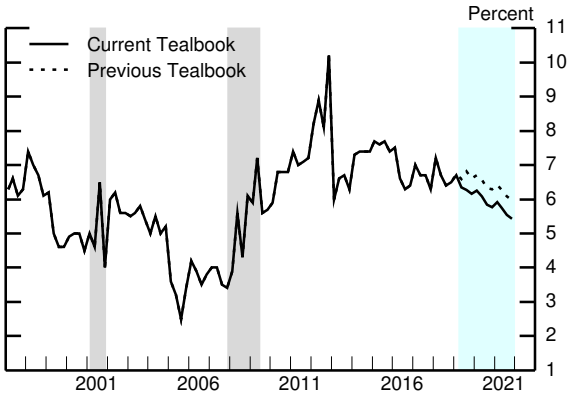
Exports and Imports



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

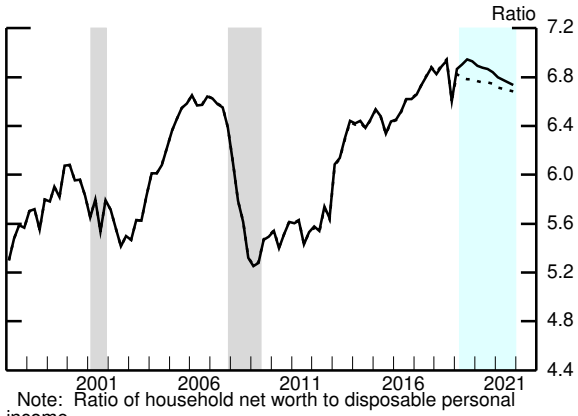
Aspects of the Medium-Term Projection

Personal Saving Rate



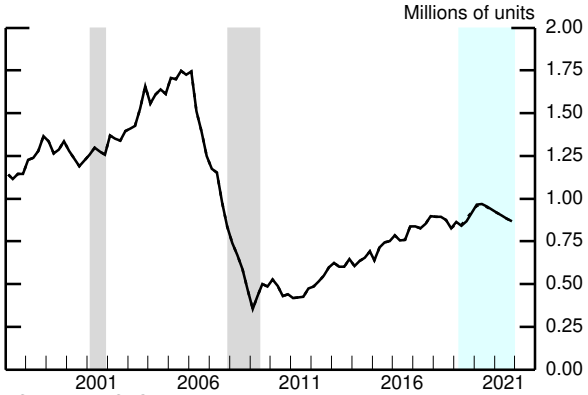
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Wealth-to-Income Ratio



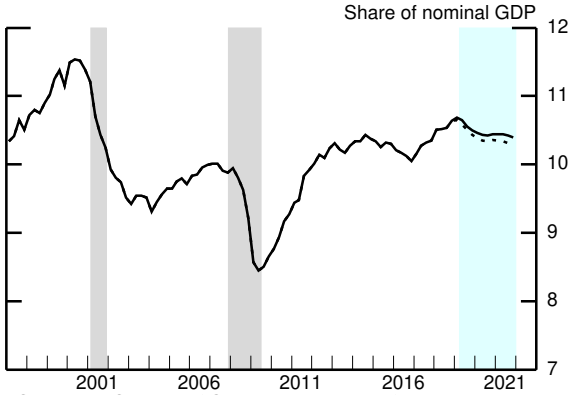
Note: Ratio of household net worth to disposable personal income.
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Single-Family Housing Starts



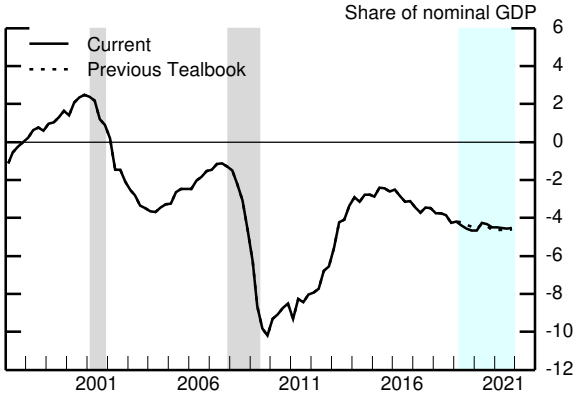
Source: U.S. Census Bureau.

Equipment and Intangibles Spending



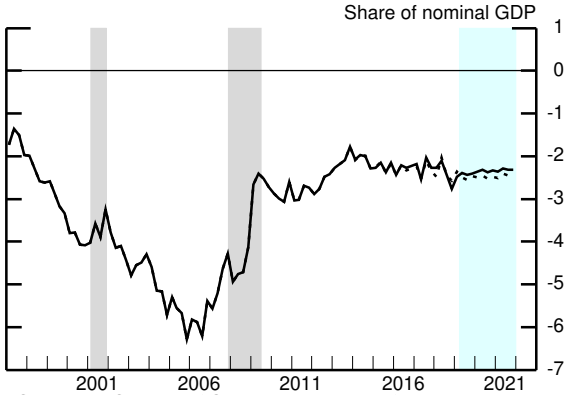
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Federal Surplus/Deficit



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

Current Account Surplus/Deficit



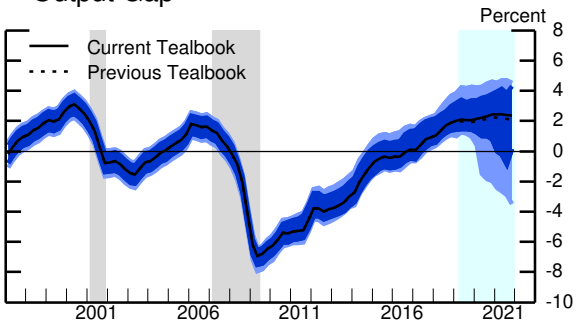
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

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

Domestic Econ Devel & Outlook

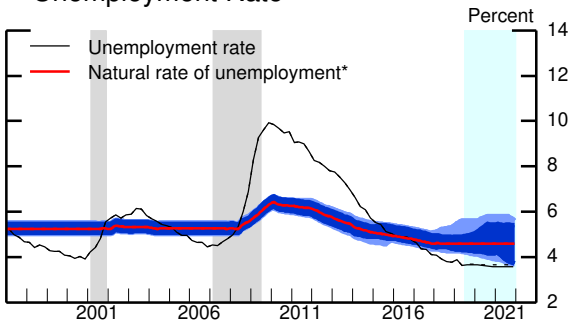
Cyclical Position of the U.S. Economy: Longer-Term Perspective

Output Gap



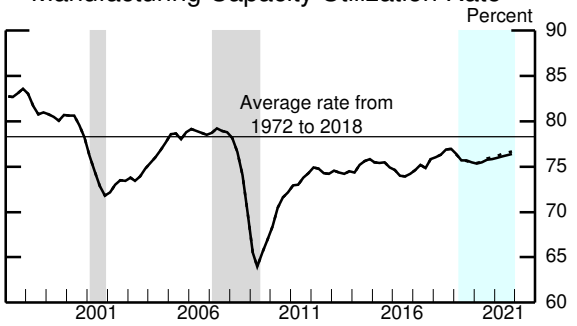
Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.

Unemployment Rate



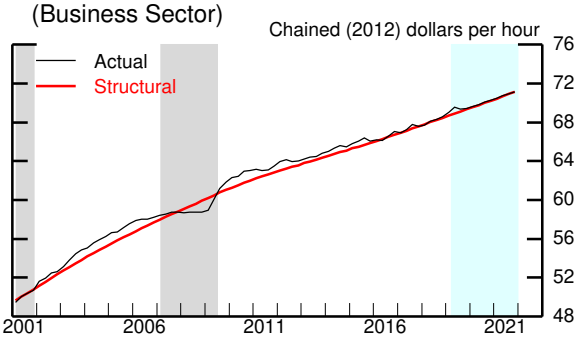
Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the natural rate.
*Staff estimate including the effect of extended and emergency unemployment insurance benefits.
Source: Various macroeconomic data; staff assumptions.

Manufacturing Capacity Utilization Rate



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

Actual and Structural 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	2011-16	2017	2018	2019	2020	2021
Potential output	3.1	3.6	2.7	1.9	1.4	1.7	1.8	1.8	1.8	1.9
Previous Tealbook	3.1	3.6	2.7	1.9	1.4	1.7	1.8	1.8	1.8	1.9
Selected contributions[1]										
Structural labor productivity[2]	1.7	2.9	2.7	1.8	1.2	1.3	1.3	1.3	1.2	1.3
Previous Tealbook	1.7	2.9	2.7	1.8	1.2	1.3	1.3	1.3	1.2	1.3
Capital deepening	.7	1.4	1.0	.5	.8	.7	.7	.8	.5	.5
Multifactor productivity	.8	1.1	1.4	1.0	.2	.4	.4	.4	.5	.6
Structural hours	1.5	1.3	.8	.5	.4	.3	.7	.2	.6	.5
Previous Tealbook	1.5	1.3	.8	.5	.4	.3	.7	.2	.6	.5
Labor force participation	.4	-.1	-.2	-.4	-.5	-.3	-.2	-.2	-.2	-.2
Previous Tealbook	.4	-.1	-.2	-.4	-.5	-.3	-.2	-.2	-.2	-.2
Memo:										
Output gap[3]	-1.2	2.5	.3	-5.4	.1	.9	1.9	2.1	2.4	2.3
Previous Tealbook	-1.2	2.5	.3	-5.4	.1	.9	1.9	1.9	2.2	2.0

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	2018	2019 H1	2019 H2	2019	2020	2021
Nonfarm payroll employment[1]	223	173	155	163	147	111
Previous Tealbook	223	165	154	159	142	99
Private employment[1]	215	161	143	152	138	101
Previous Tealbook	215	157	143	150	133	89
Labor force participation rate[2]	63.0	62.9	62.9	62.9	62.9	62.8
Previous Tealbook	63.0	62.8	62.9	62.9	62.9	62.7
Civilian unemployment rate[2]	3.8	3.6	3.7	3.7	3.6	3.6
Previous Tealbook	3.8	3.6	3.7	3.7	3.7	3.7
Employment to population ratio[2]	60.6	60.6	60.6	60.6	60.7	60.6
Previous Tealbook	60.6	60.6	60.6	60.6	60.6	60.5

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	2018	2019 H1	2019 H2	2019	2020	2021
Percent change at annual rate from final quarter of preceding period						
PCE chain-weighted price index	1.9	1.6	1.8	1.7	1.8	1.8
Previous Tealbook	1.9	1.4	1.6	1.5	1.9	1.9
Food and beverages	.5	1.8	2.6	2.2	2.6	2.6
Previous Tealbook	.5	1.7	2.8	2.3	2.6	2.6
Energy	3.5	-.8	-6.8	-3.8	-1.4	.0
Previous Tealbook	3.5	-1.8	-10.6	-6.3	-.1	.3
Excluding food and energy	1.9	1.7	2.2	1.9	1.9	1.9
Previous Tealbook	1.9	1.5	2.1	1.8	1.9	1.9
Prices of core goods imports[1]	.5	-.6	1.1	.3	.9	.8
Previous Tealbook	.5	.0	.7	.3	.9	.8

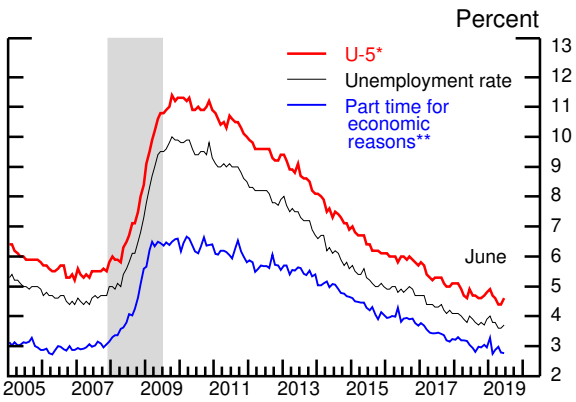
	June 2019[2]	July 2019[2]	Aug. 2019[2]	Sept. 2019[2]	Oct. 2019[2]	Nov. 2019[2]
12-month percent change						
PCE chain-weighted price index	1.5	1.6	1.7	1.6	1.6	1.7
Previous Tealbook	1.4	1.3	1.4	1.4	...	...
Excluding food and energy	1.7	1.7	1.9	1.9	1.9	1.9
Previous Tealbook	1.6	1.6	1.8	1.8	...	...

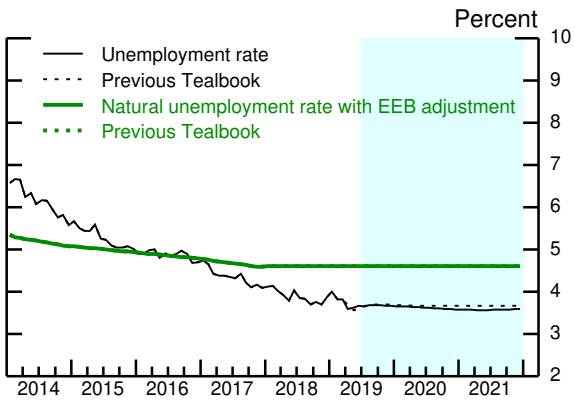
... Not applicable.
1. Core goods imports exclude computers, semiconductors, oil, and natural gas.
2. Staff forecast.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Domestic Econ Devel & Outlook

Labor Market Developments and Outlook (1)

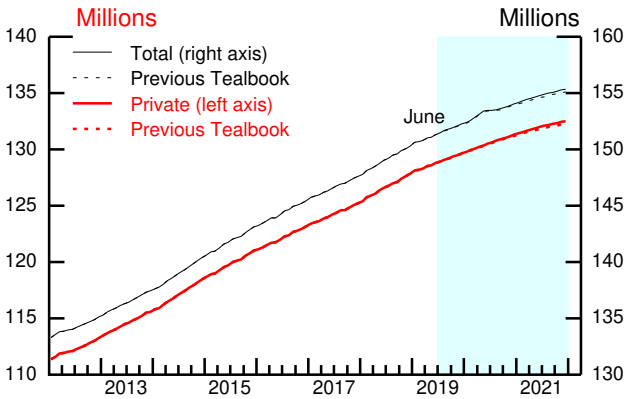
Measures of Labor Underutilization





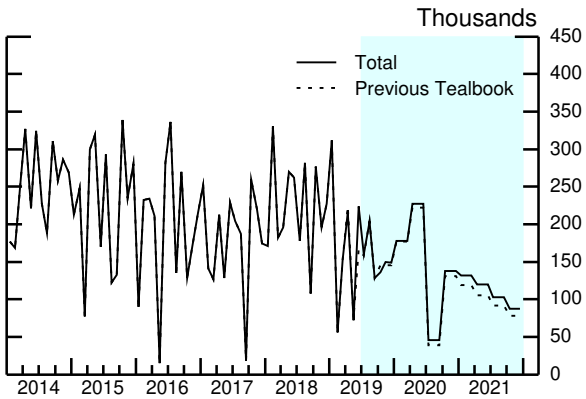
* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.
** Percent of Current Population Survey employment.
EEB Extended and emergency unemployment benefits.
Source: U.S. Department of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

Level of Payroll Employment



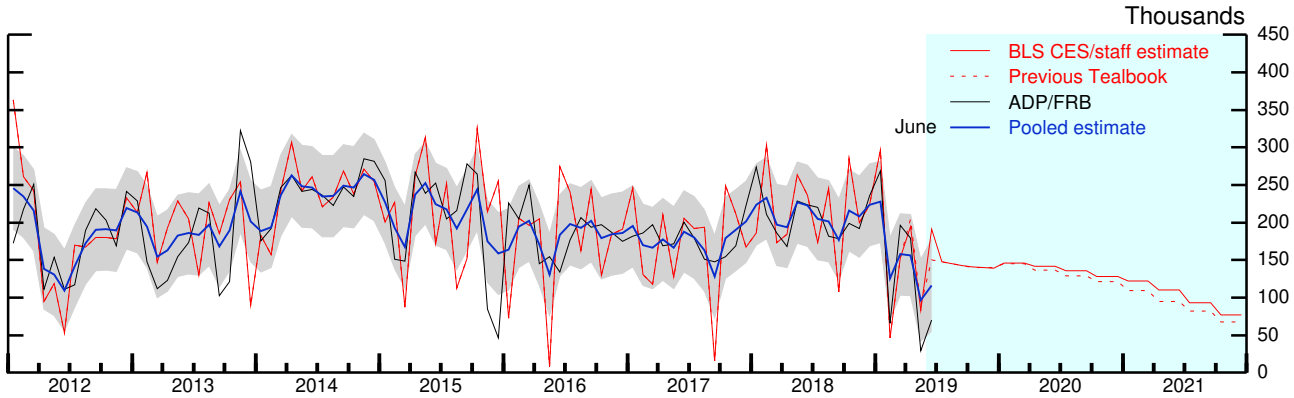
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Change in Total Payroll Employment



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

Change in Private Payroll Employment

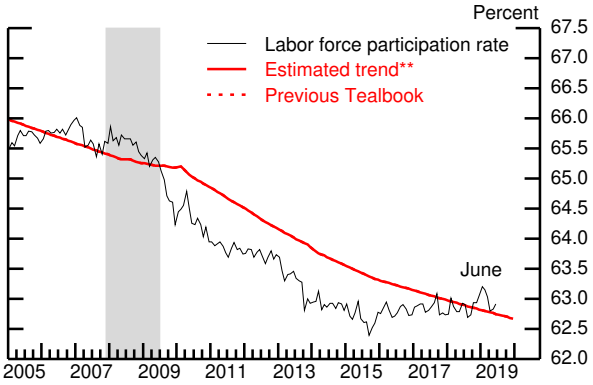


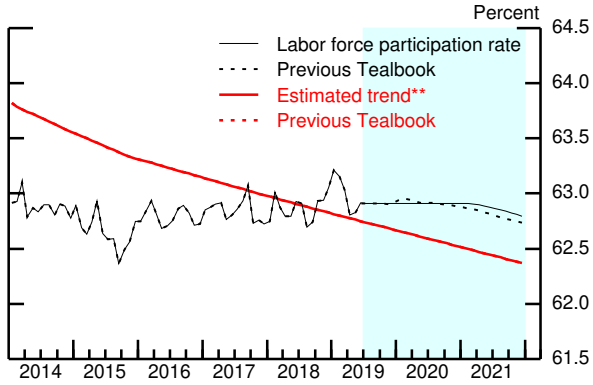
Note: Gray shaded area around blue line is 90 percent confidence interval around pooled estimate.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff calculations using microdata from ADP.

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)

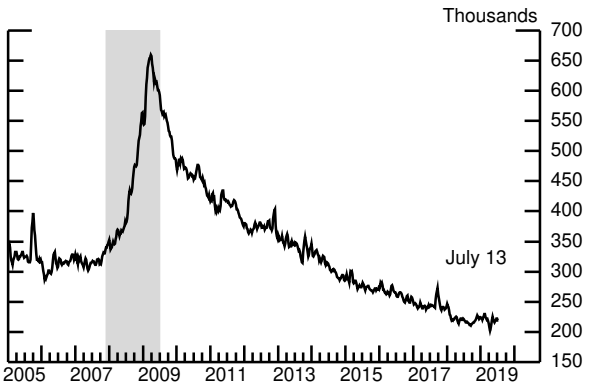
Labor Force Participation Rate*





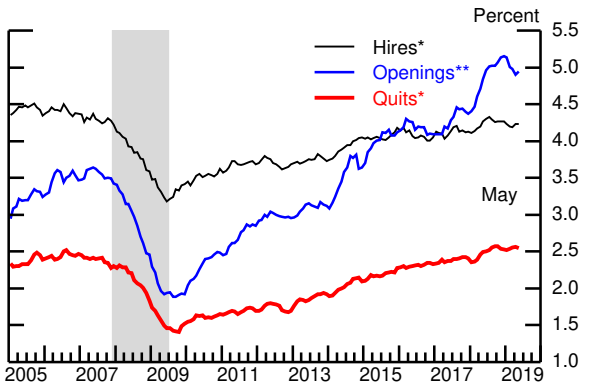
* Published data adjusted by staff to account for changes in population weights.
** Includes staff estimate of the effect of extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Initial Unemployment Insurance Claims*



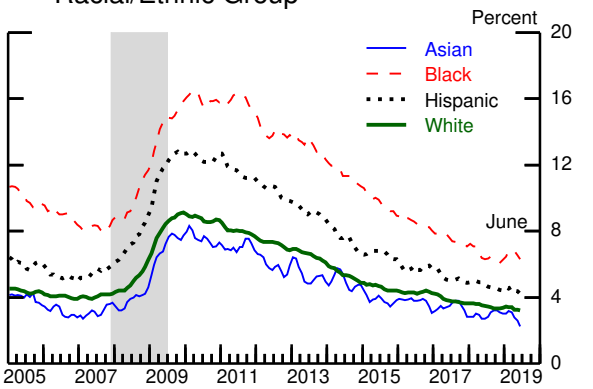
* 4-week moving average.
Source: U.S. Department of Labor, Employment and Training Administration.

Hires, Quits, and Job Openings



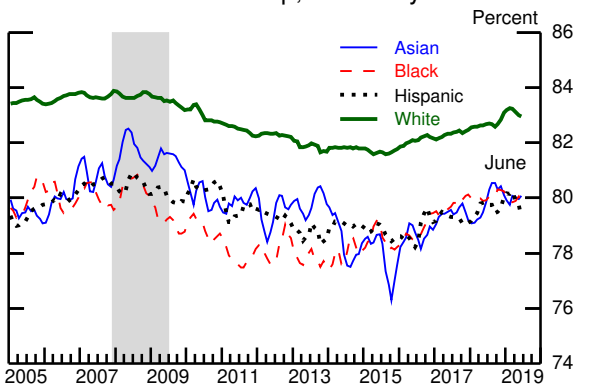
* Percent of private nonfarm payroll employment, 3-month moving average.
** Percent of private nonfarm payroll employment plus unfilled jobs, 3-month moving average.
Source: Job Openings and Labor Turnover Survey.

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



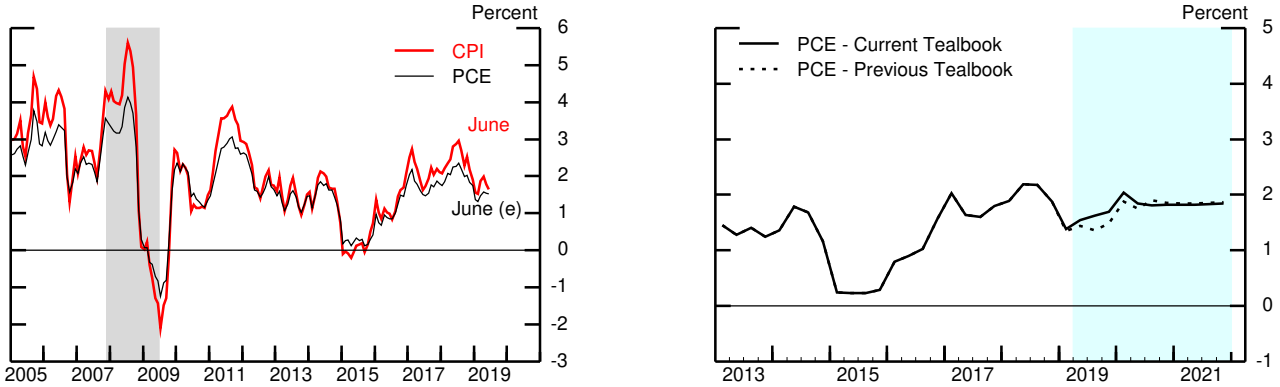
Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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

Domestic Econ Devel & Outlook

Inflation Developments and Outlook (1)

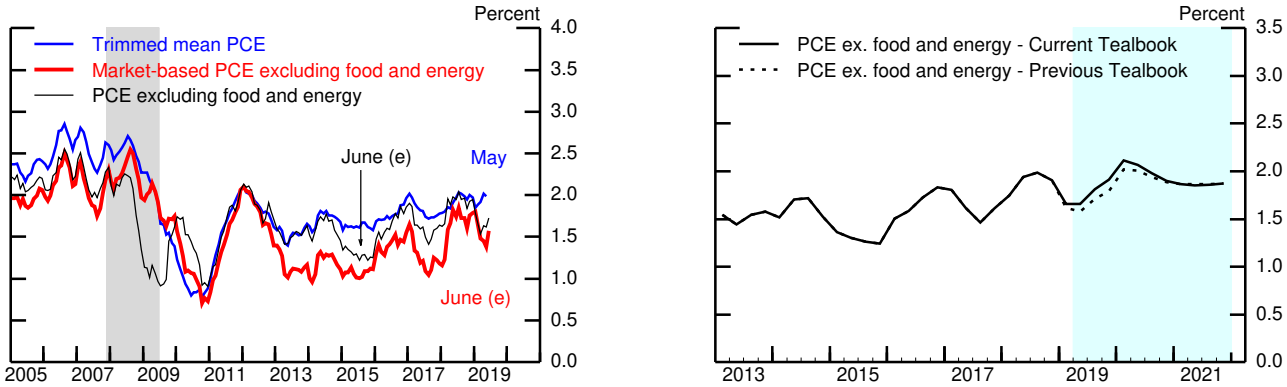
(Percent change from year-earlier period)

Headline Consumer Price Inflation



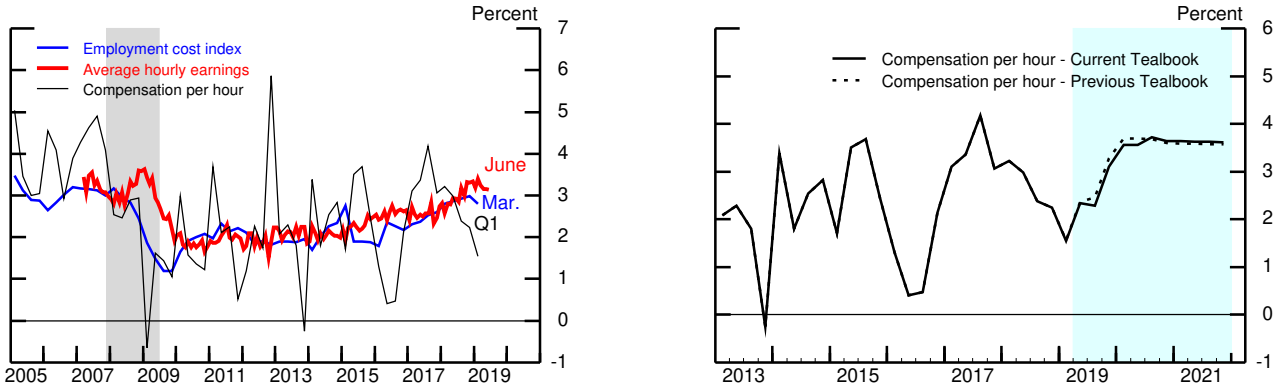
Note: PCE prices from May to June 2019 are staff estimates (e).
Source: For CPI, U.S. Department of Labor, Bureau of Labor Statistics; for PCE, U.S. Department of Commerce, Bureau of Economic Analysis.

Measures of Core PCE Price Inflation



Note: Core PCE prices from May to June 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



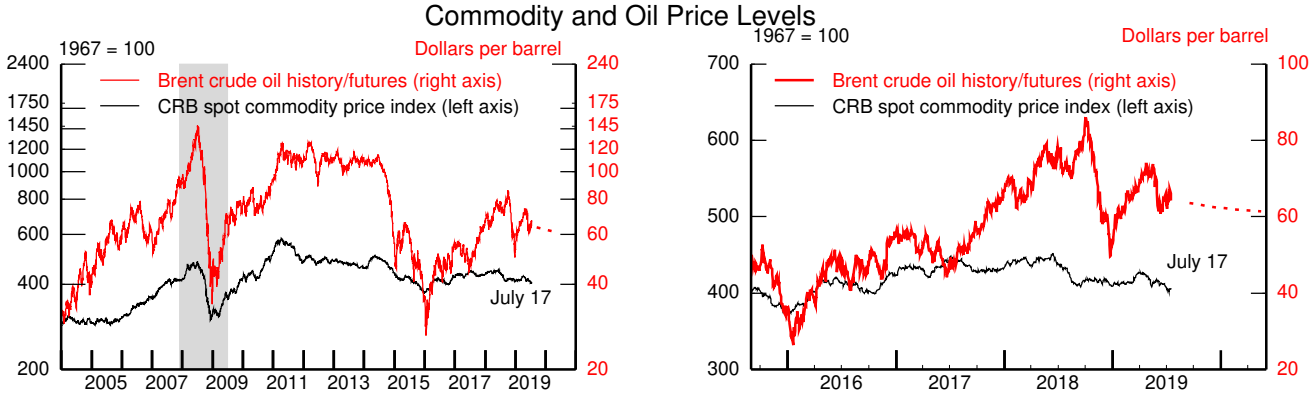
Note: Compensation per hour is for the business sector. Average hourly earnings are for the private nonfarm sector. The employment cost index is for the private sector.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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)

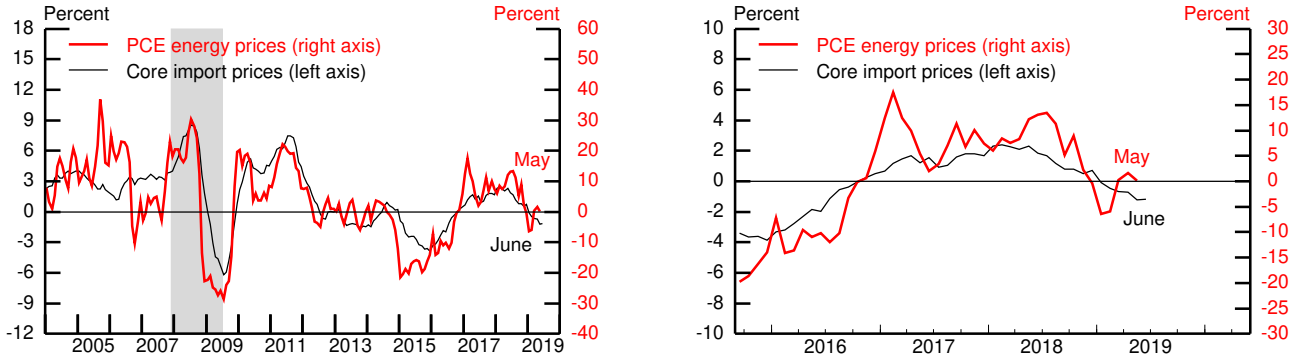
(Percent change from year-earlier period, except as noted)

Commodity and Oil Price Levels



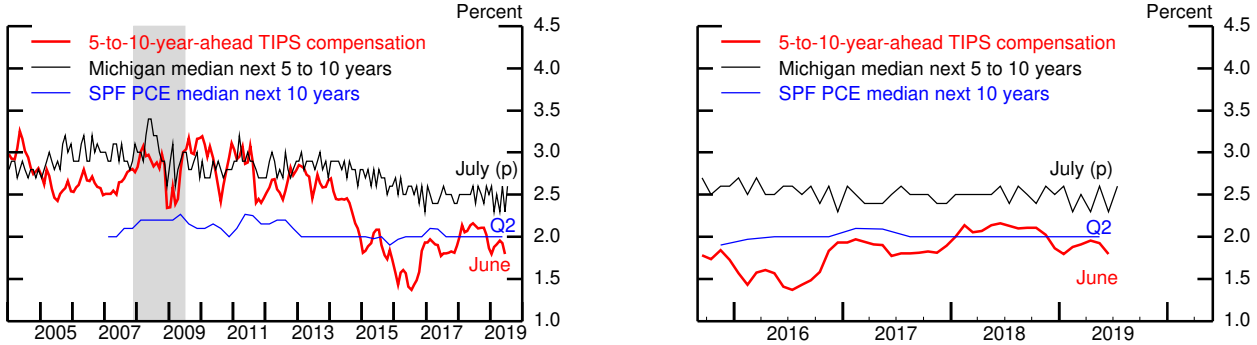
Note: Futures prices (dotted lines) are the latest observations on monthly futures contracts.
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

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.

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.

