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

June 7, 2019

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

Comparing the Staff Projection with Other Forecasts

The staff's projection for GDP growth is a little below the projections from both the Survey of Professional Forecasters (SPF) and the Blue Chip consensus in 2019, but it is nearly ½ percentage point higher than the Blue Chip in 2020. Correspondingly, the staff's unemployment rate forecast is a little above the SPF and Blue Chip in 2019; the staff forecast is the same as the Blue Chip forecast in 2020.

With regard to inflation, the staff's forecast of CPI inflation is a bit lower than outside forecasters in 2019 and a bit higher in 2020. The staff's projection of total PCE price inflation is lower than the SPF in 2019; the staff and the SPF both have total PCE price inflation at 1.9 percent in 2020. For core PCE price inflation, the staff is 0.1 percentage point above the SPF in 2019 and 0.1 percentage point below the SPF in 2020.

Please note that the Blue Chip data are embargoed until June 10.

Comparison of Tealbook and Outside Forecasts

	2019	2020
GDP (Q4/Q4 percent change)		
June Tealbook	2.0	2.1
Blue Chip (6/10/19)	2.2	1.7
SPF median (5/20/19)	2.3	n.a.
Unemployment rate (Q4 level)		
June Tealbook	3.7	3.7
Blue Chip (6/10/19)	3.6	3.7
SPF median (5/20/19)	3.6	n.a.
CPI inflation (Q4/Q4 percent change)		
June Tealbook	1.8	2.2
Blue Chip (6/10/19)	2.1	2.1
SPF median (5/20/19)	1.9	2.1
PCE price inflation (Q4/Q4 percent change)		
June Tealbook	1.5	1.9
SPF median (5/20/19)	1.7	1.9
Core PCE price inflation (Q4/Q4 percent change)		
June Tealbook	1.8	1.9
SPF median (5/20/19)	1.7	2.0

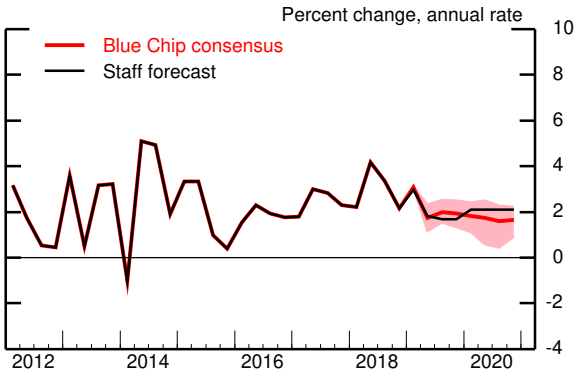
Note: SPF is the Survey of Professional Forecasters, CPI is the consumer price index, and PCE is personal consumption expenditures. Blue Chip does not provide results for overall and core PCE price inflation. The Blue Chip consensus forecast includes input from about 50 panelists, and the SPF about 40.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

n.a. Not available.

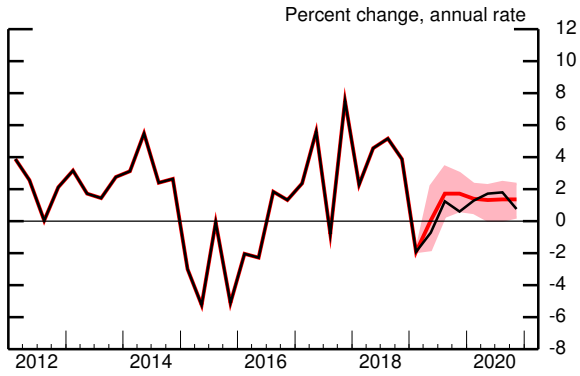
Source: Blue Chip Economic Indicators; Federal Reserve Bank of Philadelphia.

Tealbook Forecast Compared with Blue Chip**

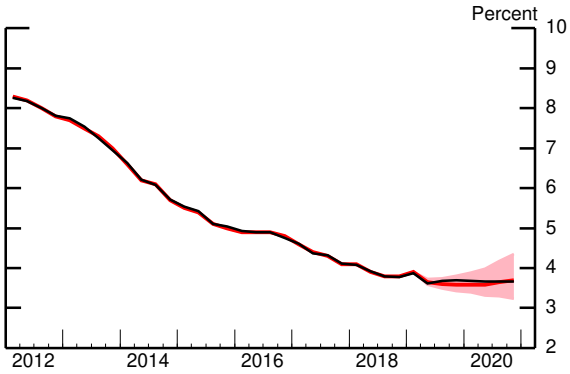
Real GDP



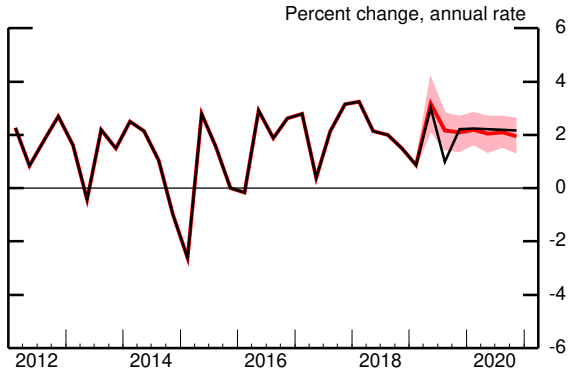
Industrial Production



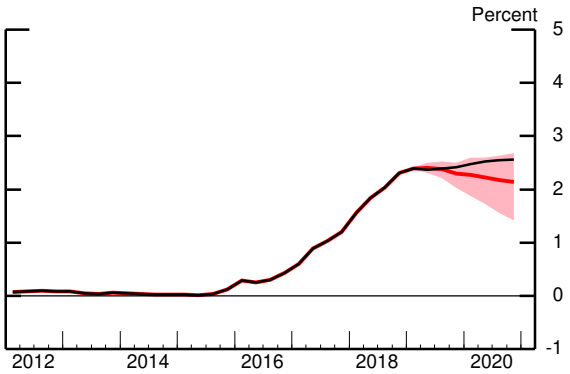
Unemployment Rate



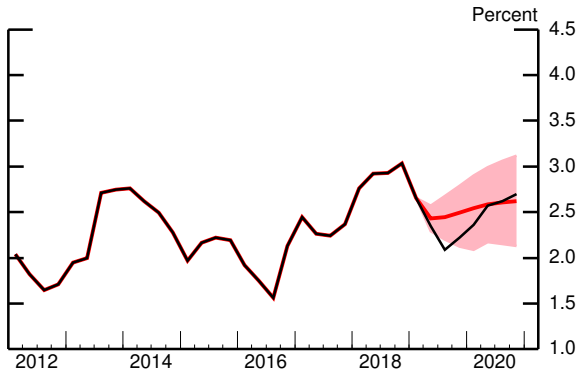
Consumer Price Index



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.
**All series are embargoed for internal (FRS) use until June 10th.

Revisions to the Staff Projection since the Previous SEP

The FOMC most recently published its Summary of Economic Projections, or SEP, following the March FOMC meeting. The following table compares the staff's current economic projection with the one we presented in the March Tealbook.

The staff's projection is conditioned on a substantially lower path for the federal funds rate than in March, a reflection of the new policy rule that we incorporated in the April Tealbook. In isolation, that lower funds rate path would have led us to strengthen our economic projection materially. However, notwithstanding the upward surprise to published first-quarter GDP growth, the incoming data on spending, income, and wealth have all been below our expectations on balance; the recent movements in equity prices, the dollar, and foreign economic growth point to a somewhat weaker outlook as well. On net, our projection for real GDP growth is just a little stronger than in the March Tealbook. Moreover, in assessing resource utilization, we discounted the strong GDP growth reading in the first quarter, and, as a result, the output gap flattens out at a slightly lower level—and the unemployment rate at a slightly higher level—than in March.

Our forecast for inflation is revised a little lower from the March Tealbook projection. In the near term, the revision reflects surprisingly soft incoming inflation data, and further out, it reflects the small downward revision we made in April to our estimate of underlying inflation. Accordingly, core PCE inflation is now projected to be a bit below 2 percent throughout the medium term.

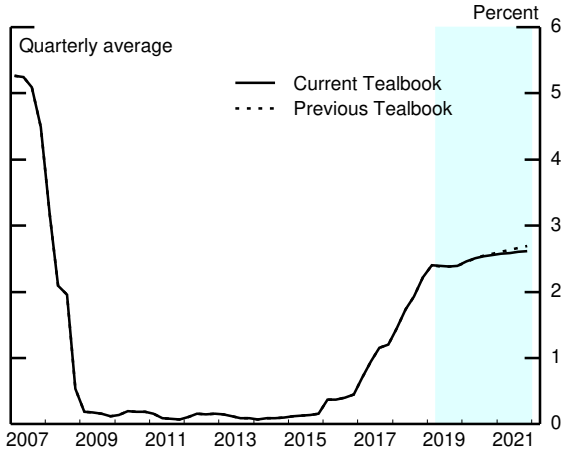
Staff Economic Projections Compared with the March Tealbook

Variable	2018	2019		2019	2020	2021	Longer run
		H1	H2				
Real GDP[1]	3.0	2.4	1.7	2.0	2.1	1.7	1.7
March Tealbook	3.1	1.8	1.9	1.8	2.0	1.5	1.7
Unemployment rate[2]	3.8	3.6	3.7	3.7	3.7	3.7	4.6
March Tealbook	3.8	3.7	3.6	3.6	3.6	3.7	4.6
PCE inflation[1]	1.9	1.4	1.6	1.5	1.9	1.9	2.0
March Tealbook	1.9	1.8	1.9	1.8	1.9	1.9	2.0
Core PCE inflation[1]	1.9	1.5	2.1	1.8	1.9	1.9	n.a.
March Tealbook	1.9	2.1	1.9	2.0	2.0	2.0	n.a.
Federal funds rate[2]	2.22	2.39	2.40	2.40	2.56	2.62	2.50
March Tealbook	2.22	2.71	3.20	3.20	3.84	4.12	2.50
Memo: Federal funds rate, end of period	2.38	2.39	2.40	2.40	2.56	2.62	2.50
March Tealbook	2.38	2.73	3.22	3.22	3.85	4.13	2.50
Output gap[2,3]	1.9	2.0	1.9	1.9	2.2	2.0	n.a.
March Tealbook	1.9	2.1	2.1	2.1	2.3	1.9	n.a.

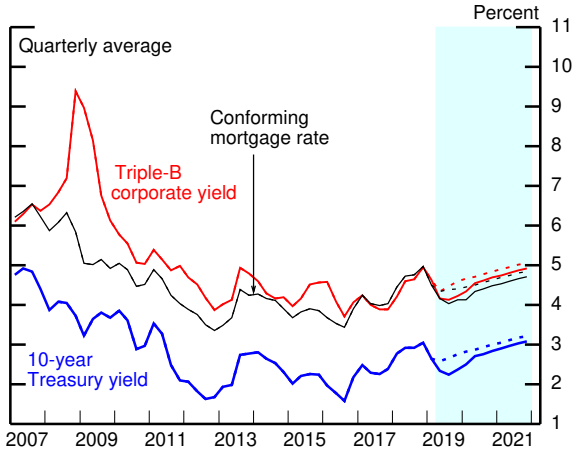
1. Percent change from final quarter of preceding period to final quarter of period indicated.
2. Percent, final quarter of period indicated.
3. Percent difference between actual and potential. A negative number indicates that the economy is operating below potential.
n.a. Not available.

Key Background Factors underlying the Baseline Staff Projection

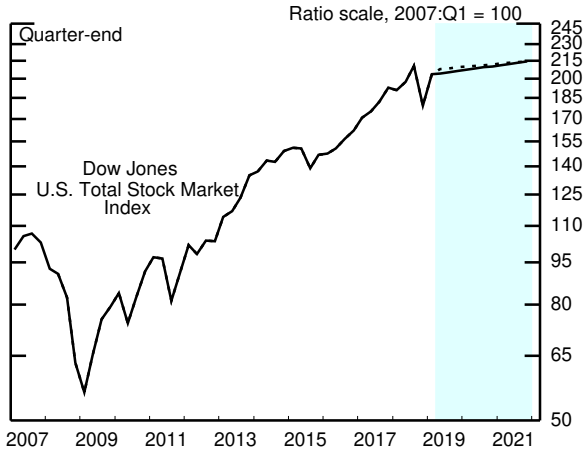
Federal Funds Rate



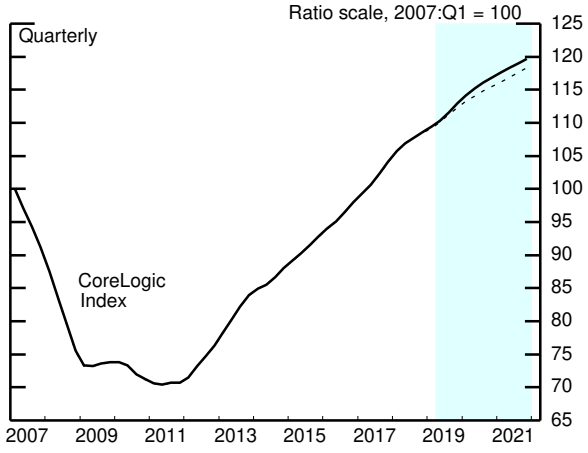
Long-Term Interest Rates



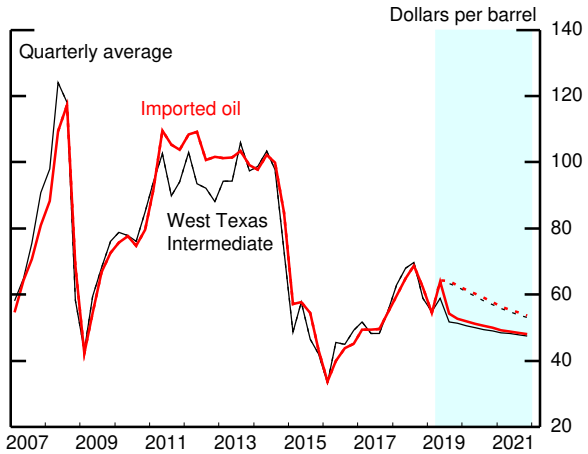
Equity Prices



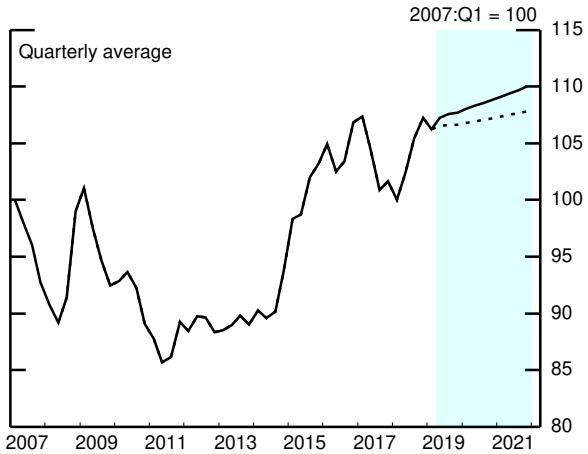
House Prices



Crude Oil Prices



Broad Real Dollar



Domestic Econ Devel & Outlook

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

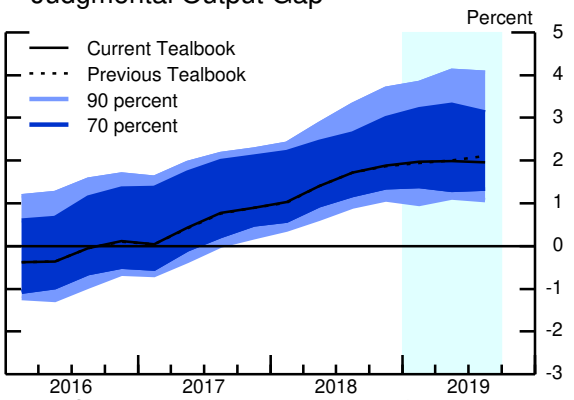
(Percent change at annual rate from final quarter of preceding period except as noted)

Measure	2017	2018	2019	2019 Q1	2019 Q2	2019 Q3
Output gap[1]	**.9**	**1.9**	**1.9**	**2.0**	**2.0**	**2.0**
Previous Tealbook	.9	1.9	2.2	1.9	2.0	2.1
Real GDP	2.5	3.0	2.0	3.0	1.8	1.7
Previous Tealbook	2.5	3.0	2.2	2.1	2.0	2.2
Measurement error in GDP	.0	.2	.2	.8	.0	.0
Previous Tealbook	.0	.2	.0	.0	.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.

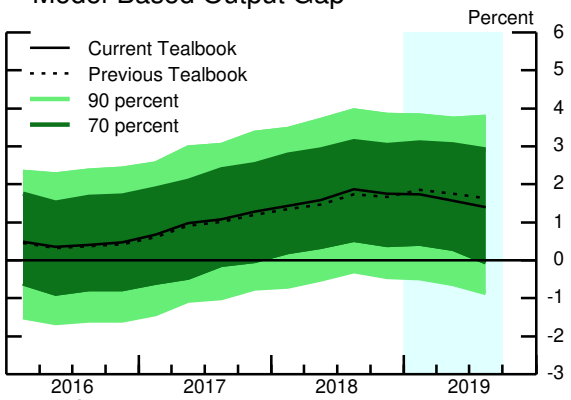
1. Percent, average for the final quarter in the period.

Judgmental Output Gap



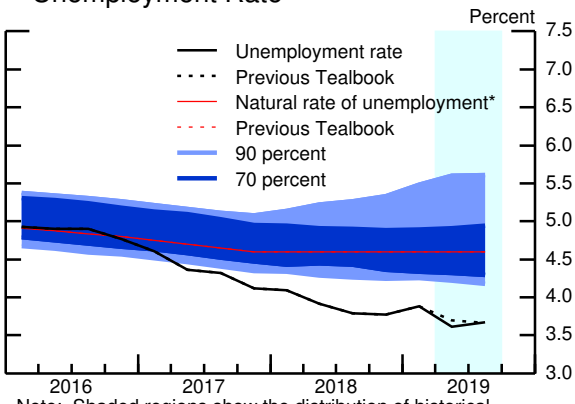
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.

Model-Based Output Gap



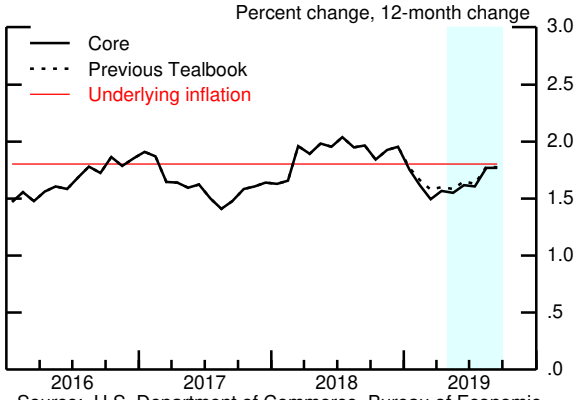
Note: Shaded regions denote model-computed uncertainty bands.
Source: Various macroeconomic data; staff assumptions.

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.