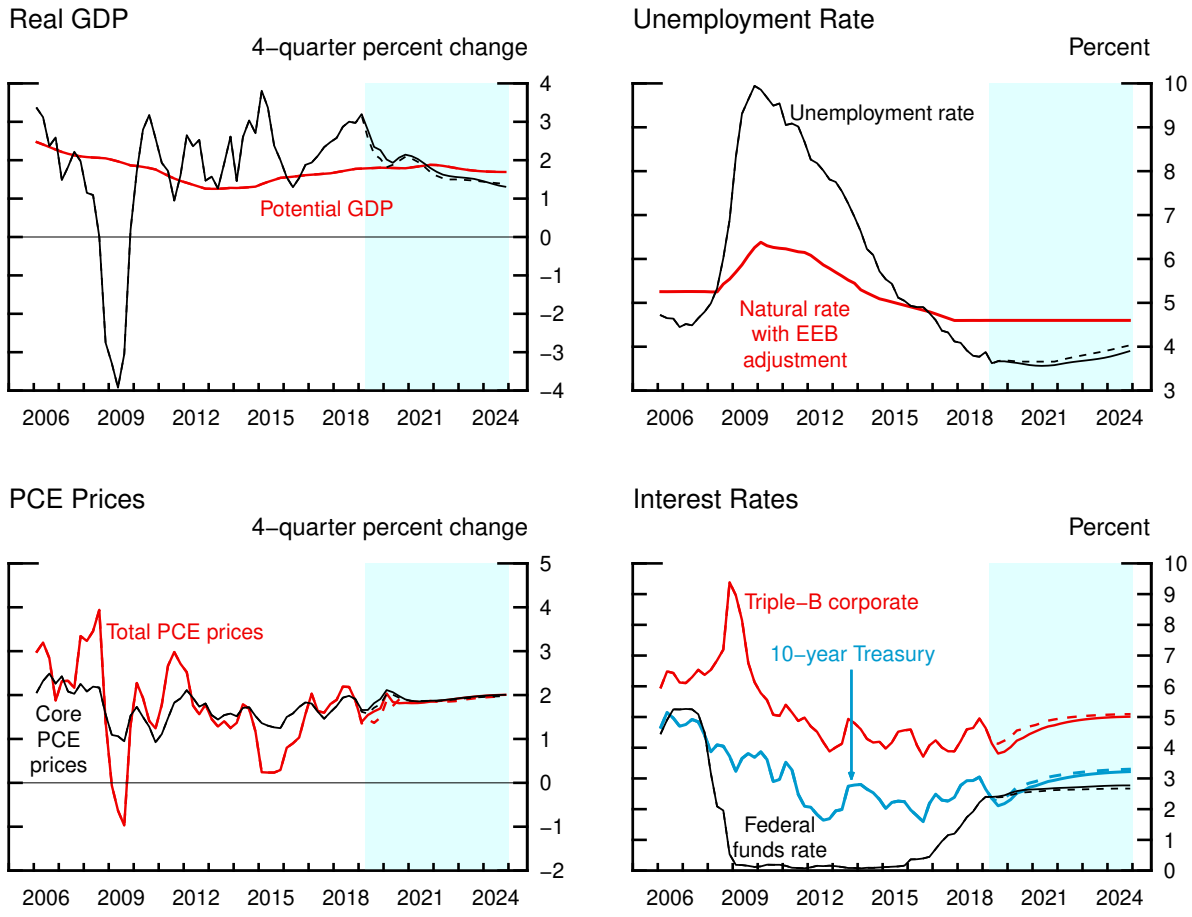
Domestic Econ Devel & Outlook

The Long–Term Outlook

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

Measure	2019	2020	2021	2022	2023	2024	Longer run
Real GDP	2.3	2.1	1.8	1.6	1.5	1.3	1.7
Previous Tealbook	2.0	2.1	1.7	1.5	1.4	1.4	1.7
Civilian unemployment rate[1]	3.7	3.6	3.6	3.7	3.7	3.9	4.6
Previous Tealbook	3.7	3.7	3.7	3.8	3.9	4.0	4.6
PCE prices, total	1.7	1.8	1.8	1.9	2.0	2.0	2.0
Previous Tealbook	1.5	1.9	1.9	1.9	1.9	2.0	2.0
Core PCE prices	1.9	1.9	1.9	1.9	2.0	2.0	2.0
Previous Tealbook	1.8	1.9	1.9	1.9	2.0	2.0	2.0
Federal funds rate[1]	2.45	2.64	2.68	2.72	2.76	2.77	2.50
Previous Tealbook	2.40	2.56	2.62	2.64	2.66	2.67	2.50
10-year Treasury yield[1]	2.2	2.7	2.9	3.1	3.2	3.2	3.4
Previous Tealbook	2.4	2.8	3.1	3.2	3.3	3.3	3.4

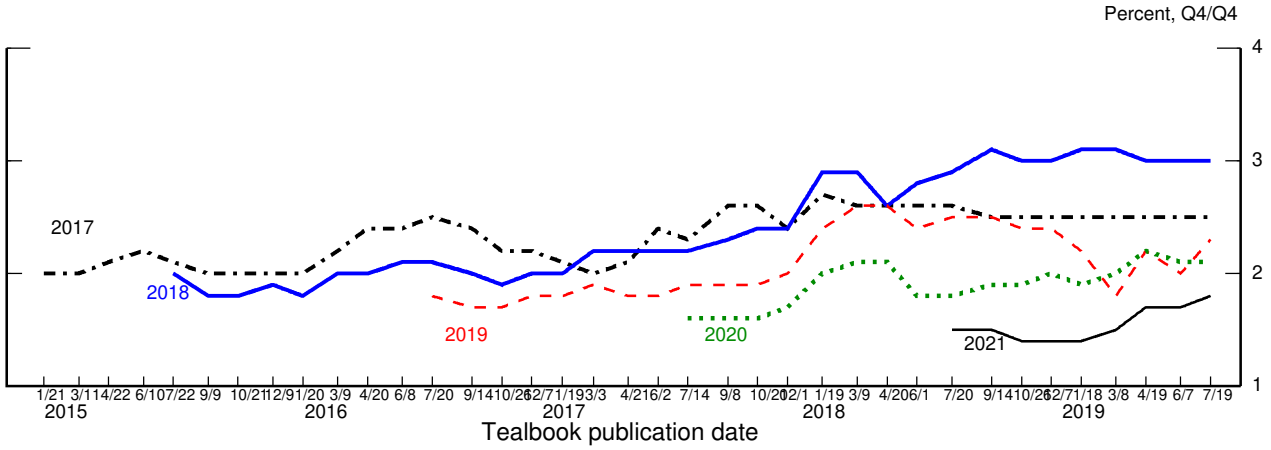
1. Percent, average for the final quarter of the period.



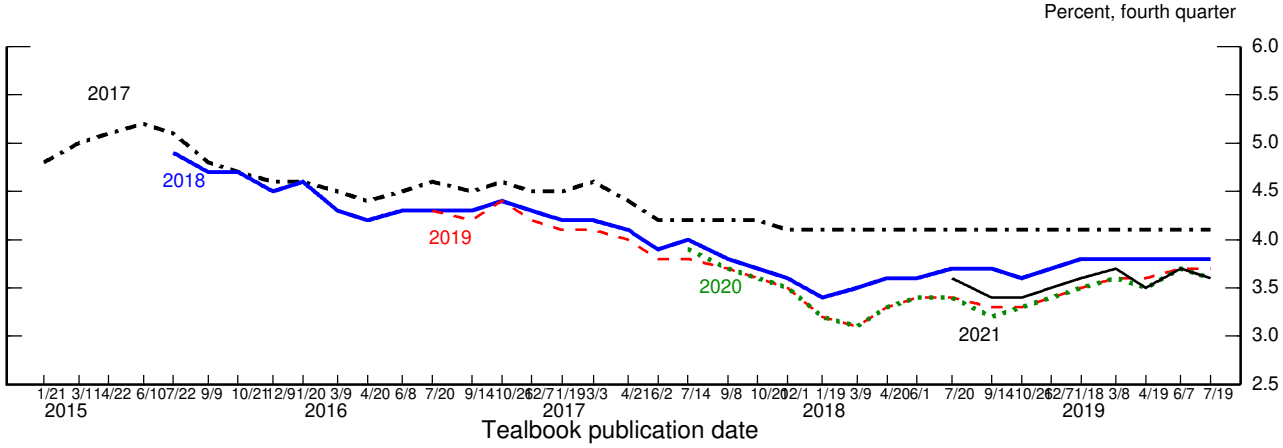
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

Evolution of the Staff Forecast

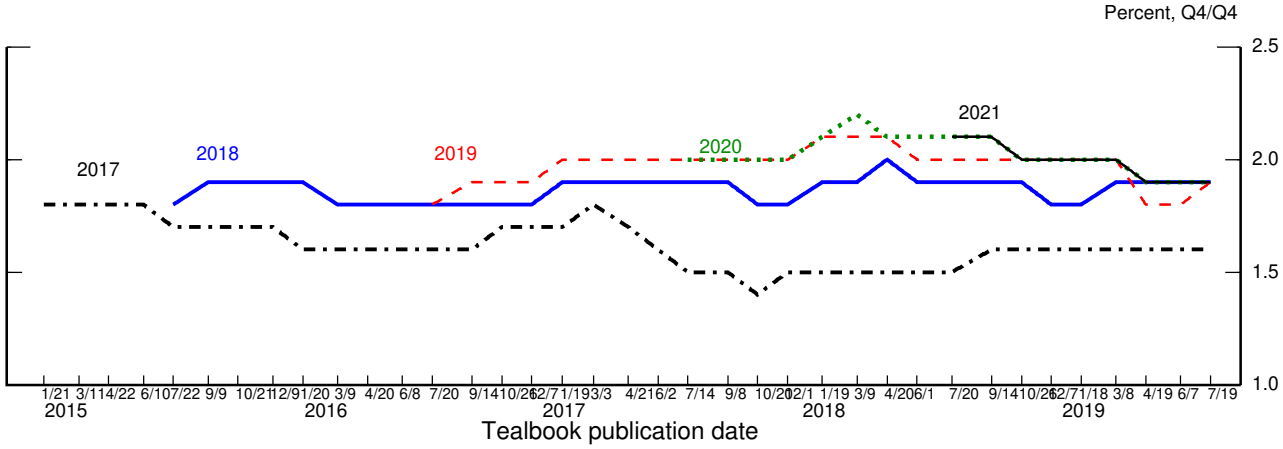
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



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International Economic Developments and Outlook

The outlook for the global economy remains murky. Incoming data are consistent with a pickup in foreign economic growth last quarter from its very subdued pace earlier this year, but growth likely remained below its potential pace. Moreover, activity indicators have been a bit weaker than expected, leading us to revise down modestly our estimate of growth in the first half of this year. Given concerns about the global outlook and little underlying inflation pressure, we expect foreign central banks to pursue more accommodative monetary policies than we had anticipated in the June Tealbook.

We estimate that growth abroad increased to an annual rate of 2.0 percent in the second quarter from the 1.5 percent pace observed in the previous two quarters but remained below its estimated potential pace of 2.4 percent. Nevertheless, we are not sure that the global economy has made it out of its soft patch. The pickup in growth is concentrated in Canada and, to a lesser extent, Mexico (countries that have a particularly large imprint on our trade-weighted measure of foreign growth). In addition, global manufacturing remains depressed, with Germany showing particular weakness and only sparse positive signs elsewhere.

We expect foreign growth to edge up to a pace close to its potential by early next year, with growth stabilizing in advanced foreign economies (AFEs), being supported by accommodative monetary policy, and rising in emerging market economies (EMEs) due, in part, to an improvement in the high-tech sector. However, this outlook is hardly assured. Most notably, the global slide in the manufacturing sector may extend further, perhaps because the elevated uncertainty around trade policies could weigh on investment to a greater degree than we have assumed in our baseline outlook. Moreover, trade tensions could escalate, with the United States imposing additional tariffs on imports from China and Mexico and on automobile imports. We explore both of these scenarios in the Risks and Uncertainty section. We also anticipate a resurfacing of risks surrounding a "no deal" Brexit in the fall.

Foreign inflation is estimated to have stepped up in the second quarter, reflecting an acceleration in energy prices as well as EME food prices. In the AFEs, underlying inflation continues to be low, with 12-month core inflation in the euro area and Japan still far below central bank targets. Against the backdrop of muted inflation pressures, subdued GDP growth, and pronounced risks to the global outlook, we foresee a more

accommodative foreign monetary policy stance. We expect the European Central Bank (ECB) to cut its deposit rate in September and to resume its large-scale asset purchase program later this year. We also pushed back our assumptions for the timing of further rate hikes by the Bank of Canada (BOC) and Bank of England (BOE) and now expect shallower tightening cycles over the forecast period. In the EMEs, several central banks, including Chile, India, Indonesia, Russia, and South Korea, have cut policy rates, and others have adopted more dovish rhetoric.

ADVANCED FOREIGN ECONOMIES

- ***Euro Area.*** Recent indicators continue to point to lackluster growth. Industrial production through May and PMIs through June suggest that GDP growth slowed to 1 percent in the second quarter from 1.6 percent in the first. The slowdown partly reflected the tapering of temporary factors that had boosted growth earlier, such as a partial payback in car production from the slump in the second half of 2018, but also continuing weakness in German manufacturing. Given the weak underlying momentum, we expect growth to edge up only slightly later this year and to pick up a bit more appreciably thereafter, rising to 1.8 percent (above potential) in 2021. Relative to the June Tealbook, we revised down our estimate for the second quarter 0.2 percentage point in light of modestly disappointing data but marked up our forecast for 2020 and 2021 a touch, in line with our assumption for more accommodative monetary policy.

  Headline inflation on a 12-month basis was 1.3 percent in June, while core inflation was 1.1 percent. Going forward, we expect inflation to reach only 1.4 percent in 2021, even as the output gap closes. Given the subdued outlook for inflation and lack of momentum in growth, we now expect the ECB to cut its deposit rate by 20 basis points in September (to negative 0.6 percent) and to restart its asset purchase program in the fourth quarter, purchasing €30 billion per month through the end of 2020. We also project that the deposit rate will remain negative throughout the forecast period, ending 2021 at negative 0.5 percent, 0.5 percentage point lower than assumed in the June Tealbook.

- ***United Kingdom.*** Brexit uncertainty continues to weigh on economic activity. We estimate that real GDP contracted 0.2 percent in the second quarter, following a 2 percent expansion in the first. This estimate is 0.9 percentage point weaker than in the June Tealbook, reflecting a larger-than-expected reversal from the pre-Brexit

stockpiling that had boosted growth in the first quarter as well as temporary shutdowns by several car manufacturers. Amid elevated political uncertainties, growth should remain relatively subdued, averaging a modest 1.3 percent in the second half of the year. Although the risk of a no-deal Brexit has materially increased (and other outcomes, such as another extension or a reversal of Brexit, are still on the table), our outlook assumes an orderly Brexit in the fourth quarter, followed by a long transition period. Accordingly, with uncertainty gradually fading and monetary policy remaining accommodative, we project that growth will pick up a bit and settle at 1.6 percent in 2020 and 2021, about its potential rate.

Headline 12-month inflation stayed at 2 percent in June, while core inflation was only 1.7 percent. With the BOE's recent communications citing elevated downside risks to the growth outlook, we now assume a more accommodative path for monetary policy. We expect the policy rate to rise from its current rate of 0.75 percent to only 1 percent by early 2021 and stay at that level thereafter, 0.5 percentage point lower than in the June Tealbook.

- ***Japan.*** After strong growth in the first quarter, indicators suggest that real GDP was about flat in the second, as a surge in private consumption was offset by a rebound in imports. Looking through the volatility from the consumption tax hike scheduled for October, we expect GDP growth to be near zero in the second half of the year. Over the next two years, we see GDP growth slightly above its potential pace of 0.7 percent, supported by additional spending related to the 2020 Tokyo Olympics and very accommodative monetary policy.

  The 12-month changes in total and core CPI edged down to 0.8 percent and 0.3 percent, respectively, in May. After the boost provided by the upcoming tax hike, we expect total inflation to stabilize at 1 percent in 2021. With underlying inflation still quite far from the Bank of Japan's (BOJ) 2 percent inflation target, we expect the BOJ to keep its deposit rate at negative 0.1 percent and to continue to purchase assets to keep the 10-year sovereign yield around the current target of zero percent throughout the forecast period.

- ***Canada.*** After a soft patch around the turn of the year due to temporary cutbacks in oil production, we estimate that growth picked up in the second quarter as oil production rebounded. Recent data, notably monthly GDP for April, suggest that real GDP growth was 2.6 percent in the second quarter, compared with a 0.4 percent pace

in the first. We expect growth to average 1.7 percent over the forecast period. Relative to the June Tealbook, we revised up a touch our outlook in the second and third quarters because of better-than-expected incoming data.

In June, 12-month inflation slowed to the BOC's 2 percent target, and we expect it to hover around that rate over the remainder of the forecast period. At its July meeting, the BOC kept its policy rate unchanged at 1.75 percent but highlighted downside risks, including elevated trade tensions. Accordingly, we now expect the next rate hike to occur in mid-2021, compared with late 2020 in our June forecast.

EMERGING MARKET ECONOMIES

- ***China.*** China's GDP growth slowed sharply to 5.6 percent in the second quarter, from 7.3 percent in the first. Much of this slowdown was expected and reflected payback from a spike in industrial production in the first quarter, which may have been related to changes in tax policy. But contractions in exports and imports and a manufacturing PMI below 50 also portray an economy facing lackluster demand, possibly as a result of the trade tensions with the United States. Although retail sales for June strengthened, that pickup was boosted by a one-off surge in auto sales as car dealers discounted prices ahead of a change in auto emission standards. A pickup in credit growth in June, however, suggests that the authorities are cautiously stepping up policy support, and we see growth edging up to 5.8 percent in the second half of the year. For 2019 as a whole, year-on-year growth is expected to be 6.2 percent, within the government's target range of 6 to 6.5 percent, and also about in line with our admittedly tenuous estimates of potential growth.

- ***Other Emerging Asia.*** Incoming data point to a softer-than-expected recovery in the second quarter. We now estimate that real GDP growth picked up from 2.4 percent in the first quarter to 2.8 percent in the second, 0.3 percentage point less than our June forecast. Industrial production weakened in May following April's strong print, manufacturing PMIs fell across the region in June, and Singapore's real GDP unexpectedly contracted in the second quarter. On the positive side, exports in the region holding steady in the second quarter following contractions in the previous two quarters, and high-tech indicators suggest a recovery, albeit a sluggish one, for the industry. Recovery in manufacturing, together with support from fiscal policy in some countries, should boost growth to 3.5 percent by the end of the year, about its

potential pace, and it should remain at about that level over the remainder of the forecast period.

- ***Mexico.*** Recent data have been mixed but, on balance, suggest that GDP expanded modestly in the second quarter after contracting in the first. Manufacturing production growth increased, boosted by strong exports, and private consumption rebounded. However, plunging construction activity and weakness in services have weighed on growth. We now expect the economy to grow at a sluggish 0.5 percent pace in the second quarter, about 1 percentage point below our June Tealbook forecast. Growth should then pick up gradually to a still-unimpressive 2.5 percent by the end of 2020, supported by stronger U.S. manufacturing production and some monetary policy easing by the Bank of Mexico (BOM). However, the recent resignation of the finance minister, who decried the administration's erratic economic policies, has increased policy uncertainty, and a potential loss of investor confidence poses a material downside risk to our forecast.

  Twelve-month inflation fell to 3.9 percent in June, pulled down by energy prices. Citing still-ongoing pressures from wage growth and core inflation, the BOM left its policy rate unchanged at 8.25 percent in June. However, it changed its assessment of inflation risks to neutral from tilted to the upside, with one member of the monetary policy committee voting for a rate cut. We continue to expect the BOM to begin cutting its policy rate in the fourth quarter of this year.

- ***Brazil.*** Incoming data provide little basis for optimism about the Brazilian economy. The unemployment rate remained in double digits, retail sales were weak, and industrial production stayed depressed, partially reflecting a dam disaster earlier this year. We estimate that GDP growth in the second quarter was barely positive, avoiding a technical recession. On the bright side, the pension reform cleared a major hurdle when it was approved by the lower house of Congress. Assuming the passage of the reform this year, diminished uncertainty and increases in business confidence should boost growth gradually to 2.5 percent by next year. We now expect that authorities will loosen monetary policy in the fourth quarter amid inflation close to its target of 4 percent and lackluster domestic demand.

- ***Turkey.*** The independence of the Central Bank of the Republic of Turkey (CBRT) was dealt another blow after President Erdogan ousted Governor Murat Cetinkaya. He was replaced by Murat Uysal, formerly one of the CBRT's deputy governors.

President Erdogan, an ardent critic of high interest rates, reportedly warned Cetinkaya multiple times to cut policy rates—which were raised last August in response to financial volatility and rising inflation—and fired him when he did not oblige. The firing dashed hopes of a return to a more orthodox approach to macroeconomic policymaking after Erdogan's party fared worse than expected in recent local elections. Turkish asset prices fell in the aftermath of the firing of Cetinkaya—with the lira depreciating and bond yields and credit spreads rising—although the market reaction was relatively muted.

The Foreign GDP Outlook

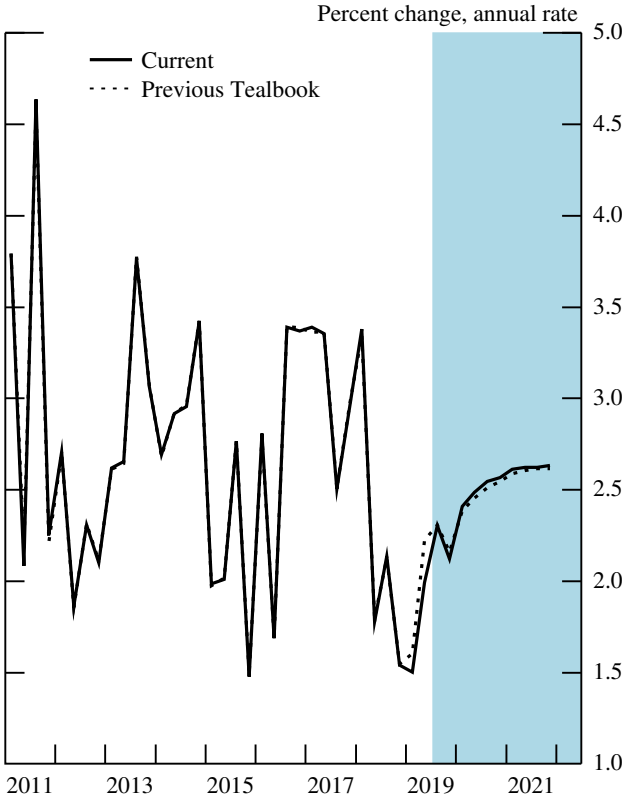
Real GDP* Percent change, annual rate

	2018			2019			2020	2021
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	2.6	2.1	1.5	1.5	2.0	2.2	2.5	2.6
Previous Tealbook	2.6	2.1	1.5	1.6	2.2	2.2	2.5	2.6
2. Advanced Foreign Economies	1.8	1.1	.8	1.2	1.5	1.3	1.6	1.7
Previous Tealbook	1.8	1.1	.7	1.2	1.5	1.3	1.5	1.6
3. Canada	2.0	2.1	.3	.4	2.6	1.7	1.7	1.7
4. Euro Area	1.6	.5	1.0	1.6	1.0	1.1	1.5	1.8
5. Japan	.9	-2.6	1.8	2.2	-.0	.0	.9	.8
6. United Kingdom	.9	2.8	.9	2.0	-.2	1.3	1.6	1.6
7. Emerging Market Economies	3.4	3.2	2.3	1.8	2.4	3.1	3.4	3.6
Previous Tealbook	3.3	3.2	2.3	2.0	3.0	3.2	3.4	3.6
8. China	6.8	5.9	6.0	7.3	5.6	5.8	5.7	5.7
9. Emerging Asia ex. China	3.9	2.6	2.7	2.4	2.8	3.3	3.5	3.5
10. Mexico	1.9	2.7	.1	-.7	.5	1.7	2.3	2.7
11. Brazil	1.0	2.0	.4	-.6	.4	1.7	2.5	2.8

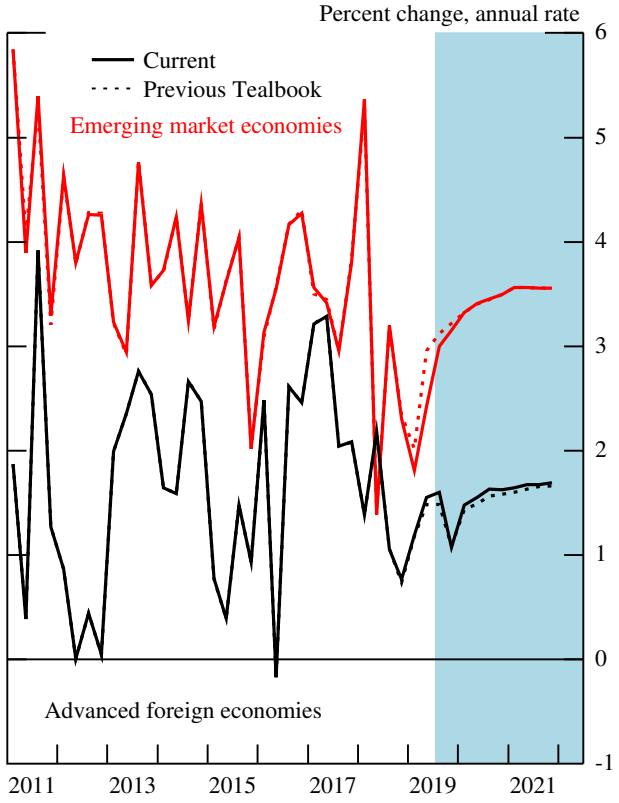
* GDP aggregates weighted by shares of U.S. merchandise exports.

Int'l Econ Devel & Outlook

Total Foreign GDP



Foreign GDP



The Foreign Inflation Outlook

Consumer Prices* Percent change, annual rate

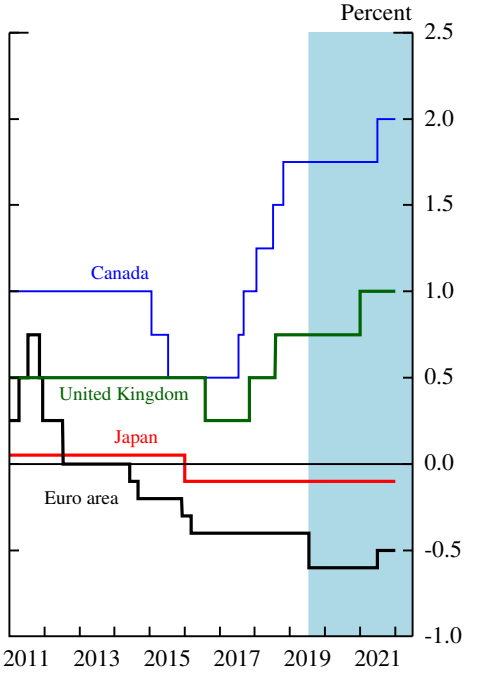
	2018			2019			2020	2021
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	2.2	3.4	1.9	.8	3.3	2.6	2.3	2.3
Previous Tealbook	2.2	3.4	1.9	.8	2.9	2.4	2.3	2.3
2. Advanced Foreign Economies	1.9	2.4	.7	.7	2.2	1.9	1.5	1.5
Previous Tealbook	1.9	2.5	.7	.7	1.4	1.7	1.4	1.5
3. Canada	2.2	2.6	1.1	1.6	3.4	1.8	1.9	2.0
4. Euro Area	2.2	2.6	.7	.1	2.2	1.4	1.3	1.4
5. Japan	.6	2.0	-.1	.9	.2	3.6	.9	1.0
6. United Kingdom	2.2	2.7	1.8	.9	2.7	2.3	2.1	2.0
7. Emerging Market Economies	2.5	4.1	2.7	.8	4.1	3.0	2.8	2.8
Previous Tealbook	2.5	4.1	2.7	.8	3.9	2.9	2.8	2.8
8. China	1.5	3.7	2.0	.6	4.3	3.0	2.5	2.5
9. Emerging Asia ex. China	2.2	2.0	1.2	.1	3.1	2.7	2.8	2.7
10. Mexico	4.0	6.5	4.9	1.1	4.5	3.2	3.2	3.2
11. Brazil	3.7	6.6	2.5	2.9	5.2	3.8	4.3	4.3

* CPI aggregates weighted by shares of U.S. non-oil imports.

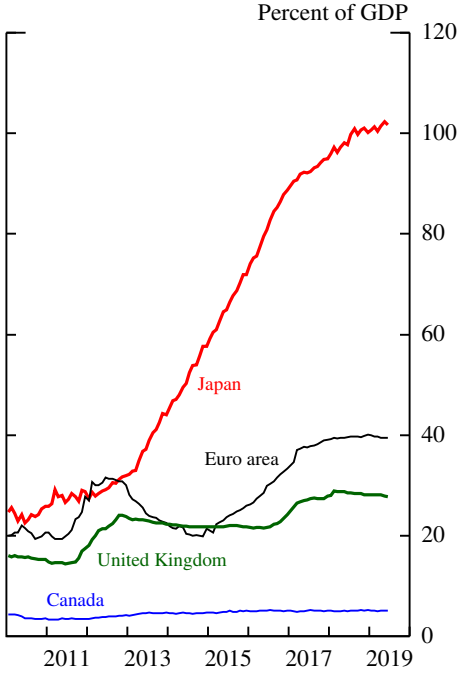
Int'l Econ Devel & Outlook

Foreign Monetary Policy

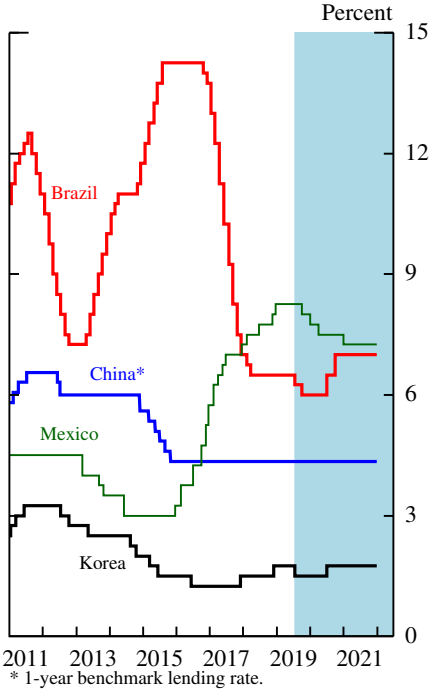
AFE Policy Rates



AFE Central Bank Balance Sheets



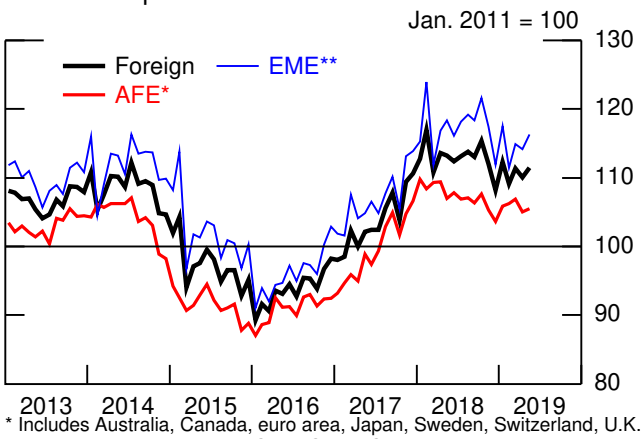
EME Policy Rates



* 1-year benchmark lending rate.

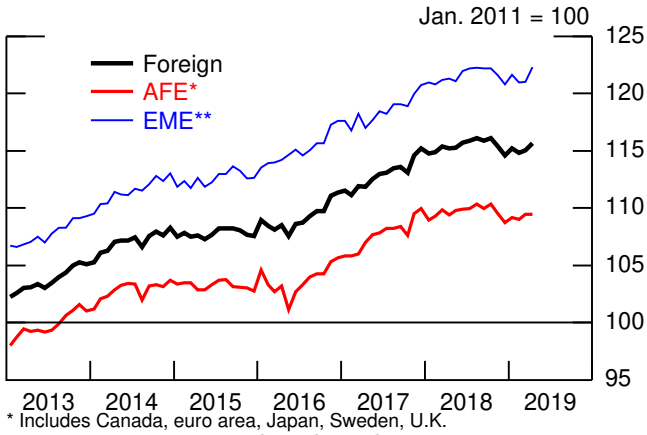
Recent Foreign Indicators

Nominal Exports



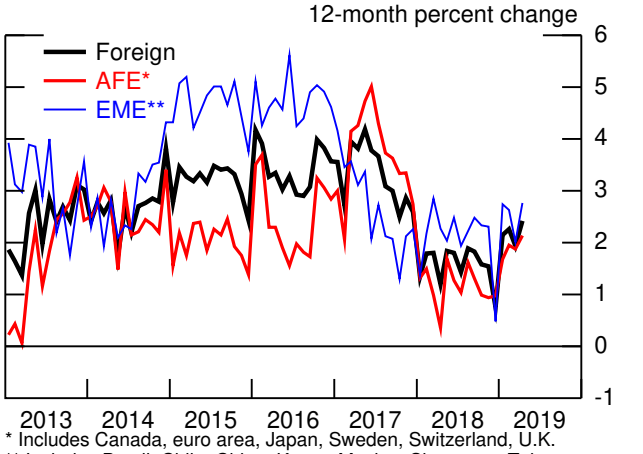
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Singapore, Taiwan, Thailand.

Industrial Production



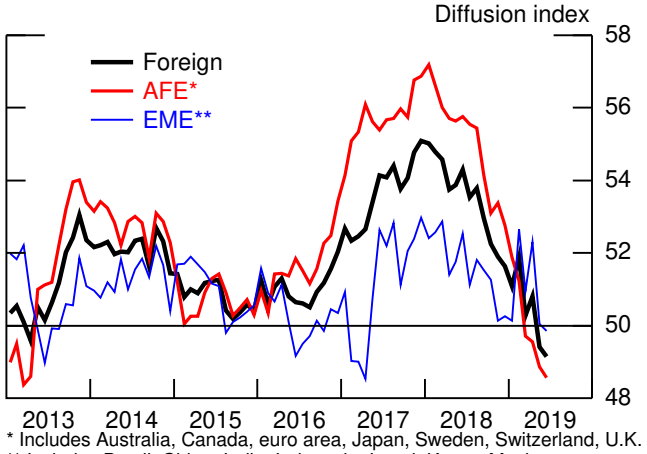
* Includes Canada, euro area, Japan, Sweden, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand.

Retail Sales



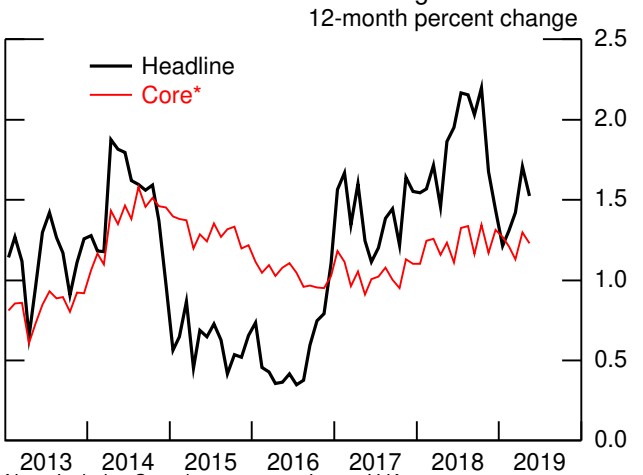
* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, Chile, China, Korea, Mexico, Singapore, Taiwan.

Manufacturing PMI



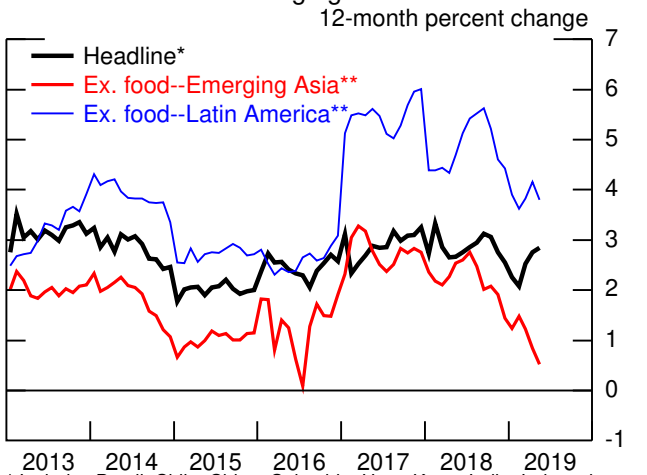
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, China, India, Indonesia, Israel, Korea, Mexico, Russia, Singapore, Taiwan, Turkey.

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

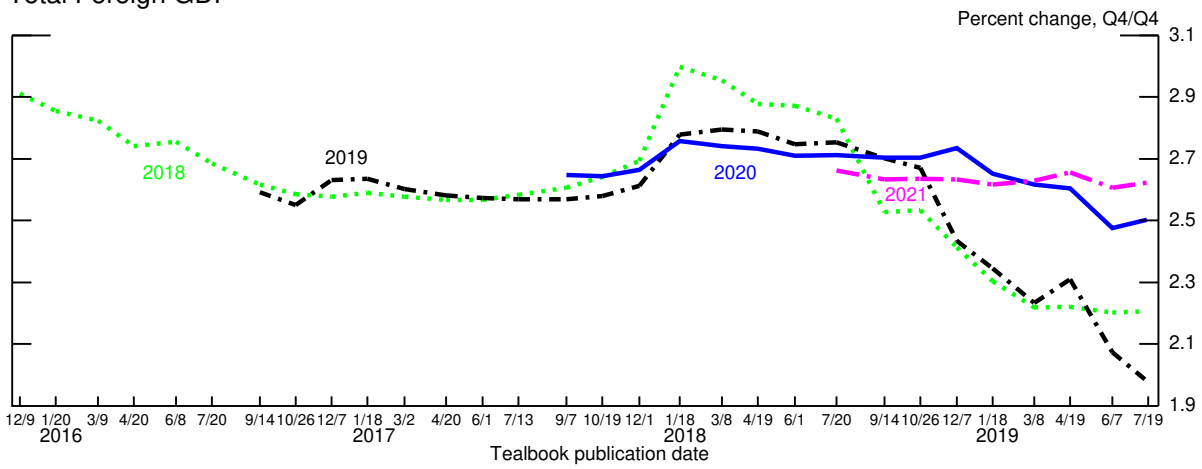


* Includes Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand.
** Excludes all food; staff calculation. Latin America excludes Argentina and Venezuela.

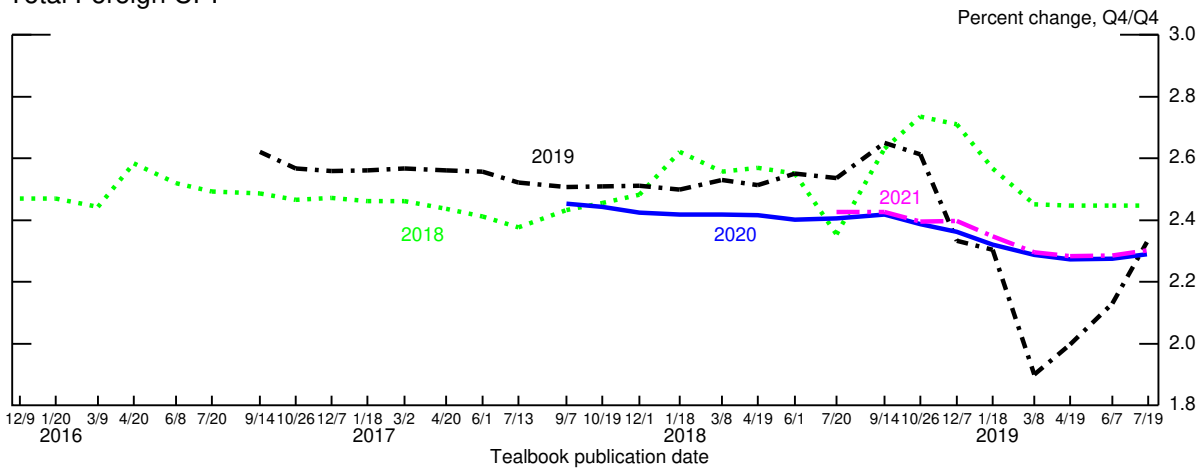
Int'l Econ Devel & Outlook

Evolution of Staff's International Forecast

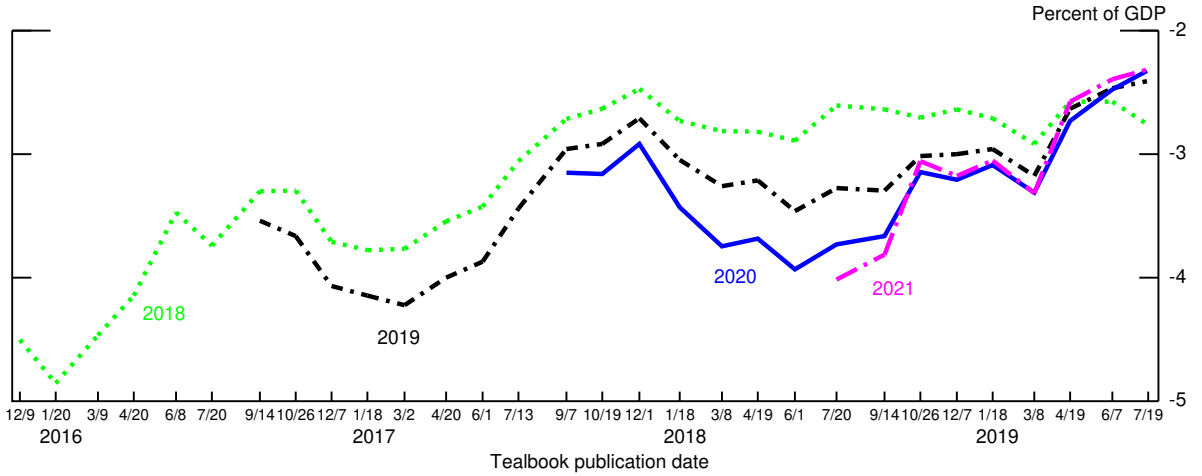
Total Foreign GDP



Total Foreign CPI



U.S. Current Account Balance



Financial Market Developments

Over the intermeeting period, financial market developments reflected noticeable shifts in expectations for monetary policy in response to Federal Reserve communications and economic data releases, and the expected path of policy moved down slightly, on net, over the period. Currently, both market- and survey-based evidence suggest that market participants see a 25 basis point reduction in the target range as the most likely outcome at the July meeting, but that they also place some weight on a 50 basis point reduction. Federal Reserve communications were generally regarded as more accommodative than had been anticipated, exerting downward pressure on measures of the expected path for the federal funds rate. However, some better-than-expected economic data releases and a slight improvement in the outlook regarding trade partially offset these declines. Yields on nominal Treasury securities also edged down on net. Equity prices increased over the period, with notable gains on Federal Reserve communications and announcements related to trade negotiations. Corporate bond spreads narrowed. The more-accommodative-than-expected Federal Reserve communications, increased oil prices, and higher-than-expected inflation data contributed to a rebound in inflation compensation.

- Measures of the expected level of the federal funds rate at the end of this year and beyond moved down a bit on net. A straight read of OIS quotes suggests a cumulative decline of 80 basis points this year, while a model that adjusts for term premiums suggests a reduction of 49 basis points.

- Nominal Treasury yields fell 9 basis points and 4 basis points, respectively, at the 2- and 10-year maturities.

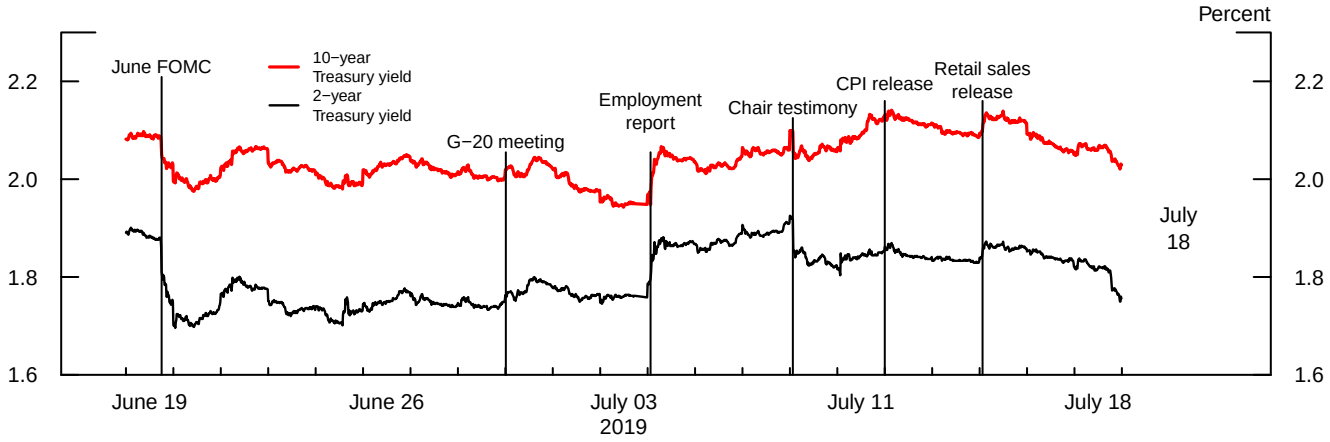
- Inflation compensation moved up 16 basis points and 12 basis points, respectively, for the 5-year and the 5-to-10-year horizons to 1.65 percent and 1.83 percent, respectively.

- The S&P 500 index increased 2.7 percent and its option-implied volatility—the VIX—decreased somewhat. Investment-grade and high-yield corporate bond spreads narrowed 13 basis points and 17 basis points, respectively.

- Global equity indexes increased slightly and the exchange value of the dollar decreased modestly on balance.

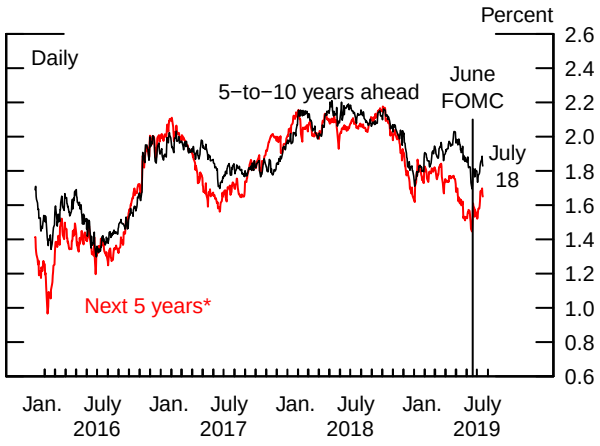
Policy Expectations and Treasury Yields

Intraday Treasury Yields



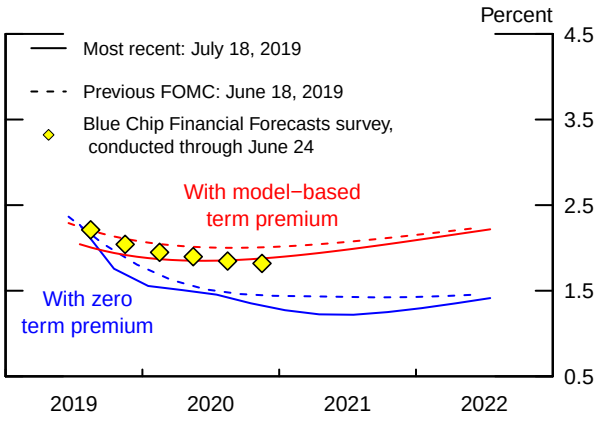
Note: Data are spaced at 5−minute intervals from 8:00 a.m. to 4:00 p.m.
Source: Bloomberg.

TIPS−Based Inflation Compensation



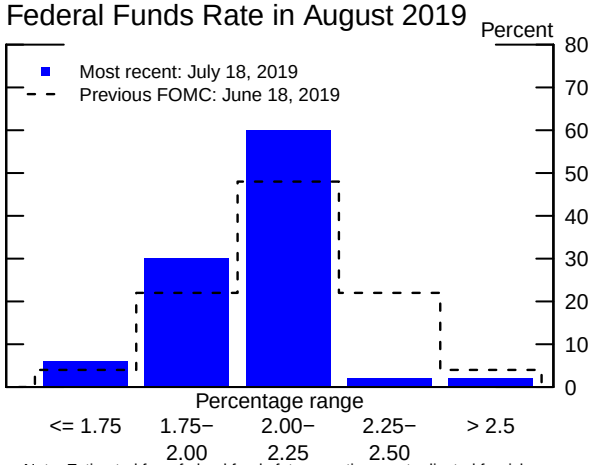
Note: Estimates based on smoothed nominal and inflation−indexed Treasury yield curves.
* Adjusted for lagged indexation of Treasury Inflation−Protected Securities (carry effect).
Source: Federal Reserve Bank of New York; Board staff calculations.

Implied Federal Funds Rate



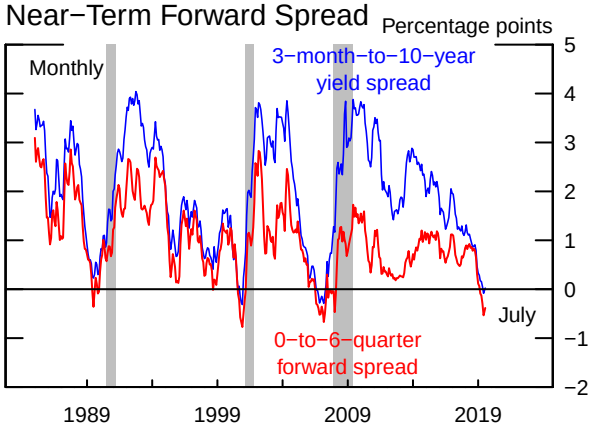
Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points. Model−based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premiums. The Blue Chip path is the average of respondents' expectations for the federal funds rate in the survey conducted through June 24 and published July 1.
Source: Bloomberg; Wolters Kluwer Legal and Regulatory Solutions U.S.; Board staff calculations.

Market−Implied Probability Distribution of the Federal Funds Rate in August 2019



Note: Estimated from federal funds futures options, not adjusted for risk premiums.
Source: CME Group; 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 June 2019 are monthly averages. Data for July 2019 are based on values for July 18. Shaded bars indicate U.S. recessions as defined by the National Bureau of Economic Research.
Source: Federal Reserve Bank of New York; Board staff calculations.

Financial Markets

DOMESTIC DEVELOPMENTS

Measures of expectations for near-term domestic monetary policy exhibited notable shifts and reversals over the intermeeting period and ended the period down slightly, on net, with market participants appearing to continue to attach the greatest weight to a 25 basis point reduction in the target range for the federal funds rate at the July meeting. Investors also continue to place some weight on a 50 basis point reduction. The June FOMC statement and press conference, as well as the Chair's remarks during his July *Monetary Policy Report* testimony, were interpreted as being more accommodative than had been expected, exerting downward pressure on market-based measures of policy expectations. However, expectations for monetary policy also reacted noticeably to better-than-expected economic data releases, such as the June employment report, and to a slight easing of near-term trade tensions at the G-20 meeting, which exerted partially offsetting upward pressure.

Consistent with significant variation in near-term expectations for monetary policy, market-based indicators of interest rate uncertainty remained somewhat elevated. The option-implied volatility for six-month-ahead one-year swap rates hovered near the top of its range since 2010.

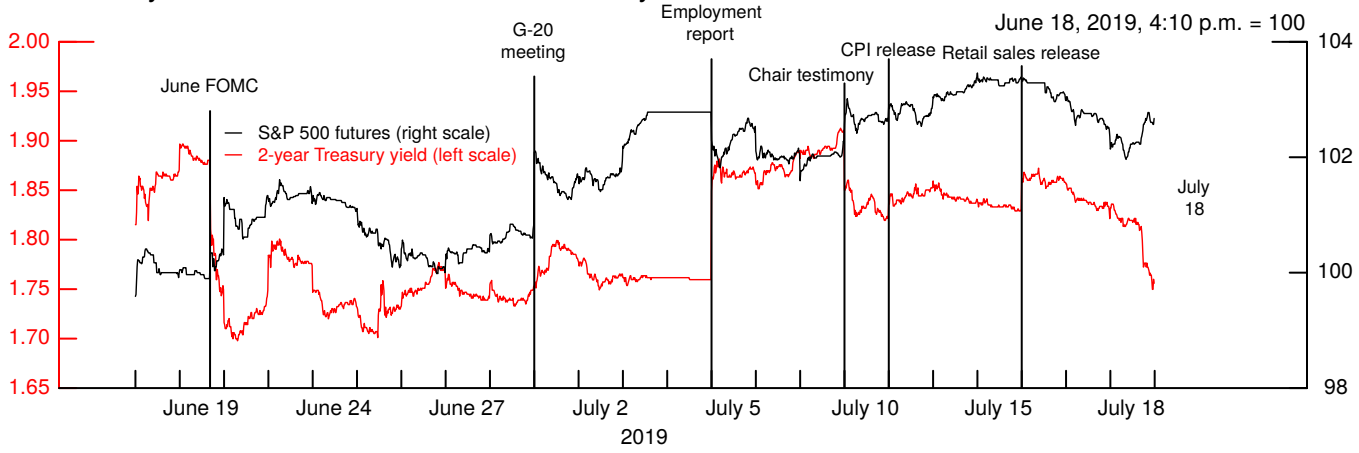
Market-based expectations for the federal funds rate for the end of this year and beyond moved down a bit on net. A straight read of OIS forward rates implies that the federal funds rate will decline about 80 basis points in 2019 and about 30 basis points in 2020. In contrast, a staff model that adjusts for term premiums indicates only a 49 basis point decline in the rate by year-end 2019 and is consistent with a flat path for the federal funds rate in 2020.

The nominal U.S. Treasury yield curve declined and steepened slightly, on net, over the intermeeting period. Nominal Treasury yields at the 2- and 10-year maturities fell 9 basis points and 4 basis points, respectively. Both the near-term forward spread and the spread between 10-year and three-month Treasury yields are still in the bottom decile of their respective distributions since 1971.[1] On net, since the June FOMC meeting, 5-year and 5-to-10-year TIPS-based inflation compensation moved up 16 basis points and 12 basis points, respectively, and now stand at 1.65 percent and 1.83 percent.

[1] Some research suggests that the near-term forward spread is a bit more informative in terms of predicting a transition to recession in the subsequent four quarters, compared with some popular measures such as the spread between 10-year and 2-year Treasury yields.

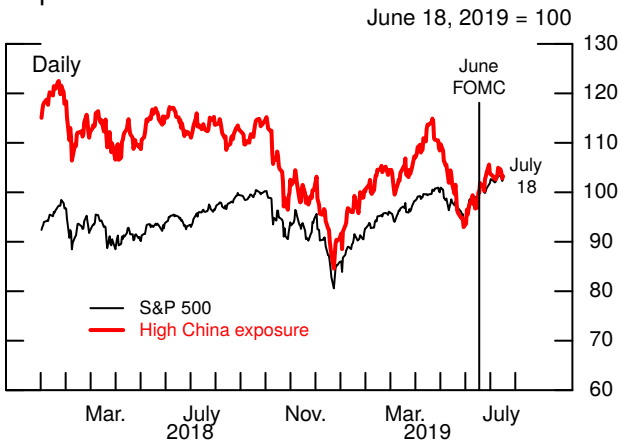
Corporate Asset Market Developments

Intraday S&P 500 Futures and 2-Year Treasury Yield



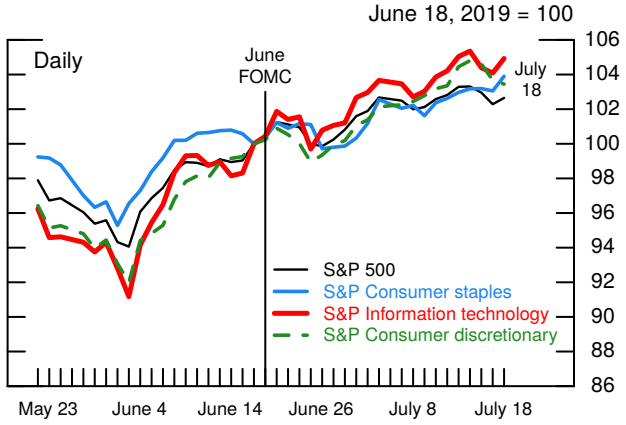
Note: Data are spaced at 5-minute intervals from 9:30 a.m. to 4:10 p.m.
Source: Bloomberg.

S&P 500 Index and China Exposure Portfolio



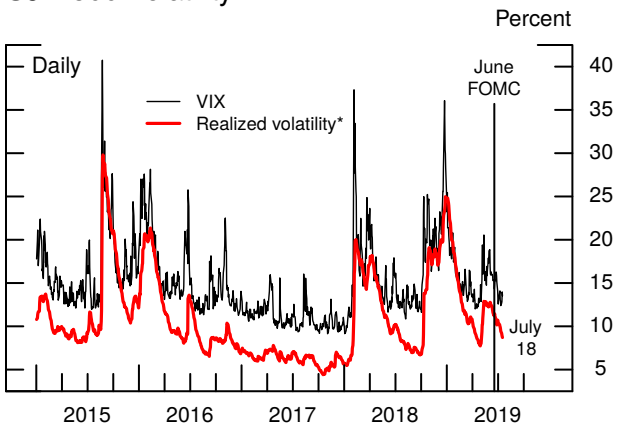
Note: China exposure is measured based on Board staff calculations of stock price sensitivity to the ASHR China A-Shares exchange-traded fund.
Source: Bloomberg; Compustat; Yahoo Finance.

Selected S&P 500 Stock Price Indexes



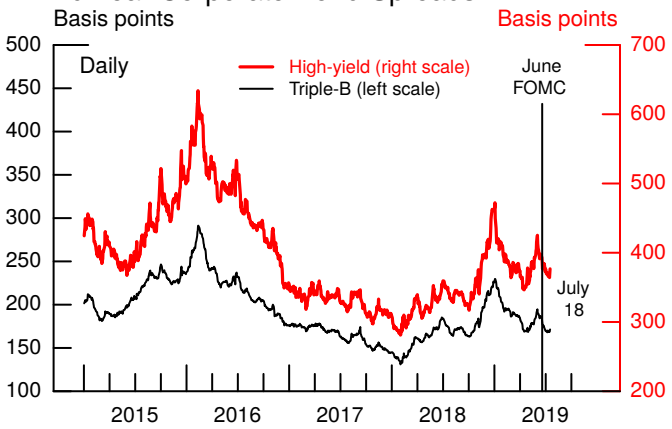
Source: Bloomberg.

S&P 500 Volatility



* 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: Spreads over 10-year Treasury yield.
Source: Merrill Lynch; Federal Reserve Bank of New York; Board staff calculations.

Financial Markets

More-accommodative-than-expected Federal Reserve communications, stronger-than-expected inflation data releases, and rising oil prices—amid increased geopolitical tensions with Iran—contributed to the upward pressure on inflation compensation.

Broad stock price indexes increased 2.7 percent, on net, over the intermeeting period, with notable increases following the June FOMC communications, the Chair's July *Monetary Policy Report* testimony, and announcements regarding trade negotiations following the G-20 meeting. Equity price increases were broad based across major sectors, with technology, consumer staples, and consumer discretionary firms outperforming broad indexes. Stock prices of firms with high exposure to China reacted more positively than stock prices of firms with low exposure to the announcement that China and the United States agreed at the G-20 meeting to hold off on imposing new tariffs. One-month option-implied volatility on the S&P 500 index (the VIX) decreased somewhat, on net, and now stands near the 24th percentile of its historical range.

Yields on corporate bonds decreased a touch, approaching historic lows. Spreads on investment-grade and speculative-grade corporate bonds over comparable-maturity Treasury yields narrowed 13 basis points and 17 basis points, respectively. Corporate bond spreads are somewhat low by historical standards but remain above the very low levels that prevailed in early 2018.

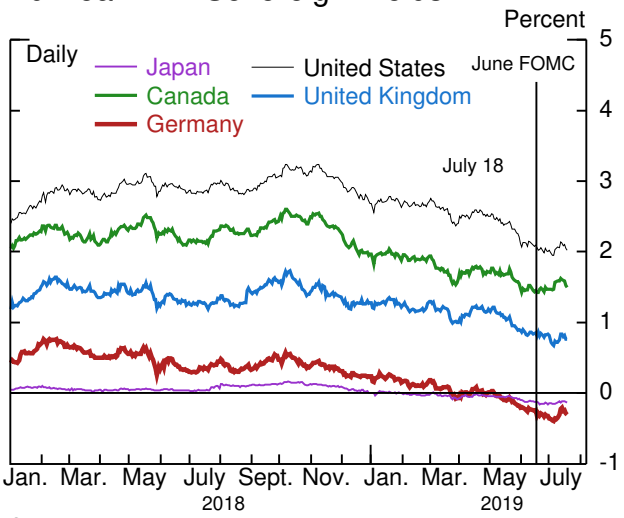
FOREIGN DEVELOPMENTS

Accommodative central bank communications, both in the United States and abroad, and some easing of trade tensions supported global risk assets over the intermeeting period. On balance, these developments weighed on the exchange value of the dollar, which ended the period slightly weaker.

Expectations for further policy accommodation in the euro area firmed following the nomination of Christine Lagarde as the next president of the European Central Bank (ECB). This development, along with ongoing reaction to ECB President Draghi's mid-June speech suggesting that the ECB would respond to a deterioration in the inflation outlook, pushed euro-area yields to record lows. Notably, the 10-year German bund yield briefly fell below the ECB's deposit facility rate of negative 40 basis points. However, core euro-area yields retraced their earlier declines following stronger-than-expected industrial production data for May released later in the period. Euro-area peripheral spreads narrowed significantly, including a 57 basis point drop in Italian spreads as the

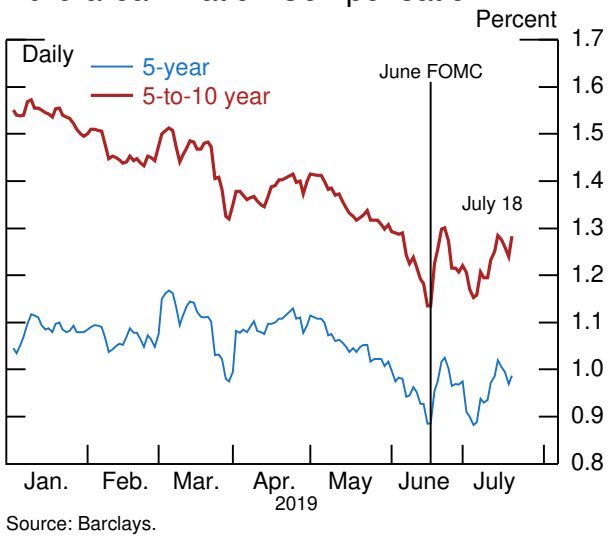
Foreign Developments

10-Year AFE Sovereign Yields



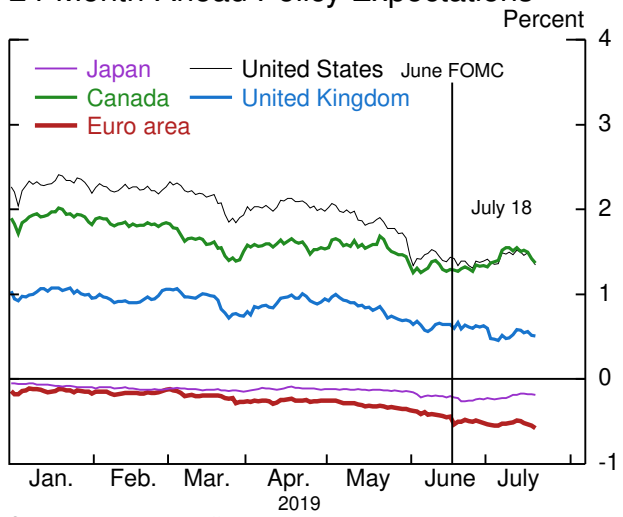
Source: Bloomberg.

Euro-area Inflation Compensation



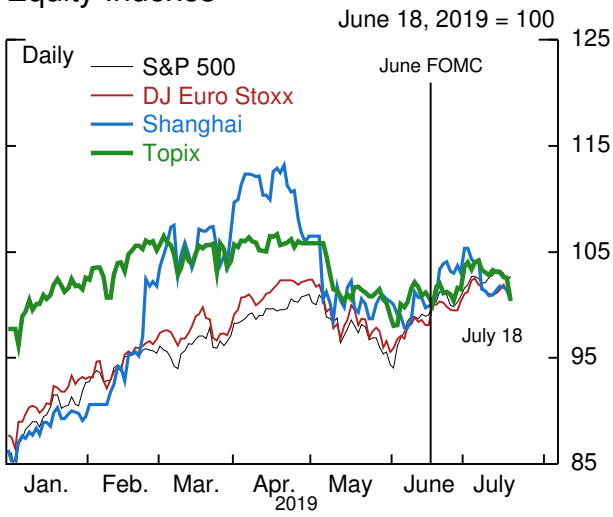
Source: Barclays.

24-Month-Ahead Policy Expectations



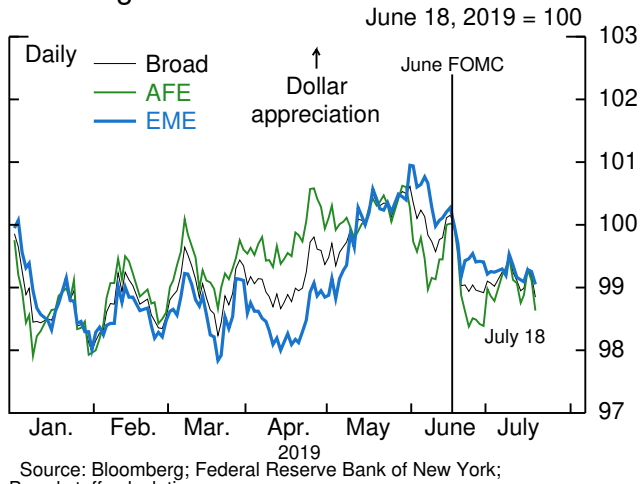
Source: Bloomberg, staff calculations.

Equity Indexes



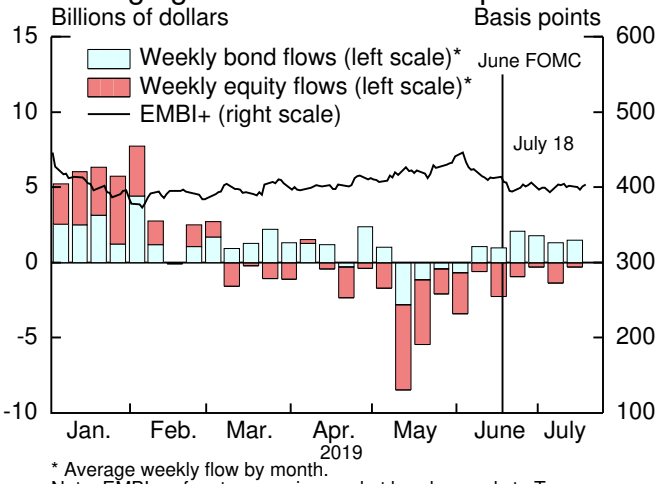
Note: Indexes denominated in local currency.
Source: Bloomberg.

Exchange Rates



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

Emerging Market Flows and Spreads



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

Financial Markets

government passed some fiscal consolidation measures. Extremely low yields continue to weigh on the profitability of European banks (see the box "Interest Rate Expectations and Market Performance of European Banks"). In Canada, strong consumer price and wage data releases pushed up long-term yields. These moves were partially offset by Bank of Canada communications emphasizing downside risks to the outlook, leaving the 10-year Canadian yield 8 basis points higher, on net, over the intermeeting period.

Global equity indexes increased slightly over the intermeeting period, supported by expectations for further monetary accommodation by major central banks and some lessening of trade uncertainty. At the G-20 meeting, the United States and China agreed to restart trade negotiations and to indefinitely postpone tariffs on the remaining $300 billion of Chinese imports. The U.S. Administration also announced an easing of restrictions on U.S. firms' sales to Huawei, which boosted global technology stocks.

The broad dollar index declined about 1 percent since the June FOMC meeting, in part as a result of narrowing yield differentials between the United States and AFEs. Reduced trade uncertainty contributed to the dollar depreciation against EME currencies. Expected policy accommodation by advanced-economy central banks supported EME asset prices, and EME bond flows were positive in recent weeks. Turkish assets came under pressure following the unexpected replacement of the head of the Turkish central bank; there was no evidence of spillovers into other markets.

SHORT-TERM FUNDING MARKETS AND FEDERAL RESERVE OPERATIONS

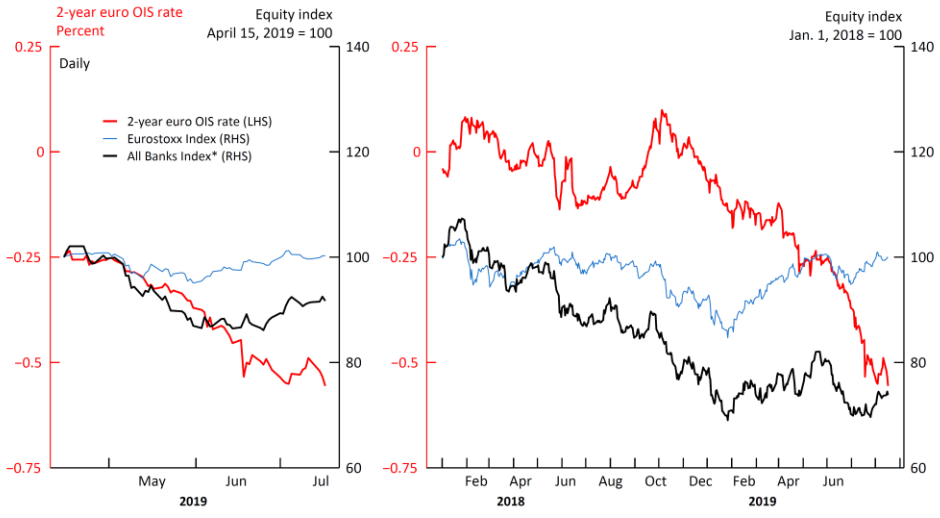
Conditions in domestic short-term funding markets remained stable. The EFFR averaged 2.40 percent over the intermeeting period but reached a high of 2.42 percent, its highest spread to IOER yet but still well within the target range. Secured rates were also elevated, with the SOFR averaging 2.44 percent. Rates on overnight CP changed little since the previous FOMC meeting, while rates on longer-term unsecured instruments such as three-month negotiable CDs declined on net. ON RRP take-up increased somewhat over the intermeeting period, averaging about $12 billion per day, reflecting the attractiveness of the ON RRP relative to low Treasury bill rates. Assets under management of government MMFs continued to increase over the period.

Interest Rate Expectations and Market Performance of European Banks

Disappointing data and dovish communications from the European Central Bank (ECB) over the past several months, stressing a weaker growth outlook, have contributed to a further decline in the expected path of ECB policy rates and raised concerns about the earnings outlook for European banks. Since mid-April, the broad index of European corporate share prices is little changed, but European bank share prices have declined notably. Over the same period, market participants have not priced in additional default risk for financial firms compared to corporates. This fact suggests market participants assess that lower-for-longer interest rates will not have significant effects on the safety and soundness of large European banks and, by implication, on financial stability.