Domestic Econ Devel & Outlook

Summary of the Near-Term Outlook for GDP

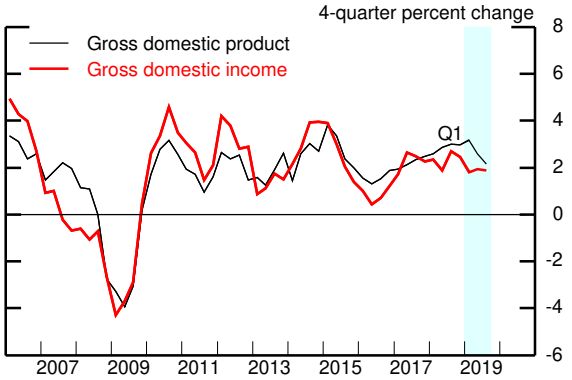
(Percent change at annual rate except as noted)

Measure	2019:Q1		2019:Q2		2019:Q3	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	**2.1**	**3.0**	**2.0**	**1.8**	**2.2**	**1.7**
Private domestic final purchases	1.0	1.1	2.3	2.2	3.3	2.1
Personal consumption expenditures	1.1	.9	2.6	3.0	2.7	2.3
Residential investment	-.3	-3.5	-2.6	-.7	6.6	4.6
Nonres. private fixed investment	.6	3.1	2.2	-.7	5.4	.6
Government purchases	2.6	2.8	2.9	4.4	1.6	1.1
Contributions to change in real GDP						
Inventory investment[1]	.2	.6	.3	-.4	-1.0	-.1
Net exports[1]	.6	1.0	-.7	-.5	.2	-.2

1. Percentage points.

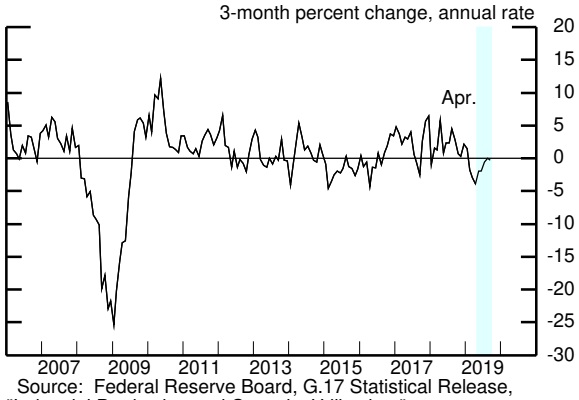
Recent Nonfinancial Developments (1)

Real GDP and GDI



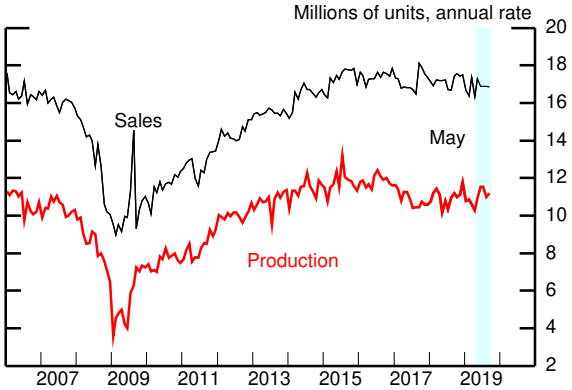
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Manufacturing IP ex. Motor Vehicles and Parts



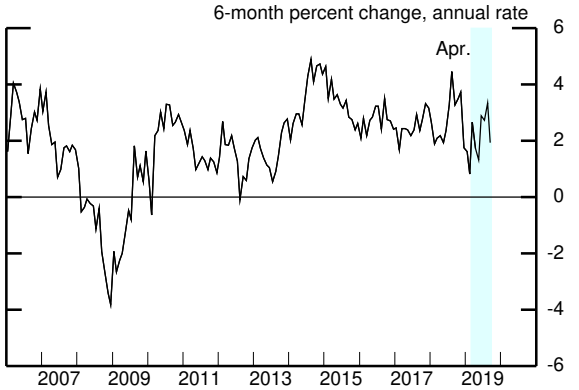
Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."

Sales and Production of Light Motor Vehicles



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

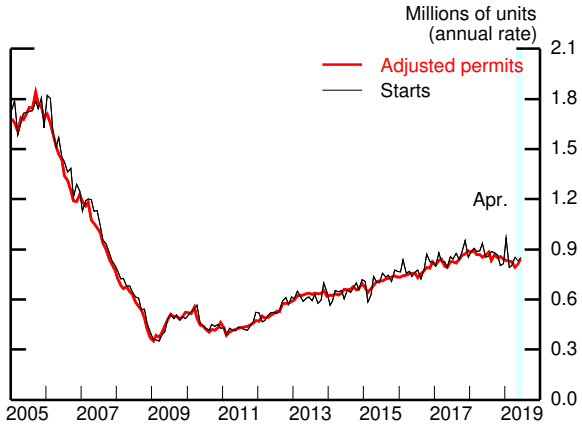
Real PCE Growth



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

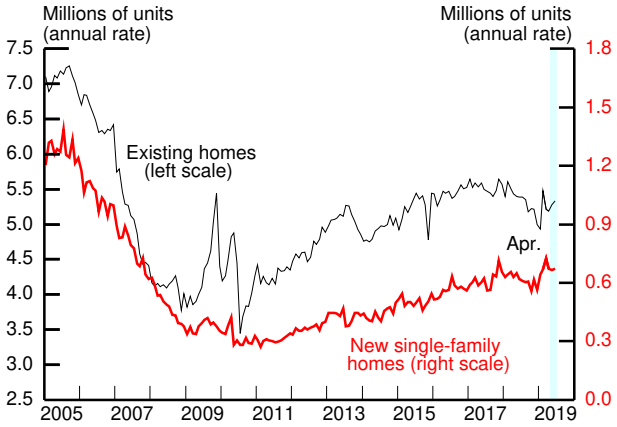
Recent Nonfinancial Developments (2)

Single-Family Housing Starts and Permits



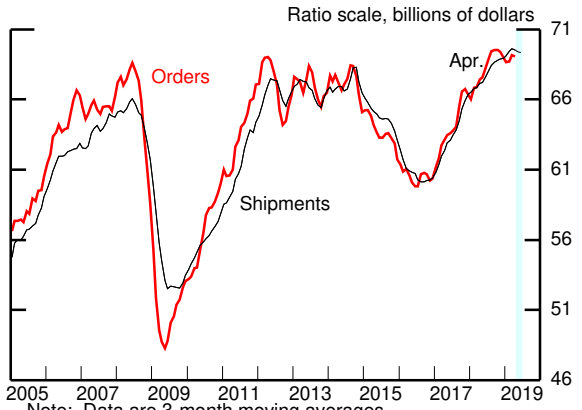
Note: Adjusted permits equal permit issuance plus starts outside of permit-issuing areas.
Source: U.S. Census Bureau.

Home Sales



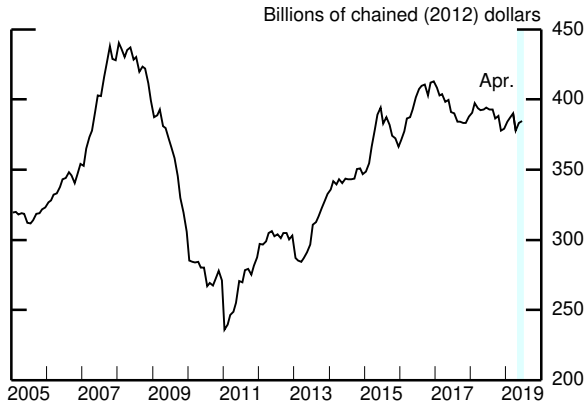
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

Nondefense Capital Goods ex. Aircraft



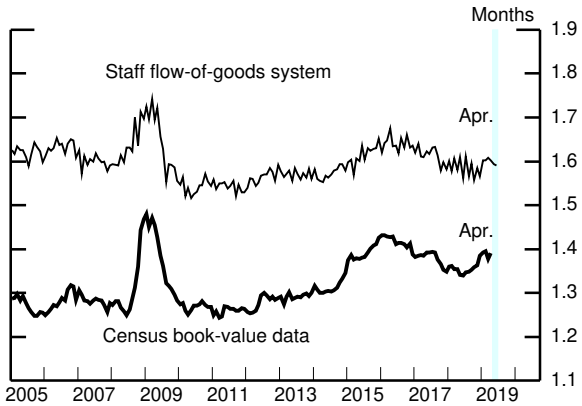
Note: Data are 3-month moving averages.
Source: U.S. Census Bureau.

Nonresidential Construction Put in Place



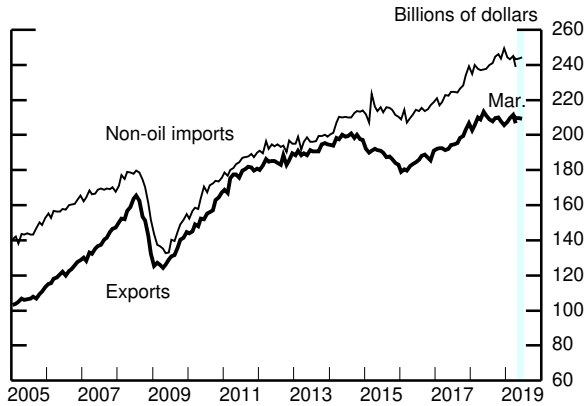
Note: Nominal CPIP deflated by BEA prices through 2018:Q4 and by the staff's estimated deflator thereafter.
Source: U.S. Census Bureau.

Inventory Ratios



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

Exports and Non-oil Imports



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

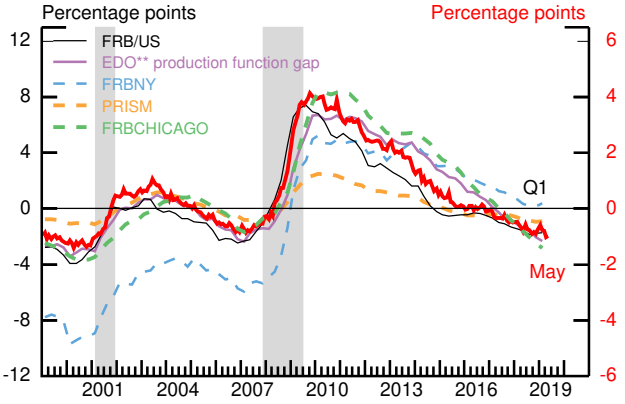
Federal Reserve System Nowcasts of 2019:Q2 Real GDP Growth
(Percent change at annual rate from previous quarter)

Federal Reserve entity	Type of model	Nowcast as of June 6, 2019
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	2.0
New York	• Factor-augmented autoregressive model combination • Factor-augmented autoregressive model combination, financial factors only • Dynamic factor model	2.4 2.2 1.0
Cleveland	• Bayesian regressions with stochastic volatility • Tracking model	1.7 0.8
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	1.5
Chicago	• Dynamic factor models • Bayesian VARs	0.3 2.2
St. Louis	• Dynamic factor models • News index model • Let-the-data-decide regressions	1.7 3.1 2.3
Kansas City	• Accounting-based tracking estimate	0.2
Board of Governors	• Tealbook estimate (judgmental) • Monthly dynamic factor models (DFM-45) • Mixed-frequency dynamic factor model (DFM-BM)	1.9 2.4 2.2
Memo: Median of Federal Reserve System nowcasts		2.0

Alternative Measures of Slack

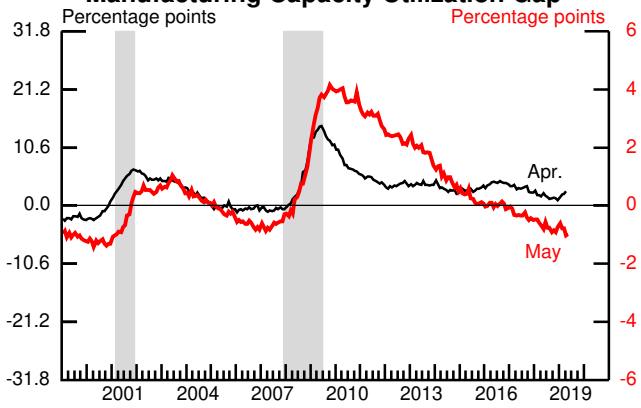
The red line in each panel is the staff's measure of the unemployment rate gap (right axis).

Output Gaps



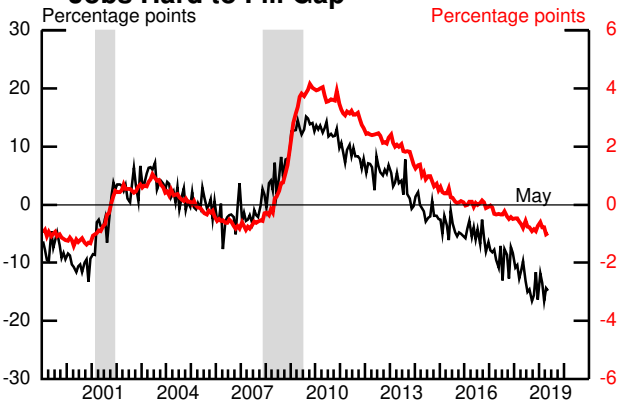
** EDO is Estimated, Dynamic, Optimization-based model.
Source: Federal Reserve Board; PRISM: Federal Reserve Board Bank of Chicago; Federal Reserve Board Bank of Philadelphia, PRISM Model Documentation (June 2011); FRBNY: Federal Reserve Bank of New York Staff Report 618 (May 2013, revised April 2014).

Manufacturing Capacity Utilization Gap*



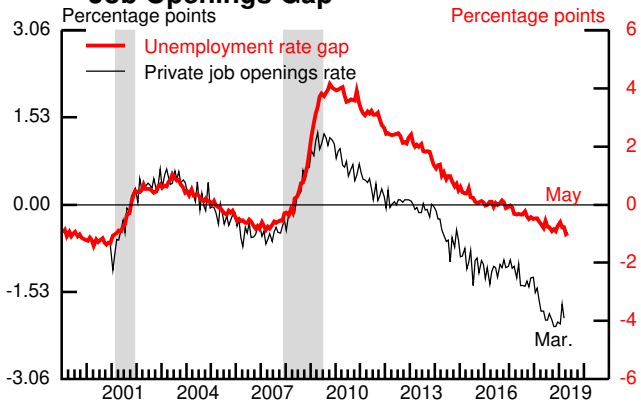
Source: Federal Reserve Board.

Jobs Hard to Fill Gap*



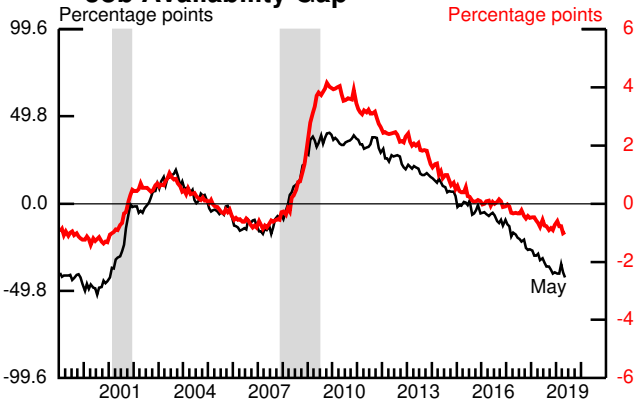
Note: Percent of small businesses surveyed with at least one "hard to fill" job opening. Seasonally adjusted by Federal Reserve Board staff.
Source: National Federation of Independent Business, Small Business Economic Trends Survey.

Job Openings Gap*



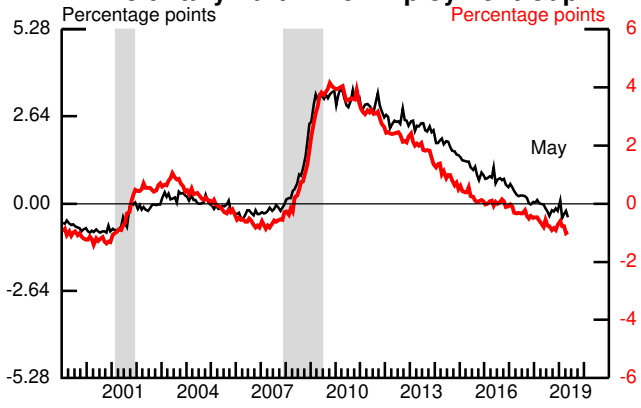
Note: Job openings rate is the number of job openings divided by employment plus job openings.
Source: Job Openings and Labor Turnover Survey; U.S. Department of Labor, Bureau of Labor Statistics, Current Employment Statistics.

Job Availability Gap*



Note: Percent of households believing jobs are plentiful minus the percent believing jobs are hard to get.
Source: Conference Board.

Involuntary Part-Time Employment Gap

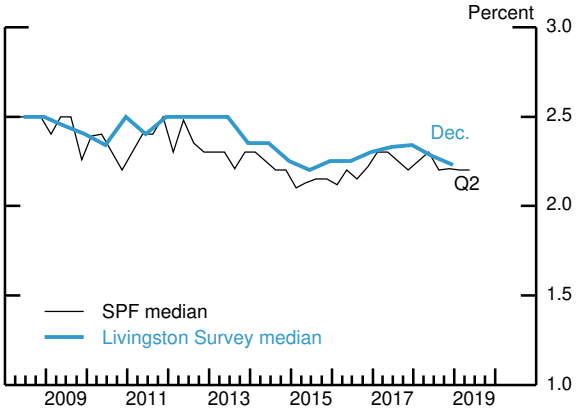


Note: Percent of employment.
Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey.

* Plots the negative of the gap to have the same sign as the unemployment rate gap.
Note: The shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research. Output gaps are multiplied by negative 0.52 to facilitate comparison with the unemployment rate gap. Manufacturing capacity utilization gap is constructed by subtracting its average rate from 1972 to 2018. Other gaps were constructed by subtracting each series' average in 2004:Q4 and 2005:Q1.

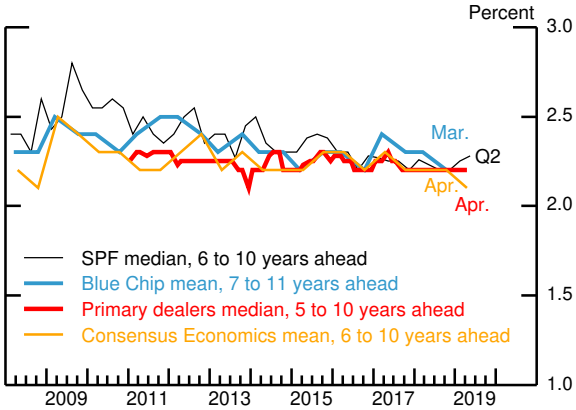
Survey Measures of Longer-Term Inflation Expectations

CPI Next 10 Years



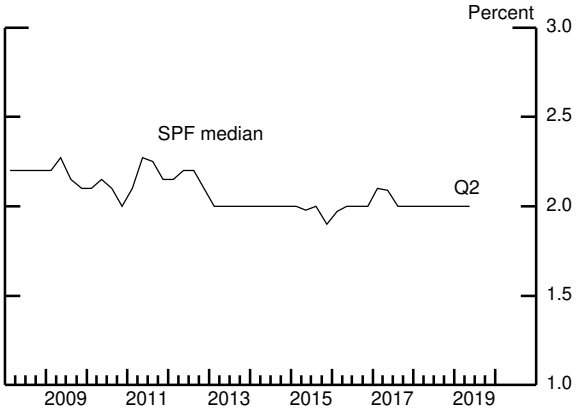
Note: SPF is Survey of Professional Forecasters.
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations



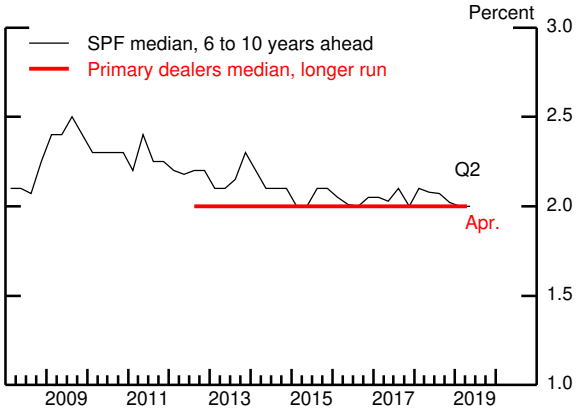
Source: Federal Reserve Bank of Philadelphia; Blue Chip Economic Indicators; Federal Reserve Bank of New York; Consensus Economics.

PCE Next 10 Years



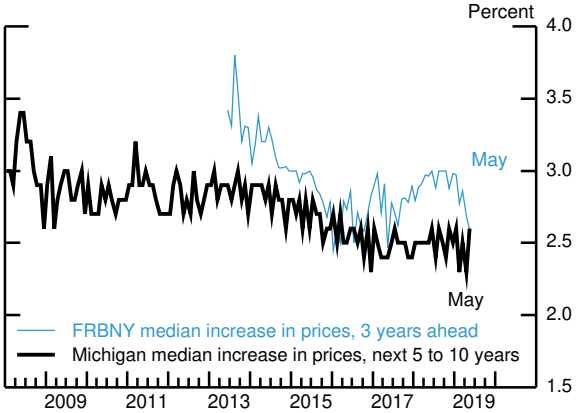
Source: Federal Reserve Bank of Philadelphia.

PCE Forward Expectations



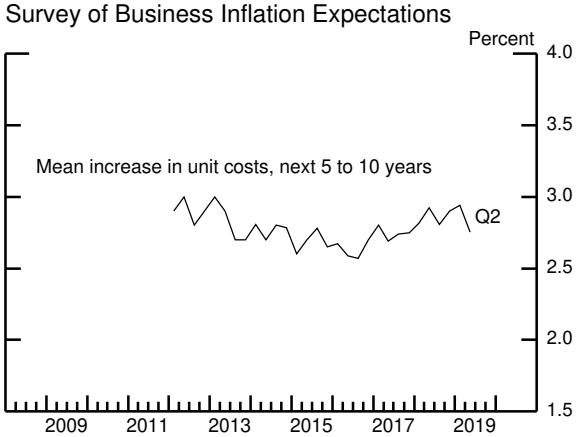
Note: Primary dealers data begin in August 2012.
Source: Federal Reserve Bank of Philadelphia; Federal Reserve Bank of New York.