A weaker European economy would likely depress profits at both European corporates and banks; however, banks would bear the brunt of lower-for-longer interest rate policies, which have been shown to compress banks' net interest margins.[1] Indeed, we see a notable divergence of stock performance of European corporates and banks. As shown in figure 1, coinciding with the steep decline in expected ECB policy rates implied by overnight index swaps (the red line), the European bank stock index (the black line) has underperformed the broad European stock index (the blue line).

Figure 1: European Stock Indexes and 2-Year Euro Overnight Index Swap Rate



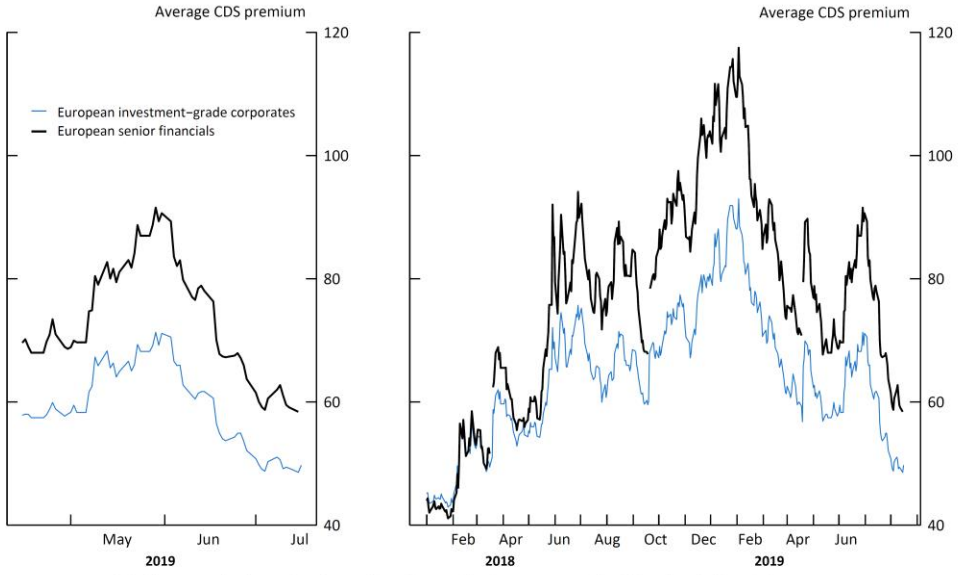
Note: Last data value is July 17, 2019.
*All Banks Index is an index of bank stock prices for 32 European banks weighted by total bank assets as of 2019:Q1.
Source: Bloomberg; staff calculations.

[1] For more details, see Stijn Claessens, Nicholas Coleman, and Michael Donnelly (2018), " 'Low-for-Long' Interest Rates and Banks' Interest Margins and Profitability: Cross-Country Evidence," *Journal of Financial Intermediation*, vol. 35 (July), pp. 1–16; see also Committee on the Global Financial System (2018), "Financial Stability Implications of a Prolonged Period of Low Interest Rates," CGFS paper 61 (Basel, Switzerland: Bank for International Settlements, July), https://www.bis.org/publ/cgfs61.pdf.

The underperformance of European banks relative to the broader market is not new. For example, the right panel of figure 1 shows that the divergence in corporate and bank stock prices largely coincides with the overall downward trend in ECB policy expectations since late 2018. The declines in the bank index are broad based and influenced only slightly by the roughly 50 percent decline since January 1, 2018, in Deutsche Bank's stock price. Deutsche Bank's stock price has been adversely affected by chronically low profitability, legacy problems, market pessimism about its newest, drastic restructuring plan, and the recent step-down in interest rate expectations.

The market does not appear to be inferring any implications of the changes in the euro-area economic outlook and ECB policy rates for financial stability because, on net, the cost of protection against default risk of European financials has fallen and has not changed relative to that of European corporates, as illustrated in figure 2. Credit default swap (CDS) indexes of senior debt of European financials (the black line) and European investment-grade corporates (the blue line) have both declined in recent weeks to their lowest levels since early 2018.[2] Average CDS premiums of European financials' subordinated debt (not shown), which is more sensitive to default risk than senior debt, are also little changed. These trends imply that the factors driving corporate default risk—mainly the economic outlook—are also driving the default risk of European financials, and that expectations of lower-for-longer rates do not appear to be have added to default risk of European banks.

Figure 2: European CDS Indexes

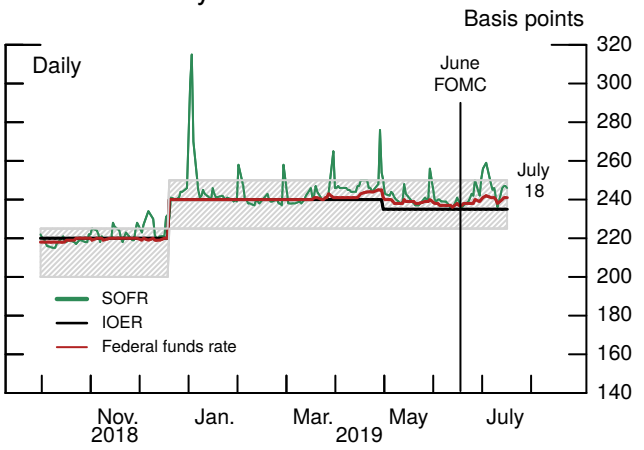


Note: The indexes may be changed each March and September in response to illiquidity of underlying CDS contracts. These changes can cause discontinuities in the indexes. Last data value is July 16, 2019.
Source: Markit.

[2] The European financials index includes banks (roughly 75 percent weight) and insurance companies (roughly 25 percent weight).

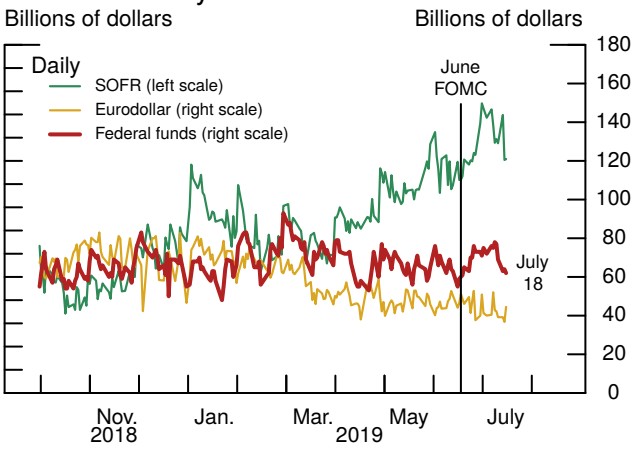
Short-Term Funding Markets

Selected Money Market Rates



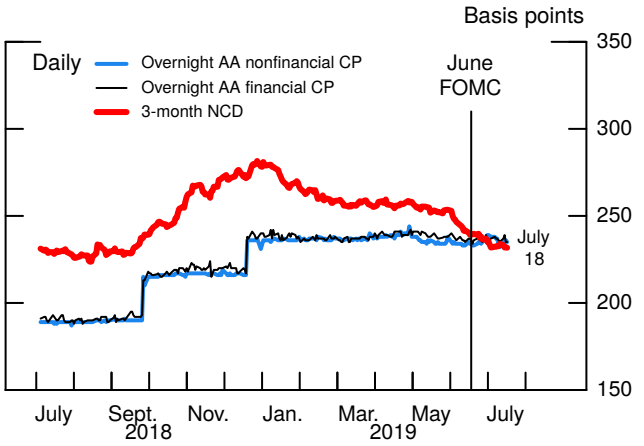
Note: SOFR is Secured Overnight Financing Rate. IOER is interest on excess reserves. Federal funds rate is a weighted median. Shaded area is the target range for the federal funds rate.
Source: Federal Reserve Bank of New York; Federal Reserve Board.

Selected Money Market Volumes



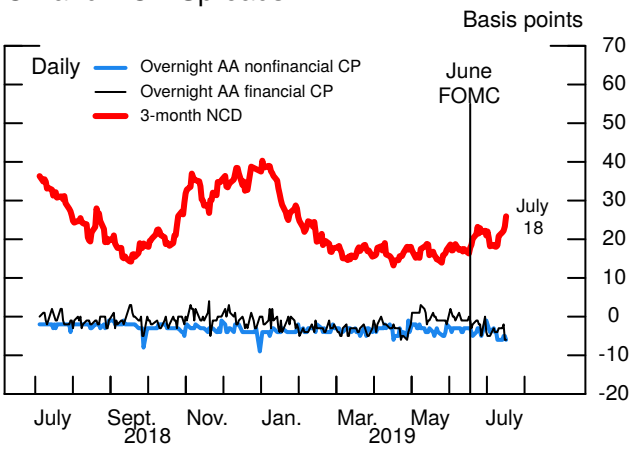
Note: SOFR is Secured Overnight Financing Rate.
Source: Federal Reserve Bank of New York; Federal Reserve Board.

CP and NCD Rates



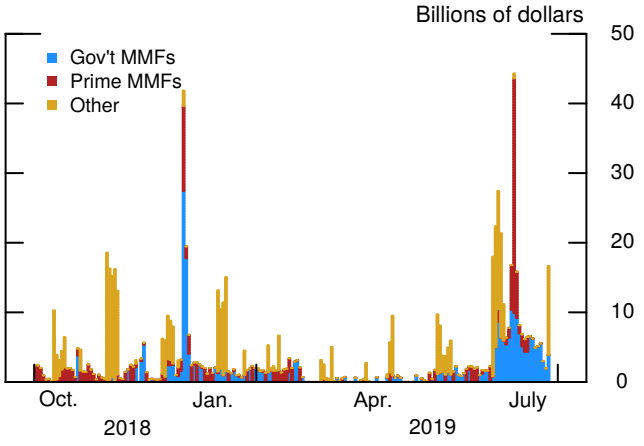
Note: CP is commercial paper; NCD is negotiable certificate of deposit. NCD rates are computed as 5-day moving averages.
Source: Depository Trust & Clearing Corporation.

CP and NCD Spreads



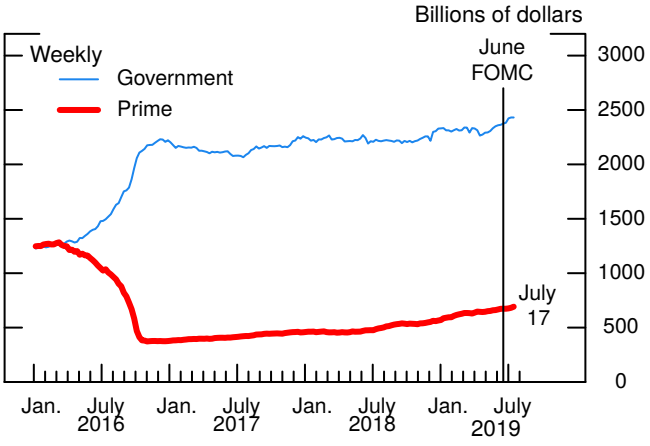
Note: CP is commercial paper; NCD is negotiable certificate of deposit. Overnight CP spreads are to the effective federal funds rate and NCD spreads to OIS. NCD spreads are 5-day moving averages.
Source: Depository Trust & Clearing Corporation.

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.

MMF Assets under Management



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

Financial Markets

Financing Conditions for Businesses and Households

Financing conditions for businesses and households were little changed over the intermeeting period and remained generally supportive of spending. Net debt financing for businesses slowed somewhat from May's brisk pace but nonetheless posted solid gains in June. Credit standards for loans to households generally remained favorable for all but the riskiest borrowers.

- Corporate bond issuance moderated in June from the rapid pace in May, though speculative-grade bond issuance increased strongly and yields neared historical lows. Institutional leveraged loan issuance picked up in May before returning to a moderate pace in June.

- Banks in the July 2019 SLOOS reported that standards for commercial and industrial (C&I) loans to large and middle-market firms eased, on net, in the second quarter. Even so, C&I loan growth was fairly modest over the quarter as a whole.

- Mortgage rates remained near their lowest level in two years, and credit standards continued to be generally accommodative.

- Consumer credit continued to expand at a moderate pace, with borrowing rates either flat or easing.

BUSINESS FINANCING CONDITIONS

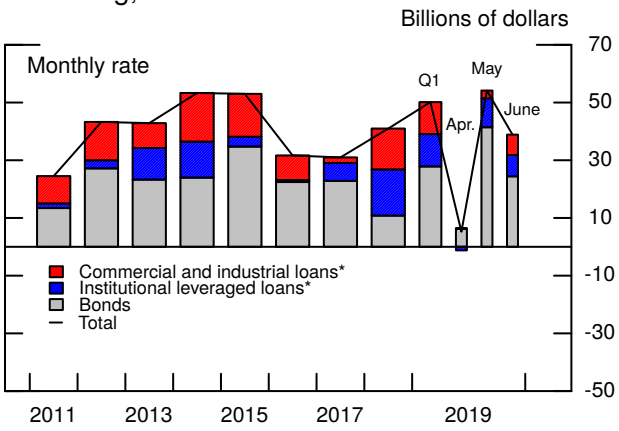
Nonfinancial Businesses

Financing conditions for businesses remained accommodative, with net debt financing expanding in June at a pace in line with the average for recent years. Total gross corporate bond issuance, while down from its outsized pace in May, remained robust in June, with speculative-grade issuance increasing strongly and yields on corporate bonds slipping further to near historical lows. Gross institutional leveraged loan issuance increased notably in May but subsequently returned to the more moderate pace observed earlier this year.

Responses to the July 2019 SLOOS indicated that, on net, banks continued to ease standards and terms on C&I loans to large and middle-market firms in the second quarter, with many citing aggressive competition from other bank or nonbank lenders as the reason for doing so. Standards for loans to small firms changed little on net. Consistent

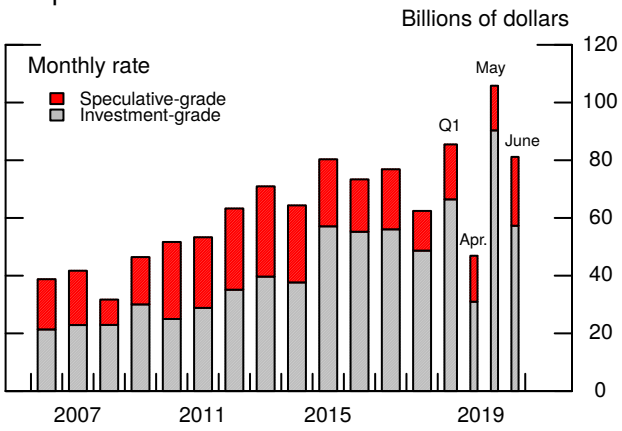
Business Finance

Selected Components of Net Debt Financing, Nonfinancial Firms



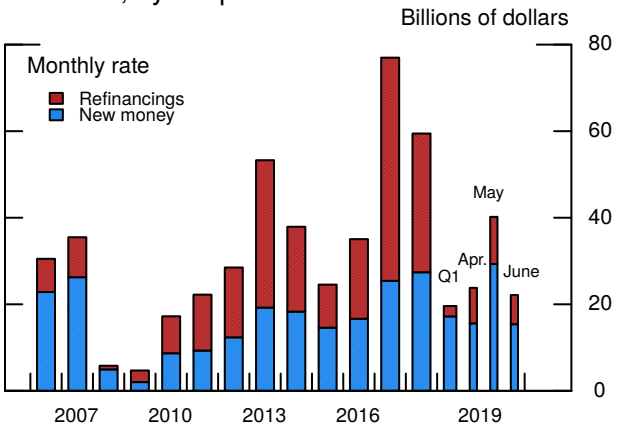
* Period-end basis.
Source: Mergent Fixed Income Securities Database; Thomson Reuters LPC; Federal Reserve Board.

Gross Issuance of Nonfinancial Corporate Bonds



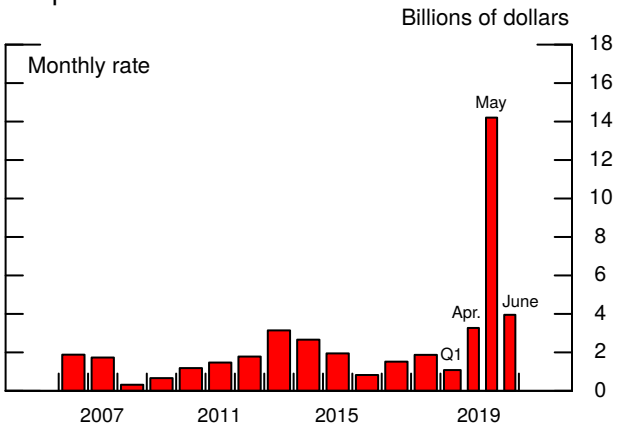
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.
Source: Mergent Fixed Income Securities Database.

Institutional Leveraged Loan Gross Issuance, by Purpose



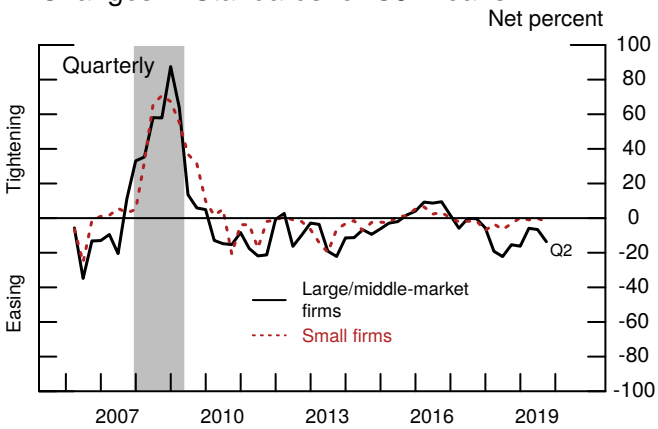
Source: Thomson Reuters LPC.

IPO Issuance by Nonfinancial Corporations



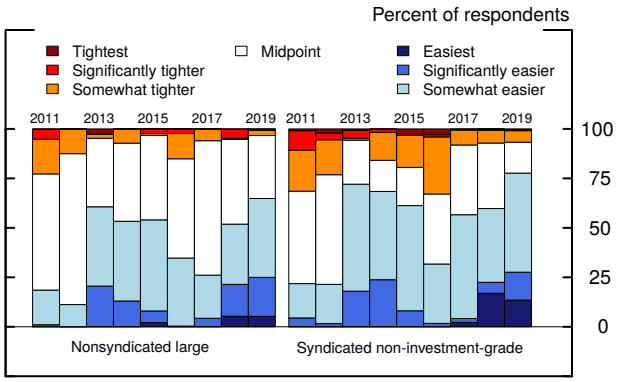
Note: IPO is initial public offering.
Source: Securities Data Company.

Changes in Standards for C&I Loans



Note: Banks' responses are weighted by the outstanding amount of the relevant loan categories on their balance sheets at the end of the previous quarter. The shaded bar indicates a period of business recession as defined by the National Bureau of Economic Research. C&I is commercial and industrial.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Level of Standards on Commercial and Industrial Loans at Domestic Banks



Note: Banks were asked to describe their current level of standards in relation to the midpoint of the range of standards at their bank between 2005 and the present. Responses are weighted by survey respondents' commercial and industrial holdings reported in the Q1 Call Reports of the given year.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Financing Conditions

with the sustained trend of easing, banks reported that the current level of standards for C&I loans was on the easier end of the range of standards that have prevailed since 2005. Apparently, easy supply conditions were offset by slackening demand, as C&I loan growth was weak overall in the second quarter despite a modest pickup in June.

Public equity issuance has been strong in recent months. Very high levels of equity issuance through both initial and seasoned offerings in May were followed up with solid numbers in June. Overall, the market volatility in May left no discernible imprint on corporate fundraising.

The credit quality of nonfinancial corporations continued to show signs of stabilization in June, following some deterioration earlier in the year. Although the six-month trailing nonfinancial bond default rate edged up in May, June saw few credit ratings changes while the KMV expected year-ahead default rate ticked down during the intermeeting period to its lowest level since last September. Meanwhile, expectations of year-ahead earnings per share for S&P 500 firms have been revised down only a touch in recent months after sharp downward revisions around the turn of the year.

Small Businesses

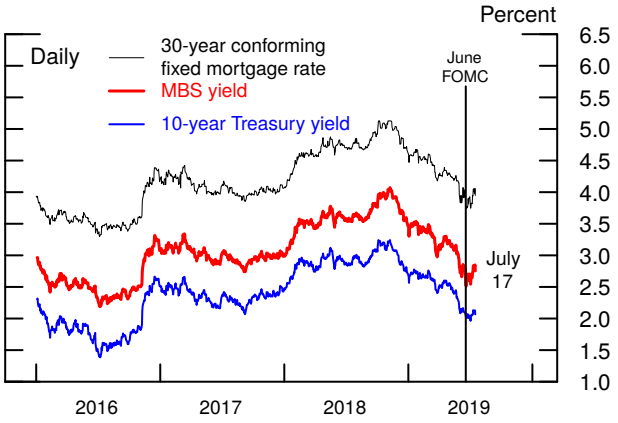
Available data suggest that the supply of credit to small businesses remained accommodative, while demand continued to be somewhat weak. Small business loan originations, as measured by the Thomson Reuters/PayNet Small Business Lending Index, continued to rise in May. In addition, in the June National Federation of Independent Business (NFIB) survey, the net percent of respondents reporting that it was harder to obtain credit now than three months ago was near post-crisis lows. At the same time, the demand for credit by small businesses appears to have remained muted. Over half of small business owners in the June NFIB poll continued to report that they were not interested in a loan, and a significant net share of SLOOS respondents reported weaker demand for C&I loans from small firms in the second quarter.

Commercial Real Estate

Financing conditions remained generally accommodative for commercial real estate (CRE) despite a modest deceleration in bank loan growth. Banks in the July SLOOS reported that standards were about unchanged, on net, in the second quarter for most CRE loan categories, although standards were reportedly a bit tighter for multifamily loans—the slowest-growing CRE category at banks for that period. Agency

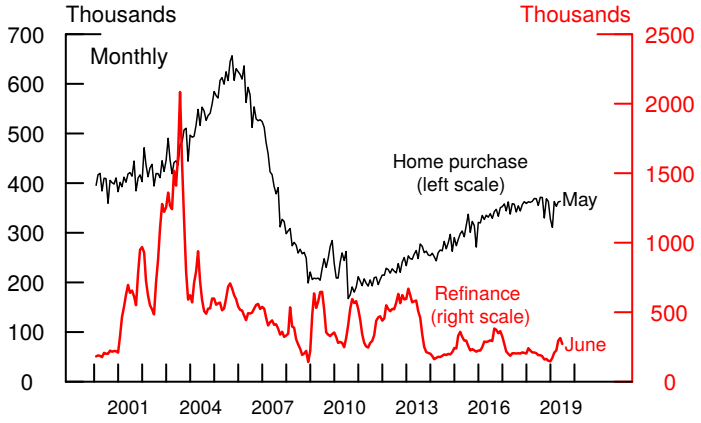
Household Finance

Mortgage Rate and MBS Yield



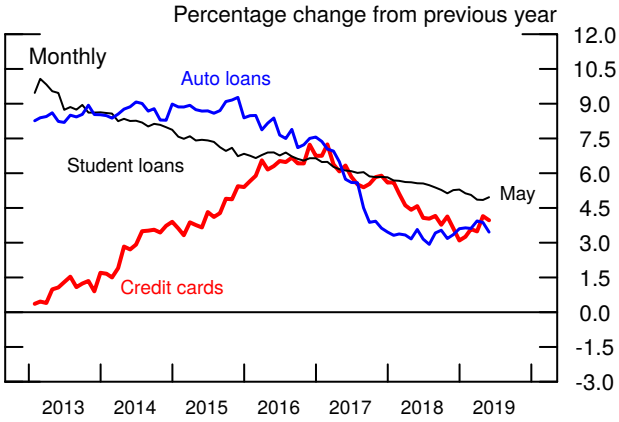
Note: Through May 31, 2019, the mortgage-backed securities (MBS) yield is the Fannie Mae 30-year current-coupon rate. From June 3, 2019, forward, the MBS yield is the uniform MBS 30-year current-coupon rate.
Source: For MBS yield, Barclays; for mortgage rate, Loansifter; for Treasury yield, Federal Reserve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

Purchase and Refinance Originations



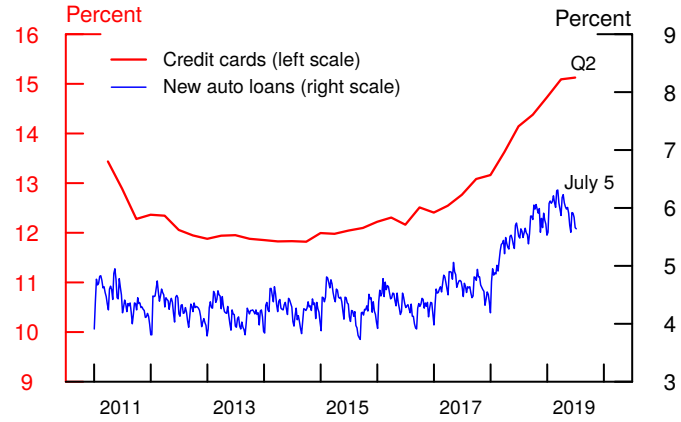
Note: The data are seasonally adjusted by Federal Reserve Board Staff.
Source: For values before 2019, data reported under the Home Mortgage Disclosure Act of 1975; for values in 2019, Board staff estimates.

Consumer Credit



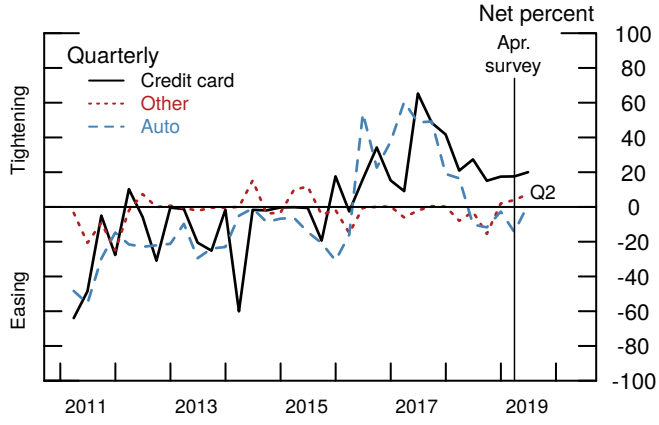
Source: Federal Reserve Board, Statistical Release G.19, "Consumer Credit."

Consumer Interest Rates



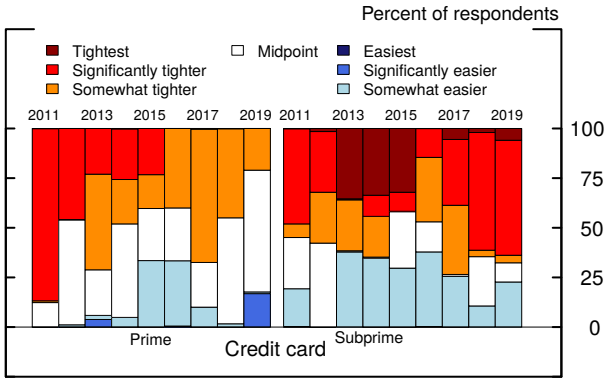
Note: Credit card data reflect rates at commercial banks on all credit card plans; data are reported quarterly and not seasonally adjusted. Auto loans data are reported weekly and not seasonally adjusted.
Source: For credit cards, Federal Reserve Board; for auto loans, J.D. Power.

Changes in Standards for Consumer Loans



Note: Banks' responses are weighted by the outstanding amount 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.

Level of Standards on Credit Card Loans at Domestic Banks



Note: Banks were asked to describe their current level of standards in relation to their midpoint range of standards between 2005 and the present. Responses are weighted by survey respondents' credit card holdings reported in the Q1 Call Reports of the given year.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Financing Conditions

and non-agency commercial mortgage-backed securities issuance was strong in the second quarter, as yield spreads ticked down.

MUNICIPAL GOVERNMENT FINANCING CONDITIONS

Credit conditions for state and local governments in municipal bond markets remained accommodative on balance. Gross issuance of municipal bonds was robust in May and June, with new capital raising accounting for the majority of the issuance. Municipal bond yields, and spreads over comparable-maturity Treasury securities, decreased a touch in both secondary and primary markets.

HOUSEHOLD FINANCING CONDITIONS

Residential Real Estate

Financing conditions in the residential mortgage market remained accommodative over the intermeeting period. Mortgage rates rose 18 basis points since the June FOMC meeting but remained about 1 full percentage point below their late-2018 level. Underwriting standards—as measured by both SLOOS responses and maximum allowable debt-to-income ratios—were little changed over the second quarter, although they remain tight for borrowers with low credit scores. These conditions have supported a modest increase in origination volume in recent months, with home-purchase originations having returned to around the solid levels seen in 2017.

Refinance originations have risen as well but remain near historical lows. Although many borrowers look like they could benefit from refinancing at the current rate, refinancing activity is likely to remain muted. Staff calculations indicate that most of the borrowers who could benefit from refinancing previously refrained from doing so during periods with similarly low rates. These borrowers may be unaware of the potential savings or may be unable or unwilling to refinance for other reasons.

Consumer Credit

Financing conditions in consumer credit markets were little changed in recent months and remained generally supportive of consumer spending. Growth in consumer credit in April and May was up a bit from earlier in the year due to a pickup in credit card balances. Meanwhile, interest rates on credit card accounts were little changed in the second quarter, while rates on auto loans continued to slip lower, on net, from highs observed earlier this year.

Banks in the July SLOOS continued to report tightened standards for credit cards over the second quarter, tightening that was likely concentrated on individuals with low credit scores. Indeed, SLOOS respondents also indicated that the level of standards for subprime credit cards continued to be on the tighter end of their post-2005 range, while standards for prime credit cards remained around the midpoint of their range. Nonetheless, another indicator of credit card supply—the mail volume of credit card offers—rose notably for nonprime borrowers in the second quarter.

FINANCING AND FINANCIAL CONDITIONS INDEXES

A staff index that provides a measure of financing conditions for nonfinancial corporations indicates that financing conditions have eased slightly over the intermeeting period and remain accommodative relative to historical standards. The modest easing in the index is consistent with the recent increase in equity prices and narrowing of corporate spreads over the same period. As shown in the appendix to this Tealbook section, other publicly available financial conditions indexes, which aggregate a large set of financial variables into a summary series, also pointed to either roughly unchanged or slightly more accommodative financial conditions. Overall, these indexes indicate that broad financial conditions are either accommodative or close to a neutral level relative to historical standards.

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]

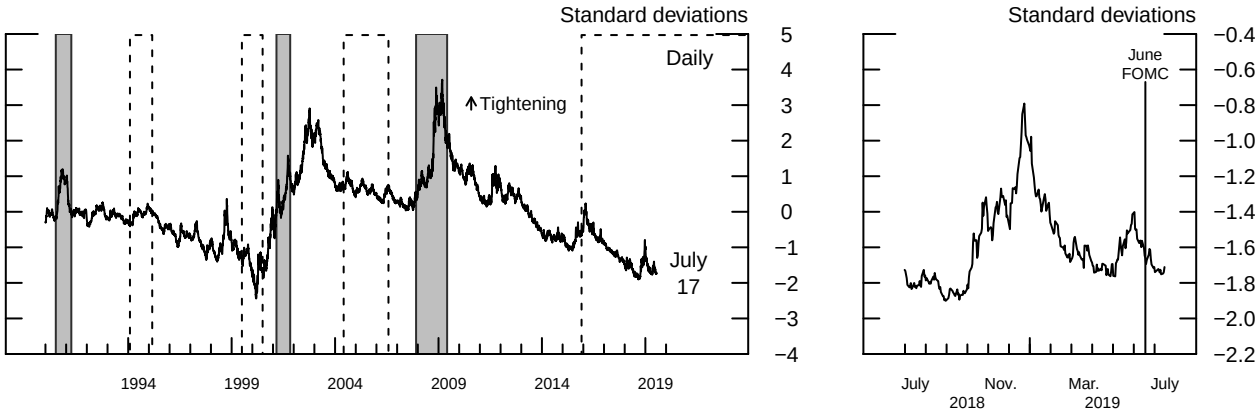
The other FCIs are constructed by aggregating a large set of financial variables into a summary series using various statistical methods. While these indexes provide a useful summary of broad financial market developments, the movements in these indexes may reflect both changes in financing conditions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

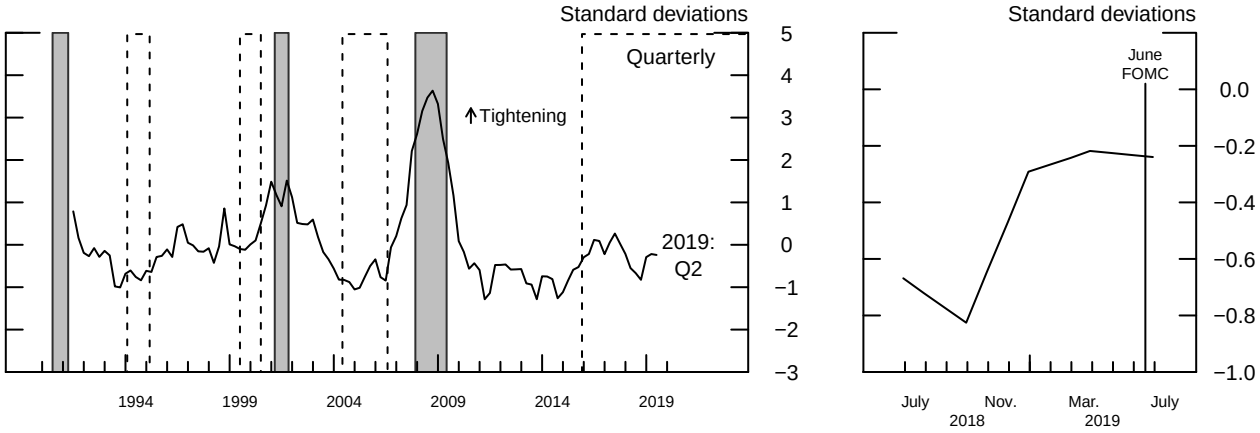
Selected Financial Conditions Indexes

Staff FCI for Nonfinancial Corporations



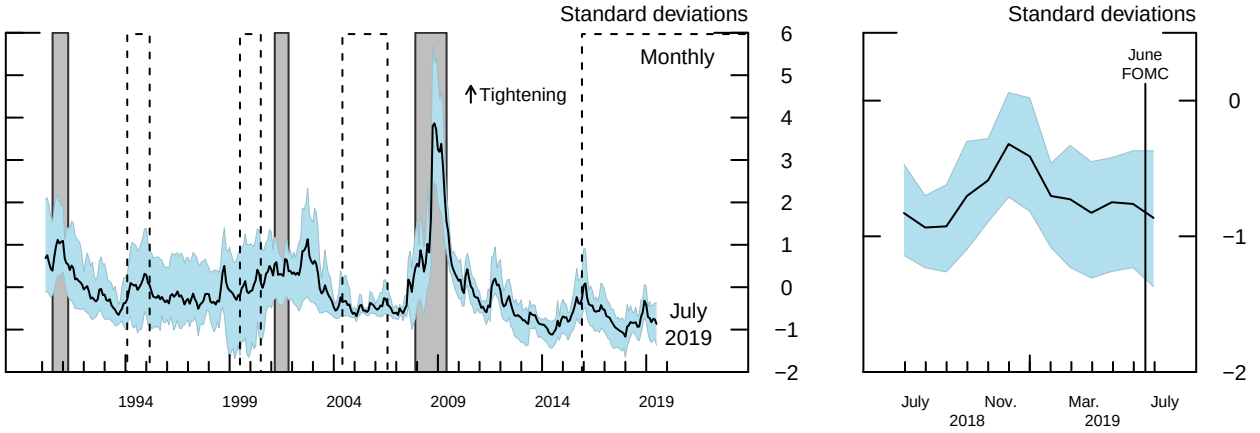
Note: The financial conditions index (FCI) is the deviation from the long−run relation between the systematic components of the cumulative log returns of 2 portfolios of firms with credit ratings above and just below investment grade. The systematic components are derived from the 5−factor Fama−French 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

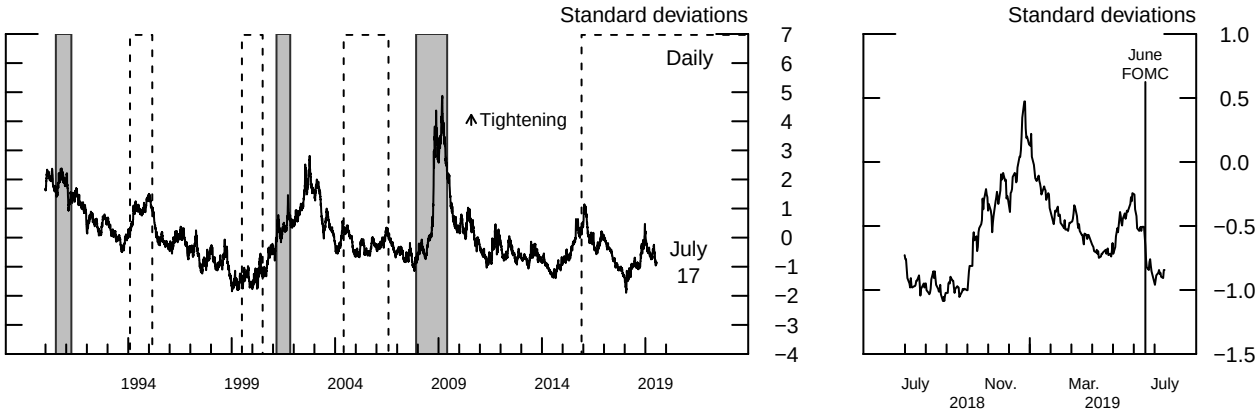


Note: Mean FCI represents the mean of FCIs developed by Goldman Sachs and the Federal Reserve Banks of Chicago, St. Louis, and Kansas City. The blue shaded region represents the range of these 4 standardized FCIs.
Source: Bloomberg; The Federal Reserve Banks of Chicago, St. Louis, and Kansas City.

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.

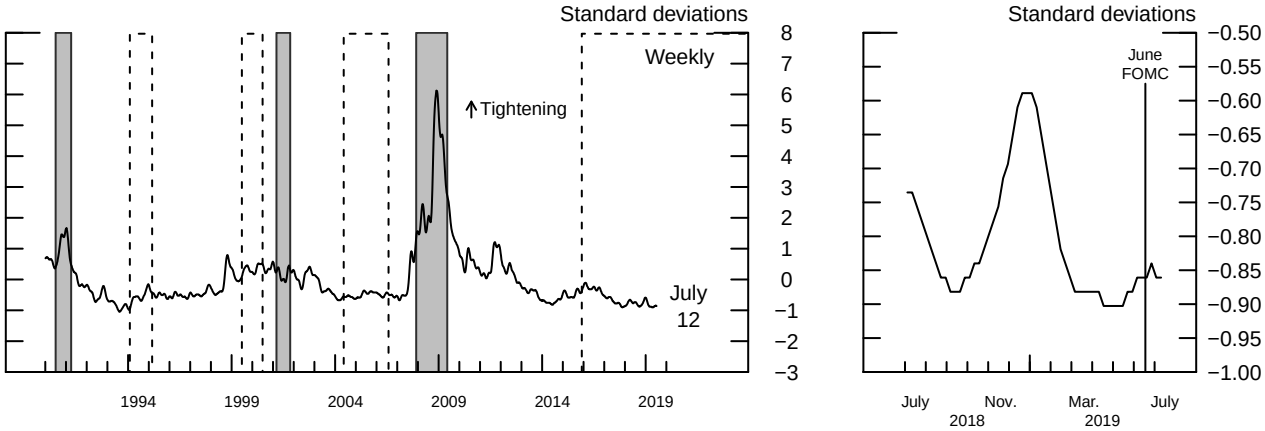
Selected Financial Conditions Indexes (continued)

Goldman Sachs FCI



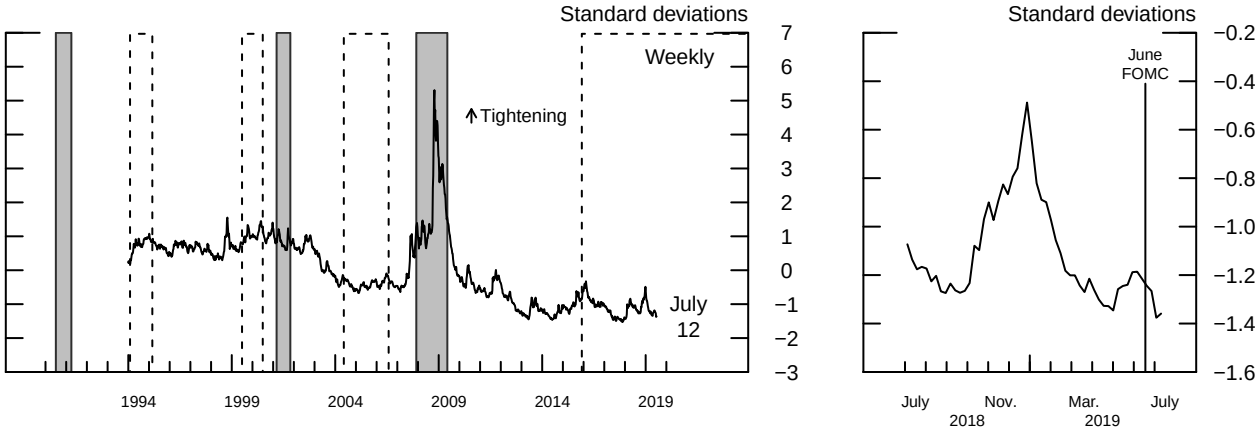
Note: The index is a weighted average of 5 financial variables: the federal funds rate, the 10−year Treasury yield, the triple−B yields spreads to Treasury, the S&P price−to−earnings ratio, the broad value of the U.S. dollar. Weights are pinned down by the contribution of each financial variable on real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

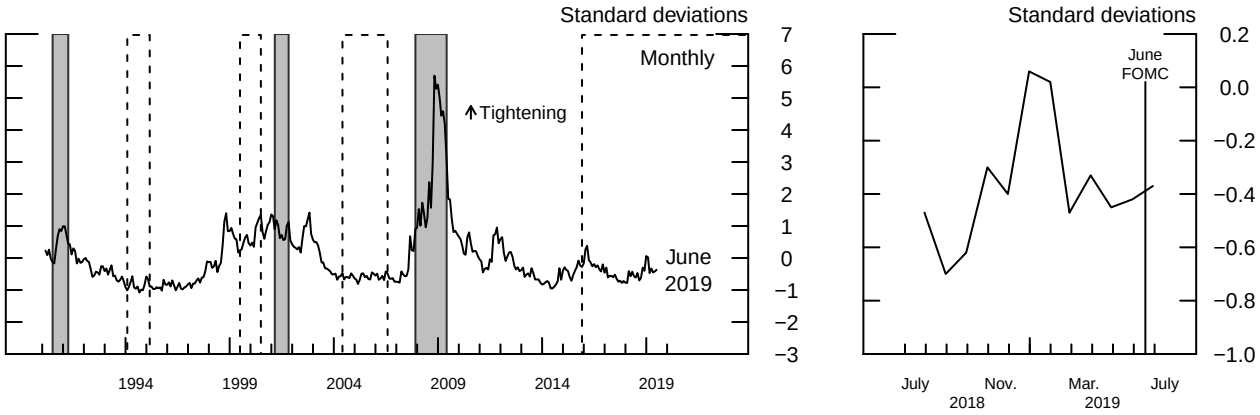


Note: The index is the principal component of 18 variables including short− and long−term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, breakeven inflation rate, and the S&P 500 index.
Source: Federal Reserve Bank of St. Louis.

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 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 view the uncertainty around our forecast of economic activity as being broadly in line with the average over the past 20 years (the benchmark used by the FOMC), a period that includes the most recent two recessions along with a number of other episodes with elevated uncertainty and market volatility. Moreover, in line with our assessment in the June Tealbook, we still judge the risks around our baseline projection for real GDP growth to be tilted to the downside over the next year as well as further out, with a corresponding skew to the upside for the unemployment rate. Important factors in our assessment are that trade policies, foreign economic developments, and federal policies for budget appropriations and the debt limit—along with financial market reactions—are more likely to move in directions that would have significant negative effects on U.S. economic activity than to resolve more favorably than assumed. Also, the softness in business investment and manufacturing production so far this year could be pointing to a more substantial slowing in economic growth than in the baseline. Of course, there are risks to the upside as well. Many of the underlying fundamentals for household spending and business investment remain solid—bolstered, in part, by the 2017 tax cuts—with a strong labor market, favorable financial conditions, and upbeat readings on consumer (but not business) sentiment. In these circumstances, consumer spending could expand at a pace that is faster than in the staff projection, which, in turn, could help boost business investment.

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 remains elevated at 65 percent.[1] The recession probability estimate from a model-averaging framework that uses a selection of real and financial variables is 36 percent, which is above the unconditional recession probability of 23 percent but lower than in the previous Tealbook.[2] Also, 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 currently 16 percent and rises to above 30 percent by the end of the medium term. Given the

[1] This estimate should be interpreted with some caution given the long sample period over which the model is estimated and secular trends—particularly declining term premiums—that may materially affect its predictions.

[2] Since the previous Tealbook, the decline in corporate bond spreads and the VIX, along with the strong recent gains for real PCE and payroll employment, contributed significantly to the downward revision in this recession probability estimate. (The set of financial variables used in this estimation framework includes the term spread.)

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	.09	.05	.02	.05
Previous Tealbook	.06	.04	.01	.04
Between 1 3/4 and 2 1/4 percent				
Current Tealbook	.28	.27	.41	.25
Previous Tealbook	.27	.24	.41	.24
Less than 1 percent				
Current Tealbook	.07	.13	.02	.19
Previous Tealbook	.11	.18	.02	.20

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	.01	.03	.14	.04
Previous Tealbook	.02	.03	.11	.04
Decrease by 1 percentage point				
Current Tealbook	.09	.03	.02	.05
Previous Tealbook	.08	.03	.02	.05

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	.09	.36	.65	.23
Previous Tealbook	.08	.11	.51	.67	.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.

proximity of the federal funds rate to the ELB, monetary policy may have less capacity to offset significant negative economic shocks than positive ones, contributing to a downside skew in economic outcomes. In addition, as shown in the exhibit "Conditional Distributions of Macroeconomic Variables 2 Years Ahead," the estimated distributions are currently skewed to the upside for the unemployment rate and skewed to the downside for GDP growth two years ahead.[3] In contrast to these two-year-ahead estimates and our judgmental assessment of overall risks, the four-quarter-ahead estimates of forecast risks around GDP growth and the unemployment rate, presented in the exhibit "Time-Varying Macroeconomic Risk 1 Year Ahead," are not unusually wide or skewed.

With regard to inflation, we continue to see average uncertainty around the projection, but with the risks to the forecast for economic activity tilted to the downside, the risks to the inflation projection would also tend to have at least some downward skew. Moreover, even though the latest monthly data on consumer prices have been firmer than the readings from early this year, inflation so far has still been below our expectations from the beginning of this year. In addition, underlying trend inflation, and thus longer-run inflation expectations, could currently be lower than assumed in the baseline. Also, the exchange value of the dollar could appreciate more than expected and put downward pressure on inflation. Of course, there are also risks to the upside. For example, an extended period with unusually tight resource utilization could eventually lead to greater upward pressure on wages and prices, consistent with the predictions of models that emphasize nonlinear effects of resource utilization on inflation. In addition, an unexpectedly widespread and sustained increase in trade barriers could lead to temporarily higher inflation.

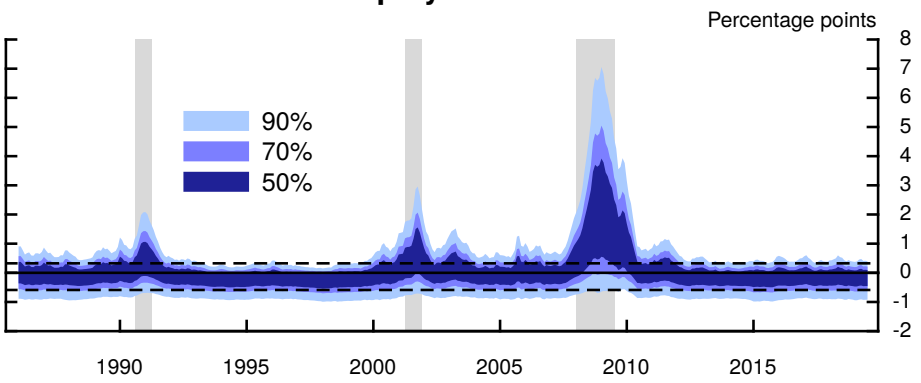
All of these inflation risks would tend to be of relatively modest size as long as inflation expectations remained reasonably well anchored. However, the risks could increase substantially, in either direction, if expectations were to follow actual inflation up or down. Such

[3] The results shown in the exhibit are consistent with recent research, using quantile regressions, on the distribution of fluctuations in the unemployment rate and in real GDP growth. For the unemployment rate, see Michael Kiley (2018), "Unemployment Risk," Finance and Economics Discussion Series 2018-067 (Washington: Board of Governors of the Federal Reserve System, September), https://doi.org/10.17016/FEDS.2018.067. For real GDP growth, see Tobias Adrian, Federico Grinberg, Nellie Liang, and Sheheryar Malik (2018), "The Term Structure of Growth-at-Risk," Hutchins Center on Fiscal and Monetary Policy Working Paper 42 (Washington: Brookings Institute, August), https://www.brookings.edu/wp-content/uploads/2018/08/WP42-NL-updated.pdf. The results of their research suggest that the upside risk to the unemployment rate and the downside risk to GDP growth are more pronounced in the medium term—specifically, two to three years ahead—when the unemployment rate is low or credit growth is high.

Risks & Uncertainty

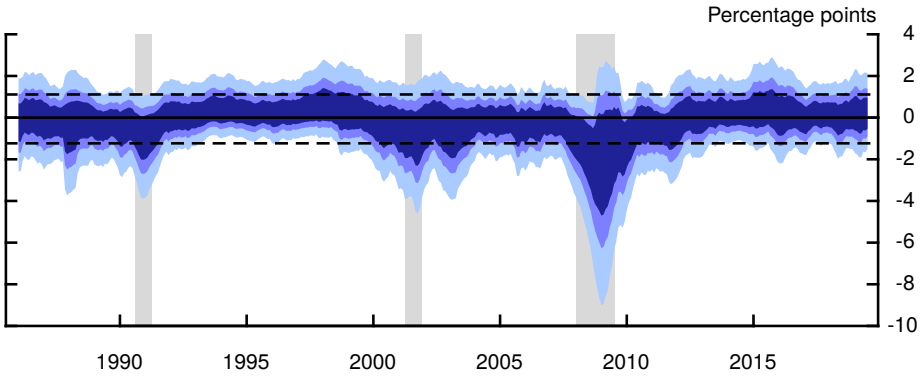
Time-Varying Macroeconomic Risk 1 Year Ahead

Unemployment Rate



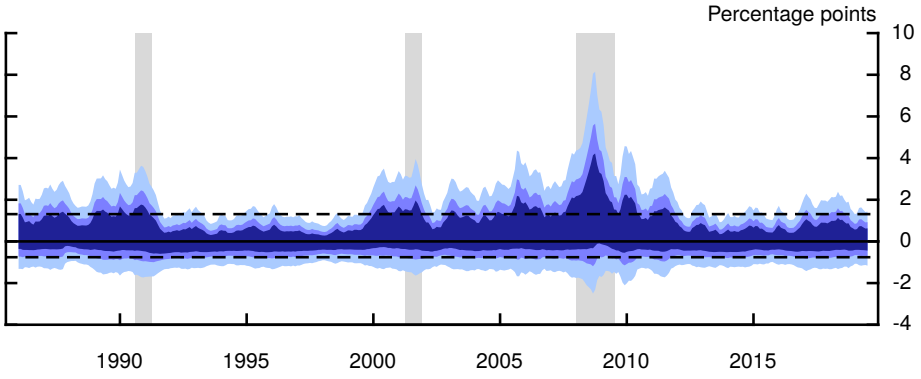
July 2019	
95th	.4
85th	.2
50th	- .2
15th	- .6
5th	- .9

GDP Growth



July 2019	
95th	2.1
85th	1.4
50th	.2
15th	- .9
5th	-1.5

CPI Inflation

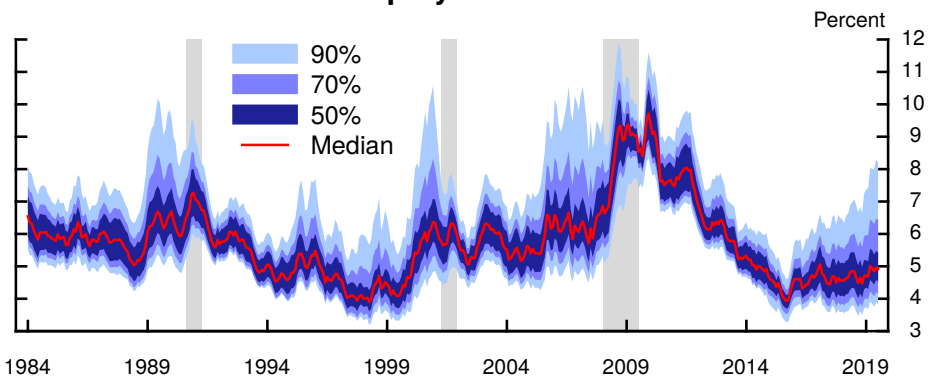


July 2019	
95th	1.4
85th	.9
50th	.1
15th	- .7
5th	-1.2

Note: The exhibit shows estimates of quantiles of the distribution of errors for four-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.

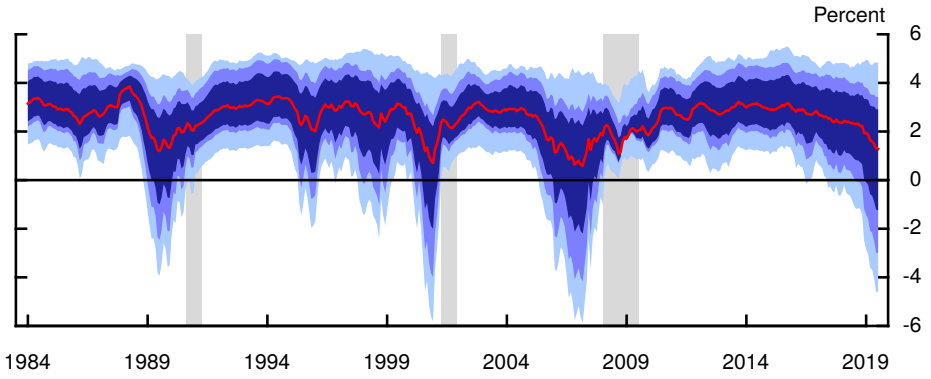
Conditional Distributions of Macroeconomic Variables 2 Years Ahead

Unemployment Rate



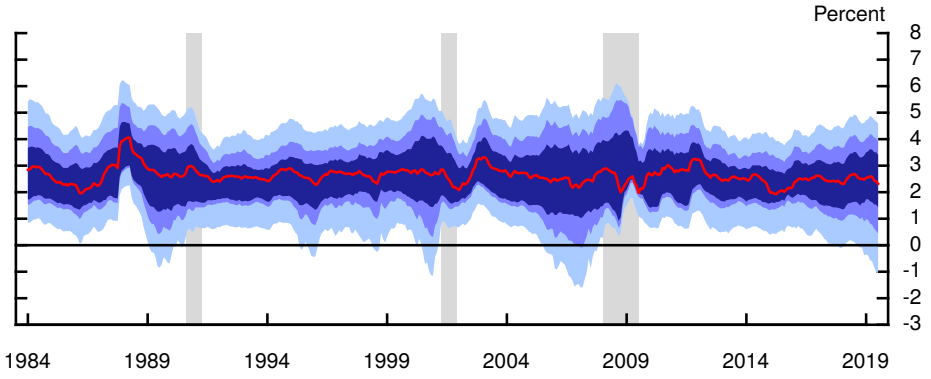
July 2019	
95th	8.2
85th	6.4
50th	4.9
15th	4.2
5th	3.8

GDP Growth



July 2019	
95th	4.8
85th	3.4
50th	1.3
15th	-3.0
5th	-4.6

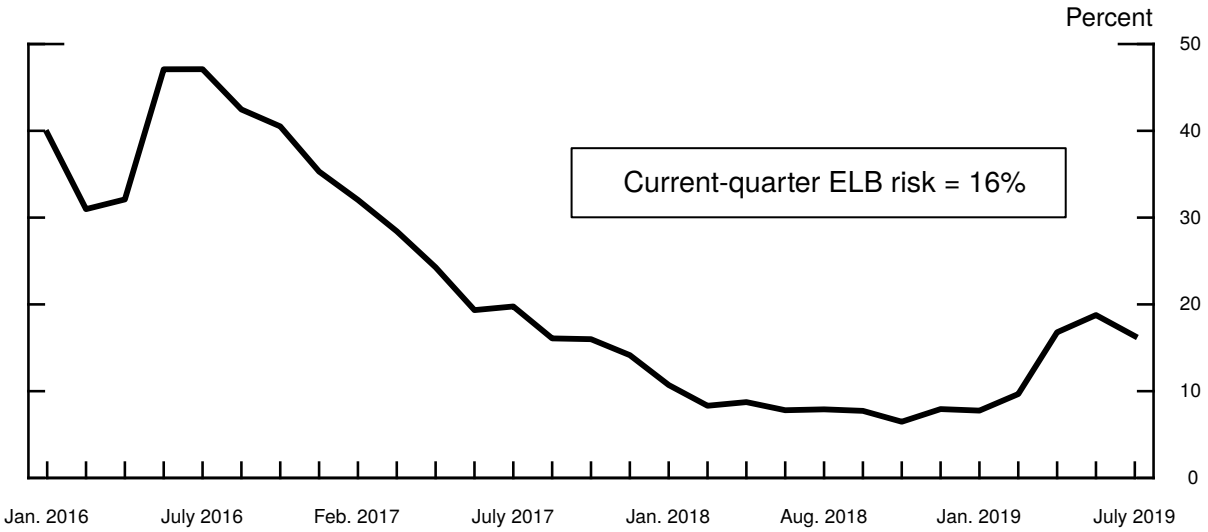
CPI Inflation



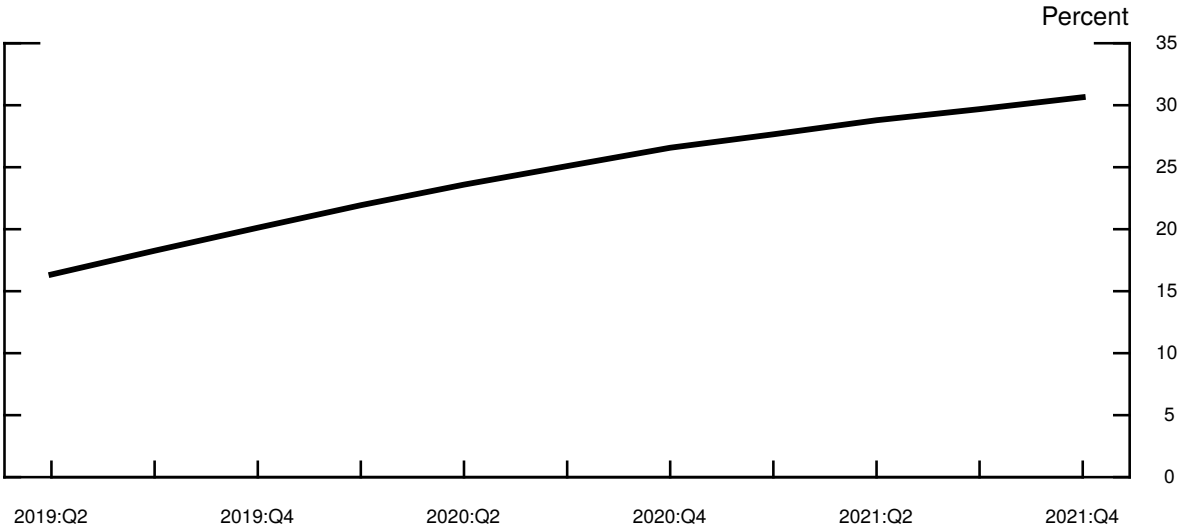
July 2019	
95th	4.6
85th	3.9
50th	2.3
15th	.5
5th	-1.1

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.

movements in expectations could induce changes in inflation to build upon themselves and thus lead inflation to deviate more significantly and persistently from 2 percent.

Our view of the risks to the economic outlook is informed by the staff's latest quantitative surveillance assessment, where the staff continues to judge overall financial vulnerabilities in the U.S. financial system to be at a moderate level. On the one hand, asset valuation pressures have increased somewhat since our previous assessment, as equity and corporate bond prices recovered much of their losses at the end of 2018 and have reached the top end of the "notable" range. Additionally, borrowing by nonfinancial businesses, as a ratio to nominal GDP, has reached new highs recently. On the other hand, growth in household-sector borrowing remains well below trend GDP growth, and underwriting standards in this sector are generally strong. In addition, the largest U.S. banks continue to have strong capital positions, and funding risks in the financial system are low. Reflecting this assessment, current financial vulnerabilities do not appear likely to intensify shocks to an unusual degree through strains within the financial sector, although a deterioration in the balance sheet of the nonfinancial corporate sector could amplify shocks from both domestic and foreign developments.

ALTERNATIVE SCENARIOS

To illustrate some of the risks to the outlook, we construct alternatives to the baseline projection using simulations of staff models. We simulate each of these scenarios using one of three models maintained by the staff, which embed different macroeconomic structures and dynamics.[4] In the first three scenarios, the federal funds rate is governed by the baseline policy rule, which assumes a coefficient of 0.2 on the output gap. In contrast, the last two scenarios ("Global Investment Slump" and "Escalation of Trade Tensions") assume a parameter value of 1.0 on the output gap in the policy rule, as we judge it is unlikely that monetary policy would react in the manner embodied in the baseline rule when output growth slows notably. The fourth scenario ("Recession with Financial Amplification") allows for an even more aggressive monetary policy response that is consistent with the historical reaction of the FOMC to a recession. Finally, the size and composition of the SOMA portfolio are assumed to follow the baseline paths in all of the scenarios.

[4] The three models used are (1) FRB/US, which is a large-scale macroeconometric model of the U.S. economy; (2) SIGMA, which is a calibrated multicounty DSGE model; and (3) GEMUS, which is a calibrated two-country DSGE model.

Alternative Scenarios

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

Measure and scenario	2019		2020	2021	2022	2023-24
	H1	H2				
Real GDP						
Tealbook baseline and extension	2.8	1.7	2.1	1.8	1.6	1.4
Lower inflation expectations	2.8	1.7	2.1	1.7	1.5	1.3
Stronger aggregate demand	2.8	3.4	3.1	2.4	2.0	1.6
Stronger aggregate supply	2.8	2.4	3.0	2.9	2.7	2.4
Recession with financial amplification	2.8	.7	-1.6	-.2	1.2	2.3
Global investment slump	2.8	.2	.9	1.7	1.9	1.6
Escalation of trade tensions	2.8	.3	1.2	1.9	1.9	1.6
Unemployment rate[1]						
Tealbook baseline and extension	3.6	3.7	3.6	3.6	3.7	3.9
Lower inflation expectations	3.6	3.7	3.6	3.6	3.8	4.0
Stronger aggregate demand	3.6	3.5	3.1	2.9	2.8	3.1
Stronger aggregate supply	3.6	3.7	3.6	3.4	3.3	3.1
Recession with financial amplification	3.6	4.0	5.9	6.9	7.0	5.9
Global investment slump	3.6	3.8	4.1	4.2	4.2	4.2
Escalation of trade tensions	3.6	3.8	4.1	4.1	4.0	4.0
Total PCE prices						
Tealbook baseline and extension	1.6	1.8	1.8	1.8	1.9	2.0
Lower inflation expectations	1.6	1.8	1.6	1.6	1.7	1.8
Stronger aggregate demand	1.6	1.8	1.8	1.9	2.0	2.1
Stronger aggregate supply	1.6	1.8	1.7	1.7	1.7	1.8
Recession with financial amplification	1.6	1.8	1.7	1.5	1.5	1.5
Global investment slump	1.6	1.5	1.3	1.6	1.7	1.9
Escalation of trade tensions	1.6	3.5	1.5	1.7	2.0	2.2
Core PCE prices						
Tealbook baseline and extension	1.7	2.2	1.9	1.9	1.9	2.0
Lower inflation expectations	1.7	2.1	1.7	1.6	1.7	1.8
Stronger aggregate demand	1.7	2.2	1.9	1.9	2.0	2.1
Stronger aggregate supply	1.7	2.1	1.8	1.7	1.7	1.8
Recession with financial amplification	1.7	2.2	1.7	1.5	1.5	1.6
Global investment slump	1.7	2.0	1.5	1.6	1.7	1.8
Escalation of trade tensions	1.7	3.9	1.6	1.7	2.0	2.2
Federal funds rate[1]						
Tealbook baseline and extension	2.4	2.4	2.6	2.7	2.7	2.8
Lower inflation expectations	2.4	2.4	2.5	2.5	2.4	2.4
Stronger aggregate demand	2.4	2.5	2.8	3.0	3.1	3.3
Stronger aggregate supply	2.4	2.3	2.3	2.3	2.3	2.5
Recession with financial amplification	2.4	2.2	.1	.1	.1	.3
Global investment slump	2.4	2.3	2.0	1.7	1.7	2.2
Escalation of trade tensions	2.4	2.3	1.9	1.9	2.1	2.7

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

Lower Inflation Expectations [FRB/US]

Total and core PCE price inflation have, on average, run below the Committee's 2 percent objective for most of the past decade. In addition, some measures of longer-run inflation expectations have drifted down in the past several years. In the baseline projection, longer-run inflation expectations relevant for wage and price setting are assumed to generate an underlying inflation trend that remains at 1.8 percent through the medium term. However, there is a risk that actual inflation expectations are anchored at a level somewhat below what is assumed in the baseline. In this scenario, we consider the possibility that the private sector's longer-run inflation expectations are consistent with underlying trend inflation that has been at 1.5 percent for a year now and that it will remain at that level for an extended period of time. Policymakers are assumed to currently recognize this lower underlying inflation trend.

Lower inflation expectations lead to actual inflation running below the baseline and hovering around 1.7 percent over the projection period. Lower realized inflation implies that the federal funds rate stays below the baseline throughout the projection period and is about 35 basis points lower by 2024. Real GDP growth and the unemployment rate are little affected, as the nominal federal funds rate evolves in tandem with inflation, leaving real interest rates essentially unchanged.

Stronger Aggregate Demand [FRB/US]

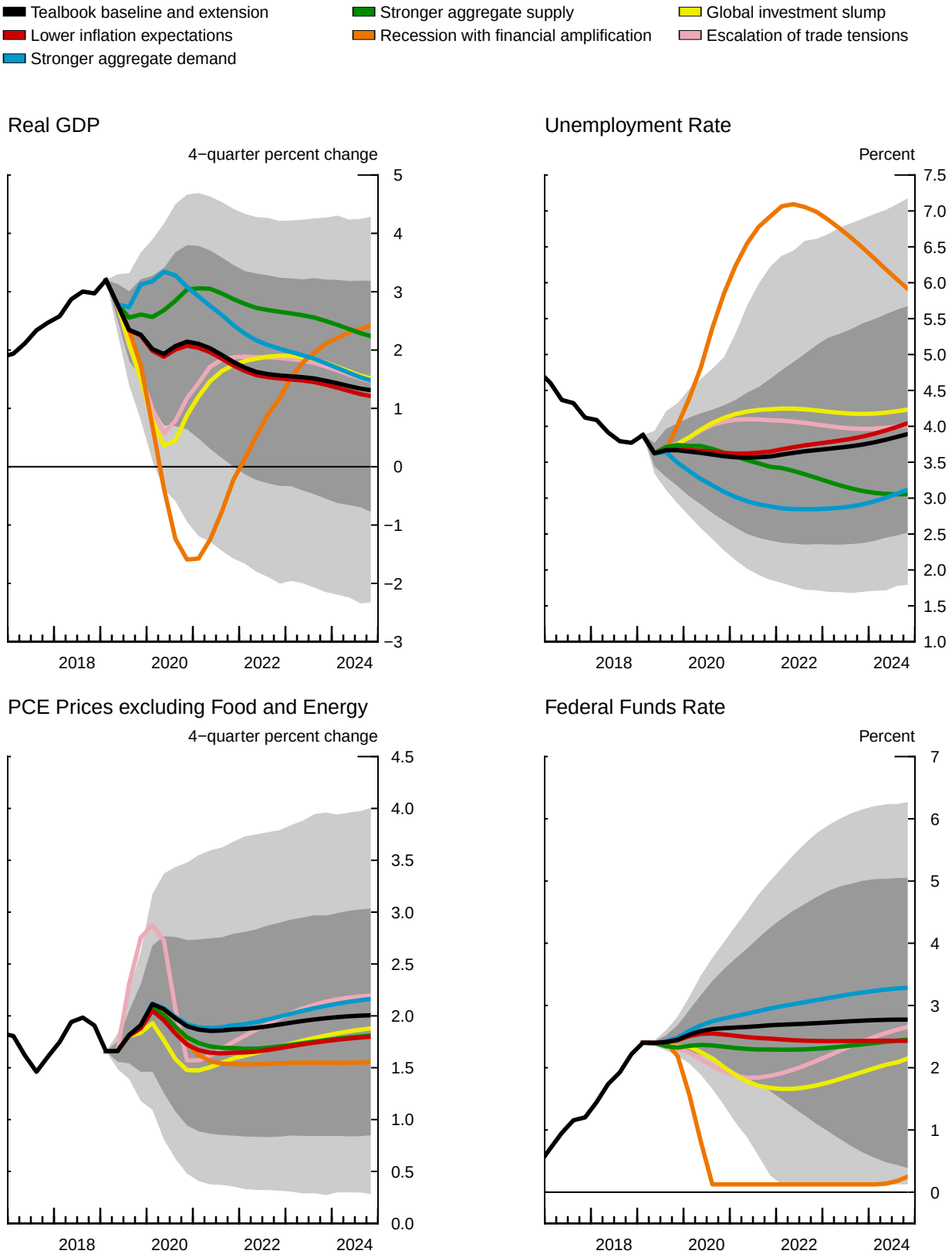
Many of the underlying fundamentals for household spending and business investment remain solid, including quite upbeat readings on consumer sentiment, strong labor market conditions, and low interest rates. Indeed, PCE is estimated to have increased at a robust pace in the second quarter. In this scenario, we assume that consumer spending and, in turn, investment expand at a pace faster than in the baseline. We also assume that these favorable conditions result in a larger cyclical response in labor force participation than has typically been the case.