Surveys of Consumers



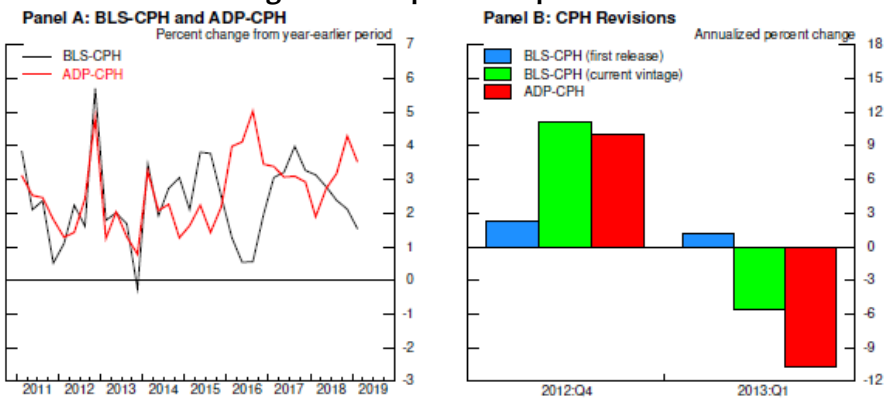
Note: Federal Reserve Bank of New York (FRBNY) Survey of Consumer Expectations reports expected 12-month inflation rate 3 years from the current survey date. FRBNY data begin in June 2013.
Source: University of Michigan Surveys of Consumers; Federal Reserve Bank of New York Survey of Consumer Expectations.

Survey of Business Inflation Expectations



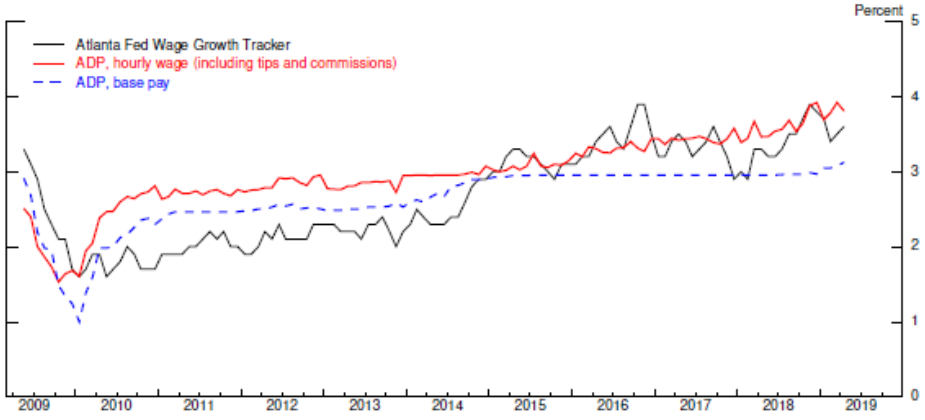
Note: Survey of businesses in the Sixth Federal Reserve District. Data begin in February 2012.
Source: Federal Reserve Bank of Atlanta.

Figure 1: Compensation per Hour



Source: For BLS-CPH, U.S. Department of Labor, Bureau of Labor Statistics; for ADP-CPH, ADP and staff calculations.

Figure 2: Median 12-Month Wage Growth



Source: For the Atlanta Fed Wage Growth Tracker, Federal Reserve Bank of Atlanta; for the ADP series, ADP and staff calculations.

up to half a year after the end of the quarter.[5] The timely and comprehensive nature of the ADP-CPH series would have been particularly useful at the end of 2012, for example, when employers pulled forward bonus pay because of the anticipated increase in 2013 income tax rates. The initial releases of BLS-CPH for the fourth quarter of 2012 and the first quarter of 2013 did not reflect any timing change in compensation (the blue bars in panel B of figure 1). It was only several months later, in mid-2013, that revisions showed BLS-CPH growth had surged in 2012:Q4 before falling in 2013:Q1 (the green bars). In contrast, the ADP-CPH measure revealed the shift in bonuses in near real time (the red bars).

Measures of average compensation, like BLS-CPH and BLS Average Hourly Earnings (AHE), have some disadvantages: They can be influenced by changes in the composition of employment, and they give more weight to high earners. A more direct measure of wage pressure may be the change in wages paid to *the same workers,* the approach taken by the WGT published by the Federal Reserve Bank of Atlanta. In figure 2 we plot median wage changes from the ADP payroll microdata and the WGT. ADP hourly wages (including tips and commissions)—the red line—have tracked the WGT series reasonably well in recent years, though there is a gap earlier in the sample. Median individual growth in base pay—the dashed blue line in figure 2—appears to be remarkably

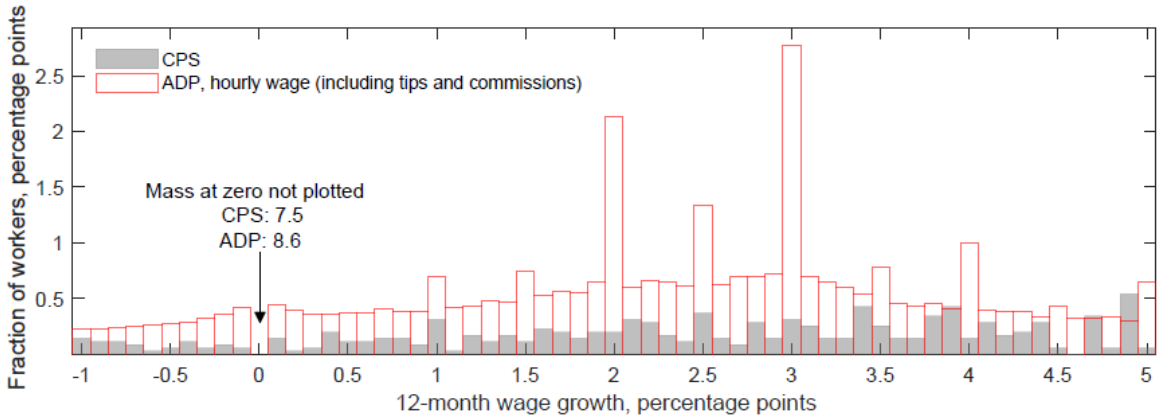
[5] That is, until tabulations from the Quarterly Census of Employment and Wages are available to measure the near-totality of U.S. payrolls. In the initial releases, BLS-CPH is estimated using limited information from BLS-AHE and various measures of hours.

stable and smooth, and it runs somewhat below median ADP hourly wage growth. The gap between the ADP series and the WGT may reflect a number of factors, including topcoding in the Current Population Survey (CPS, the source data for the WGT), measurement error, and differences in earnings and hours definitions between the source data.[6]

In fact, the ADP data provide us with direct evidence of measurement error in the individual-level CPS reports, though it is unclear how much it contributes to the differences between the ADP- and CPS-based time series. Figure 3 shows part of the distribution of 12-month wage changes for a representative month. The ADP distribution is heavily bunched around round numbers, corresponding to raises of 2.0, 2.5, or 3.0 percent per year. In contrast, the CPS distribution is more diffuse and shows almost no bunching.[7] We take this dispersion as an indication of measurement error in the CPS responses: Many workers receive round-number *raises*, but CPS wage changes are calculated from respondent-reported earnings and hours *levels*, so small reporting errors may obscure the pattern of round-number raises in the CPS.[8]

The results of the staff's analysis of this new source of compensation data are encouraging, and we are hopeful that these data will improve our understanding of the conditions faced by U.S. workers. Importantly, the data confirm the gradual step-up in compensation growth seen in both the BLS series and the WGT over the past several years. Nonetheless, the work is preliminary. Constructing measures of compensation that can be compared to official statistics is daunting, partly because the complexity of compensation makes it difficult to construct equivalent measures. Looking forward, the richness of the ADP data provides many further avenues to explore, such as creating a measure of average hourly earnings and further analyzing the importance of bunching in wage changes.

Figure 3: Distribution of Wage Changes (March 2015)



Note: Only the portion of the distribution between -1 percent and 5 percent wage growth is plotted. Each bar is the percent of workers with wage growth falling into a bin that is 0.1 percentage point wide.
Source: For CPS, Bureau of Labor Statistics and staff calculations; for ADP, ADP and staff calculations.

[6] In the CPS, households with earnings above $150,000 per year are shown as earning $150,000 (topcoding) so that any changes in those households' earnings will not be visible. In addition, earnings are self-reported, leaving room for considerable reporting error. Moreover, the ADP measures have a substantially larger sample size and include workers who change residence, so long as ADP continues to process their payrolls.

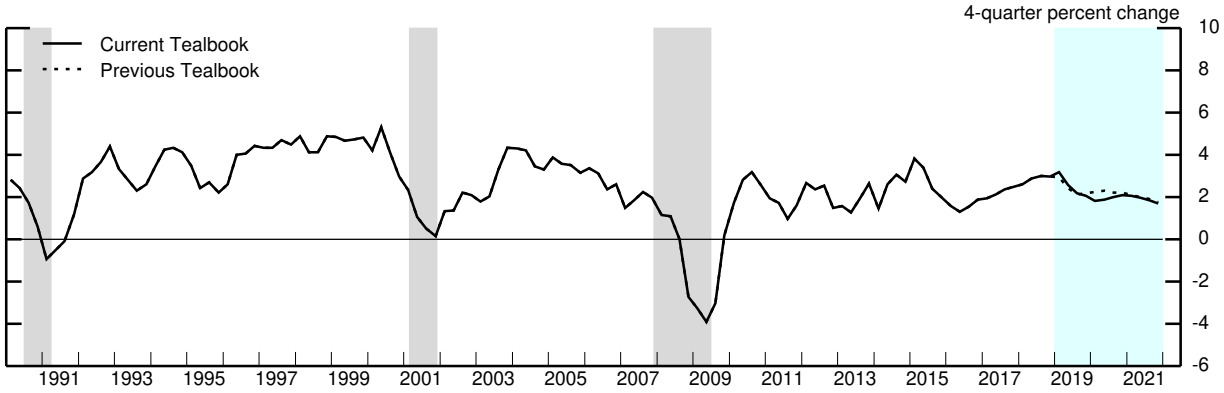
[7] The bunching in figure 3 helps explain some features of figure 2. When the median of a series is at a bunching point, moderate changes in the distribution will cause little or no change in the median. Thus, median ADP base pay hovers at 3 percent (a bunching point) for years, while the CPS series is volatile over the same window.

[8] This reasoning is also consistent with the higher cross-sectional variance in CPS wage growth as well as results in the academic literature emphasizing survey response error in questions about income and hours.

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**	**2.4**	**1.7**	**2.0**	**2.1**	**1.7**
Previous Tealbook	3.0	2.0	2.3	2.2	2.2	1.7
Final sales	2.6	2.3	2.1	2.2	2.2	1.7
Previous Tealbook	2.6	1.8	3.1	2.4	2.2	1.8
Personal consumption expenditures	2.6	2.0	2.4	2.2	2.4	2.2
Previous Tealbook	2.6	1.8	2.7	2.3	2.5	2.2
Residential investment	-3.3	-2.1	5.7	1.7	2.5	-3.4
Previous Tealbook	-3.3	-1.5	6.7	2.5	2.6	-2.7
Nonresidential structures	4.9	-.9	-.4	-.6	-1.8	-1.3
Previous Tealbook	4.9	2.0	1.5	1.8	-.7	-1.5
Equipment and intangibles	7.6	1.8	.1	1.0	2.8	2.3
Previous Tealbook	7.6	1.2	4.8	3.0	2.8	2.4
Federal purchases	2.7	4.5	3.0	3.7	2.5	.8
Previous Tealbook	2.7	4.7	2.6	3.6	2.6	1.0
State and local purchases	.8	3.1	.1	1.6	.9	1.0
Previous Tealbook	.8	1.6	1.0	1.3	1.0	1.0
Exports	2.3	1.3	1.7	1.5	2.8	3.1
Previous Tealbook	2.3	.5	4.8	2.6	2.4	3.8
Imports	3.4	-.5	1.4	.4	2.6	3.0
Previous Tealbook	3.4	.8	2.6	1.7	3.1	3.0
	Contributions to change in real GDP (percentage points)					
Inventory change	.4	.1	-.4	-.1	-.1	.0
Previous Tealbook	.4	.3	-.8	-.3	.0	.0
Net exports	-.2	.2	.0	.1	-.1	-.1
Previous Tealbook	-.2	-.1	.2	.1	-.2	.0

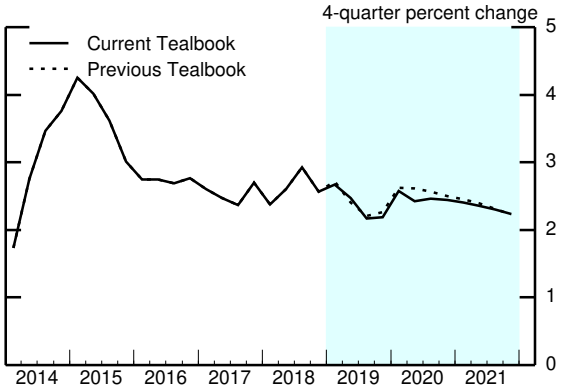
Real GDP



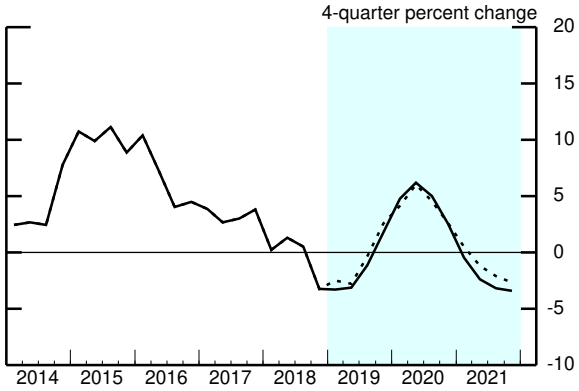
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Components of Final Demand

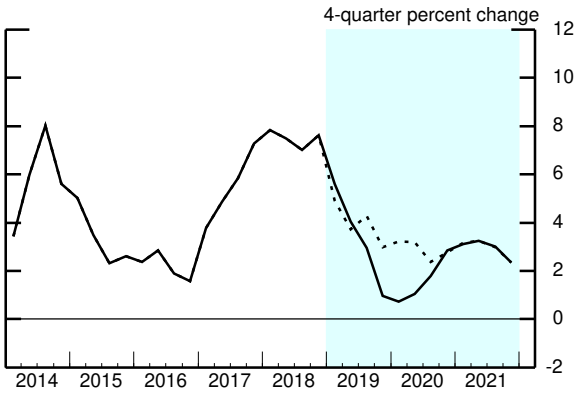
Personal Consumption Expenditures



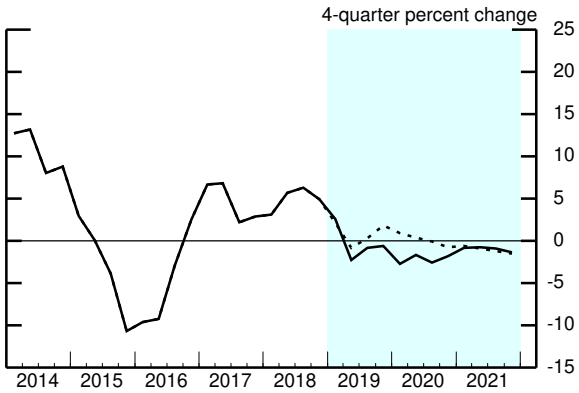
Residential Investment



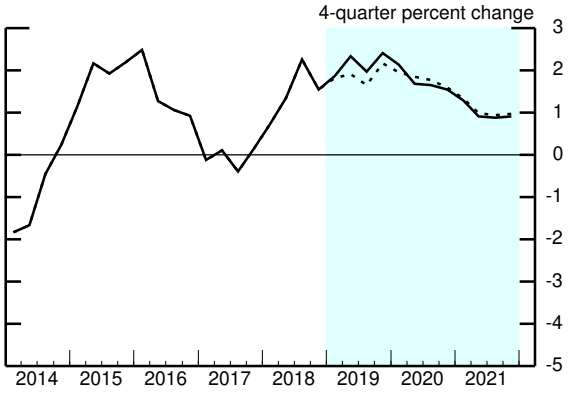
Equipment and Intangibles



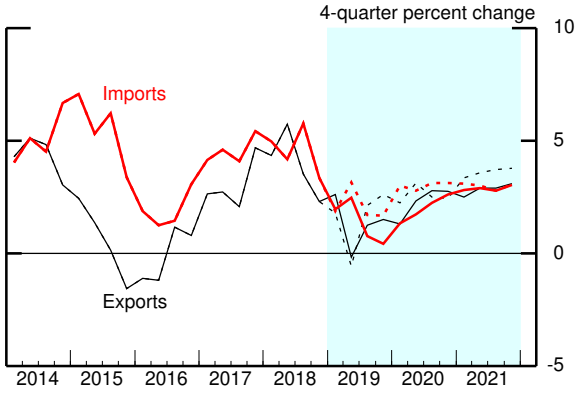
Nonresidential Structures



Government Consumption and Investment



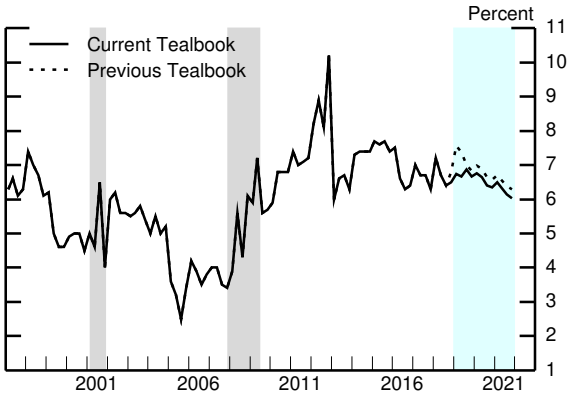
Exports and Imports



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

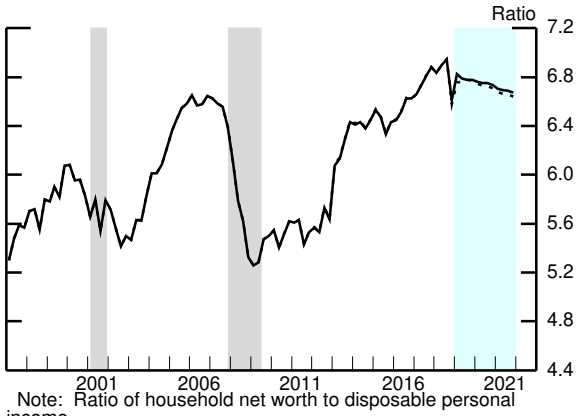
Aspects of the Medium-Term Projection

Personal Saving Rate



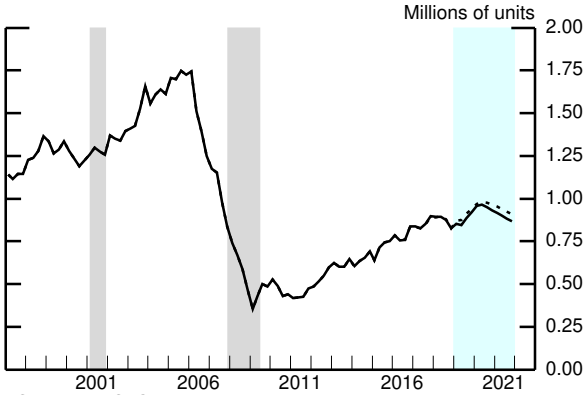
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Wealth-to-Income Ratio



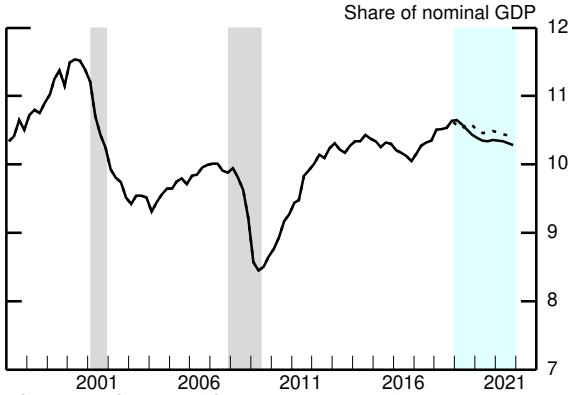
Note: Ratio of household net worth to disposable personal income.
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Single-Family Housing Starts



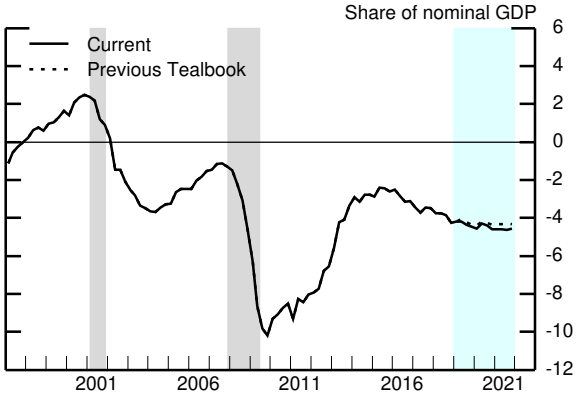
Source: U.S. Census Bureau.

Equipment and Intangibles Spending



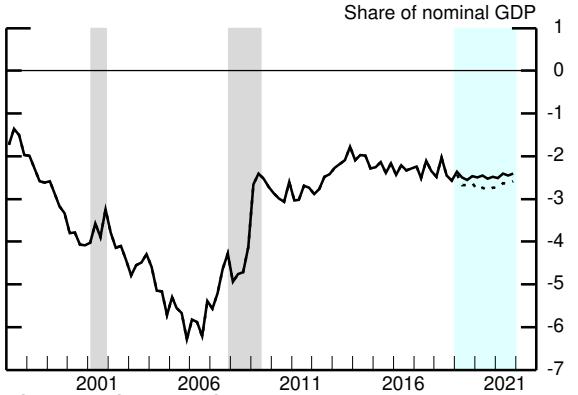
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Federal Surplus/Deficit



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

Current Account Surplus/Deficit



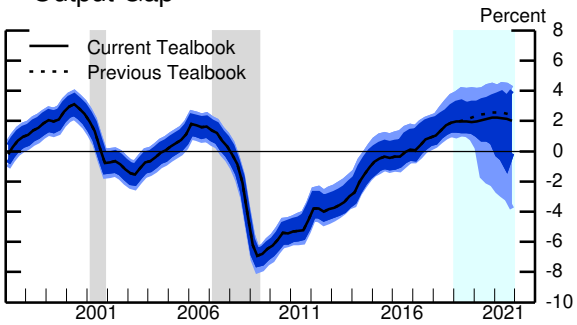
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

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

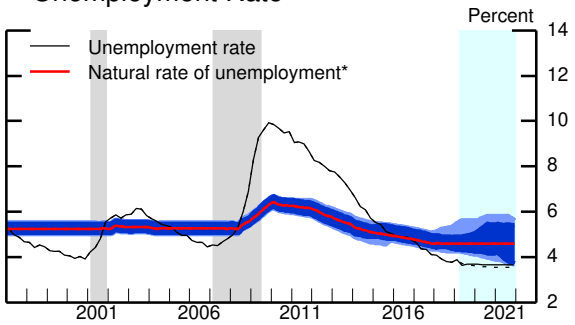
Output Gap



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.

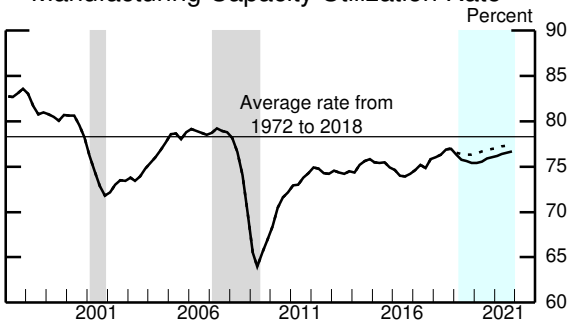
Source: Various macroeconomic data; staff assumptions.

Unemployment Rate



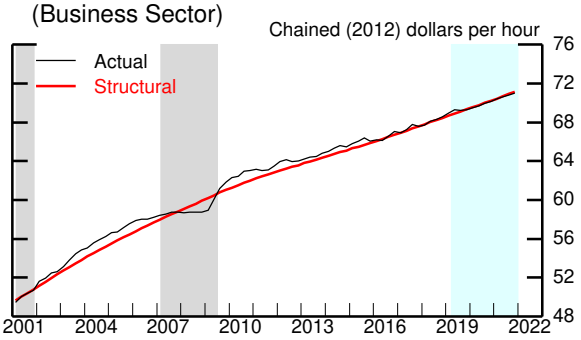
Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the natural rate.
*Staff estimate including the effect of extended and emergency unemployment insurance benefits.
Source: Various macroeconomic data; staff 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	1.9	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	1.2	1.2	1.3	1.3	1.4
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	.8	.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	1.9	2.2	2.0
Previous Tealbook	-1.2	2.5	.3	-5.4	.1	.9	1.9	2.2	2.6	2.4

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	165	154	159	142	99
Previous Tealbook	223	178	168	173	151	103
Private employment[1]	215	157	143	150	133	89
Previous Tealbook	215	167	156	162	142	93
Labor force participation rate[2]	63.0	62.8	62.9	62.9	62.9	62.7
Previous Tealbook	63.0	63.0	63.0	63.0	63.0	62.8
Civilian unemployment rate[2]	3.8	3.6	3.7	3.7	3.7	3.7
Previous Tealbook	3.8	3.7	3.6	3.6	3.5	3.5
Employment to population ratio[2]	60.6	60.6	60.6	60.6	60.6	60.5
Previous Tealbook	60.6	60.7	60.7	60.7	60.8	60.6

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	1.4	1.6	1.5	1.9	1.9
Previous Tealbook	1.9	1.6	1.9	1.8	1.8	1.8
Food and beverages	.5	1.7	2.8	2.3	2.6	2.6
Previous Tealbook	.5	2.9	2.8	2.9	2.6	2.6
Energy	3.5	-1.8	-10.6	-6.3	-.1	.3
Previous Tealbook	3.5	1.2	-1.9	-.4	-1.5	-.9
Excluding food and energy	1.9	1.5	2.1	1.8	1.9	1.9
Previous Tealbook	1.9	1.6	2.0	1.8	1.9	1.9
Prices of core goods imports[1]	.5	.0	.7	.3	.9	.8
Previous Tealbook	.5	.4	1.3	.9	1.1	.9

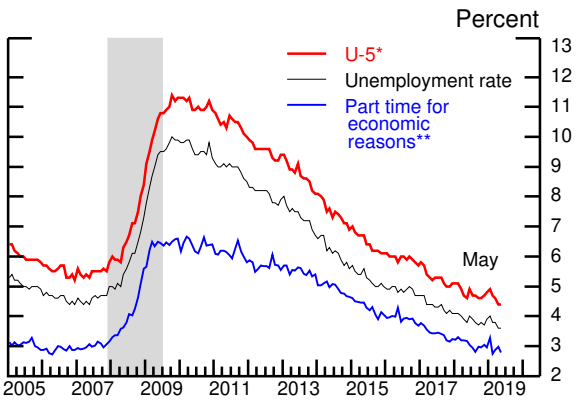
	Mar. 2019	Apr. 2019	May 2019[2]	June 2019[2]	July 2019[2]	Aug. 2019[2]
12-month percent change						
PCE chain-weighted price index	1.4	1.5	1.5	1.4	1.3	1.4
Previous Tealbook	1.5	1.6	1.6	1.6	1.6	1.7
Excluding food and energy	1.5	1.6	1.6	1.6	1.6	1.8
Previous Tealbook	1.6	1.6	1.6	1.7	1.6	1.8

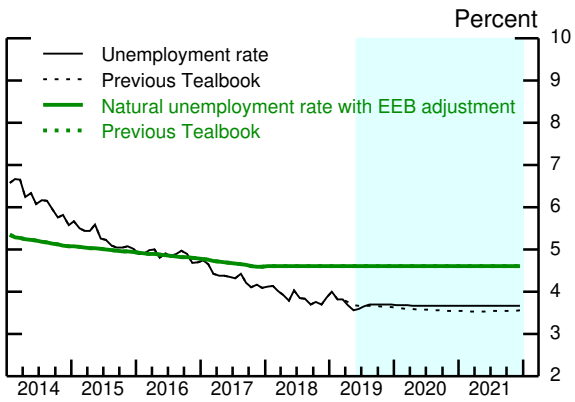
1. Core goods imports exclude computers, semiconductors, oil, and natural gas.
2. Staff forecast.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Domestic Econ Devel & Outlook

Labor Market Developments and Outlook (1)

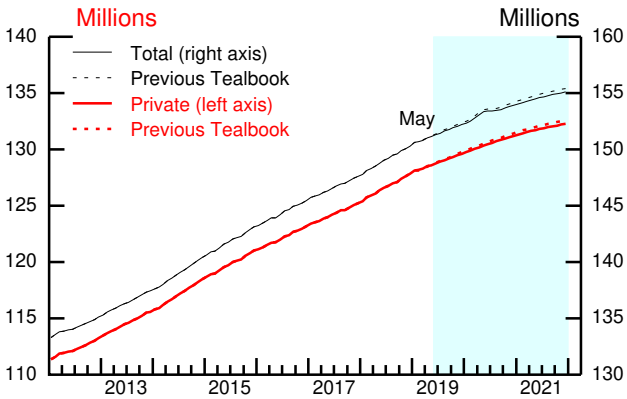
Measures of Labor Underutilization





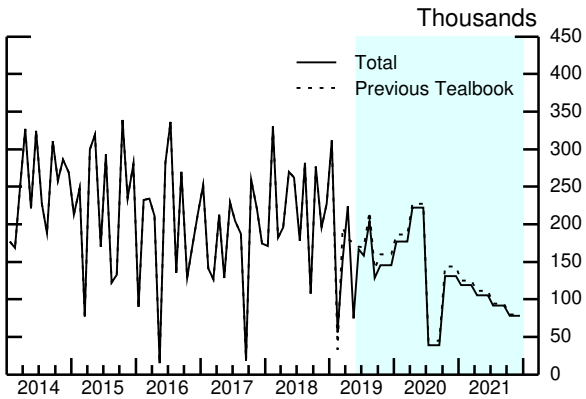
* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.
** Percent of Current Population Survey employment.
EEB Extended and emergency unemployment benefits.
Source: U.S. Department of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

Level of Payroll Employment



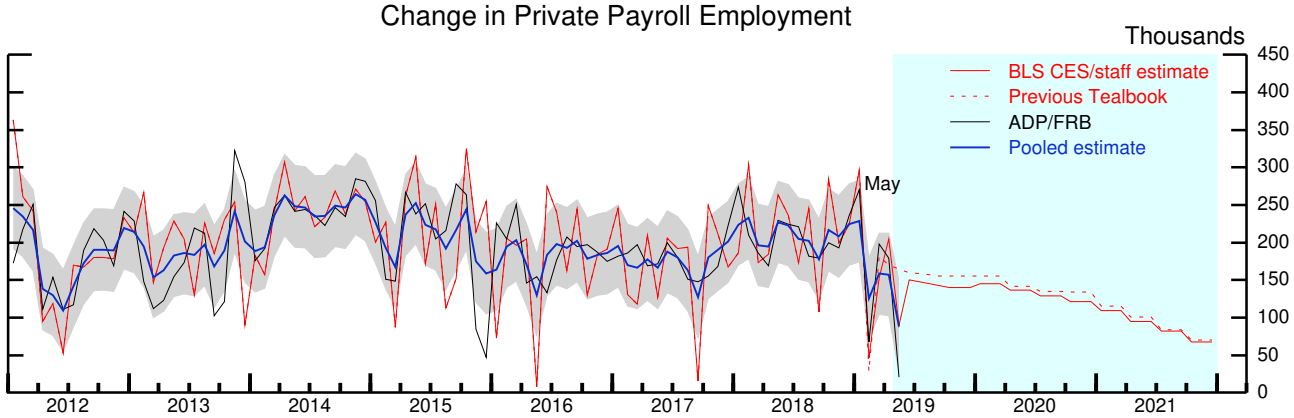
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Change in Total Payroll Employment



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

Change in Private Payroll Employment

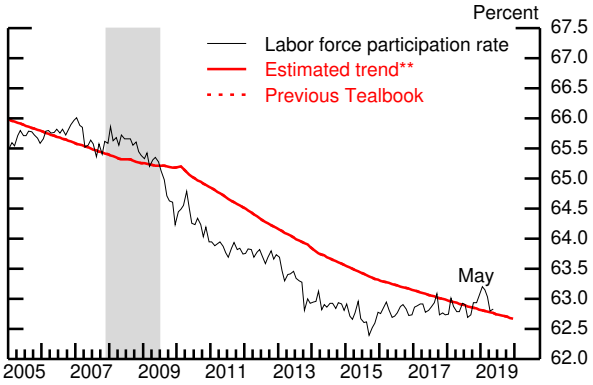


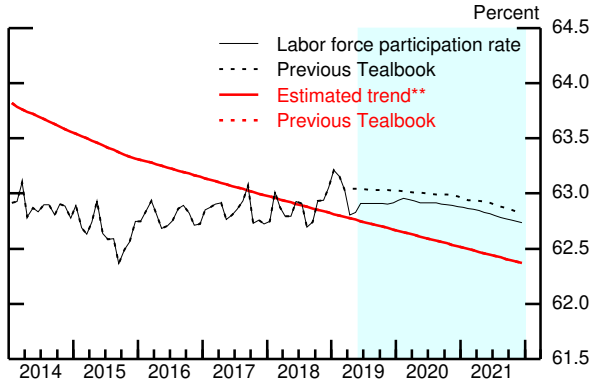
Note: Gray shaded area around blue line is 90 percent confidence interval around pooled estimate.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff calculations using microdata from ADP.

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)

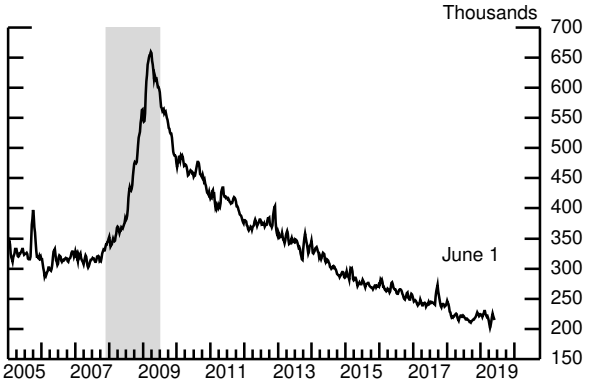
Labor Force Participation Rate*





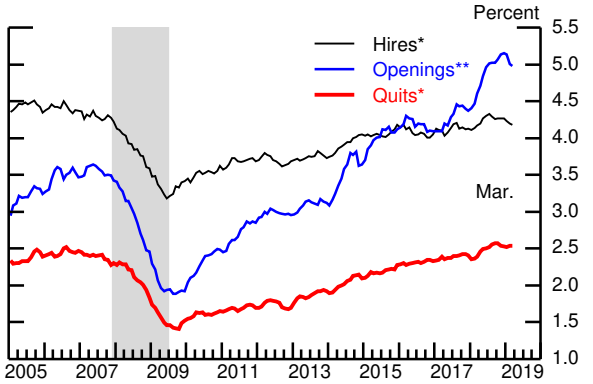
* Published data adjusted by staff to account for changes in population weights.
** Includes staff estimate of the effect of extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Initial Unemployment Insurance Claims*



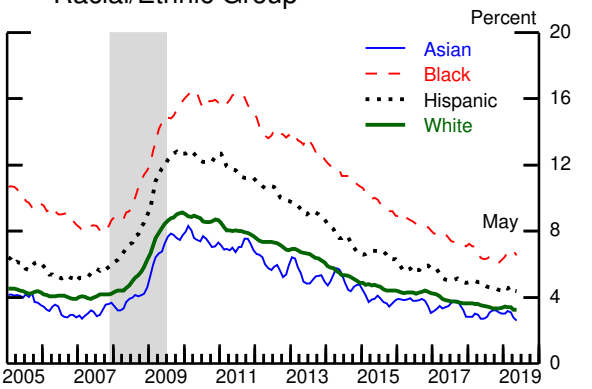
* 4-week moving average.
Source: U.S. Department of Labor, Employment and Training Administration.

Hires, Quits, and Job Openings



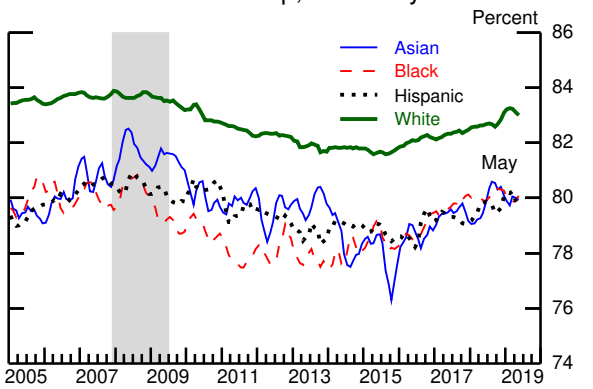
* Percent of private nonfarm payroll employment, 3-month moving average.
** Percent of private nonfarm payroll employment plus unfilled jobs, 3-month moving average.
Source: Job Openings and Labor Turnover Survey.

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

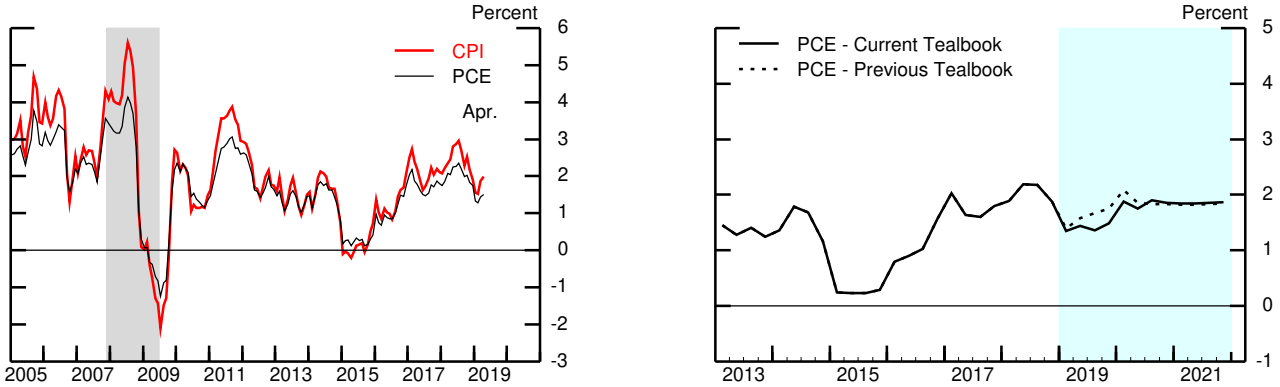


Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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

Inflation Developments and Outlook (1)

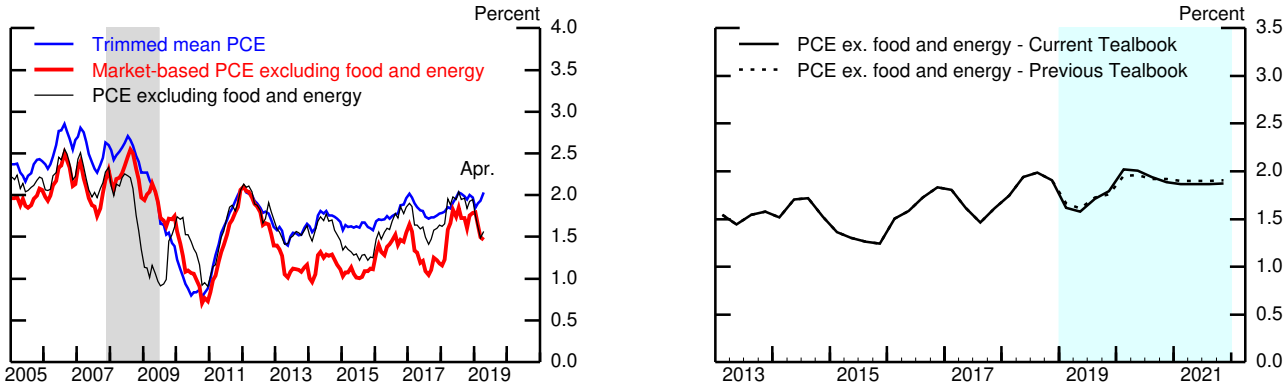
(Percent change from year-earlier period)

Headline Consumer Price Inflation



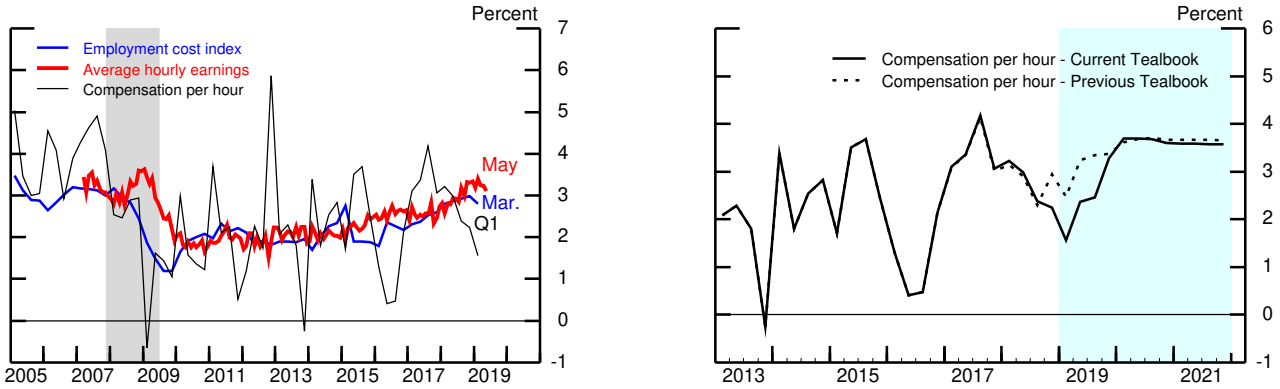
Source: For CPI, U.S. Department of Labor, Bureau of Labor Statistics; for PCE, U.S. Department of Commerce, Bureau of Economic Analysis.