Under these assumptions, GDP increases 3.1 percent, on average, in 2019 and 2020, which is a pace comparable with that in 2018. With a greater-than-typical cyclical response in labor force participation, the unemployment rate declines to 3 percent at the beginning of 2021, a smaller decline than what the model's Okun's law relationship would suggest. Inflation increases slightly, reaching 2.1 percent in 2024. In response to the stronger economy, and with inflation little changed, the federal funds rate rises relative to the baseline, reaching 3¼ percent in 2024.

Risks & Uncertainty

Forecast Confidence Intervals and Alternative Scenarios

Confidence Intervals Based on FRB/US Stochastic Simulations*



* 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.

Stronger Aggregate Supply [FRB/US]

The unemployment rate is currently 0.9 percentage point below the staff's 4.6 percent estimate for its natural rate. Nevertheless, wage gains have remained modest in recent years largely because, in the staff's assessment, trend productivity growth has been slow. However, another way of reconciling modest wage growth with a very low unemployment rate is that resource utilization may be less tight than assumed in the baseline. In this scenario, the level of potential output in recent years is assumed to have been higher than judged in the baseline, such that the output gap was close to zero in the middle of last year. Moreover, this scenario assumes that potential output growth in future years is faster than in the baseline. Specifically, we assume that the natural rate of unemployment has been lower in the past several years than in the baseline and continues to fall to 3.75 percent at the end of 2019, more than ¾ percentage point lower than in the baseline.[5] We also assume that the trend labor force participation rate has been decreasing at a slower pace than in the baseline for the past several years and continues to do so going forward. In addition, structural productivity is assumed to grow ¼ percentage point faster than in the baseline in the past several years and going forward.

Because we assume that households and businesses fully recognize the higher potential growth and its implications for income and profits, consumer spending and investment are stronger. GDP growth is, on average, about 1 percentage point per year above the baseline. The unemployment rate falls to about 3 percent by the end of 2024, around ¾ percentage point lower than in the staff projection. Even so, given the lower natural rate in this scenario, resource utilization is less tight than in the baseline over the next several years. The path for inflation is slightly below the baseline, on average, primarily reflecting the stronger productivity growth in this scenario. Because policymakers are assumed to recognize these more favorable supply-side conditions, the path of the federal funds rate is about 35 basis points lower, on average, than in the baseline.

Recession with Financial Amplification [FRB/US]

The softness in business investment and manufacturing production so far this year and the continued flatness in the yield curve could be pointing to a substantial deterioration in economic activity. As noted earlier, a statistical model based on the term spread in Treasury

[5] A natural rate of 3.75 percent is comparable with the average of the 10 lowest forecasts for the longer-run unemployment rate submitted by respondents in the March 2019 long-range Blue Chip survey.

yields indicates that the probability of a recession over the next year is elevated. Moreover, leverage in the nonfinancial business sector is elevated. In this scenario, a recession is assumed to be amplified by highly indebted businesses that reduce their hiring and investment by more than they would if their debt was lower.[6] We also assume that monetary policymakers aggressively respond to the sharp and sustained increase in the unemployment rate, consistent with the FOMC's typical reaction in previous recessions.

Real GDP starts to decline later this year and the unemployment rate starts to rise sharply. The federal funds rate declines significantly but becomes constrained by the ELB in the third quarter of 2020, thereby prolonging the downturn. GDP only begins to recover in 2021, and the unemployment rate peaks at 7.1 percent in 2022, an increase of more than 3½ percentage points from the start of the recession. With substantial slack in resource utilization, inflation falls to 1.5 percent in 2021.

Global Investment Slump [SIGMA]

The growth of goods trade, manufacturing, and investment has slowed significantly in many areas of the global economy since 2017. By our assessment, recent tariff increases and heightened uncertainty about trade policy likely played a significant role in this slowdown, as have other factors such as the downturn in the global tech cycle—a synchronized pattern of production and trade in electronics across economies—and country-specific developments that lowered global demand. As these other factors fade, in our baseline we expect trade, manufacturing, and investment to stabilize. However, recent surveys of business attitudes and intentions—not only in the United States, but globally—continue to flag concerns about trade policy, and measures of trade policy uncertainty are at historically high levels.[7] Trade policy uncertainty may have played a larger role in the recent manufacturing slowdown than we have assessed, and its adverse effects on the global outlook may have yet to play out fully.

In this scenario, we assume that global investment remains more sensitive to the unprecedented level of trade policy uncertainty than we envision in the baseline, which sets in

[6] Specifically, we assume shocks that are somewhat more severe than those consistent with the recession in the early 1990s.

[7] See, for instance, the trade policy uncertainty index presented in Dario Caldara, Matteo Iacoviello, Patrick Molligo, Andrea Prestipino, and Andrea Raffo (2019), "The Economic Effects of Trade Policy Uncertainty," paper presented at the 91st meeting of the Carnegie-Rochester-NYU Conference in Public Policy, held at New York University, New York, April 12–13.

motion a global investment slump. As firms in the United States and abroad wait for these uncertainties to be resolved, lower capital accumulation reduces labor productivity and impairs the efficient allocation of capital and labor, with adverse effects on structural productivity, and business and consumer confidence is depressed.[8] Concerns about the global outlook cause flight-to-safety flows into dollar-denominated assets, contributing to a 5 percent appreciation of the dollar. All told, the level of foreign GDP is 1.5 percent below the baseline through 2021.

Weaker aggregate demand in the United States and abroad and the stronger dollar cause a substantial slowdown in U.S. economic activity. In particular, real GDP growth falls to 0.2 percent in the second half of 2019, 1.5 percentage points below the baseline, and the unemployment rate rises above 4.0 percent in 2020. Core PCE inflation remains below 2 percent until 2024. Accordingly, the federal funds rate follows a shallower path than in the baseline, falling to 1.7 percent in 2021.

Escalation of Trade Tensions [GEMUS]

Our current baseline assumes a ceasefire in ongoing trade disputes, meaning that the United States and its trading partners impose no new tariffs, but existing tariffs, including those raised on May 10 on a sizable tranche of Chinese imports, remain in place. While the current process of trade negotiations could ultimately lead to lower trade barriers, we cannot exclude the possibility that trade tensions escalate further, resulting in a sizable increase in trade barriers that would entail profoundly adverse effects.

This scenario assumes that, in the second half of 2019, additional tariffs are imposed on imports not previously tariffed from China and on vehicle imports from most countries. In addition, tariffs are imposed on all Mexican imports, notwithstanding the June 7 agreement that reduced the threat of such an action. In particular, we assume that, throughout the second half of 2019, tariffs of 25 percent are imposed on $275 billion of imports from China, tariffs of 20 percent are imposed on $160 billion of vehicle imports, and tariffs of 25 percent are imposed on $314 billion of imports from Mexico. In our scenario, Mexico and China partially retaliate against the U.S. actions, while tariffs on vehicles trigger a fully proportionate response. Because higher U.S. tariffs reduce imports while higher foreign tariffs reduce U.S. exports, these policies have little effect on the trade balance. However, the higher cost of imported consumption goods

[8] For an estimate of the misallocation and productivity effects of increased uncertainty, see Nicholas Bloom, Max Floetotto, Nir Jaimovich, Itay Saporta-Eksten, and Stephen J. Terry (2018), "Really Uncertain Business Cycles," *Econometrica*, vol. 86 (May), pp. 1031–65.

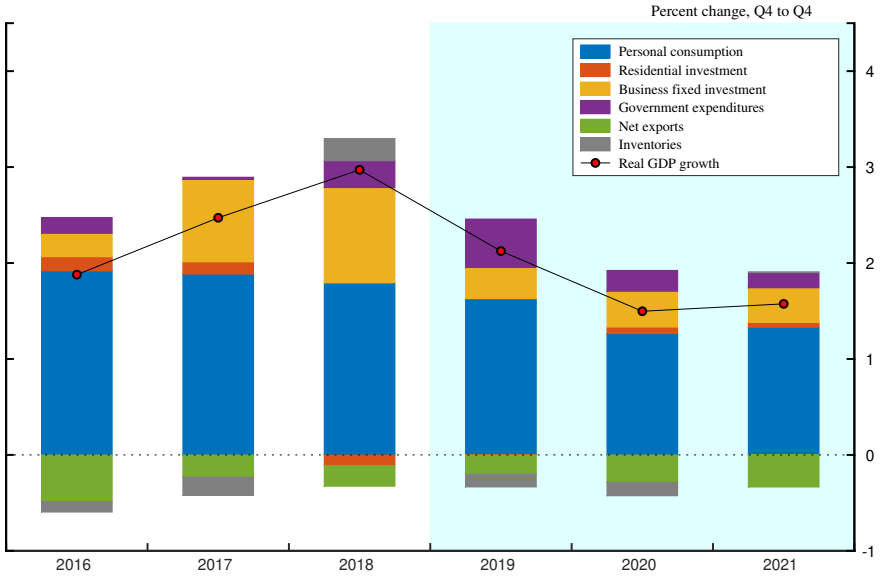
Alternative Model Forecasts

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

Measure and projection	2019		2020		2021	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP						
Staff	2.0	2.3	2.1	2.1	1.7	1.8
FRB/US	1.8	2.1	1.5	1.5	1.6	1.6
EDO[1]	2.4	2.5	2.2	2.1	2.3	2.3
Unemployment rate[2]						
Staff	3.7	3.7	3.7	3.6	3.7	3.6
FRB/US	3.8	3.8	4.0	4.0	4.1	4.2
EDO[1]	4.0	4.0	4.3	4.3	4.5	4.6
Total PCE prices						
Staff	1.5	1.7	1.9	1.8	1.9	1.8
FRB/US	1.3	1.5	1.8	1.8	1.9	1.9
EDO[1]	1.6	1.7	1.9	1.9	2.0	2.0
Core PCE prices						
Staff	1.8	1.9	1.9	1.9	1.9	1.9
FRB/US	1.7	1.8	2.0	2.0	2.0	2.0
EDO[1]	1.6	1.7	1.9	1.9	2.0	2.0
Federal funds rate[2]						
Staff	2.4	2.4	2.6	2.6	2.6	2.7
FRB/US	2.3	2.4	2.4	2.5	2.5	2.5
EDO[1]	2.8	2.8	3.3	3.2	3.7	3.6

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.

depresses household spending, while business demand for investment declines as a result of the higher cost of imported capital goods and as lower expected profits cause corporate borrowing spreads to rise and equity prices to fall. In addition, the escalation of trade tensions leads to a widespread decline in global sentiment and asset prices, with global equity prices falling about 20 percent.

These developments lead to a significant and protracted slowdown in the U.S. economy. Real GDP growth drops to only 0.3 percent in the second half of 2019 and rises to only 1.2 percent in 2020, almost 1 percentage point below the baseline. Higher import prices boost total PCE inflation to 3.5 percent in the second half of this year before inflation falls below the baseline as the effect of the new tariffs dies out and as the economy slows down. Despite the initial jump in inflation, policymakers decide to "look through" the temporary increase in prices. Accordingly, the federal funds rate follows a shallower path than in the baseline, declining to 1.9 percent by the end of 2020, 0.7 percentage point below the baseline.

ALTERNATIVE MODEL FORECASTS

As shown in the "Alternative Model Forecasts" exhibit, the FRB/US model projects real GDP growth to slow from 3 percent in 2018 to 2.1 percent in 2019 and to about 1½ percent in the next two years—a modestly weaker path than in the Tealbook baseline.[9] The model's forecast of real GDP growth has revised up about 35 basis points in 2019 compared with the previous Tealbook, primarily reflecting better-than-expected consumption growth from the model's perspective. In terms of the contour of the model's forecast, the projected deceleration in real GDP mainly reflects the projection that both consumption and business investment growth will move down from what the model perceives as unusually strong readings in recent years. In the case of consumption, the model could not explain those earlier positive surprises based on fundamentals (wealth and income) and hence does not carry that strength forward in the projection; instead, it has consumption rising at a rate closer to the model's trend. The model's assessment that asset prices (equity and property wealth) are currently above normal valuations and thus will fall or decelerate over the next year also contributes to the weakening in consumption growth through the wealth channel. With slowing overall output, business investment also decelerates. Given that relatively weak outlook, the model forecasts the output

[9] The FRB/US forecast is conditioned on the staff projections for variables from the U.S. government sector, foreign real GDP growth, foreign inflation, and the paths of the U.S. dollar and oil prices. The federal funds rate is governed by the same specification for the policy rule used in the baseline. The model forecast starts in the third quarter of this year, taking as given key macroeconomic variables from the judgmental forecast for the second quarter.

gap to decline from a current estimate of 1½ percent to about ½ percent at the end of 2021, and the unemployment rate rises to 4.2 percent at the end of 2021, still below its estimate of the natural rate of 4.7 percent. Core inflation increases from 1.8 percent in 2019 to about 2.0 percent in 2020 and 2021.

The EDO model projects real GDP growth to average 2¼ percent over the next three years, close to the model's estimate of average potential growth. In contrast to both the Tealbook and FRB/US assessments, the EDO model estimates the output gap to be negative 0.2 percent currently and projects it to remain slightly negative through 2021. Core inflation gradually converges to the FOMC's 2 percent objective by the end of 2020. For a number of years, wages have been below the level consistent with the model's wage Phillips curve, holding down marginal costs and depressing inflation over that period, and the model expects these wage shocks to fade gradually.

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
Real GDP						
(percent change, Q4 to Q4)						
Projection	2.3	2.1	1.8	1.6	1.5	1.3
Confidence interval						
Tealbook forecast errors	1.4–3.8	.6–3.6	-.3–3.4	. . .	. . .	. . .
FRB/US stochastic simulations	1.5–3.2	.6–3.8	.0–3.5	-.3–3.2	-.5–3.2	-.8–3.2
Civilian unemployment rate						
(percent, Q4)						
Projection	3.7	3.6	3.6	3.7	3.7	3.9
Confidence interval						
Tealbook forecast errors	3.3–4.0	2.6–4.6	2.1–5.1	. . .	. . .	. . .
FRB/US stochastic simulations	3.2–4.0	2.7–4.3	2.4–4.7	2.4–5.1	2.4–5.4	2.5–5.7
PCE prices, total						
(percent change, Q4 to Q4)						
Projection	1.7	1.8	1.8	1.9	2.0	2.0
Confidence interval						
Tealbook forecast errors	1.1–2.1	.9–3.3	.7–3.3	. . .	. . .	. . .
FRB/US stochastic simulations	1.2–2.2	.8–2.8	.7–2.9	.7–3.0	.7–3.1	.8–3.1
PCE prices excluding						
food and energy						
(percent change, Q4 to Q4)						
Projection	1.9	1.9	1.9	1.9	2.0	2.0
Confidence interval						
Tealbook forecast errors	1.7–2.2	1.3–2.5	. . .	. . .	. . .	. . .
FRB/US stochastic simulations	1.5–2.3	.9–2.7	.8–2.8	.8–2.9	.8–3.0	.9–3.0
Federal funds rate						
(percent, Q4)						
Projection	2.4	2.6	2.7	2.7	2.8	2.8
Confidence interval						
FRB/US stochastic simulations	2.3–2.7	2.0–3.6	1.6–4.3	1.1–4.7	.6–5.0	.4–5.1

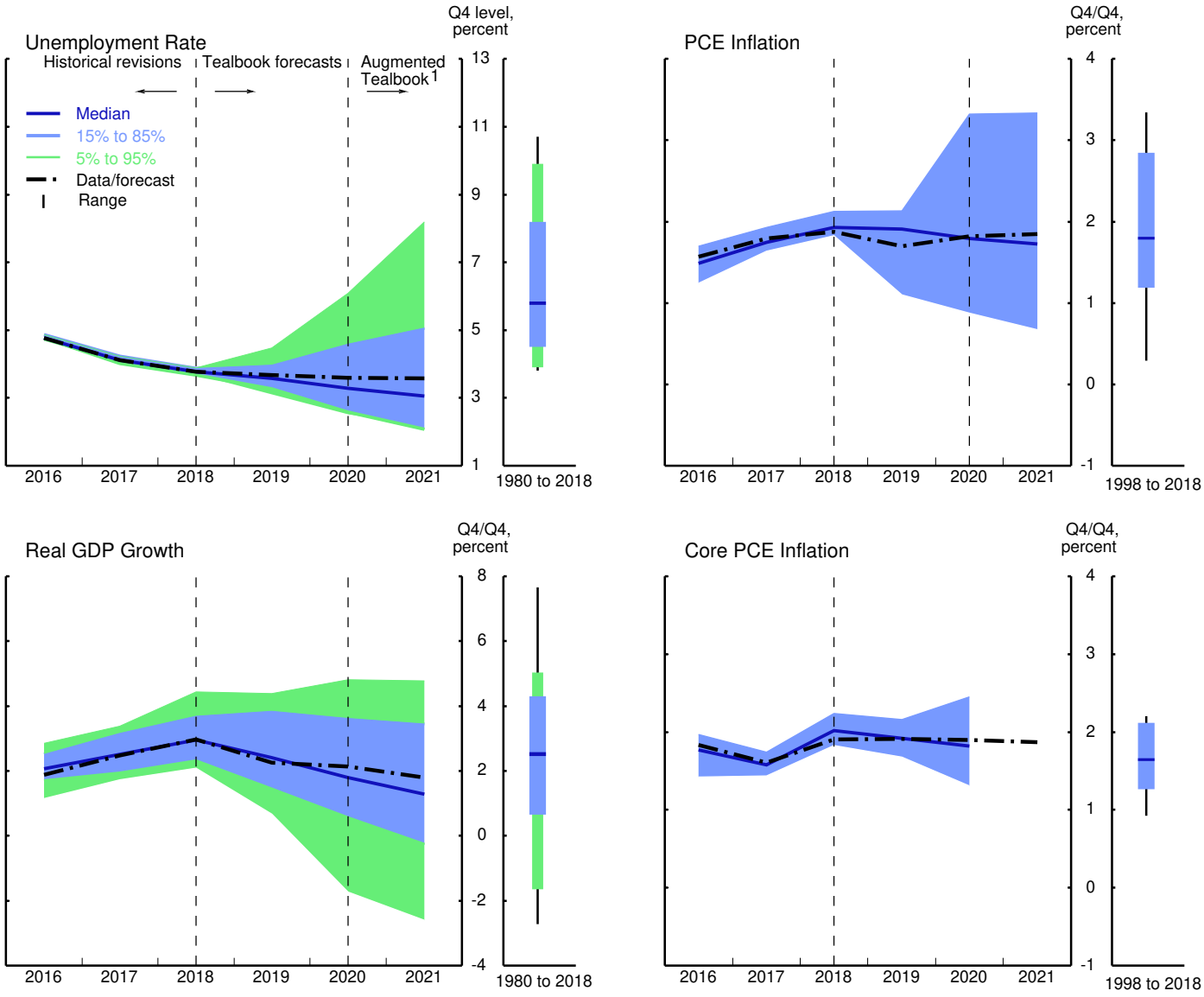
Note: Shocks underlying FRB/US stochastic simulations are randomly drawn from the 1969–2018 set of model equation residuals. Intervals derived from Tealbook forecast errors are based on projections made from 1980 to 2018 for real GDP and unemployment and from 1998 to 2018 for PCE prices. The intervals for real GDP, unemployment, and total PCE prices are extended into 2021 using information from the Blue Chip survey and forecasts from the CBO and CEA.
. . . Not applicable.

Risks & Uncertainty

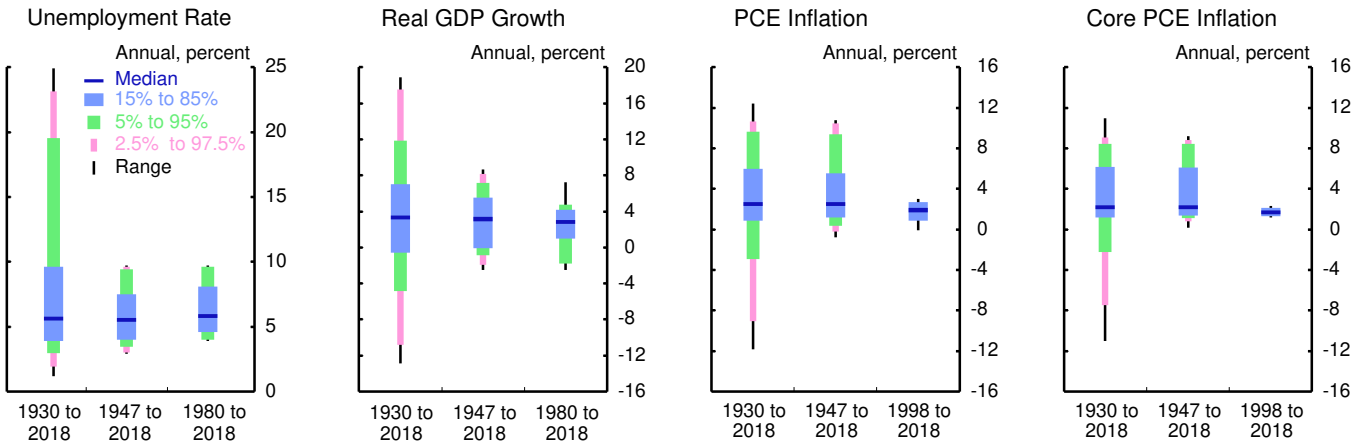
Prediction Intervals Derived from Historical Tealbook Forecast Errors

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 2021.

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

In this section, we discuss a range of strategies for setting the federal funds rate and compare the associated interest rate paths and macroeconomic outcomes with those in the Tealbook baseline projection. Compared with the June Tealbook, the inflation projection is a bit higher in the next few quarters and little changed thereafter, whereas the output gap is seen as modestly more positive over the medium term and beyond. Consequently, the policy rate paths prescribed by the strategies are generally slightly higher than in the June Tealbook. In a special exhibit, we examine optimal control simulations when the underlying baseline projection is consistent with the median responses to the June 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 slightly higher inflation and the somewhat wider output gap, the near-term prescriptions of the policy rules are slightly higher than those in the June Tealbook.

- The inertial Taylor (1999) rule prescribes higher policy rates than the Tealbook baseline because it responds more strongly to the positive output gap than the conditional attenuated rule underlying the Tealbook baseline projection.

[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 here 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 of the output gap.

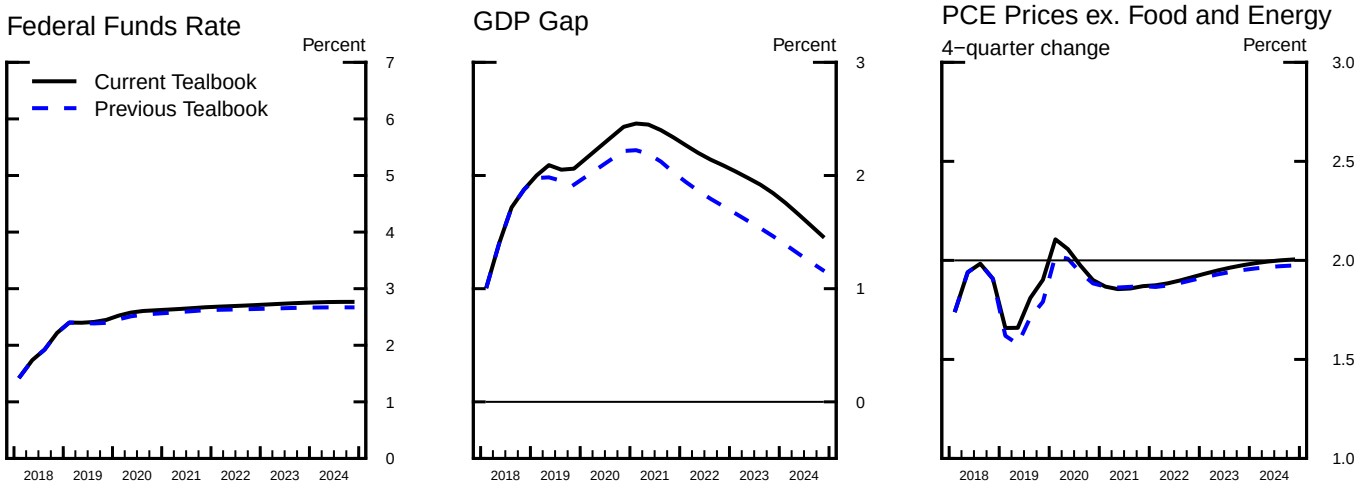
Policy Rules and the Staff Projection

Near−Term Prescriptions of Selected Simple Policy Rules[1]

(Percent)

	2019:Q3	2019:Q4
Inertial Taylor (1999) rule	**2.67**	**2.93**
Previous Tealbook projection	*2.64*	*2.85*
Taylor (1993) rule	**3.22**	**3.36**
Previous Tealbook projection	*3.02*	*3.12*
First−difference rule	**2.50**	**2.63**
Previous Tealbook projection	*2.44*	*2.51*
Flexible price−level targeting rule	**2.13**	**1.93**
Previous Tealbook projection	*2.10*	*1.87*
Addendum:		
Tealbook baseline	**2.41**	**2.45**

Key Elements of the Staff Projection



A Medium−Term Notion of the Equilibrium Real Federal Funds Rate[2]

(Percent)

	Current Value	*Current−Quarter Estimate Based on Previous Tealbook*	*Previous Tealbook*
Tealbook baseline			
FRB/US *r**	1.95	*1.74*	*1.79*
Average projected real federal funds rate	.70	*.68*	*.68*
SEP−consistent baseline			
FRB/US *r**	.65		
Average projected real federal funds rate	.38		

1. The lines denoted "Previous Tealbook projection" report prescriptions based on the previous Tealbook's staff outlook for inflation and resource slack. Rules that have a lagged policy rate as a right−hand−side variable are conditional on the current−Tealbook value of the lagged policy rate.

2. 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 either the Tealbook or SEP−consistent projection. The SEP−consistent baseline corresponds to the June 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 the inertial Taylor (1999) rule and the Tealbook baseline rule.

- The first-difference rule, which responds to the change in the expected output gap, prescribes a policy rate path that is slightly higher than the Tealbook baseline path.

- The FPLT rule calls for cutting the federal funds rate to about 2 percent by the fourth quarter of 2019 in an effort to eliminate a cumulative shortfall in the core PCE price index of 2½ percent 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 June 2019 SEP.[3] In both cases, simulations of the FRB/US model are used. 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. This concept of *r** 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 1.97 percent, the current value of the Tealbook-consistent FRB/US *r** is about 25 basis points higher than its estimate for the same quarter in the June Tealbook because of the wider output gap projected by the staff in the medium term.

[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 2021 (the final year reported in the June 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 0.65 percent, the June 2019 SEP-consistent FRB/US r^* is somewhat lower than the current-quarter estimate based on the March 2019 SEP projection, at 0.89 percent (not shown). The downward revision mainly stems from a decline in the median projected path for the federal funds rate over the medium term without much change in the output gap projection.

- The Tealbook-consistent FRB/US r^* is higher than the SEP-consistent FRB/US r^* because the Tealbook projection features a wider output gap over the medium term despite its somewhat higher path for the real federal funds rate.

SIMPLE POLICY RULE SIMULATIONS

The second exhibit reports the Tealbook baseline 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 is flat at 2.4 percent this year and edges up to 2.7 percent by the end of 2021. The prescribed path for the policy rate is revised up only a bit compared with the June Tealbook because the baseline rule responds modestly and gradually to the wider output gap.

- The inertial Taylor (1999) rule, which embodies the same degree of inertia as the Tealbook baseline rule but responds more strongly to the positive output gap, calls for the federal funds rate to increase at a faster pace and to slightly exceed 3½ percent by 2021. Thereafter, the path remains above the Tealbook baseline path for several years. The less accommodative monetary conditions produce an unemployment rate that, in contrast to the Tealbook baseline, rises steadily toward the staff's estimate of the natural rate of unemployment.

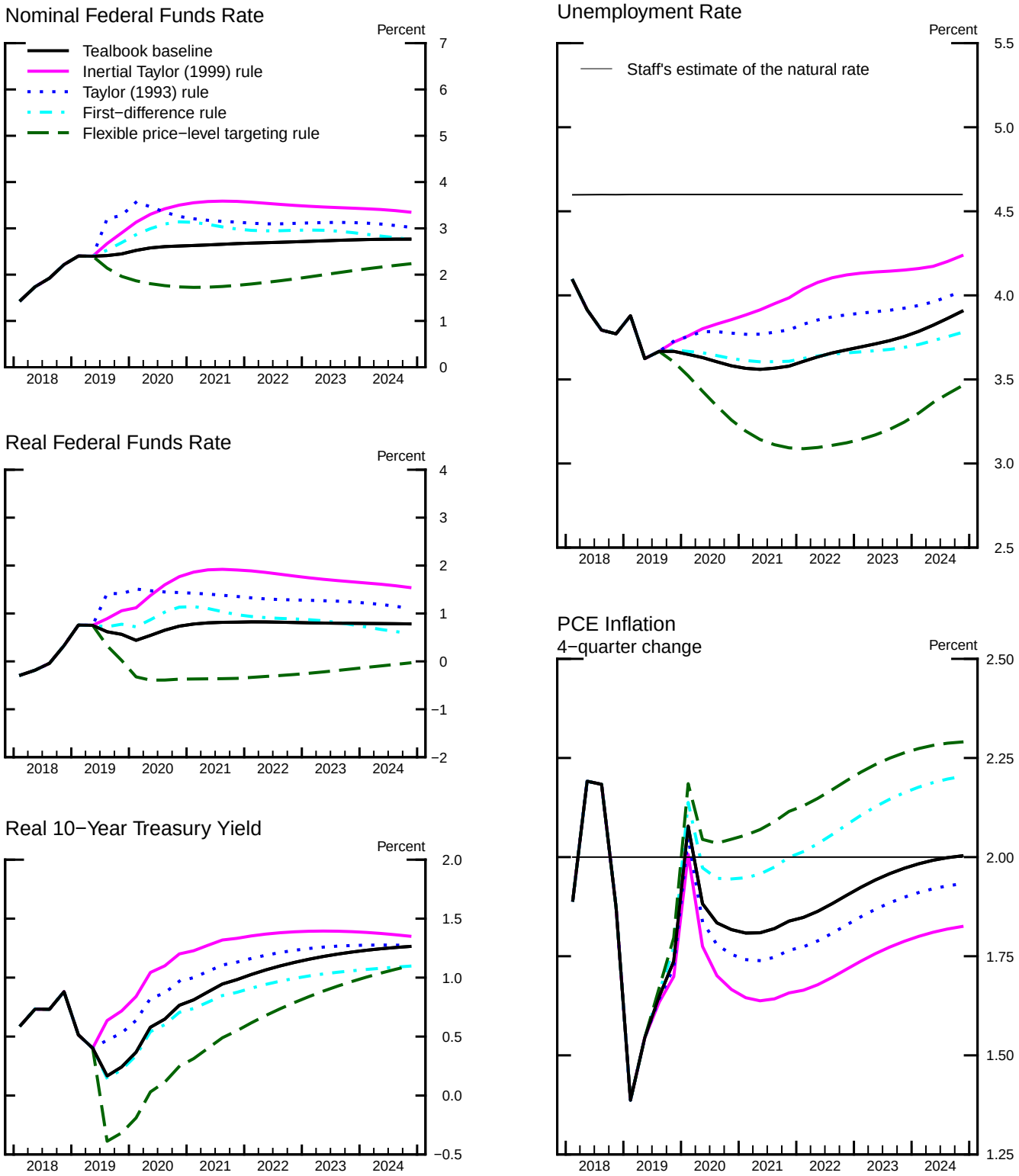
Inflation is lower and the real 10-year Treasury yield is higher than the corresponding values in the Tealbook baseline.

- The Taylor (1993) rule calls for increases in the federal funds rate in the near term, to 3½ percent by early 2020, after which the rule calls for slight declines. The federal funds rate path prescribed by this rule is at first above the corresponding paths under both the inertial Taylor (1999) rule and the Tealbook baseline rule. Later, however, it is below the path under the inertial Taylor (1999) rule and above the path in the Tealbook baseline. The relatively high initial values arise because the Taylor (1993) rule has no inertial component and thus calls for an immediate upward adjustment in the path of the policy rate in response to the high level of the current output gap.