Measures of Core PCE Price Inflation



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.

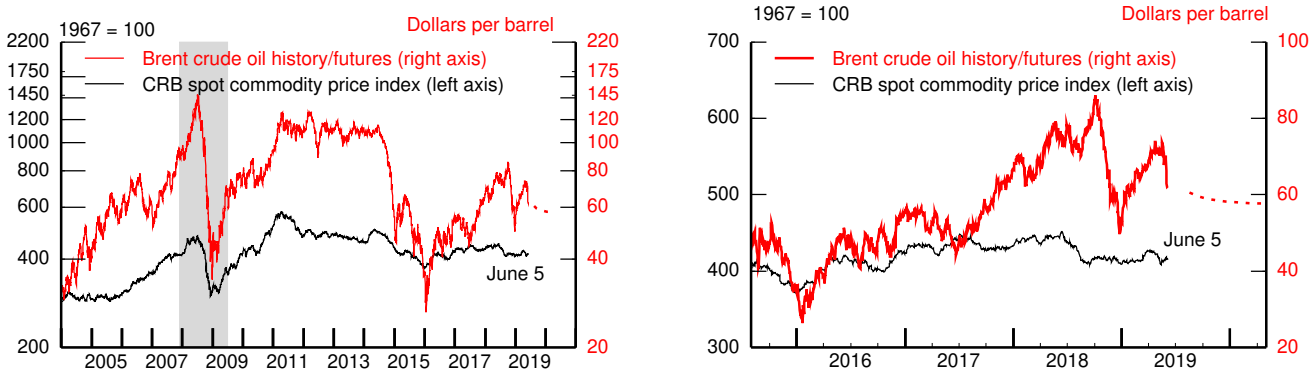
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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)

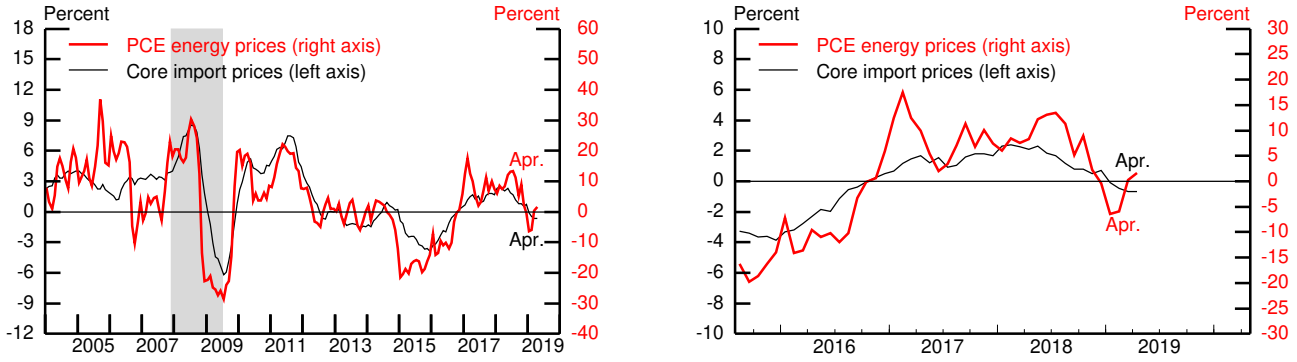
(Percent change from year-earlier period, except as noted)

Commodity and Oil Price Levels



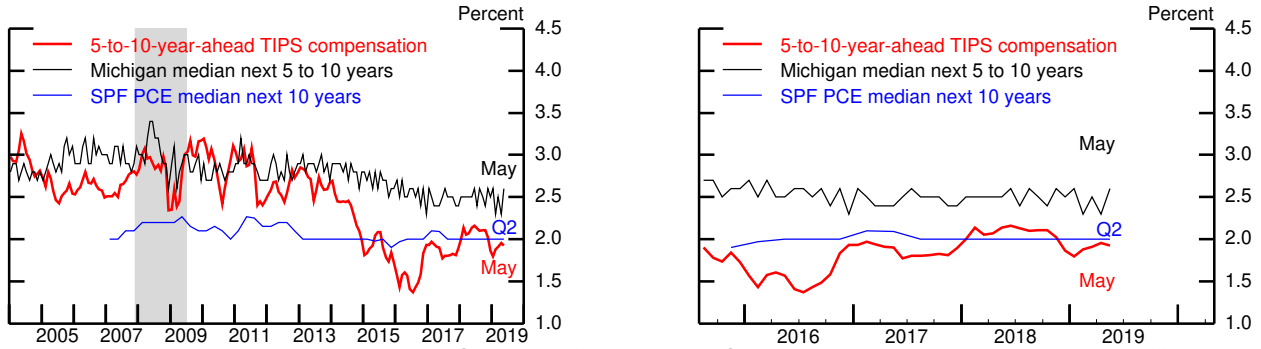
Note: Futures prices (dotted lines) are the latest observations on monthly futures contracts.
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

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.
SPF Survey of Professional Forecasters.
Source: For Michigan, University of Michigan Surveys of Consumers; for SPF, the 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.

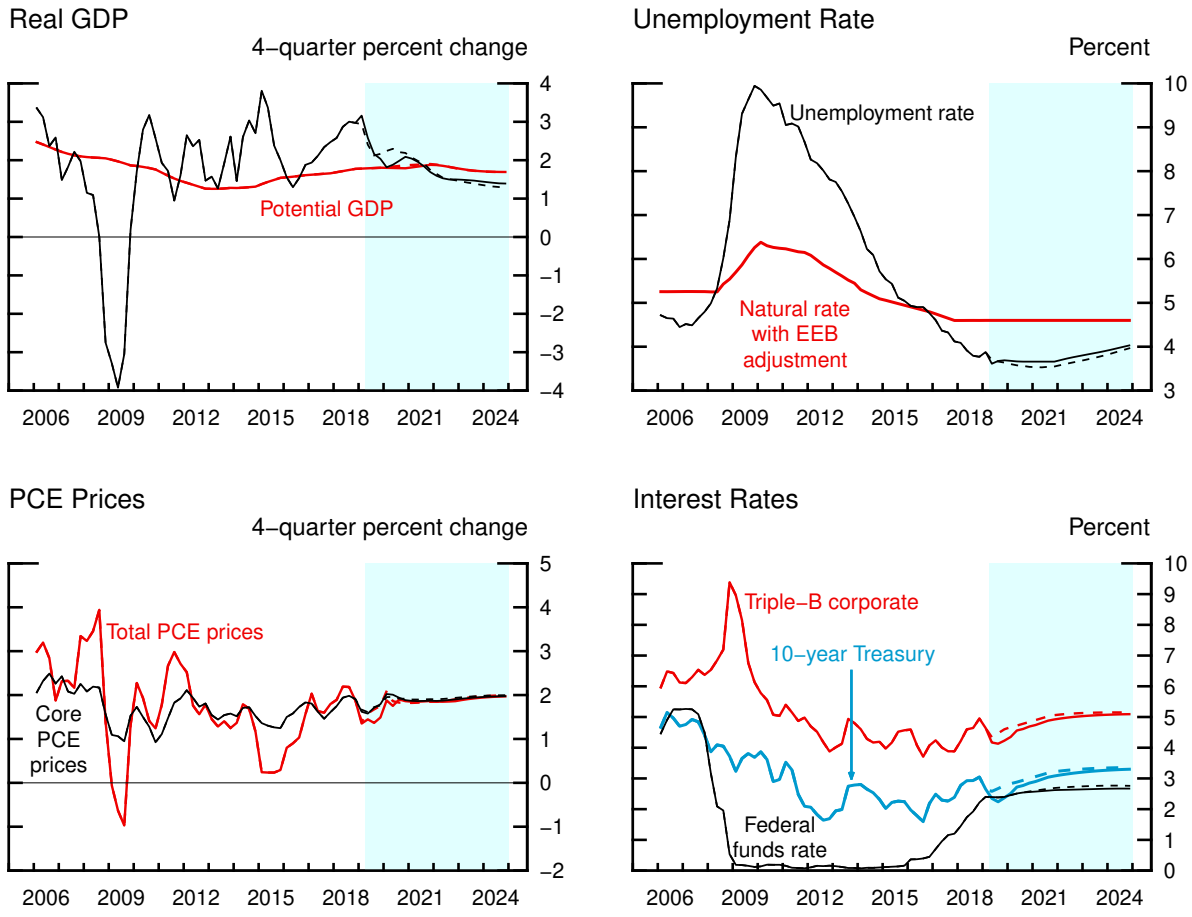
Domestic Econ Devel & Outlook

The Long–Term Outlook

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

Measure	2019	2020	2021	2022	2023	2024	Longer run
Real GDP	2.0	2.1	1.7	1.5	1.4	1.4	1.7
Previous Tealbook	2.2	2.2	1.7	1.5	1.4	1.3	1.7
Civilian unemployment rate[1]	3.7	3.7	3.7	3.8	3.9	4.0	4.6
Previous Tealbook	3.6	3.5	3.5	3.7	3.8	4.0	4.6
PCE prices, total	1.5	1.9	1.9	1.9	1.9	2.0	2.0
Previous Tealbook	1.8	1.8	1.8	1.9	2.0	2.0	2.0
Core PCE prices	1.8	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]	2.40	2.56	2.62	2.64	2.66	2.67	2.50
Previous Tealbook	2.39	2.58	2.69	2.74	2.76	2.76	2.50
10-year Treasury yield[1]	2.4	2.8	3.1	3.2	3.3	3.3	3.4
Previous Tealbook	2.8	3.0	3.2	3.3	3.3	3.4	3.4

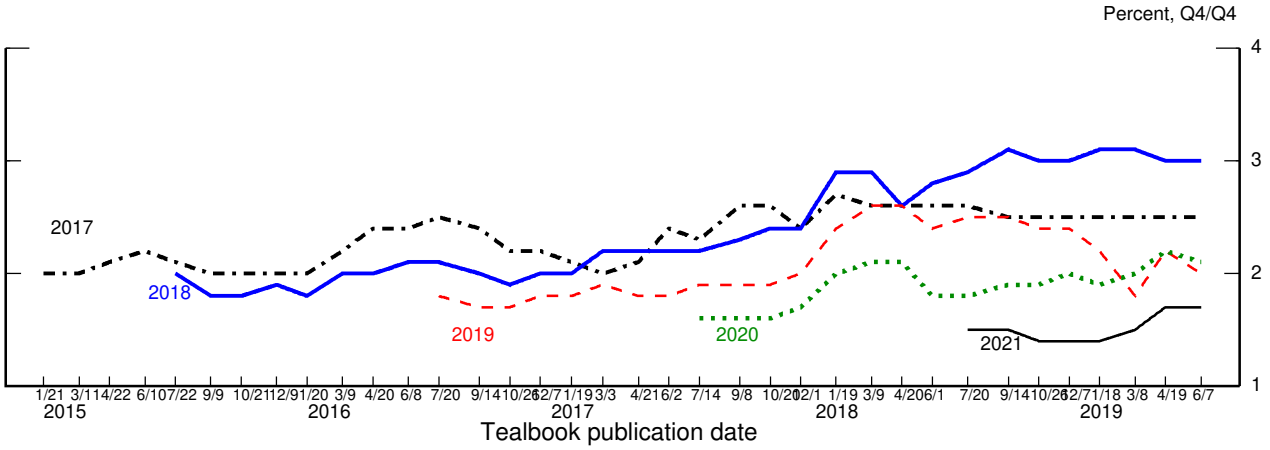
1. Percent, average for the final quarter of the period.



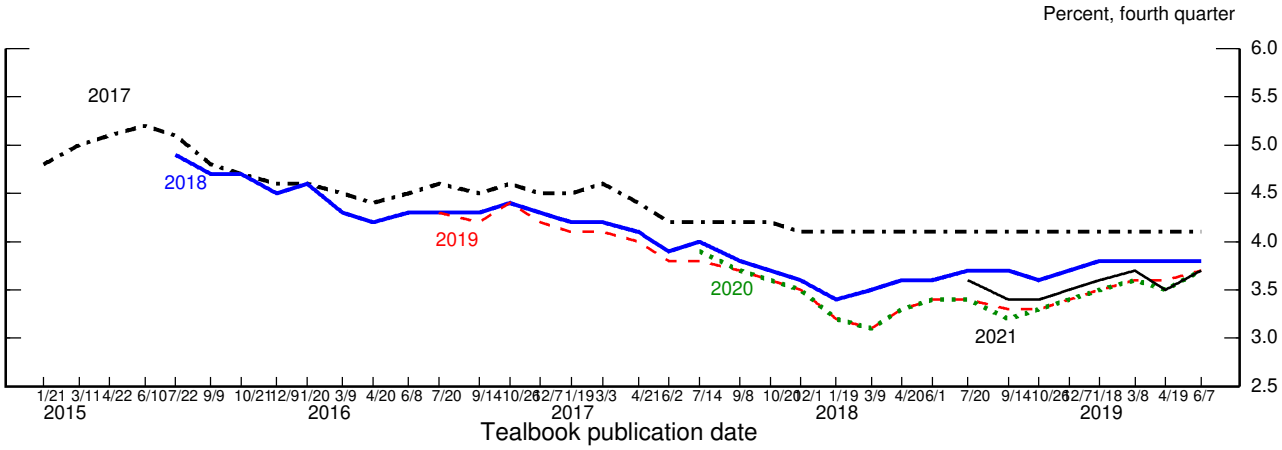
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

Evolution of the Staff Forecast

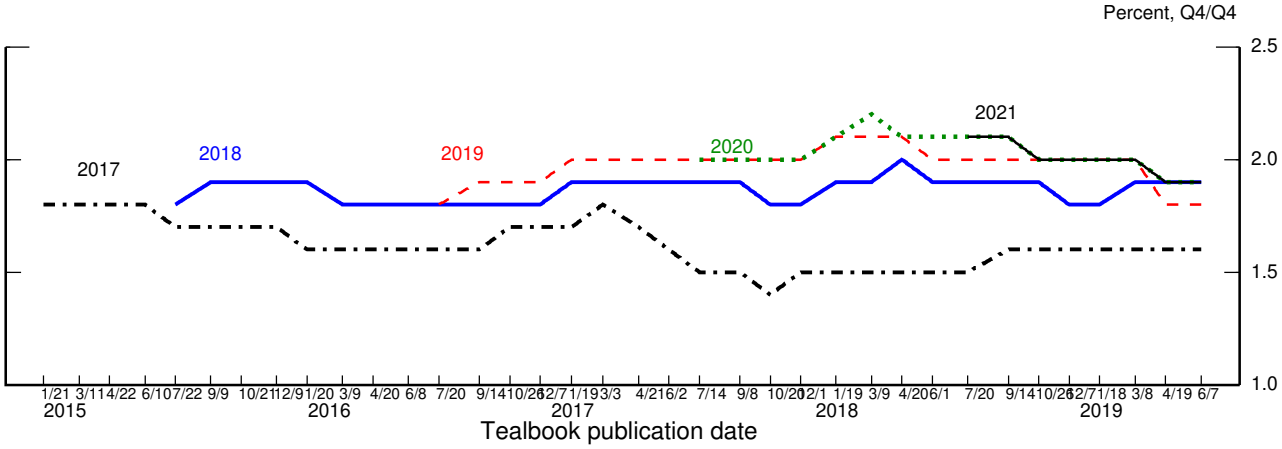
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



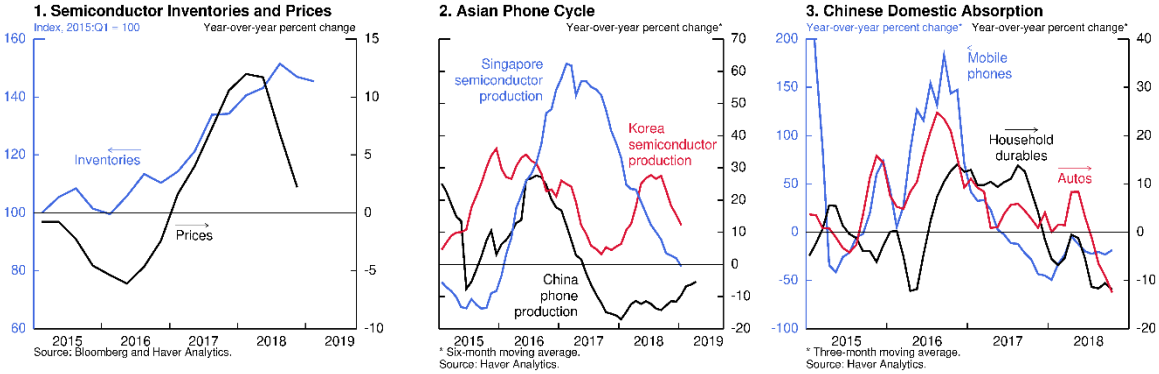
Accounting for the Asian Tech Cycle

Global trade weakened markedly at the end of 2018, with particular weakness in the emerging market economies (EMEs). EME exports contracted almost 7 percent at an annual rate in the fourth quarter and a further 3½ percent in the first quarter of this year. Emerging Asia's tech sector has been especially weak, with production and export of high-tech products falling substantially in recent quarters. These developments raise the question of whether the tech slowdown has been a *driver* of the broader slowdown in global trade, perhaps due to supply-side factors such as the timing of new product releases, or whether the tech slowdown merely *reflects* either a broader slowdown in global demand or the effects of recent tariff hikes and trade tensions. This discussion argues that slowing Chinese domestic demand, more than supply-side developments or tariffs, was the primary driver of recent developments in the Asian tech sector.

Highly integrated global supply chains for consumer electronics have created a correlated pattern of production and trade in electronics and software across economies, particularly in emerging Asia, now commonly referred to as the tech cycle. The tech cycle is increasingly dictated by smartphones, for which sales have generally eclipsed those of other tech products: Global smartphone sales were about 1.4 billion units in 2018, compared to 260 million units for personal computers. This trend is reflected in regional trade patterns, with about half of Asian semiconductor exports now directed to China, the final assembler of most mobile phones.

Technological advances in the semiconductor industry are often viewed as the fundamental driver of the tech cycle. The high rate of obsolescence for new chips leads to relatively short product life cycles for high-end electronics. Upturns in the tech cycle may therefore reflect the production and export of components associated with new product releases, which are prompted by innovations in semiconductor and circuit technology.

We first examine the historical relationship between product releases and high-tech data. Specifically, we run country-level regressions of semiconductor inventories, high-tech production, and high-tech exports on smartphone release date indicators, controlling for trend growth and lunar New Year effects. We find that release dates can help explain the inventory cycle in semiconductors. However, new releases have little explanatory power for trade and production.[1]



[1] This exercise closely follows Benjamin Carton, Joannes Mongardini, and Yiqun Li (2018), "A New Smartphone for Every Fifth Person on Earth: Quantifying the New Tech Cycle," IMF Working Paper No. 18/22 (Washington: International Monetary Fund, January 24). However, their paper uses non-seasonally adjusted data as dependent variables. While we believe this approach has merits, there are likely seasonal factors influencing these data beyond smartphone releases; hence, we use seasonally adjusted data.

What about developments over the past year? Semiconductor inventories continued to grow in 2018 (the blue line in figure 1), and the previous analysis suggests that product releases in late 2018 and early 2019 could partially explain this trend. In spite of new releases, however, phone production has remained weak. Figure 2 shows that Chinese phone production (the black line) has been in decline since 2017. This contraction, amid still-robust semiconductor output in emerging Asia, including Korea and Singapore (the red and blue lines, respectively), helped drive the run-up in inventories and depressed semiconductor prices (the black line in figure 1), which subsequently weighed on trade through 2018.

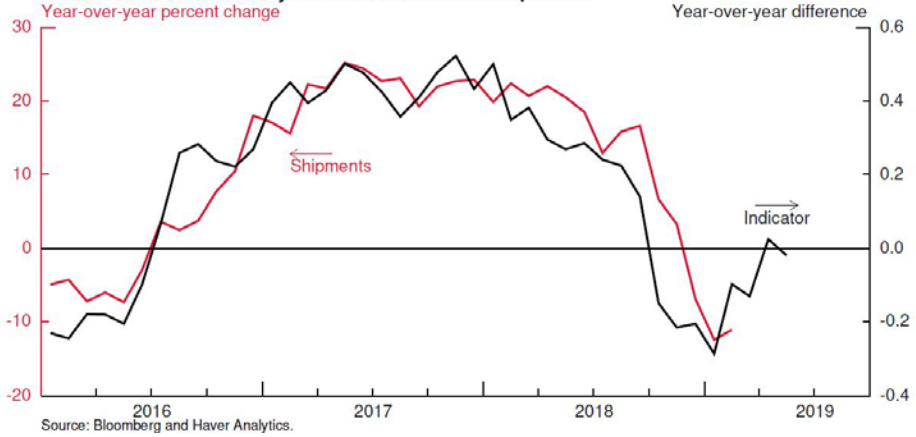
What accounts for the weakness of phone production since 2017? The most notable factor is a broad-based slowdown in Chinese demand, likely reflecting in part the authorities' financial deleveraging campaign. As can be seen in figure 3, beginning in 2017, Chinese domestic consumption slowed for mobile phones, household durables, and autos, with purchases of phones showing particular weakness toward the end of last year. With China accounting for about one-third of global smartphone consumption, this falloff in demand has been sufficient to drive the downturn in the regional supply chain.

What are the prospects for a recovery in the high-tech industry in 2019? Data received since the April Tealbook show some signs of the tech sector stabilizing. Chinese mobile phone production picked up in April for the third successive month. Likely supported by this strengthening in demand, Singapore's tech exports stepped up in April, and Korean semiconductor exports this quarter are up through May. More generally, after a contraction in high-tech industrial production across emerging Asia in March, data for April have thus far been promising, with rebounds in Korea, Singapore, and Taiwan.

Semiconductor equity prices provide a useful forward-looking indicator of global electronics trade. We construct a tech equities indicator by extracting common variation from the stock prices of 133 firms in the semiconductor industry globally. As can be seen in figure 4, changes in our headline indicator track global semiconductor shipments growth quite closely.

Our tech indicator suggests that investor sentiment bottomed out at the turn of the year. Expectations of recovery are likely driven by a more optimistic growth outlook in China and the rollout of 5G networks globally, which should accelerate product releases in 2019 and 2020. However, heightened U.S.–Chinese trade tensions, including U.S. restrictions on business with Huawei, drove semiconductor equities down in May and remain the most prominent downside risks to a recovery in the industry.

4. Semiconductor Industry Indicator and Global Shipments



Source: Bloomberg and Haver Analytics.

Int'l Econ Devel & Outlook

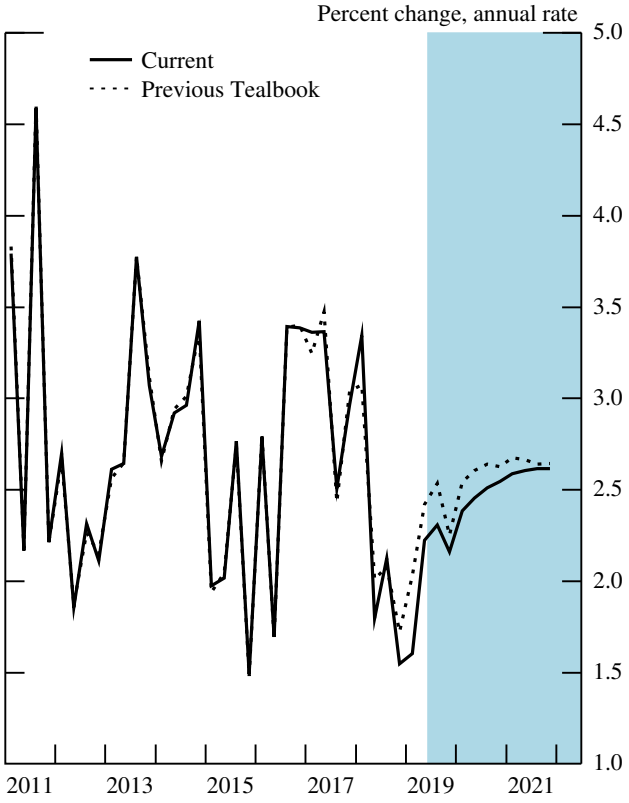
The Foreign GDP Outlook

Real GDP* Percent change, annual rate

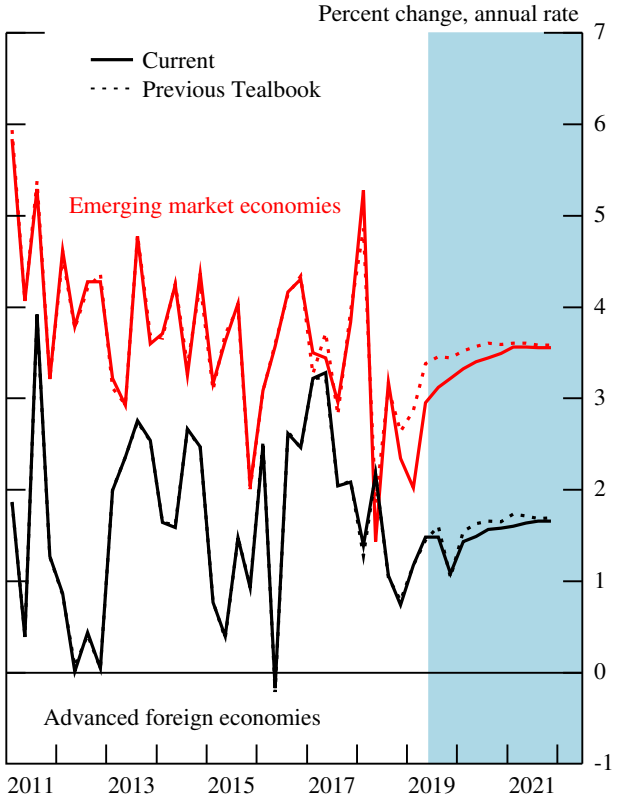
	2018			2019			2020	2021
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	2.6	2.1	1.5	1.6	2.2	2.2	2.5	2.6
Previous Tealbook	2.5	2.1	1.7	2.0	2.4	2.4	2.6	2.7
2. Advanced Foreign Economies	1.8	1.1	.7	1.2	1.5	1.3	1.5	1.6
Previous Tealbook	1.7	1.0	.8	1.2	1.4	1.3	1.6	1.7
3. Canada	2.0	2.1	.3	.4	2.1	1.6	1.7	1.7
4. Euro Area	1.6	.5	1.0	1.6	1.2	1.0	1.3	1.7
5. Japan	.9	-2.5	1.6	2.1	.1	.1	1.0	.8
6. United Kingdom	.9	2.8	.9	2.0	.7	1.2	1.6	1.6
7. Emerging Market Economies	3.3	3.2	2.3	2.0	3.0	3.2	3.4	3.6
Previous Tealbook	3.3	3.1	2.6	2.9	3.4	3.5	3.6	3.6
8. China	6.8	5.8	6.0	7.3	6.1	5.9	5.7	5.7
9. Emerging Asia ex. China	3.9	2.6	2.8	2.6	3.1	3.5	3.5	3.5
10. Mexico	1.9	2.7	.1	-.7	1.4	1.7	2.3	2.7
11. Brazil	1.0	2.0	.4	-.6	1.2	1.9	2.4	2.8

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

Total Foreign GDP



Foreign GDP



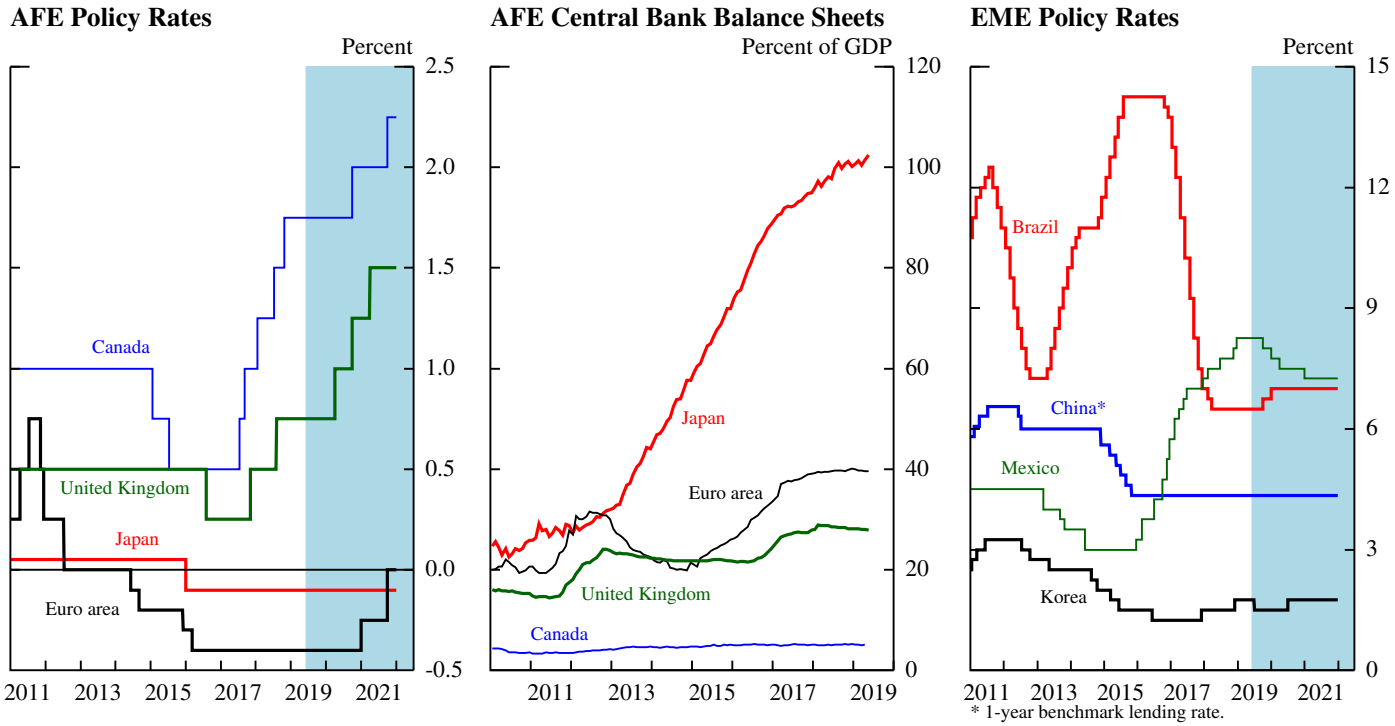
The Foreign Inflation Outlook

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	2.9	2.4	2.3	2.3
Previous Tealbook	2.2	3.4	1.9	.7	2.5	2.4	2.3	2.3
2. Advanced Foreign Economies	1.9	2.5	.7	.7	1.4	1.7	1.4	1.5
Previous Tealbook	1.9	2.4	.8	.6	1.6	1.9	1.4	1.5
3. Canada	2.2	2.6	1.1	1.6	2.8	1.8	1.9	1.9
4. Euro Area	2.2	2.6	.7	.1	1.0	.9	1.2	1.3
5. Japan	.6	2.0	-.1	.9	.0	3.2	.9	1.0
6. United Kingdom	2.2	2.7	1.9	.8	2.6	2.0	2.2	2.2
7. Emerging Market Economies	2.5	4.1	2.7	.8	3.9	2.9	2.8	2.8
Previous Tealbook	2.5	4.1	2.7	.8	3.0	2.7	2.8	2.8
8. China	1.5	3.7	2.0	.6	4.0	2.5	2.5	2.5
9. Emerging Asia ex. China	2.2	2.0	1.2	.1	3.2	2.8	2.8	2.7
10. Mexico	4.0	6.5	4.9	1.1	4.3	3.3	3.2	3.2
11. Brazil	3.7	6.6	2.5	2.9	5.8	4.2	4.3	4.3

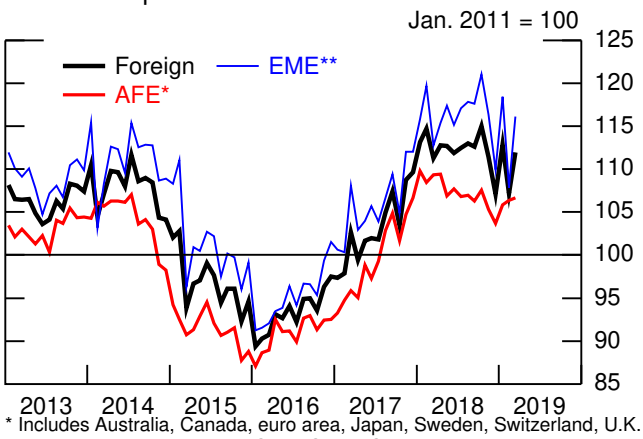
* CPI aggregates weighted by shares of U.S. non-oil imports.

Foreign Monetary Policy



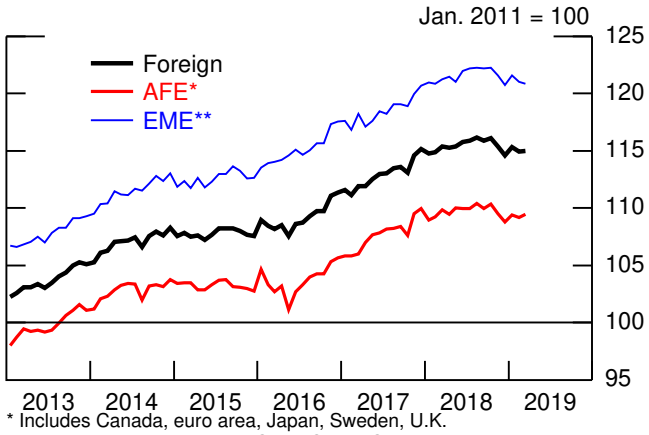
Recent Foreign Indicators

Nominal Exports



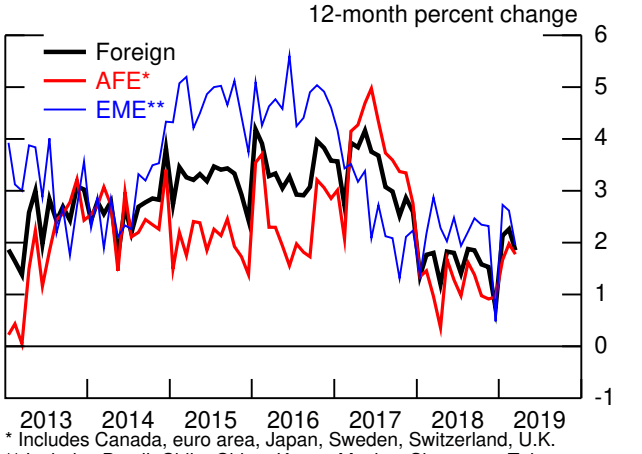
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Singapore, Taiwan, Thailand.

Industrial Production



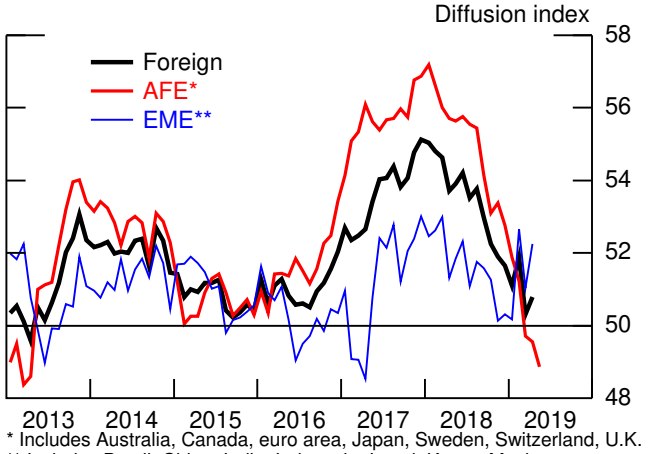
* Includes Canada, euro area, Japan, Sweden, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand.

Retail Sales



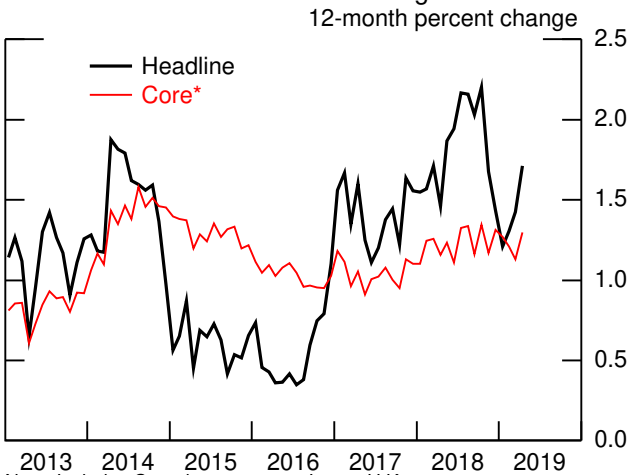
* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, Chile, China, Korea, Mexico, Singapore, Taiwan.

Manufacturing PMI



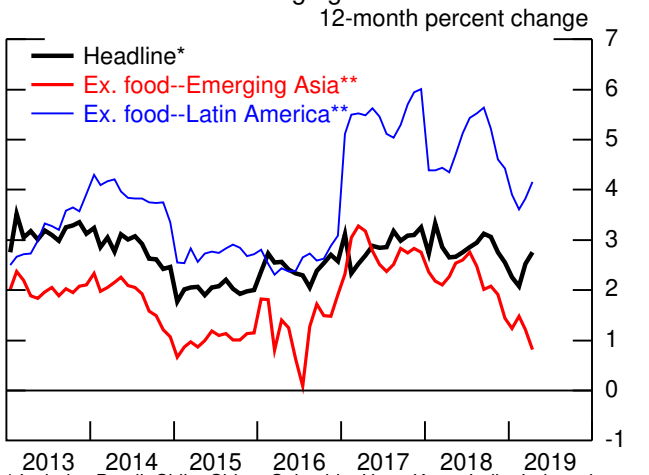
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, China, India, Indonesia, Israel, Korea, Mexico, Russia, Singapore, Taiwan, Turkey.

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

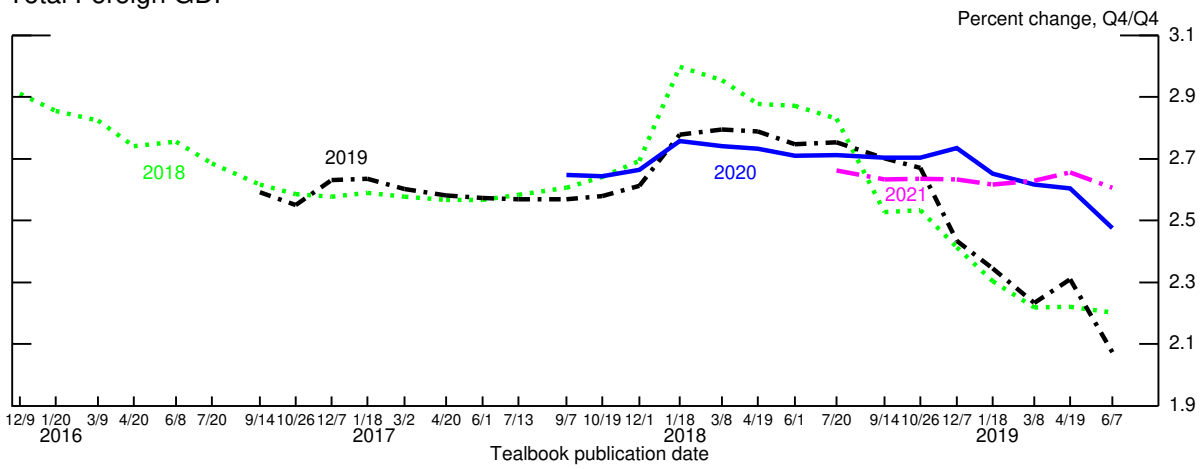


* Includes Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand.
** Excludes all food; staff calculation. Latin America excludes Argentina and Venezuela.