- The first-difference rule, which reacts to the expected change in the output gap rather than its level, prescribes small, gradual increases in the federal funds rate through the end of 2020, followed by a sequence of slight reductions during the period in which the output gap is projected to narrow. The federal funds rate path edges down to 2¾ percent by 2024, in line with the prescriptions of the conditional attenuated rule that year. The resulting path for the real 10-year Treasury yield is similar to the baseline projection in the near term and lower than that projection in the medium term. As a result, this strategy generates higher inflation and eventually a lower unemployment rate than 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 2½ percent shortfall requires inflation to run above 2 percent in coming years. Because 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, the path of the real 10-year Treasury rate immediately drops to negative 0.4 percent and remains below the corresponding Tealbook baseline path throughout the period shown. The unemployment rate is substantially lower under the FPLT rule than in the Tealbook baseline and all other simulations, dropping to near

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.

3 percent in 2021. Inflation exceeds 2 percent by about 20 basis points, on average, over the next decade.

- Over the projection period shown, the simple rules' policy rate prescriptions are as much as 40 basis points higher than the corresponding prescriptions in the June Tealbook because of higher projected resource utilization.

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.[4] The concept of optimal control employed here is one in which policymakers are able to commit future policymakers to their plans; such a commitment, where feasible, may lead to improved economic outcomes.[5]

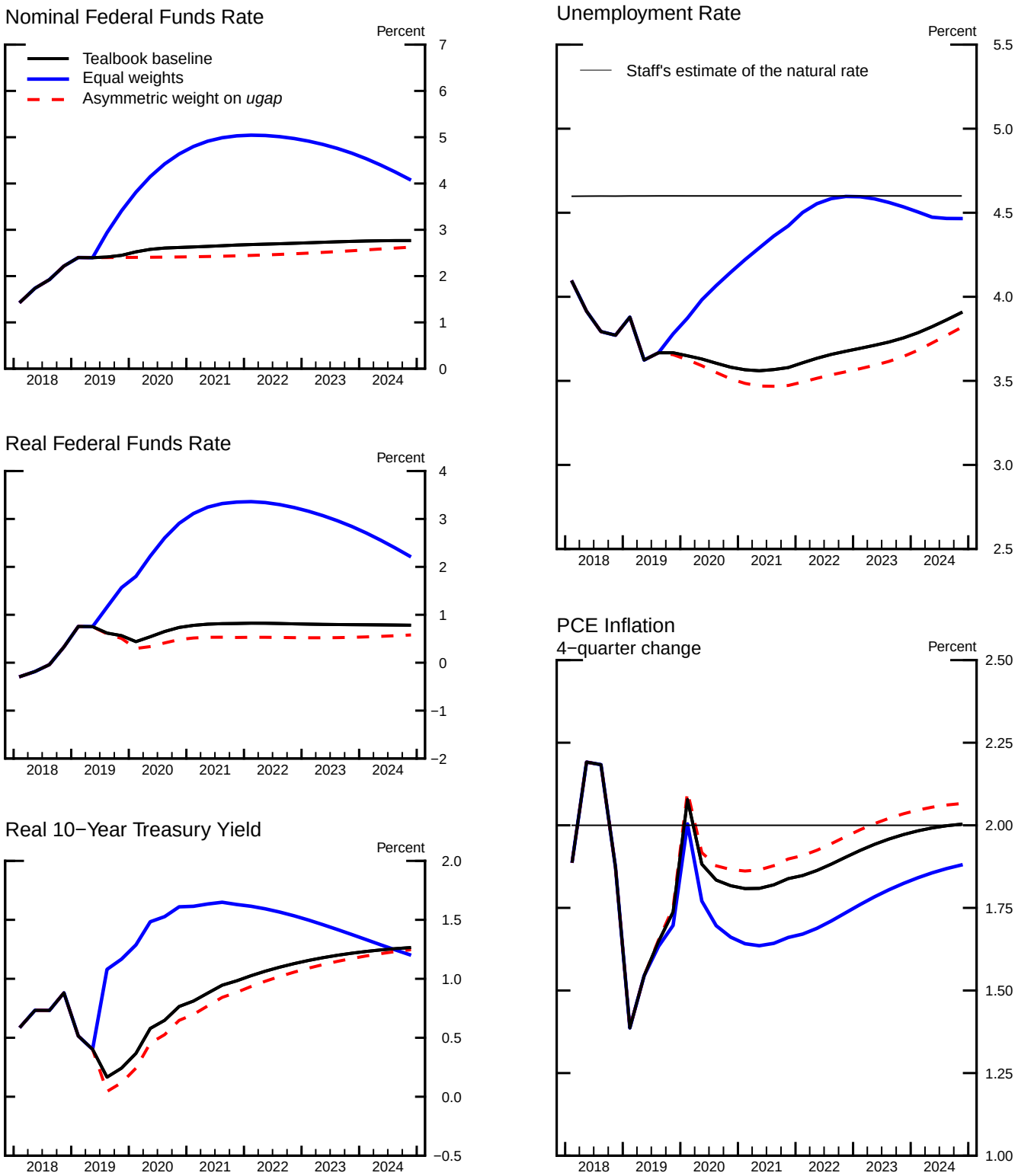
- The simulation labeled "Equal weights" presents the case in which policymakers are assumed to place equal weights on keeping headline PCE inflation close to the Committee's objective of 2 percent, on keeping the unemployment rate close to the staff's estimate of the natural rate of unemployment, and 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 and reaches a peak of 5 percent in late 2021.[6] This strategy is designed to counter the projected sizable and persistent undershooting by the unemployment rate of its natural rate that occurs in the Tealbook baseline—an outcome that policymakers with the equal-weights loss function judge to be undesirable. The smaller unemployment gap implies

[4] 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 in this Tealbook section provides technical details on the optimal control simulations.

[5] 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.

[6] Because monetary policy actions are assumed to be understood and credible, changes in the federal funds rate are not disruptive, regardless of the magnitude of their departure from historical norms. In practice, however, if the FOMC were to raise the real federal funds rate abruptly, wage and price setters and financial market participants could misinterpret policymakers' intentions and may anticipate tighter monetary policy than policymakers envision, in which case macroeconomic outcomes may be less favorable than would otherwise be the case.

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.

only a modestly lower path of inflation because, in the FRB/US model, the response of inflation to the level of resource utilization is small.

- 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 considerably below the path under equal weights because policymakers' desire to keep inflation close to 2 percent is not tempered by an aversion to the unemployment rate falling below its natural rate. Moreover, the policy rate path and outcomes under this strategy are similar to those under the Tealbook baseline because, with inflation running near 2 percent over the next several years and with policymakers attaching no loss to unemployment undershooting its natural rate, the current policy rate path already delivers outcomes that are close to optimal, based on this loss function.

- The federal funds rate projections from the equal-weights and asymmetric specifications conditional on the current Tealbook projection are as much as 45 basis points and 30 basis points higher, respectively, than their corresponding prescriptions based on the June Tealbook projection. The revisions to the asymmetric specification are somewhat smaller than those for the equal-weights specification because policy in the former specification is only affected by revisions to the unemployment gap when the unemployment rate is above the estimate of its natural rate.

OPTIMAL CONTROL USING A PROJECTION CONSISTENT WITH THE SEP

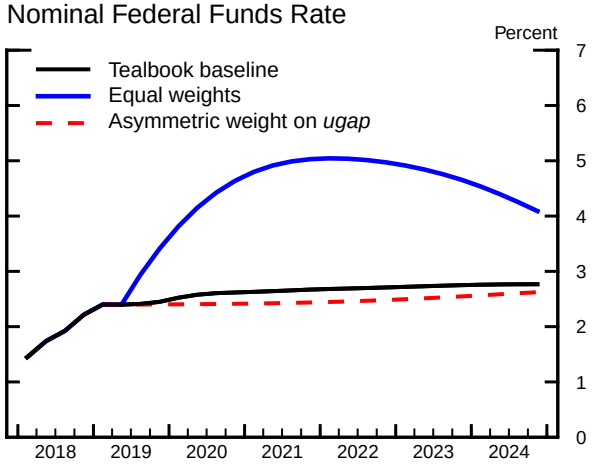
The next exhibit illustrates the sensitivity of optimal control policy rate prescriptions and outcomes to changes in assumptions about structural features of the economy, such as the natural rate of unemployment. The exhibit compares simulations conditional on the Tealbook baseline (discussed earlier and reproduced in the left column) to those conditional on the SEP-consistent projection (shown in the right column).

- Overall, the path of the federal funds rate, the unemployment rate, and the inflation rate in the Tealbook baseline are similar to those in the SEP-

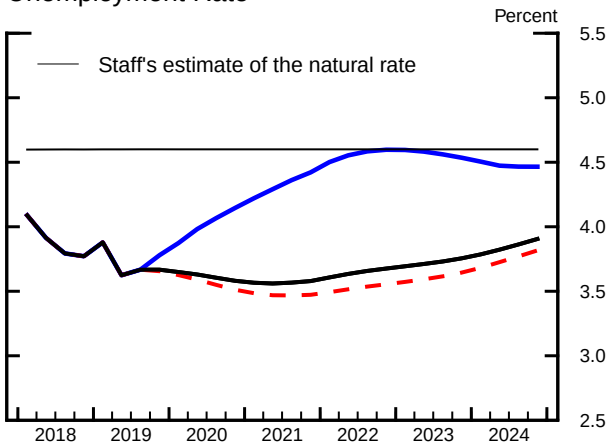
Optimal Control Using a Projection Consistent with the SEP

Tealbook Baseline

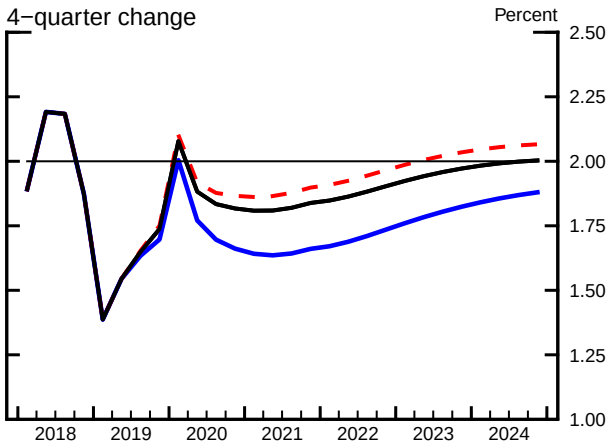
Nominal Federal Funds Rate



Unemployment Rate

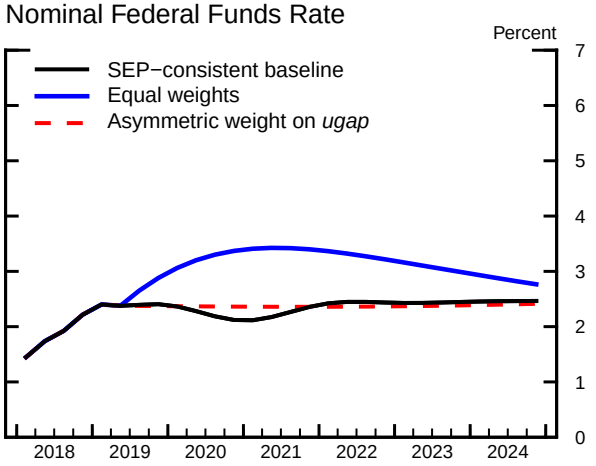


PCE Inflation
4−quarter change

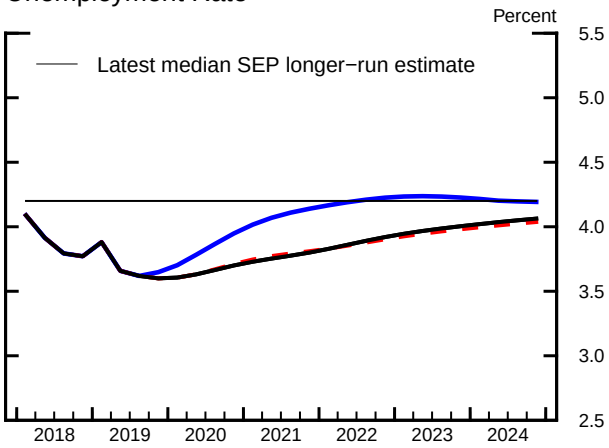


SEP−Consistent Baseline

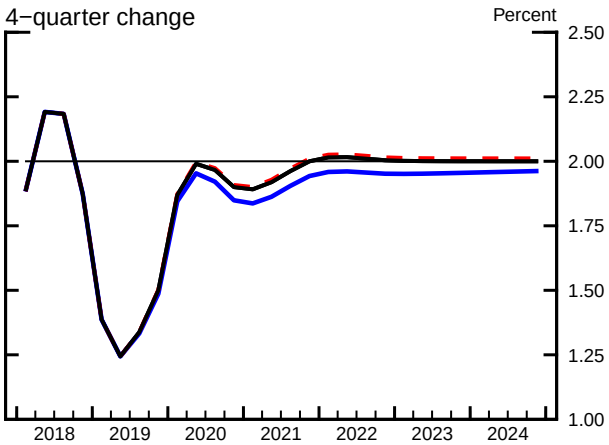
Nominal Federal Funds Rate



Unemployment Rate



PCE Inflation
4−quarter change



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.

consistent baseline. However, the staff's estimate of the natural rate of unemployment, at 4.6 percent, is higher than the median estimate of the longer-run unemployment rate in the June 2019 SEP, which stands at 4.2 percent. Accordingly, the Tealbook projection features greater labor market tightness than is implicit in the SEP-consistent projection.[7]

- Under the equal-weights specification, the path of the federal funds rate peaks at 3.4 percent in 2021 when we condition on the SEP-consistent baseline, about 1½ percentage points less than prescribed under this loss function when we condition 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 near those in the SEP-consistent baseline. This similarity arises because the asymmetric specification attaches no loss to unemployment undershooting its natural rate and sees inflation near or at 2 percent over the next several years; thus, from the perspective of this loss function, the baseline policy rate path is already near optimal. However, this similarity does not imply that policymakers are acting according to an asymmetric loss function. In particular, policymakers' assessments of appropriate policy may factor in elements that are not captured by our perfect-foresight analysis, such as uncertainty about the natural rate of unemployment in a low-r^* environment.[8]

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

[7] In the construction of the SEP-consistent baseline, we assume that the natural rate of unemployment over the projection period coincides with the median SEP estimate of the unemployment rate in the longer run.

[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 coincide with the perceived economic tradeoffs of SEP respondents.

Outcomes of Simple Policy Rule Simulations

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

Outcome and strategy	2019	2020	2021	2022	2023	2024
Nominal federal funds rate[1]						
Inertial Taylor (1999)	2.9	3.5	3.6	3.5	3.4	3.4
Taylor (1993)	3.3	3.3	3.1	3.1	3.1	3.0
First-difference	2.7	3.1	3.0	3.0	2.9	2.8
Flexible price-level targeting	2.0	1.7	1.8	1.9	2.1	2.2
Extended Tealbook baseline	2.4	2.6	2.7	2.7	2.8	2.8
Real GDP						
Inertial Taylor (1999)	2.1	1.7	1.5	1.5	1.6	1.4
Taylor (1993)	2.2	1.9	1.7	1.6	1.5	1.4
First-difference	2.2	2.1	1.8	1.7	1.6	1.4
Flexible price-level targeting	2.4	2.7	2.1	1.7	1.4	1.3
Extended Tealbook baseline	2.3	2.2	1.8	1.6	1.5	1.3
Unemployment rate[1]						
Inertial Taylor (1999)	3.7	3.9	4.0	4.1	4.2	4.2
Taylor (1993)	3.7	3.8	3.8	3.9	3.9	4.0
First-difference	3.7	3.6	3.6	3.7	3.7	3.8
Flexible price-level targeting	3.6	3.3	3.1	3.1	3.2	3.5
Extended Tealbook baseline	3.7	3.6	3.6	3.7	3.8	3.9
Total PCE prices						
Inertial Taylor (1999)	1.7	1.7	1.7	1.7	1.8	1.8
Taylor (1993)	1.7	1.8	1.8	1.8	1.9	1.9
First-difference	1.8	1.9	2.0	2.1	2.2	2.2
Flexible price-level targeting	1.8	2.0	2.1	2.2	2.3	2.3
Extended Tealbook baseline	1.7	1.8	1.8	1.9	2.0	2.0
Core PCE prices						
Inertial Taylor (1999)	1.9	1.7	1.7	1.7	1.8	1.8
Taylor (1993)	1.9	1.8	1.8	1.8	1.9	1.9
First-difference	1.9	2.0	2.0	2.1	2.2	2.2
Flexible price-level targeting	2.0	2.1	2.1	2.2	2.3	2.3
Extended Tealbook baseline	1.9	1.9	1.9	1.9	2.0	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	2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Nominal federal funds rate[1]								
Inertial Taylor (1999)	2.4	2.4	2.7	2.9	3.1	3.3	3.4	3.5
Taylor (1993)	2.4	2.4	3.2	3.3	3.6	3.5	3.3	3.3
First-difference	2.4	2.4	2.5	2.7	2.9	3.0	3.1	3.1
Flexible price-level targeting	2.4	2.4	2.1	2.0	1.9	1.8	1.8	1.7
Extended Tealbook baseline	2.4	2.4	2.4	2.4	2.5	2.6	2.6	2.6
Real GDP								
Inertial Taylor (1999)	3.2	2.8	2.3	2.1	1.8	1.6	1.6	1.7
Taylor (1993)	3.2	2.8	2.3	2.2	1.8	1.7	1.7	1.9
First-difference	3.2	2.8	2.3	2.2	2.0	1.9	2.0	2.1
Flexible price-level targeting	3.2	2.8	2.3	2.4	2.3	2.4	2.7	2.7
Extended Tealbook baseline	3.2	2.8	2.3	2.3	2.0	2.0	2.1	2.2
Unemployment rate[1]								
Inertial Taylor (1999)	3.9	3.6	3.7	3.7	3.8	3.8	3.8	3.9
Taylor (1993)	3.9	3.6	3.7	3.7	3.8	3.8	3.8	3.8
First-difference	3.9	3.6	3.7	3.7	3.7	3.7	3.6	3.6
Flexible price-level targeting	3.9	3.6	3.7	3.6	3.5	3.4	3.3	3.3
Extended Tealbook baseline	3.9	3.6	3.7	3.7	3.6	3.6	3.6	3.6
Total PCE prices								
Inertial Taylor (1999)	1.4	1.5	1.6	1.7	2.0	1.8	1.7	1.7
Taylor (1993)	1.4	1.5	1.6	1.7	2.0	1.8	1.8	1.8
First-difference	1.4	1.5	1.7	1.8	2.1	2.0	1.9	1.9
Flexible price-level targeting	1.4	1.5	1.7	1.8	2.2	2.0	2.0	2.0
Extended Tealbook baseline	1.4	1.5	1.6	1.7	2.1	1.9	1.8	1.8
Core PCE prices								
Inertial Taylor (1999)	1.7	1.7	1.8	1.9	2.0	1.9	1.8	1.7
Taylor (1993)	1.7	1.7	1.8	1.9	2.1	2.0	1.9	1.8
First-difference	1.7	1.7	1.8	1.9	2.2	2.1	2.1	2.0
Flexible price-level targeting	1.7	1.7	1.8	2.0	2.2	2.2	2.2	2.1
Extended Tealbook baseline	1.7	1.7	1.8	1.9	2.1	2.1	2.0	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	2020	2021	2022	2023	2024
Nominal federal funds rate[1]						
Equal weights	3.4	4.6	5.0	5.0	4.7	4.1
Asymmetric weight on *ugap*	2.4	2.4	2.4	2.5	2.5	2.6
Extended Tealbook baseline	2.4	2.6	2.7	2.7	2.8	2.8
Real GDP						
Equal weights	2.0	1.2	1.2	1.4	1.7	1.7
Asymmetric weight on *ugap*	2.3	2.3	1.9	1.6	1.5	1.3
Extended Tealbook baseline	2.3	2.2	1.8	1.6	1.5	1.3
Unemployment rate[1]						
Equal weights	3.8	4.1	4.4	4.6	4.5	4.5
Asymmetric weight on *ugap*	3.7	3.5	3.5	3.6	3.6	3.8
Extended Tealbook baseline	3.7	3.6	3.6	3.7	3.8	3.9
Total PCE prices						
Equal weights	1.7	1.7	1.7	1.7	1.8	1.9
Asymmetric weight on *ugap*	1.8	1.9	1.9	2.0	2.0	2.1
Extended Tealbook baseline	1.7	1.8	1.8	1.9	2.0	2.0
Core PCE prices						
Equal weights	1.9	1.7	1.7	1.7	1.8	1.9
Asymmetric weight on *ugap*	1.9	1.9	1.9	2.0	2.0	2.1
Extended Tealbook baseline	1.9	1.9	1.9	1.9	2.0	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	2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Nominal federal funds rate[1]								
Equal weights	2.4	2.4	2.9	3.4	3.8	4.1	4.4	4.6
Asymmetric weight on *ugap*	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Extended Tealbook baseline	2.4	2.4	2.4	2.4	2.5	2.6	2.6	2.6
Real GDP								
Equal weights	3.2	2.8	2.3	2.0	1.5	1.2	1.1	1.2
Asymmetric weight on *ugap*	3.2	2.8	2.3	2.3	2.1	2.0	2.2	2.3
Extended Tealbook baseline	3.2	2.8	2.3	2.3	2.0	2.0	2.1	2.2
Unemployment rate[1]								
Equal weights	3.9	3.6	3.7	3.8	3.9	4.0	4.1	4.1
Asymmetric weight on *ugap*	3.9	3.6	3.7	3.7	3.6	3.6	3.5	3.5
Extended Tealbook baseline	3.9	3.6	3.7	3.7	3.6	3.6	3.6	3.6
Total PCE prices								
Equal weights	1.4	1.5	1.6	1.7	2.0	1.8	1.7	1.7
Asymmetric weight on *ugap*	1.4	1.5	1.7	1.8	2.1	1.9	1.9	1.9
Extended Tealbook baseline	1.4	1.5	1.6	1.7	2.1	1.9	1.8	1.8
Core PCE prices								
Equal weights	1.7	1.7	1.8	1.9	2.0	1.9	1.8	1.7
Asymmetric weight on *ugap*	1.7	1.7	1.8	1.9	2.1	2.1	2.0	1.9
Extended Tealbook baseline	1.7	1.7	1.8	1.9	2.1	2.1	2.0	1.9

1. Percent, average for the quarter.

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 for quarter *t;* for quarters prior to 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

[1] The box "A New Conditional Baseline Policy Rule" in the Domestic Economic Developments and Outlook section of the April 2019 Tealbook A describes the conditional baseline rule.

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 4.6 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) 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 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.

[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 (2014).

To isolate the effects of changes in macroeconomic projections on the prescriptions of these inertial rules, the lines labeled "Previous Tealbook projection" report prescriptions that are conditional on the previous Tealbook projections for inflation and the output gap but that use the value of the lagged federal funds rate in the current Tealbook for the first 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 prior to the simulation period.

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

Interval	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate[1]	
	06/07/19	07/18/19	06/07/19	07/18/19	06/07/19	07/18/19	06/07/19	07/18/19	06/07/19	07/18/19
Quarterly										
2018:Q1	4.3	4.3	2.2	2.2	2.5	2.5	2.2	2.2	4.1	4.1
Q2	7.6	7.6	4.2	4.2	2.0	2.0	2.1	2.1	3.9	3.9
Q3	4.9	4.9	3.4	3.4	1.6	1.6	1.6	1.6	3.8	3.8
Q4	4.1	4.1	2.2	2.2	1.5	1.5	1.8	1.8	3.8	3.8
2019:Q1	3.5	3.8	3.0	3.1	.4	.5	1.0	1.2	3.9	3.9
Q2	3.7	4.8	1.8	2.5	2.4	2.6	1.9	2.1	3.6	3.6
Q3	3.6	4.0	1.7	1.6	1.2	1.9	2.1	2.2	3.7	3.7
Q4	3.8	3.7	1.7	1.8	2.0	1.8	2.1	2.1	3.7	3.7
2020:Q1	4.1	4.1	2.1	2.1	1.9	1.9	2.0	2.0	3.7	3.6
Q2	4.3	4.4	2.1	2.1	1.9	1.8	1.9	1.9	3.7	3.6
Q3	4.2	4.2	2.1	2.1	1.8	1.8	1.8	1.9	3.7	3.6
Q4	4.1	4.1	2.1	2.1	1.8	1.8	1.8	1.8	3.7	3.6
Two-quarter[2]										
2018:Q2	5.9	5.9	3.2	3.2	2.2	2.2	2.1	2.1	-.2	-.2
Q4	4.5	4.5	2.8	2.8	1.5	1.5	1.7	1.7	-.1	-.1
2019:Q2	3.6	4.3	2.4	2.8	1.4	1.6	1.5	1.7	-.2	-.2
Q4	3.7	3.8	1.7	1.7	1.6	1.8	2.1	2.2	.1	.1
2020:Q2	4.2	4.2	2.1	2.1	1.9	1.9	1.9	2.0	.0	-.1
Q4	4.1	4.2	2.1	2.1	1.8	1.8	1.8	1.8	.0	.0
Four-quarter[3]										
2017:Q4	4.5	4.5	2.5	2.5	1.8	1.8	1.6	1.6	-.7	-.7
2018:Q4	5.2	5.2	3.0	3.0	1.9	1.9	1.9	1.9	-.3	-.3
2019:Q4	3.6	4.0	2.0	2.3	1.5	1.7	1.8	1.9	-.1	-.1
2020:Q4	4.1	4.2	2.1	2.1	1.9	1.8	1.9	1.9	.0	-.1
2021:Q4	3.7	3.8	1.7	1.8	1.9	1.8	1.9	1.9	.0	.0
Annual										
2017	4.2	4.2	2.2	2.2	1.8	1.8	1.6	1.6	4.4	4.4
2018	5.2	5.2	2.9	2.9	2.0	2.0	1.9	1.9	3.9	3.9
2019	4.1	4.4	2.5	2.6	1.4	1.6	1.7	1.8	3.7	3.7
2020	4.0	4.1	1.9	2.0	1.8	1.9	2.0	2.0	3.7	3.6
2021	3.9	4.0	1.9	2.0	1.9	1.8	1.9	1.9	3.7	3.6

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	2018			2019				2020							
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2018[1]	2019[1]	2020[1]	2021[1]
Real GDP	4.2	3.4	2.2	3.1	2.5	1.6	1.8	2.1	2.1	2.1	2.1	3.0	2.3	2.1	1.8
Previous Tealbook	4.2	3.4	2.2	3.0	1.8	1.7	1.7	2.1	2.1	2.1	2.1	3.0	2.0	2.1	1.7
Final sales	5.4	1.0	2.1	2.6	3.4	1.8	2.3	2.7	2.3	1.8	2.2	2.6	2.5	2.2	1.8
Previous Tealbook	5.4	1.0	2.1	2.4	2.2	1.8	2.4	2.6	2.3	1.8	2.2	2.6	2.2	2.2	1.7
Priv. dom. final purch.	4.3	3.0	2.6	1.3	3.1	2.2	2.2	2.5	2.4	2.3	2.3	3.0	2.2	2.4	2.0
Previous Tealbook	4.3	3.0	2.6	1.1	2.2	2.1	2.2	2.4	2.4	2.3	2.3	3.0	1.9	2.3	1.9
Personal cons. expend.	3.8	3.5	2.5	.9	4.1	2.5	2.4	2.4	2.4	2.4	2.4	2.6	2.5	2.4	2.3
Previous Tealbook	3.8	3.5	2.5	.9	3.0	2.3	2.5	2.4	2.4	2.4	2.4	2.6	2.2	2.4	2.2
Durables	8.6	3.7	3.6	-2.4	15.4	1.0	2.3	1.9	1.9	1.8	1.8	3.4	3.9	1.9	1.7
Nondurables	4.0	4.6	2.1	2.3	6.0	3.6	3.0	2.5	2.5	2.5	2.5	2.7	3.7	2.5	2.4
Services	3.0	3.2	2.4	1.0	1.9	2.4	2.3	2.5	2.5	2.5	2.5	2.4	1.9	2.5	2.3
Residential investment	-1.3	-3.6	-4.7	-2.0	-2.6	4.3	7.3	9.7	4.8	-.1	-2.6	-3.3	1.6	2.8	-3.6
Previous Tealbook	-1.3	-3.6	-4.7	-3.5	-.7	4.6	6.9	8.6	4.8	-.2	-2.7	-3.3	1.7	2.5	-3.4
Nonres. priv. fixed invest.	8.7	2.5	5.4	4.4	.0	.0	-.2	.8	1.6	2.1	3.0	7.0	1.1	1.9	1.9
Previous Tealbook	8.7	2.5	5.4	3.1	-.7	.6	-.6	.4	1.2	2.2	3.3	7.0	.6	1.8	1.5
Equipment & intangibles	7.1	4.4	8.3	4.5	2.6	.0	.5	2.0	2.6	3.3	4.0	7.6	1.9	3.0	2.7
Previous Tealbook	7.1	4.4	8.3	2.8	.8	.1	.2	1.8	2.0	3.1	4.4	7.6	1.0	2.8	2.3
Nonres. structures	14.5	-3.4	-3.9	4.3	-8.3	.1	-2.2	-3.3	-2.0	-1.8	-.3	4.9	-1.6	-1.9	-.8
Previous Tealbook	14.5	-3.4	-3.9	4.0	-5.6	2.5	-3.2	-4.5	-1.4	-1.2	-.2	4.9	-.6	-1.8	-1.3
Net exports[2]	-841	-950	-956	-905	-923	-938	-929	-914	-922	-939	-933	-912	-924	-927	-943
Previous Tealbook[2]	-841	-950	-956	-904	-930	-945	-932	-917	-930	-952	-952	-912	-928	-938	-965
Exports	9.3	-4.9	1.8	5.4	-2.7	.7	2.9	4.3	2.2	2.6	2.9	2.3	1.5	3.0	3.5
Imports	-.6	9.3	2.0	-1.9	.0	2.3	1.1	1.3	2.6	3.8	1.5	3.4	.4	2.3	3.2
Gov't. cons. & invest.	2.5	2.6	-.4	2.8	6.2	1.1	1.2	1.3	2.1	.6	.9	1.5	2.8	1.2	.9
Previous Tealbook	2.5	2.6	-.4	2.8	4.4	1.1	1.3	1.7	2.6	1.0	.9	1.5	2.4	1.5	.9
Federal	3.7	3.5	1.1	-.1	10.9	3.5	3.9	2.2	4.2	-.1	.7	2.7	4.5	1.7	.8
Defense	6.0	4.9	6.3	4.0	6.9	3.5	4.1	1.6	1.3	1.0	1.0	5.0	4.6	1.2	.5
Nondefense	.5	1.6	-6.1	-5.8	17.3	3.6	3.7	3.1	8.7	-1.6	.2	-.5	4.4	2.5	1.2
State & local	1.8	2.0	-1.3	4.6	3.4	-.3	-.4	.8	.8	1.0	1.0	.8	1.8	.9	1.0
Change in priv. inventories[2]	-37	90	97	123	79	69	46	18	11	31	26	45	79	22	28
Previous Tealbook[2]	-37	90	97	126	107	104	66	38	29	46	41	45	101	38	45

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Real GDP	1.5	2.6	2.7	2.0	1.9	2.5	3.0	2.3	2.1	1.8
Previous Tealbook	1.5	2.6	2.7	2.0	1.9	2.5	3.0	2.0	2.1	1.7
Final sales	1.9	2.0	3.0	1.9	2.1	2.6	2.6	2.5	2.2	1.8
Previous Tealbook	1.9	2.0	3.0	1.9	2.1	2.6	2.6	2.2	2.2	1.7
Priv. dom. final purch.	2.6	2.6	4.3	2.7	2.7	3.3	3.0	2.2	2.4	2.0
Previous Tealbook	2.6	2.6	4.3	2.7	2.7	3.3	3.0	1.9	2.3	1.9
Personal cons. expend.	1.6	1.9	3.8	3.0	2.8	2.7	2.6	2.5	2.4	2.3
Previous Tealbook	1.6	1.9	3.8	3.0	2.8	2.7	2.6	2.2	2.4	2.2
Durables	6.3	5.0	9.2	6.0	6.8	7.7	3.4	3.9	1.9	1.7
Nondurables	.7	2.8	3.0	3.0	2.0	3.0	2.7	3.7	2.5	2.4
Services	1.2	1.1	3.2	2.6	2.4	1.8	2.4	1.9	2.5	2.3
Residential investment	15.4	7.1	7.8	8.9	4.5	3.8	-3.3	1.6	2.8	-3.6
Previous Tealbook	15.4	7.1	7.8	8.9	4.5	3.8	-3.3	1.7	2.5	-3.4
Nonres. priv. fixed invest.	5.6	5.4	6.4	-.7	1.8	6.3	7.0	1.1	1.9	1.9
Previous Tealbook	5.6	5.4	6.4	-.7	1.8	6.3	7.0	.6	1.8	1.5
Equipment & intangibles	6.1	5.1	5.6	2.6	1.6	7.3	7.6	1.9	3.0	2.7
Previous Tealbook	6.1	5.1	5.6	2.6	1.6	7.3	7.6	1.0	2.8	2.3
Nonres. structures	4.0	6.7	8.8	-10.7	2.5	2.9	4.9	-1.6	-1.9	-.8
Previous Tealbook	4.0	6.7	8.8	-10.7	2.5	2.9	4.9	-.6	-1.8	-1.3
Net exports[1]	-569	-533	-578	-725	-786	-859	-912	-924	-927	-943
Previous Tealbook[1]	-569	-533	-578	-725	-786	-859	-912	-928	-938	-965
Exports	2.1	6.0	3.0	-1.6	.8	4.7	2.3	1.5	3.0	3.5
Imports	.6	3.0	6.7	3.4	3.1	5.4	3.4	.4	2.3	3.2
Gov't. cons. & invest.	-2.1	-2.4	.2	2.2	.9	.1	1.5	2.8	1.2	.9
Previous Tealbook	-2.1	-2.4	.2	2.2	.9	.1	1.5	2.4	1.5	.9
Federal	-2.6	-6.1	-1.2	1.2	.2	1.3	2.7	4.5	1.7	.8
Defense	-4.7	-6.5	-3.6	-.2	-.7	1.3	5.0	4.6	1.2	.5
Nondefense	1.2	-5.5	2.7	3.4	1.5	1.3	-.5	4.4	2.5	1.2
State & local	-1.7	.2	1.1	2.8	1.4	-.5	.8	1.8	.9	1.0
Change in priv. inventories[1]	71	109	87	129	23	23	45	79	22	28
Previous Tealbook[1]	71	109	87	129	23	23	45	101	38	45