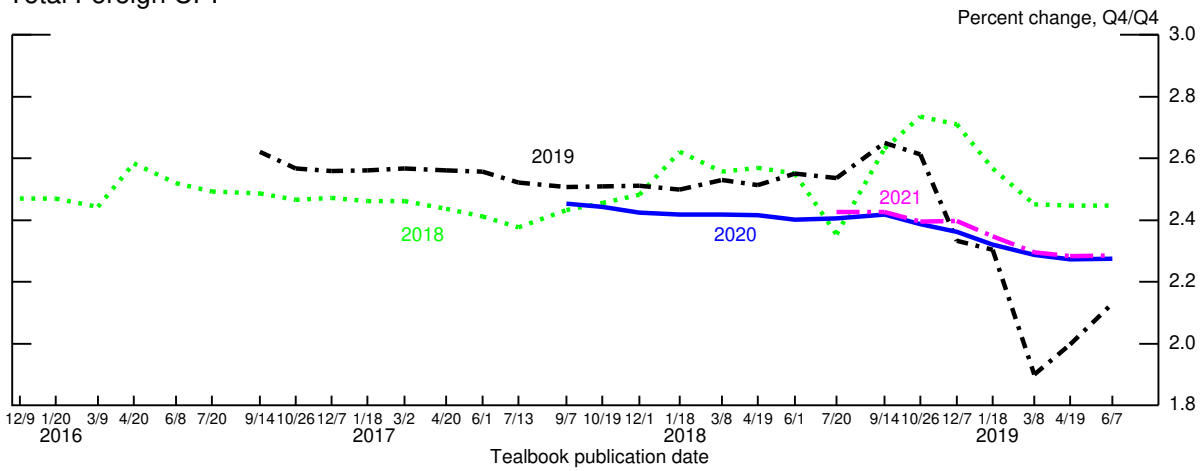
Int'l Econ Devel & Outlook

Evolution of Staff's International Forecast

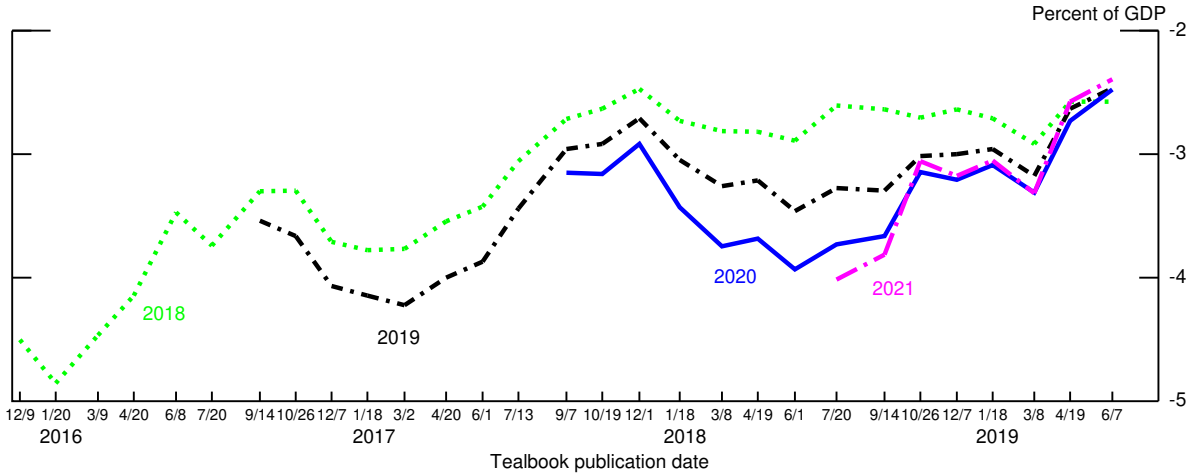
Total Foreign GDP



Total Foreign CPI

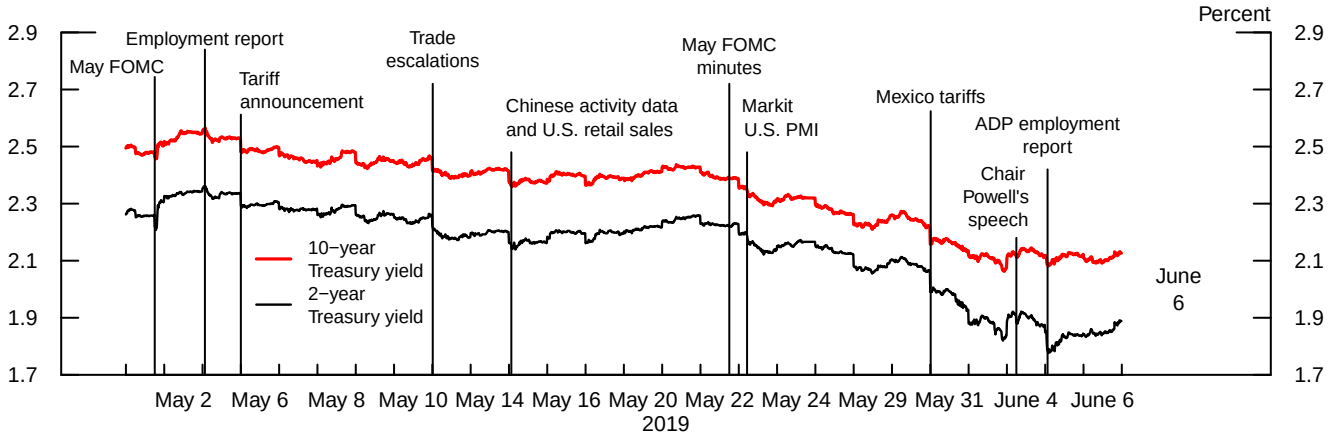


U.S. Current Account Balance



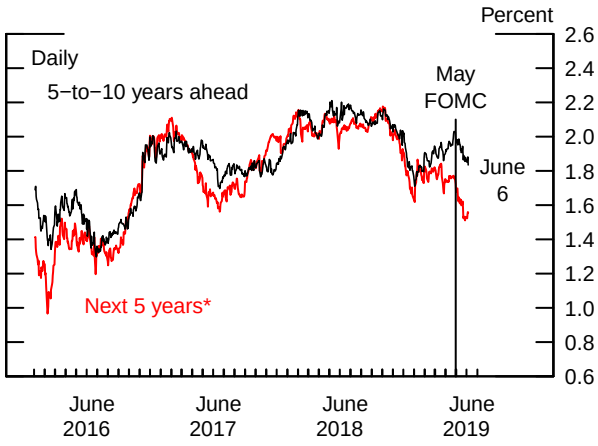
Policy Expectations and Treasury Yields

Intraday Treasury Yields



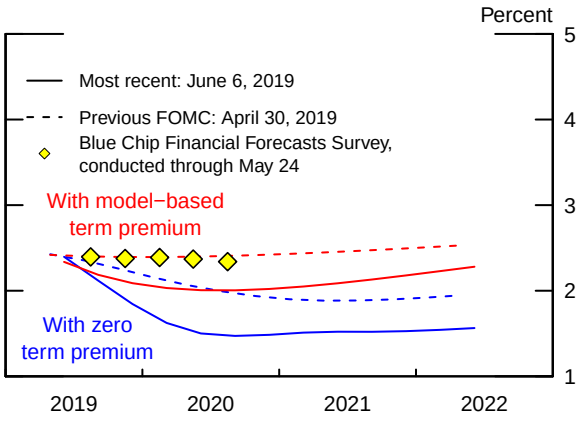
Note: Data are spaced at 5−minute intervals from 8:00 a.m. to 4:00 p.m.
Source: Bloomberg.

TIPS−Based Inflation Compensation



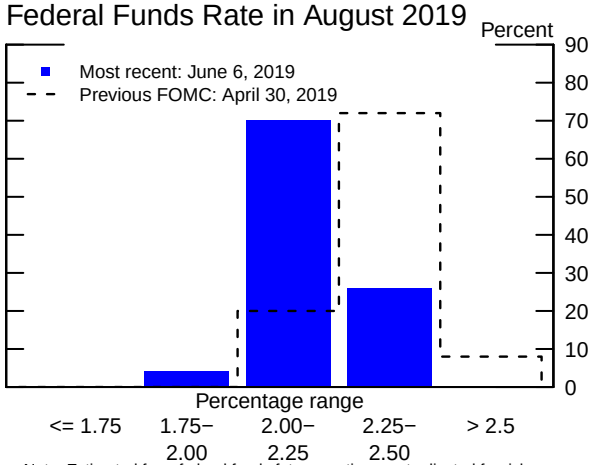
Note: Estimates based on smoothed nominal and inflation−indexed Treasury yield curves.
* Adjusted for lagged indexation of Treasury Inflation−Protected Securities (carry effect).
Source: Federal Reserve Bank of New York; Board staff calculations.

Implied Federal Funds Rate



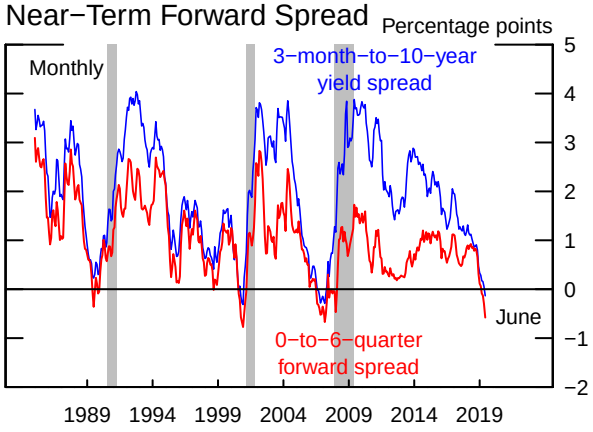
Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points. Model−based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premiums. The Blue Chip path is the average of respondents' expectations for the federal funds rate in the survey conducted through May 24 and published June 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 May 2019 are monthly averages. Data for June 2019 are based on values for June 6. 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.

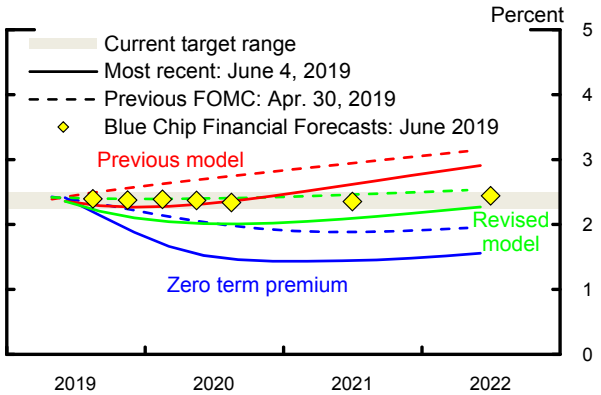
Financial Markets

In a revised version of the staff's shadow rate model, different sets of model parameters are used to describe the period before December 2008 and the period after December 2008. In other words, the revised shadow rate model has a structural break around the time of the onset of the Global Financial Crisis. Consequently, the estimated parameters of the model that are relevant for yield dynamics in recent years are based on a substantially shorter sample (December 2008 to March 2019) than the previous model. In the staff's best judgement, the benefit of the revised model in terms of topicality now outweighs the greater estimation uncertainty associated with a shorter sample period.[4]

The green lines in figure 1 show the implied path for the federal funds rate from the revised model. The revised model suggests a substantially flatter federal funds rate path over the next several years than the unadjusted path. In contrast, the previous model indicates further gradual rate increases over the medium term. Put differently, the revised model currently implies less negative term premiums compared with the previous model. Longer-range expectations from the revised model—that is, expectations for the average federal funds rate 5 to 10 years ahead—have also been notably lower than those from the previous model in recent years (figure 2). Nevertheless, the expectations implied by both models share certain qualitative features such as the prominent increase in long-term expectations after the U.S. presidential election in late 2016, which was not mirrored in long-range Blue Chip survey forecasts. That said, the revised model better captures the preceding decline in long-range survey forecasts in 2015 and 2016 and the lower level of those forecasts seen since.

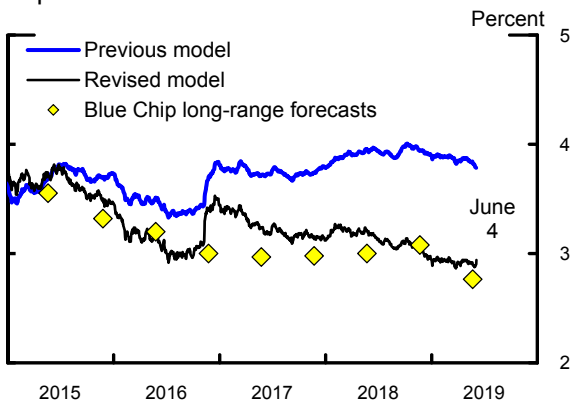
Going forward, the staff will show the term-premium-adjusted federal funds rate path based on the revised model. In light of the still-limited post-2008 data, the staff will monitor the model's output closely and make further updates as judged appropriate.

Figure 1: Measures of Federal Funds Rate Expectations



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 paths are estimated using shadow rate term structure models maintained by Board staff; "previous model" is a single-regime model estimated on a sample from 1991 to 2016, "revised model" is estimated on a sample from 1991 to 2019 with a structural break in 2008. The Blue Chip path is the average of respondents' expectations for the federal funds rate in the survey published June 1.
Source: Bloomberg; Wolters Kluwer Legal and Regulatory Solutions U.S., Blue Chip Financial Forecasts; Board staff calculations.

Figure 2: 5–to–10–Year Federal Funds Rate Expectations

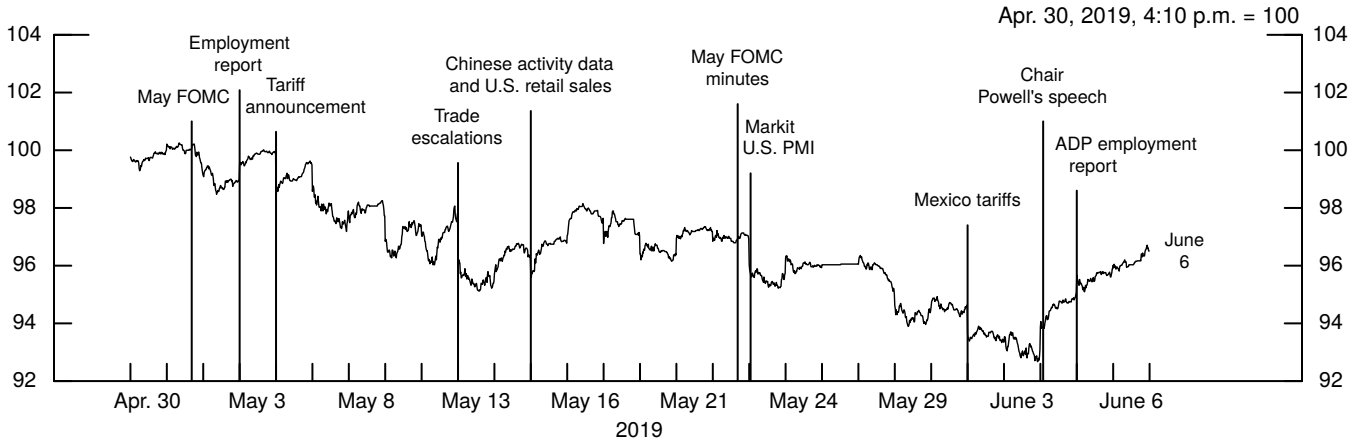


Source: Bloomberg; Wolters Kluwer Legal and Regulatory Solutions U.S., Blue Chip Financial Forecasts; Board staff calculations.

[4] The revised version also makes a number of technical adjustments to the specification of the model. Most importantly, to account for the potential difficulty in forecasting the path of the federal funds rate in a new interest rate environment, the revised model uses a more sparse cross section of Blue Chip survey forecast horizons in its estimation.

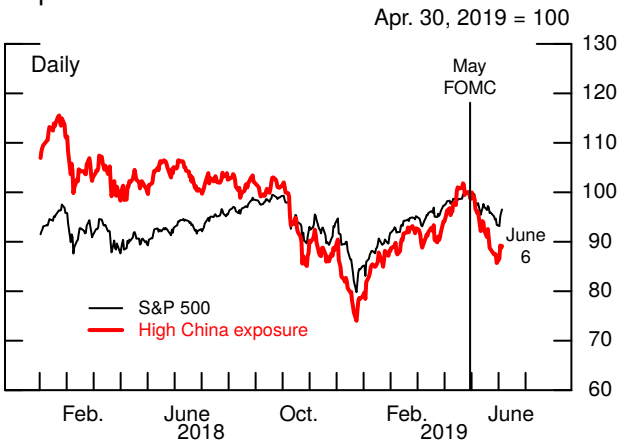
Corporate Asset Market Developments

Intraday S&P 500 Futures



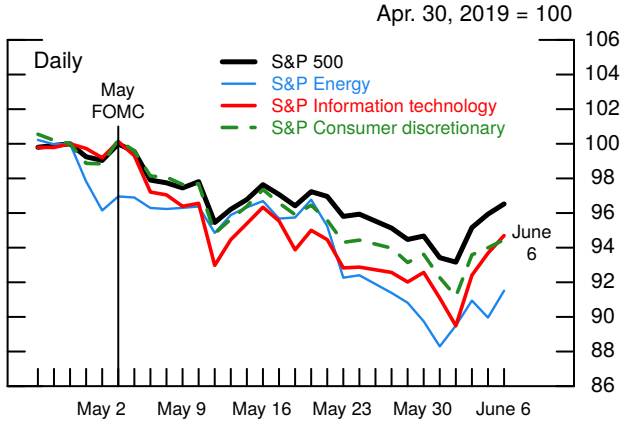
Note: Data are spaced at 5-minute intervals from 9:30 a.m. to 4:10 p.m.
Source: Bloomberg.

S&P 500 Index and China Exposure Portfolio



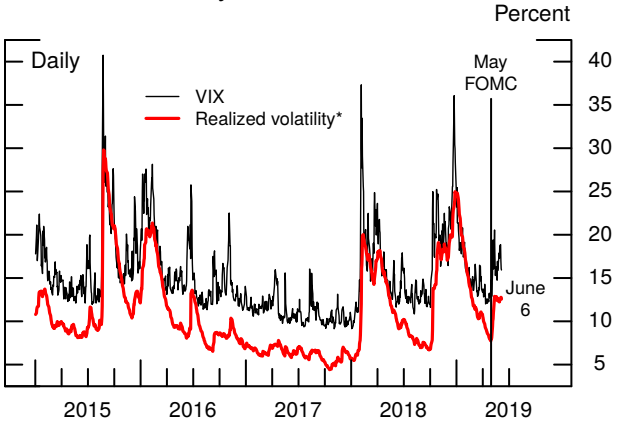
Note: China exposure is measured based on Board staff calculations of stock price sensitivity to the ASHR China A-Shares exchange-traded fund.
Source: Bloomberg; Compustat; Yahoo Finance.

Selected S&P 500 Stock Price Indexes



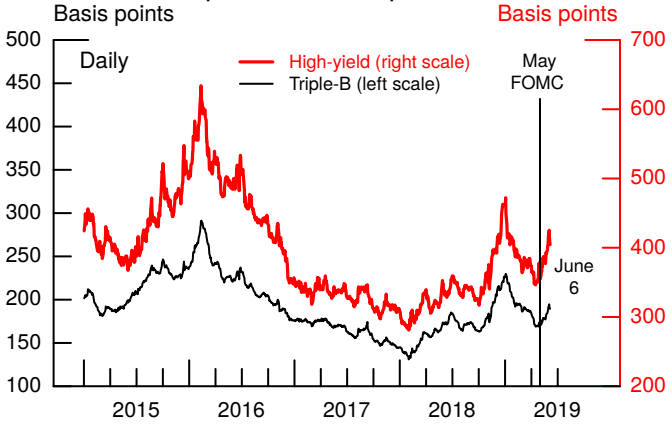
Source: Bloomberg.

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

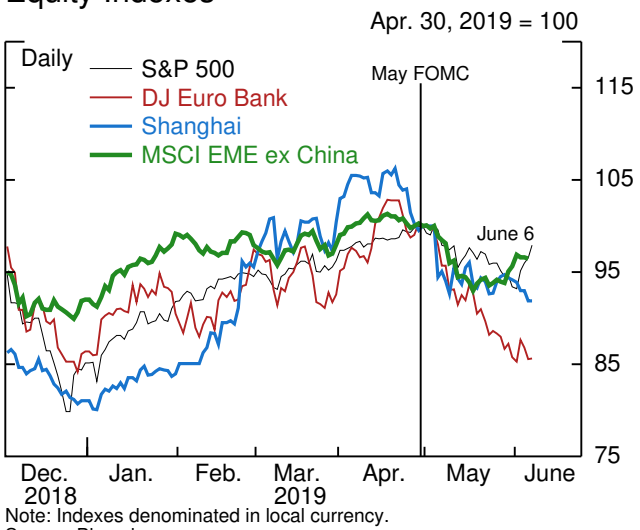


Note: Spreads over 10-year Treasury yield.
Source: Merrill Lynch; Federal Reserve Bank of New York; Board staff calculations.