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	2018			2019				2020							
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2018[1]	2019[1]	2020[1]	2021[1]
Real GDP	4.2	3.4	2.2	3.1	2.5	1.6	1.8	2.1	2.1	2.1	2.1	3.0	2.3	2.1	1.8
Previous Tealbook	4.2	3.4	2.2	3.0	1.8	1.7	1.7	2.1	2.1	2.1	2.1	3.0	2.0	2.1	1.7
Final sales	5.3	1.0	2.1	2.6	3.3	1.8	2.3	2.7	2.3	1.8	2.2	2.6	2.5	2.2	1.8
Previous Tealbook	5.3	1.0	2.1	2.4	2.2	1.7	2.4	2.6	2.2	1.8	2.2	2.6	2.2	2.2	1.7
Priv. dom. final purch.	3.7	2.6	2.2	1.2	2.6	1.8	1.9	2.1	2.0	1.9	1.9	2.5	1.9	2.0	1.7
Previous Tealbook	3.7	2.6	2.2	.9	1.9	1.8	1.9	2.0	2.0	1.9	2.0	2.5	1.6	2.0	1.6
Personal cons. expend.	2.6	2.4	1.7	.6	2.7	1.7	1.6	1.6	1.6	1.6	1.6	1.8	1.7	1.6	1.6
Previous Tealbook	2.6	2.4	1.7	.6	2.0	1.6	1.7	1.7	1.7	1.7	1.7	1.8	1.5	1.7	1.5
Durables	.6	.3	.3	-.2	1.0	.1	.2	.1	.1	.1	.1	.2	.3	.1	.1
Nondurables	.6	.6	.3	.3	.8	.5	.4	.3	.3	.3	.3	.4	.5	.3	.3
Services	1.4	1.5	1.1	.5	.9	1.1	1.1	1.2	1.2	1.2	1.2	1.1	.9	1.2	1.1
Residential investment	-.1	-.1	-.2	-.1	-.1	.2	.3	.4	.2	.0	-.1	-.1	.1	.1	-.1
Previous Tealbook	-.1	-.1	-.2	-.1	.0	.2	.3	.3	.2	.0	-.1	-.1	.1	.1	-.1
Nonres. priv. fixed invest.	1.2	.4	.7	.6	.0	.0	.0	.1	.2	.3	.4	.9	.1	.3	.3
Previous Tealbook	1.2	.4	.7	.4	-.1	.1	-.1	.1	.2	.3	.4	.9	.1	.2	.2
Equipment & intangibles	.7	.5	.9	.5	.3	.0	.0	.2	.3	.3	.4	.8	.2	.3	.3
Previous Tealbook	.7	.5	.9	.3	.1	.0	.0	.2	.2	.3	.4	.8	.1	.3	.2
Nonres. structures	.4	-.1	-.1	.1	-.3	.0	-.1	-.1	-.1	-.1	.0	.1	-.1	-.1	.0
Previous Tealbook	.4	-.1	-.1	.1	-.2	.1	-.1	-.1	.0	.0	.0	.1	.0	-.1	.0
Net exports	1.2	-2.0	-.1	.9	-.3	-.3	.2	.3	-.1	-.2	.1	-.2	.1	.0	-.1
Previous Tealbook	1.2	-2.0	-.1	1.0	-.5	-.2	.2	.3	-.2	-.3	.0	-.2	.1	-.1	-.1
Exports	1.1	-.6	.2	.7	-.3	.1	.3	.5	.3	.3	.3	.3	.2	.4	.4
Imports	.1	-1.4	-.3	.3	.0	-.3	-.2	-.2	-.4	-.5	-.2	-.5	-.1	-.3	-.5
Gov't. cons. & invest.	.4	.4	-.1	.5	1.0	.2	.2	.2	.4	.1	.1	.3	.5	.2	.2
Previous Tealbook	.4	.4	-.1	.5	.7	.2	.2	.3	.4	.2	.2	.3	.4	.3	.2
Federal	.2	.2	.1	.0	.7	.2	.3	.1	.3	.0	.0	.2	.3	.1	.0
Defense	.2	.2	.2	.2	.3	.1	.2	.1	.0	.0	.0	.2	.2	.0	.0
Nondefense	.0	.0	-.2	-.2	.4	.1	.1	.1	.2	.0	.0	.0	.1	.1	.0
State & local	.2	.2	-.1	.5	.4	.0	.0	.1	.1	.1	.1	.1	.2	.1	.1
Change in priv. inventories	-1.2	2.3	.1	.6	-.8	-.2	-.4	-.5	-.1	.4	-.1	.4	-.2	-.1	.0
Previous Tealbook	-1.2	2.3	.1	.6	-.4	-.1	-.7	-.5	-.2	.3	-.1	.4	-.1	-.1	.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	2018			2019				2020							
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2018[1]	2019[1]	2020[1]	2021[1]
GDP chain-wt. price index	3.0	1.8	1.7	.9	2.2	2.3	1.8	1.9	2.2	2.0	1.9	2.1	1.8	2.0	2.0
Previous Tealbook	3.0	1.8	1.7	.8	1.8	1.8	2.1	1.9	2.2	2.0	1.9	2.1	1.6	2.0	2.0
PCE chain-wt. price index	2.0	1.6	1.5	.5	2.6	1.9	1.8	1.9	1.8	1.8	1.8	1.9	1.7	1.8	1.8
Previous Tealbook	2.0	1.6	1.5	.4	2.4	1.2	2.0	1.9	1.9	1.8	1.8	1.9	1.5	1.9	1.9
Energy	.7	3.3	-2.0	-16.9	18.4	-5.5	-8.1	-2.5	-1.5	-.9	-.7	3.5	-3.8	-1.4	.0
Previous Tealbook	.7	3.3	-2.0	-16.8	15.8	-19.2	-1.2	-.1	.0	.1	-.1	3.5	-6.3	-.1	.3
Food	1.2	.4	.3	3.0	.6	2.5	2.7	2.6	2.6	2.6	2.6	.5	2.2	2.6	2.6
Previous Tealbook	1.2	.4	.3	3.0	.5	3.0	2.6	2.6	2.6	2.6	2.6	.5	2.3	2.6	2.6
Ex. food & energy	2.1	1.6	1.8	1.2	2.1	2.2	2.1	2.0	1.9	1.9	1.8	1.9	1.9	1.9	1.9
Previous Tealbook	2.1	1.6	1.8	1.0	1.9	2.1	2.1	2.0	1.9	1.8	1.8	1.9	1.8	1.9	1.9
Ex. food & energy, market based	2.2	1.2	1.5	1.7	1.5	2.1	2.0	1.9	1.8	1.7	1.7	1.7	1.8	1.8	1.7
Previous Tealbook	2.2	1.2	1.5	1.7	1.6	2.1	1.9	1.8	1.7	1.7	1.7	1.7	1.8	1.7	1.7
CPI	2.1	2.0	1.5	.9	2.9	2.0	1.8	2.1	2.1	2.1	2.1	2.2	1.9	2.1	2.2
Previous Tealbook	2.1	2.0	1.5	.9	3.0	1.0	2.2	2.2	2.2	2.2	2.2	2.2	1.8	2.2	2.2
Ex. food & energy	1.9	2.0	2.2	2.3	1.8	2.6	2.6	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.3
Previous Tealbook	1.9	2.0	2.2	2.3	2.0	2.6	2.4	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.3
ECI, hourly compensation[2]	2.4	3.0	2.7	2.7	2.8	2.8	2.8	2.7	2.7	2.7	2.7	3.0	2.8	2.7	2.7
Previous Tealbook[2]	2.4	3.0	2.7	2.7	2.8	2.8	2.8	2.7	2.7	2.7	2.7	3.0	2.8	2.7	2.7
Business sector															
Output per hour	3.5	1.5	1.2	3.7	3.5	-1.0	.3	1.1	1.1	1.5	1.4	1.8	1.6	1.3	1.2
Previous Tealbook	3.5	1.5	1.2	3.4	1.8	-.4	.5	1.3	1.1	1.3	1.3	1.8	1.3	1.3	1.2
Compensation per hour	.4	3.2	.7	1.9	3.6	3.0	3.9	3.7	3.7	3.7	3.6	2.2	3.1	3.6	3.6
Previous Tealbook	.4	3.2	.7	1.9	3.6	3.6	3.9	3.6	3.6	3.6	3.6	2.2	3.3	3.6	3.6
Unit labor costs	-3.0	1.8	-.5	-1.8	.1	4.1	3.6	2.5	2.5	2.2	2.2	.5	1.5	2.3	2.4
Previous Tealbook	-3.0	1.8	-.5	-1.4	1.8	4.0	3.4	2.3	2.5	2.2	2.2	.5	1.9	2.3	2.4
Core goods imports chain-wt. price index[3]	.6	-1.2	.1	-.8	-.5	.9	1.4	1.1	1.0	.7	.8	.5	.3	.9	.8
Previous Tealbook[3]	.6	-1.2	.1	-.7	.6	.6	.7	1.1	1.0	.7	.7	.5	.3	.9	.8

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
GDP chain-wt. price index	2.1	1.8	1.6	.9	1.5	2.0	2.1	1.8	2.0	2.0
Previous Tealbook	2.1	1.8	1.6	.9	1.5	2.0	2.1	1.6	2.0	2.0
PCE chain-wt. price index	1.8	1.2	1.2	.3	1.6	1.8	1.9	1.7	1.8	1.8
Previous Tealbook	1.8	1.2	1.2	.3	1.6	1.8	1.9	1.5	1.9	1.9
Energy	2.1	-2.9	-6.9	-16.4	2.1	8.1	3.5	-3.8	-1.4	.0
Previous Tealbook	2.1	-2.9	-6.9	-16.4	2.1	8.1	3.5	-6.3	-.1	.3
Food	1.3	.7	2.8	.3	-1.8	.7	.5	2.2	2.6	2.6
Previous Tealbook	1.3	.7	2.8	.3	-1.8	.7	.5	2.3	2.6	2.6
Ex. food & energy	1.8	1.6	1.5	1.2	1.8	1.6	1.9	1.9	1.9	1.9
Previous Tealbook	1.8	1.6	1.5	1.2	1.8	1.6	1.9	1.8	1.9	1.9
Ex. food & energy, market based	1.5	1.1	1.2	1.1	1.5	1.2	1.7	1.8	1.8	1.7
Previous Tealbook	1.5	1.1	1.2	1.1	1.5	1.2	1.7	1.8	1.7	1.7
CPI	1.9	1.2	1.2	.4	1.8	2.1	2.2	1.9	2.1	2.2
Previous Tealbook	1.9	1.2	1.2	.4	1.8	2.1	2.2	1.8	2.2	2.2
Ex. food & energy	1.9	1.7	1.7	2.0	2.2	1.8	2.2	2.3	2.3	2.3
Previous Tealbook	1.9	1.7	1.7	2.0	2.2	1.8	2.2	2.3	2.3	2.3
ECI, hourly compensation[1]	1.8	2.0	2.3	1.9	2.2	2.6	3.0	2.8	2.7	2.7
Previous Tealbook[1]	1.8	2.0	2.3	1.9	2.2	2.6	3.0	2.8	2.7	2.7
Business sector										
Output per hour	.1	1.8	.2	.7	1.1	.8	1.8	1.6	1.3	1.2
Previous Tealbook	.1	1.8	.2	.7	1.1	.8	1.8	1.3	1.3	1.2
Compensation per hour	5.9	-.3	2.8	2.5	2.1	3.1	2.2	3.1	3.6	3.6
Previous Tealbook	5.9	-.3	2.8	2.5	2.1	3.1	2.2	3.3	3.6	3.6
Unit labor costs	5.7	-2.0	2.7	1.8	1.0	2.3	.5	1.5	2.3	2.4
Previous Tealbook	5.7	-2.0	2.7	1.8	1.0	2.3	.5	1.9	2.3	2.4
Core goods imports chain-wt. price index[2]	-.4	-2.2	-.4	-4.4	-.7	1.1	.5	.3	.9	.8
Previous Tealbook[2]	-.4	-2.2	-.4	-4.4	-.7	1.1	.5	.3	.9	.8

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

Other Macroeconomic Indicators

Item	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2018[1]	2019[1]	2020[1]	2021[1]
Employment and production															
Nonfarm payroll employment[2]	243	189	233	174	171	164	145	178	227	46	138	223	163	147	111
Unemployment rate[3]	3.9	3.8	3.8	3.9	3.6	3.7	3.7	3.6	3.6	3.6	3.6	3.8	3.7	3.6	3.6
Previous Tealbook[3]	3.9	3.8	3.8	3.9	3.6	3.7	3.7	3.7	3.7	3.7	3.7	3.8	3.7	3.7	3.7
Natural rate of unemployment[3]	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Previous Tealbook[3]	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Employment-to-Population Ratio[3]	60.4	60.4	60.6	60.7	60.6	60.6	60.6	60.6	60.6	60.6	60.7	60.6	60.6	60.7	60.6
Employment-to-Population Trend[3]	60.0	60.0	59.9	59.9	59.9	59.8	59.8	59.8	59.7	59.7	59.7	59.9	59.8	59.7	59.5
Output gap[4]	1.4	1.7	1.9	2.0	2.1	2.1	2.1	2.2	2.2	2.3	2.4	1.9	2.1	2.4	2.3
Previous Tealbook[4]	1.4	1.7	1.9	2.0	2.0	2.0	1.9	2.0	2.1	2.1	2.2	1.9	1.9	2.2	2.0
Industrial production[5]	4.6	5.2	3.9	-1.9	-1.2	2.1	.7	.6	1.8	2.0	1.0	4.0	-.1	1.3	1.1
Previous Tealbook[5]	4.6	5.2	3.9	-1.9	-.7	1.2	.6	1.3	1.7	1.8	.7	4.0	-.2	1.4	1.1
Manufacturing industr. prod.[5]	2.0	3.6	1.5	-1.9	-2.2	1.4	.1	.2	1.4	1.9	1.2	2.2	-.7	1.2	1.1
Previous Tealbook[5]	2.0	3.6	1.6	-2.1	-1.9	.7	.0	.6	1.5	2.1	1.4	2.2	-.8	1.4	1.1
Capacity utilization rate - mfg.[3]	76.4	76.9	77.0	76.4	75.7	75.7	75.4	75.4	75.5	75.7	75.8	77.0	75.4	75.8	76.4
Previous Tealbook[3]	76.4	76.9	77.0	76.4	75.8	75.6	75.4	75.4	75.6	75.9	76.0	77.0	75.4	76.0	76.7
Housing starts[6]	1.3	1.2	1.2	1.2	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.2
Light motor vehicle sales[6]	17.2	16.9	17.5	16.8	17.0	17.0	16.9	16.9	16.9	16.9	16.9	17.2	16.9	16.9	16.8
Income and saving															
Nominal GDP[5]	7.6	4.9	4.1	3.8	4.8	4.0	3.7	4.1	4.4	4.2	4.1	5.2	4.0	4.2	3.8
Real disposable pers. income[5]	1.8	2.6	3.2	2.0	2.4	2.2	2.0	2.7	1.7	1.3	2.1	3.0	2.2	2.0	1.9
Previous Tealbook[5]	1.8	2.6	3.2	2.2	2.5	3.3	1.6	2.8	1.9	1.3	2.2	3.0	2.4	2.1	1.9
Personal saving rate[3]	6.7	6.4	6.5	6.7	6.3	6.3	6.2	6.2	6.1	5.8	5.8	6.5	6.2	5.8	5.4
Previous Tealbook[3]	6.7	6.4	6.5	6.7	6.6	6.8	6.6	6.7	6.6	6.3	6.3	6.5	6.6	6.3	6.0
Corporate profits[7]	12.5	14.7	-1.7	-9.9	5.3	3.1	-5.0	-6.1	3.2	5.7	4.4	7.4	-1.8	1.7	1.8
Profit share of GNP[3]	10.8	11.1	10.9	10.6	10.6	10.6	10.3	10.1	10.1	10.1	10.1	10.9	10.3	10.1	9.9
Gross national saving rate[3]	18.5	18.8	18.4	18.3	17.9	17.9	17.8	17.7	17.7	17.7	17.8	18.4	17.8	17.8	17.6
Net national saving rate[3]	3.3	3.6	3.1	2.9	2.8	2.8	2.6	2.2	2.2	2.2	2.2	3.1	2.6	2.2	1.8

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Employment and production										
Nonfarm payroll employment[1]	181	192	251	227	193	179	223	163	147	111
Unemployment rate[2]	7.8	7.0	5.7	5.0	4.8	4.1	3.8	3.7	3.6	3.6
Previous Tealbook[2]	7.8	7.0	5.7	5.0	4.8	4.1	3.8	3.7	3.7	3.7
Natural rate of unemployment[2]	5.6	5.4	5.1	4.9	4.8	4.6	4.6	4.6	4.6	4.6
Previous Tealbook[2]	5.6	5.4	5.1	4.9	4.8	4.6	4.6	4.6	4.6	4.6
Employment-to-Population Ratio[2]	58.7	58.5	59.3	59.4	59.8	60.2	60.6	60.6	60.7	60.6
Employment-to-Population Trend[2]	60.5	60.4	60.3	60.2	60.1	60.1	59.9	59.8	59.7	59.5
Output gap[3]	-3.8	-3.0	-1.0	-.4	.1	.9	1.9	2.1	2.4	2.3
Previous Tealbook[3]	-3.8	-3.0	-1.0	-.4	.1	.9	1.9	1.9	2.2	2.0
Industrial production	2.1	2.3	3.4	-3.4	-.3	3.6	4.0	-.1	1.3	1.1
Previous Tealbook	2.1	2.3	3.4	-3.4	-.3	3.6	4.0	-.2	1.4	1.1
Manufacturing industr. prod.	1.4	1.1	1.4	-1.7	.3	2.5	2.2	-.7	1.2	1.1
Previous Tealbook	1.4	1.1	1.4	-1.7	.3	2.5	2.2	-.8	1.4	1.1
Capacity utilization rate - mfg.[2]	74.2	74.5	75.8	74.9	74.2	75.8	77.0	75.4	75.8	76.4
Previous Tealbook[2]	74.2	74.5	75.8	74.9	74.2	75.8	77.0	75.4	76.0	76.7
Housing starts[4]	.8	.9	1.0	1.1	1.2	1.2	1.2	1.2	1.3	1.2
Light motor vehicle sales[4]	14.4	15.5	16.5	17.4	17.5	17.1	17.2	16.9	16.9	16.8
Income and saving										
Nominal GDP	3.6	4.4	4.4	2.9	3.4	4.5	5.2	4.0	4.2	3.8
Real disposable pers. income	4.9	-2.5	5.2	3.1	1.6	2.8	3.0	2.2	2.0	1.9
Previous Tealbook	4.9	-2.5	5.2	3.1	1.6	2.8	3.0	2.4	2.1	1.9
Personal saving rate[2]	10.2	6.3	7.4	7.4	6.4	6.3	6.5	6.2	5.8	5.4
Previous Tealbook[2]	10.2	6.3	7.4	7.4	6.4	6.3	6.5	6.6	6.3	6.0
Corporate profits[5]	.7	3.9	5.9	-10.7	7.6	3.3	7.4	-1.8	1.7	1.8
Profit share of GNP[2]	11.9	11.8	12.0	10.4	10.8	10.7	10.9	10.3	10.1	9.9
Gross national saving rate[2]	18.8	19.2	20.2	19.4	18.3	18.3	18.4	17.8	17.8	17.6
Net national saving rate[2]	3.7	4.0	5.1	4.3	3.0	3.1	3.1	2.6	2.2	1.8

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	2016	2017	2018	2019	2020	2021	2019 Q1	2019 Q2	2019 Q3	2019 Q4
Unified federal budget[1]				Nominal dollars, billions						
Receipts	3,268	3,316	3,330	3,472	3,702	3,840	736	1,102	863	810
Outlays	3,853	3,982	4,109	4,435	4,653	4,888	1,108	1,158	1,079	1,163
Surplus/deficit	-585	-665	-779	-963	-950	-1,048	-372	-56	-216	-353
				Percent of GDP						
Surplus/deficit	-3.2	-3.5	-3.9	-4.5	-4.3	-4.6	-7.2	-1.1	-4.1	-6.6
Previous Tealbook	*-3.2*	*-3.5*	*-3.9*	*-4.4*	*-4.4*	*-4.7*	*-7.2*	*-.4*	*-4.0*	*-6.5*
Primary surplus/deficit	-1.9	-2.1	-2.2	-2.8	-2.5	-2.6	-5.4	1.2	-2.9	-4.6
Net interest	1.3	1.4	1.6	1.7	1.8	2.0	1.7	2.3	1.2	2.0
Cyclically adjusted surplus/deficit	-3.0	-3.6	-4.4	-5.4	-5.3	-5.7	-8.0	-2.0	-5.0	-7.6
Federal debt held by public	76.4	76.1	77.8	76.6	79.3	81.1	78.1	77.1	76.6	79.5
Government in the NIPA[2]				Real percent change, annual rate						
Purchases	.9	.1	1.5	2.8	1.2	.9	2.8	6.2	1.1	1.2
Consumption	.9	-.1	1.4	2.0	.9	.6	.3	4.4	1.6	1.6
Investment	.7	1.4	2.3	6.2	2.2	2.0	14.1	13.0	-.8	-.4
State and local construction	1.8	-2.9	.4	6.9	.5	1.0	29.4	19.1	-8.0	-8.0
Real disposable personal income	1.6	2.8	3.0	2.2	2.0	1.9	2.0	2.4	2.2	2.0
Contribution from transfers[3]	.3	.2	.5	.9	.5	.8	2.7	.6	-.1	.5
Contribution from taxes[3]	-.1	-.6	.1	-.7	-.5	-.5	-1.5	-.9	.1	-.4
Government employment				Average net change in monthly payrolls, thousands						
Federal	3	-2	0	3	0	1	2	4	9	-4
State and local	14	9	8	9	9	9	7	11	9	9
Fiscal indicators[2]				Percentage point contribution to change in real GDP, annual rate						
Fiscal effect (FE)[4]	.4	.1	.4	.9	.5	.4	1.1	1.6	.5	.5
Discretionary policy actions (FI)	.3	.2	.6	.7	.4	.2	.8	1.3	.4	.4
Previous Tealbook	*.3*	*.2*	*.6*	*.7*	*.5*	*.2*	*.8*	*1.0*	*.4*	*.4*
Federal purchases	.0	.1	.2	.3	.1	.0	.0	.7	.2	.3
State and local purchases	.1	-.1	.1	.2	.1	.1	.5	.4	.0	.0
Taxes and transfers	.1	.1	.3	.3	.2	.0	.3	.3	.2	.2
Cyclical	-.1	-.1	-.2	-.1	-.1	.0	-.1	-.2	-.1	-.1
Other	.2	.1	.0	.3	.2	.3	.4	.5	.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	2018 Q1	2018 Q2	2018 Q3	2018 Q4	Projected 2019 Q1	2019 Q2	2019 Q3	2019 Q4	Projected 2020 Q1	2020 Q2	2020 Q3	2020 Q4
***Real GDP*[1]**												
Total foreign	3.4	1.8	2.1	1.5	1.5	2.0	2.3	2.1	2.4	2.5	2.5	2.6
Previous Tealbook	*3.3*	*1.8*	*2.1*	*1.5*	*1.6*	*2.2*	*2.3*	*2.2*	*2.4*	*2.5*	*2.5*	*2.5*
Advanced foreign economies	1.4	2.2	1.1	.8	1.2	1.5	1.6	1.1	1.5	1.6	1.6	1.6
Canada	1.5	2.5	2.1	.3	.4	2.6	1.9	1.6	1.6	1.7	1.8	1.7
Japan	-.4	2.3	-2.6	1.8	2.2	.0	2.1	-2.0	.7	1.0	1.0	.9
United Kingdom	.2	1.6	2.8	.9	2.0	-.2	1.5	1.1	1.5	1.6	1.6	1.6
Euro area	1.6	1.6	.5	1.0	1.6	1.0	1.0	1.2	1.4	1.4	1.5	1.6
Germany	1.5	1.8	-.8	.1	1.7	.3	1.4	1.4	1.4	1.4	1.4	1.4
Emerging market economies	5.4	1.4	3.2	2.3	1.8	2.4	3.0	3.2	3.3	3.4	3.5	3.5
Asia	6.0	4.0	3.8	4.0	4.3	3.8	4.2	4.3	4.3	4.3	4.3	4.3
Korea	3.9	2.3	1.8	3.8	-1.5	1.6	2.2	2.4	2.4	2.4	2.4	2.4
China	7.1	6.5	5.9	6.0	7.3	5.6	5.8	5.8	5.7	5.7	5.7	5.7
Latin America	4.7	-1.6	2.5	.3	-.6	.8	1.7	2.0	2.2	2.4	2.5	2.6
Mexico	5.4	-1.5	2.7	.1	-.7	.5	1.6	1.8	2.1	2.3	2.4	2.5
Brazil	2.1	.0	2.0	.4	-.6	.4	1.4	2.1	2.3	2.5	2.5	2.6
***Consumer prices*[2]**												
Total foreign	2.6	1.8	3.4	1.9	.8	3.3	2.5	2.7	2.3	2.3	2.3	2.3
Previous Tealbook	*2.6*	*1.8*	*3.4*	*1.9*	*.8*	*2.9*	*2.2*	*2.6*	*2.3*	*2.3*	*2.3*	*2.3*
Advanced foreign economies	2.5	1.3	2.4	.7	.7	2.2	1.4	2.5	1.4	1.5	1.5	1.5
Canada	3.3	1.2	2.6	1.1	1.6	3.4	1.7	2.0	1.9	1.9	1.9	1.9
Japan	2.8	-1.6	2.0	-.1	.9	.2	1.0	6.3	.7	1.0	1.0	1.0
United Kingdom	2.5	2.0	2.7	1.8	.9	2.7	2.3	2.2	2.2	2.1	2.1	2.1
Euro area	2.0	2.3	2.6	.7	.1	2.2	1.2	1.5	1.3	1.3	1.3	1.4
Germany	2.1	2.3	3.0	1.2	-.1	2.6	1.6	2.0	1.9	2.0	2.0	2.1
Emerging market economies	2.7	2.2	4.1	2.7	.8	4.1	3.2	2.9	2.9	2.8	2.8	2.8
Asia	2.2	1.4	3.0	1.7	.4	3.9	3.1	2.7	2.6	2.6	2.6	2.6
Korea	1.6	2.2	1.9	1.5	-3.3	2.7	2.0	1.9	2.0	2.1	2.1	2.1
China	1.9	1.1	3.7	2.0	.6	4.3	3.5	2.6	2.5	2.5	2.5	2.5
Latin America	4.1	4.2	6.8	5.4	1.7	4.9	3.5	3.6	3.4	3.4	3.4	3.4
Mexico	4.0	4.0	6.5	4.9	1.1	4.5	3.2	3.3	3.2	3.2	3.2	3.2
Brazil	3.1	4.3	6.6	2.5	2.9	5.2	3.4	4.3	4.3	4.3	4.3	4.3

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
								Projected		
Real GDP[1]										
Total foreign	2.2	3.0	3.0	2.1	2.8	3.0	2.2	2.0	2.5	2.6
Previous Tealbook	*2.2*	*3.0*	*3.0*	*2.1*	*2.8*	*3.1*	*2.2*	*2.1*	*2.5*	*2.6*
Advanced foreign economies	.3	2.4	2.1	.9	1.8	2.7	1.3	1.4	1.6	1.7
Canada	.7	3.4	2.8	-.4	1.8	2.9	1.6	1.6	1.7	1.7
Japan	.3	2.8	-.4	1.0	1.2	2.3	.3	.6	.9	.8
United Kingdom	1.6	2.6	3.1	2.2	1.7	1.6	1.4	1.1	1.6	1.6
Euro area	-1.1	.8	1.5	2.0	2.1	2.8	1.2	1.2	1.5	1.8
Germany	.2	1.6	2.3	1.3	1.9	2.8	.6	1.2	1.4	1.5
Emerging market economies	4.2	3.6	3.9	3.2	3.8	3.4	3.1	2.6	3.4	3.6
Asia	5.9	5.4	5.1	4.6	5.1	5.2	4.4	4.1	4.3	4.3
Korea	2.4	3.7	2.6	3.4	2.7	2.8	3.0	1.2	2.4	2.4
China	8.0	7.6	7.1	6.8	6.8	6.7	6.4	6.1	5.7	5.7
Latin America	2.9	1.6	2.8	1.9	2.5	1.7	1.5	1.0	2.4	2.8
Mexico	3.0	1.2	3.4	2.8	3.3	1.5	1.6	.8	2.3	2.7
Brazil	2.6	2.6	-.1	-5.5	-2.3	2.2	1.1	.8	2.5	2.8
Consumer prices[2]										
Total foreign	2.3	2.4	2.0	1.4	1.9	2.5	2.4	2.3	2.3	2.3
Previous Tealbook	*2.3*	*2.4*	*2.0*	*1.4*	*1.9*	*2.5*	*2.4*	*2.1*	*2.3*	*2.3*
Advanced foreign economies	1.3	1.0	1.2	.5	.9	1.5	1.7	1.7	1.5	1.5
Canada	1.0	1.0	2.0	1.3	1.4	1.8	2.1	2.2	1.9	2.0
Japan	-.2	1.4	2.6	.1	.3	.6	.8	2.1	.9	1.0
United Kingdom	2.6	2.1	.9	.1	1.2	3.0	2.3	2.0	2.1	2.0
Euro area	2.3	.8	.2	.3	.7	1.4	1.9	1.3	1.3	1.4
Germany	2.0	1.4	.4	.5	1.0	1.6	2.2	1.5	2.0	2.2
Emerging market economies	3.1	3.4	2.6	2.0	2.6	3.2	2.9	2.7	2.8	2.8
Asia	2.7	3.2	1.8	1.5	2.1	2.0	2.1	2.5	2.6	2.6
Korea	1.7	1.1	1.0	.9	1.4	1.4	1.8	.8	2.0	2.1
China	2.1	2.9	1.5	1.4	2.1	1.8	2.2	2.7	2.5	2.5
Latin America	4.3	4.0	4.7	3.2	4.0	6.4	5.1	3.4	3.4	3.3
Mexico	4.1	3.6	4.2	2.3	3.3	6.6	4.8	3.0	3.2	3.2
Brazil	5.6	5.8	6.5	10.4	7.1	2.8	4.1	3.9	4.3	4.3

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

	2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	Billions of dollars, s.a.a.r.											
U.S. current account balance	**-456.0**	**-429.2**	**-503.0**	**-575.7**	**-521.6**	**-508.0**	**-523.9**	**-523.1**	**-517.5**	**-512.0**	**-533.4**	**-526.8**
Previous Tealbook	*-495.7*	*-414.3*	*-506.4*	*-537.5*	*-495.6*	*-531.5*	*-546.4*	*-533.9*	*-546.3*	*-541.9*	*-563.7*	*-558.8*
Current account as percent of GDP	-2.3	-2.1	-2.4	-2.8	-2.5	-2.4	-2.4	-2.4	-2.4	-2.3	-2.4	-2.3
Previous Tealbook	*-2.5*	*-2.0*	*-2.5*	*-2.6*	*-2.4*	*-2.5*	*-2.6*	*-2.5*	*-2.5*	*-2.5*	*-2.5*	*-2.5*
Net goods & services	-612.4	-560.0	-653.7	-684.6	-618.4	-637.5	-626.7	-618.8	-605.2	-599.9	-607.6	-601.3
Investment income, net	278.3	264.0	272.0	253.3	257.5	276.4	255.7	244.7	248.4	234.7	227.1	223.4
Direct, net	340.0	327.9	338.8	314.4	326.3	339.3	332.8	335.9	353.4	355.0	359.0	366.9
Portfolio, net	-61.6	-63.9	-66.8	-61.1	-68.7	-62.9	-77.1	-91.2	-105.0	-120.3	-131.8	-143.5
Other income and transfers, net	-121.9	-133.3	-121.2	-144.4	-160.7	-146.8	-152.9	-148.9	-160.7	-146.8	-152.9	-148.9

Annual Data

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	Billions of dollars									
U.S. current account balance	**-426.8**	**-348.8**	**-365.2**	**-407.8**	**-428.3**	**-439.6**	**-491.0**	**-519.1**	**-522.4**	**-537.4**
Previous Tealbook	*-426.8*	*-348.8*	*-365.2*	*-407.8*	*-432.9*	*-449.1*	*-488.5*	*-526.9*	*-552.7*	*-562.5*
Current account as percent of GDP	-2.6	-2.1	-2.1	-2.2	-2.3	-2.3	-2.4	-2.4	-2.3	-2.3
Previous Tealbook	*-2.6*	*-2.1*	*-2.1*	*-2.2*	*-2.3*	*-2.3*	*-2.4*	*-2.5*	*-2.5*	*-2.4*
Net goods & services	-537.4	-461.1	-489.6	-498.5	-503.0	-550.1	-627.7	-625.4	-603.5	-597.5
Investment income, net	216.1	215.4	228.9	214.7	211.1	238.7	266.9	258.6	233.4	212.4
Direct, net	285.5	283.3	284.2	284.6	278.0	304.0	330.3	333.6	358.6	382.2
Portfolio, net	-69.4	-67.9	-55.3	-70.0	-66.9	-65.3	-63.4	-75.0	-125.1	-169.8
Other income and transfers, net	-105.5	-103.1	-104.6	-123.9	-136.4	-128.2	-130.2	-152.4	-152.4	-152.4

Abbreviations

AFE	advanced foreign economy
BEA	Bureau of Economic Analysis, Department of Commerce
BFI	business fixed investment
BLS	Bureau of Labor Statistics
BOC	Bank of Canada
BOE	Bank of England
BOJ	Bank of Japan
BOM	Bank of Mexico
CBRT	Central Bank of the Republic of Turkey
CD	certificate of deposit
CDS	credit default swap
C&I	commercial and industrial
CP	commercial paper
CPI	consumer price index
CRE	commercial real estate
DSGE	dynamic stochastic general equilibrium
ECB	European Central Bank
ECI	employment cost index
EFFR	effective federal funds rate
ELB	effective lower bound
EME	emerging market economy
FCI	financial conditions index
FOMC	Federal Open Market Committee; also, the Committee
FPLT	flexible price-level targeting
FRB/US	A large-scale macroeconometric model of the U.S. economy

G-20	Group of Twenty
GDI	gross domestic income
GDP	gross domestic product
GEMUS	a calibrated two-country DSGE model
GNP	gross national product
IOER	interest on excess reserves
ISM	Institute for Supply Management
LFPR	labor force participation rate
MMF	money market fund
NFIB	National Federation of Independent Business
NIPA	national income and product accounts
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
PMI	purchasing managers index
PPI	producer price 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
VAR	vector autoregression
VIX	one-month-ahead option-implied volatility on the S&P 500 index