Financial Markets

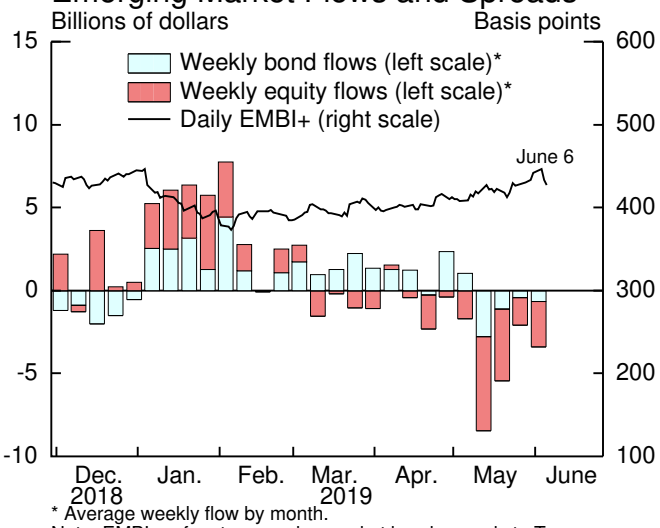
Recent International Developments

Equity Indexes



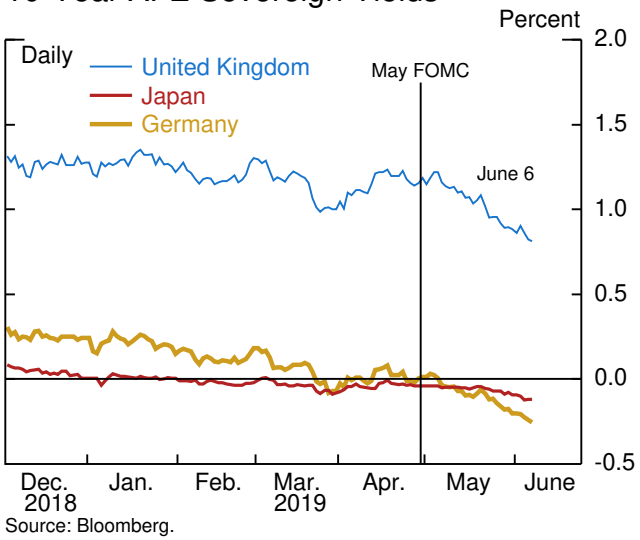
Note: Indexes denominated in local currency.
Source: Bloomberg.

Emerging Market Flows and Spreads



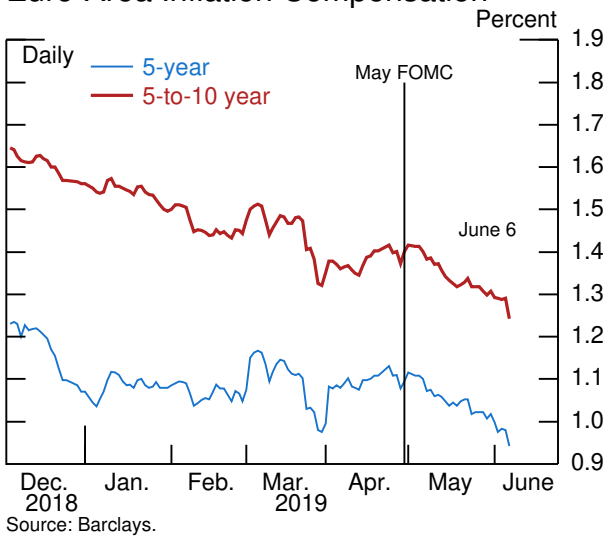
* Average weekly flow by month.
Note: EMBI+ refers to emerging market bond spreads to Treasury securities.
Source: Emerging Portfolio Fund Research. Excludes intra-China flows.

10-Year AFE Sovereign Yields



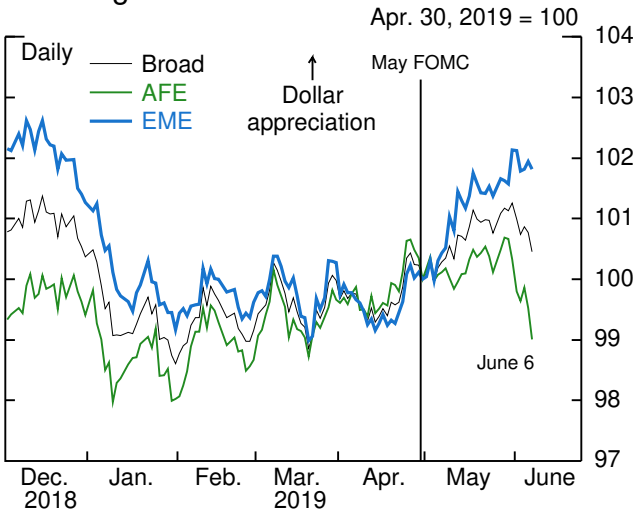
Source: Bloomberg.

Euro-Area Inflation Compensation



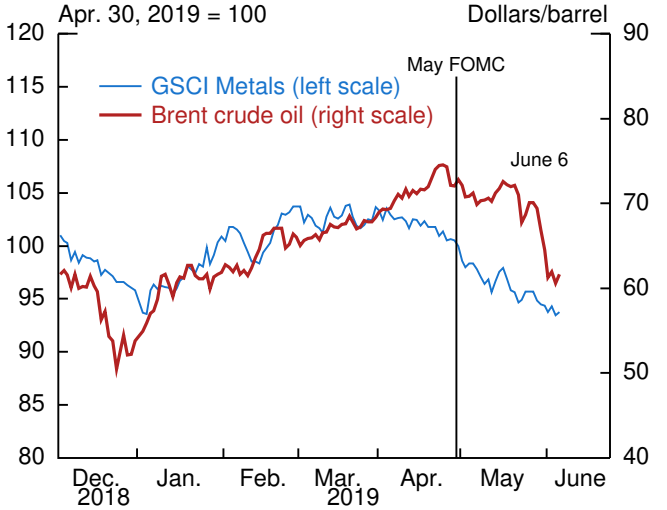
Source: Barclays.

Exchange Rates



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

Commodities

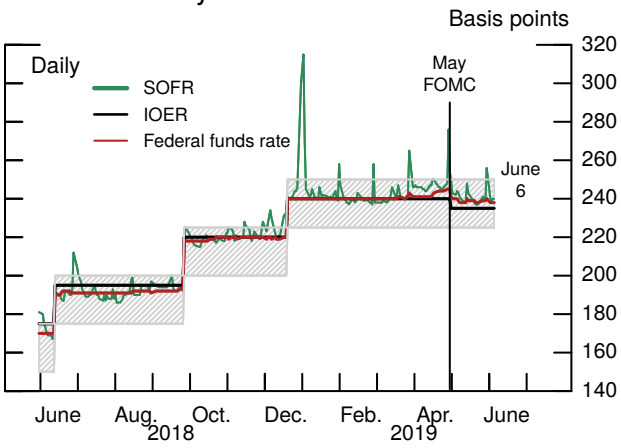


Source: Brent from Bloomberg; Metals from Standard & Poor's.

Financial Markets

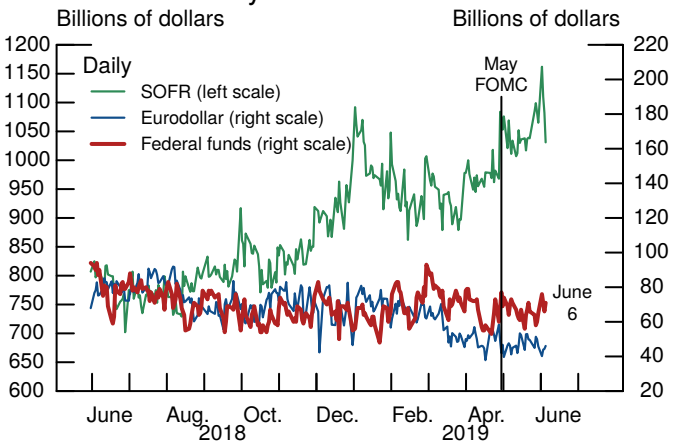
Short-Term Funding Markets

Selected Money Market Rates



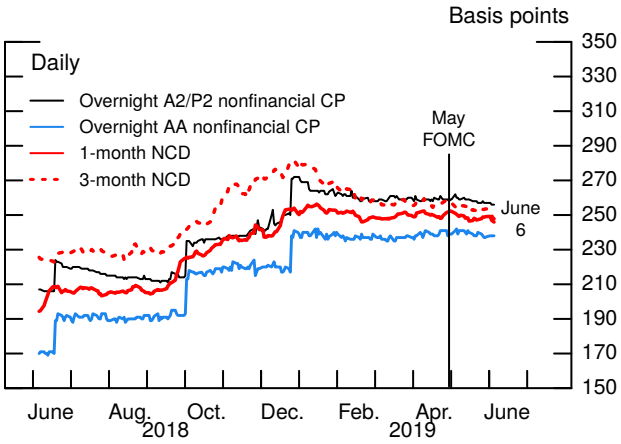
Note: SOFR is secured overnight financing rate. IOER is interest on excess reserves. Federal funds rate is a weighted median. Shaded area is the target range for the federal funds rate.
Source: Federal Reserve Board.

Selected Money Market Volumes



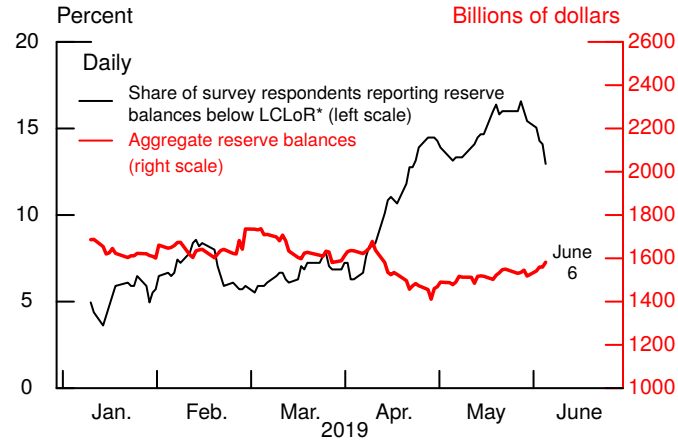
Note: SOFR is secured overnight financing rate.
Source: Federal Reserve Bank of New York; Federal Reserve Board.

CP and NCD Rates



Note: CP is commercial paper. NCD is negotiable certificates of deposit. 1-month and 3-month NCD rates are computed as 5-day moving averages.
Source: Depository Trust & Clearing Corporation.

Aggregate Reserve Balances and Lowest Comfortable Level of Reserves



Note: LCLoR is lowest comfortable level of reserve balances.
* Share is computed as a 7-day moving average.
Source: Federal Reserve Board Senior Financial Officer Survey (SFOS).

Financial Markets

Financial Markets

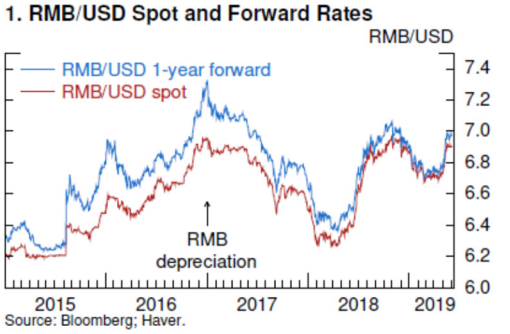
Recent Depreciation of the Chinese Renminbi

The Chinese renminbi (RMB) has come under pressure since trade tensions escalated over the past month. In this discussion, we review recent exchange rate moves and actions by Chinese authorities to stabilize the currency, and we compare the current situation to previous episodes of RMB weakness.

The RMB has fallen 2.5 percent against the U.S. dollar since trade tensions escalated in early May, and the spot exchange rate is approaching the psychological barrier of 7 yuan per dollar for the third time since its unexpected depreciation in August 2015 (figure 1). There are signs of continued depreciation pressure, albeit modest, as the offshore RMB has consistently been trading at a weaker level than the onshore RMB. In addition, investor demand for protection against further RMB depreciation (relative to appreciation) as measured by risk reversals spiked in recent weeks, though to still-low levels (figure 2).

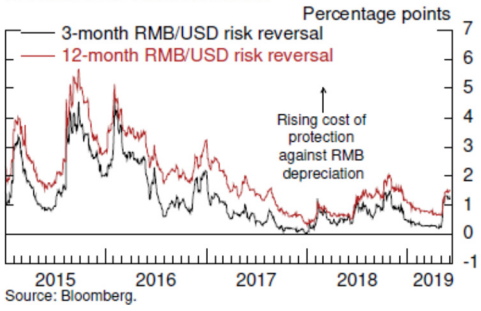
The People's Bank of China (PBOC) has not engaged in direct sales of foreign reserves and instead has used other measures to support the currency. In recent weeks, the PBOC has set the daily central parity rate of the onshore RMB stronger than would have been expected based on its de jure central parity fixing rule (figure 3).[1] Market participants generally interpret stronger-than-expected fixings as a signal that the PBOC prefers a stronger RMB. Indeed, the recent fixing is remarkably stable at 6.9 (figure 4).

1. RMB/USD Spot and Forward Rates



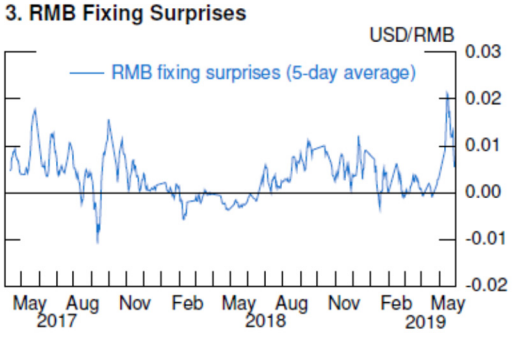
Source: Bloomberg; Haver.

2. RMB/USD Risk Reversal



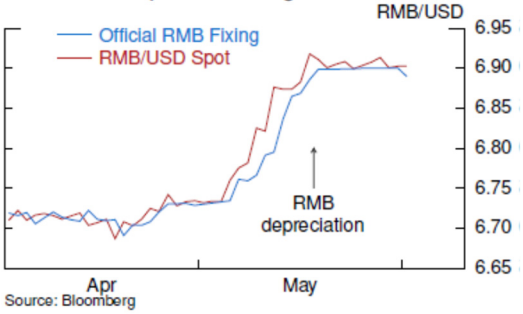
Source: Bloomberg.

3. RMB Fixing Surprises



Source: Bloomberg. RMB fixing surprises are computed as the difference between the fixing of the RMB's central parity rate and Goldman Sachs's estimate of the fixing implied by the official rule.

4. RMB/USD Spot and Fixing



Source: Bloomberg

[1] In early 2016, the PBOC detailed the rule for fixing the RMB's daily central parity rate, which serves as the midpoint for the intraday trading range of 2 percent, as the sum of the previous day's market close of the RMB to the dollar and the change that would offset overnight changes in a trade-weighted basket of currencies.

The PBOC has also attempted to discourage the shorting of the offshore RMB by selling short-term bills in Hong Kong to tighten offshore liquidity, as evidenced by a jump in offshore RMB interbank lending rates, with announced plans for further issuances in the near term. Finally, the PBOC has used communications to signal support for the RMB, including a public statement saying that China is "capable and confident" of keeping the RMB stable.[2]

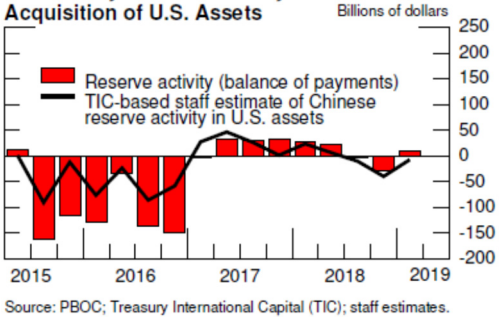
The latest bout of depreciation and policy responses by the PBOC is most reminiscent of an episode in June 2018, when the RMB depreciated 4 percent within three weeks following an escalation of trade tensions with the United States and weaker-than-expected Chinese data releases. At that time, the PBOC also used communications to signal its intention to keep the RMB stable, fixed the central parity rate stronger, and did not draw down on its foreign exchange reserves (figure 5).

Both the current and the June 2018 episodes are very different from the RMB weakness in 2015 and 2016, in that these more recent sharp depreciations have not been accompanied by expectations of future depreciation in the forwards market (figure 1) and private capital outflows have been much more modest (figure 6). We attribute the observed attenuation of recent market swings to better PBOC communication and credibility, tightened capital controls, and better fundamentals in the Chinese economy relative to the 2015–16 episode. Furthermore, even though the RMB is still managed, it is more market determined now than it was in 2015 and 2016.

Currently, market participants view 7 yuan per dollar as a soft floor and expect it to be defended at least until the G-20 summit at the end of June, as further depreciation of the RMB could hinder trade negotiations.[3] Indeed, we believe that the PBOC would be able to defend the value of the RMB if it decided to do so, using the more powerful policy tools at its disposal. For example, it could direct offshore state banks to sell the U.S. dollar for yuan or use some of its $3 trillion in foreign exchange reserves.

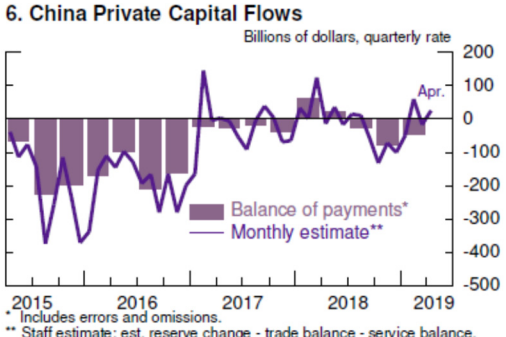
We think it is unlikely, however, that the PBOC would defend the RMB by running down its foreign exchange reserves as much as it did during the 2015–16 episode, as the PBOC seems to have a higher tolerance for exchange rate flexibility now than it did in that earlier episode. Thus, a breakdown in trade negotiations or further signs of slowing Chinese growth may cause the RMB to break through the level of 7 yuan per dollar.

5. Quarterly Reserve Activity and Chinese Acquisition of U.S. Assets



Source: PBOC; Treasury International Capital (TIC); staff estimates.

6. China Private Capital Flows



* Includes errors and omissions.
** Staff estimate: est. reserve change - trade balance - service balance.
Source: International Monetary Fund Balance of Payments; Haver.

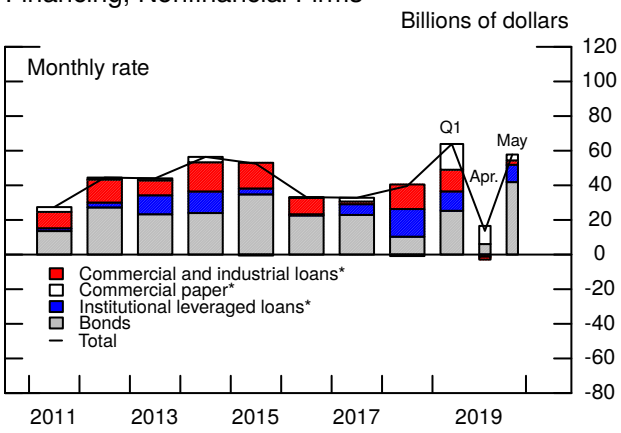
[2] PBOC Vice Governor Liu Guoqiang made the remarks in an interview with *Financial News* on May 24, 2019.

[3] Of the 25 most recent forecasts in Bloomberg, none expects the RMB to trade weaker than 7 yuan per dollar by the end of the second quarter, and only 4 expect it to trade below that level by the end of the year.

Financial Markets

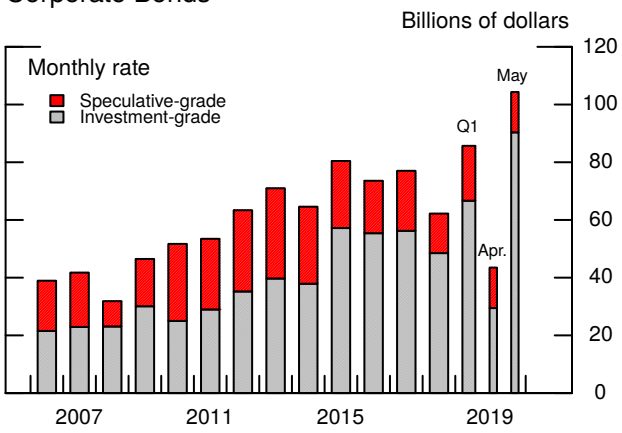
Business Finance

Selected Components of Net Debt Financing, Nonfinancial Firms



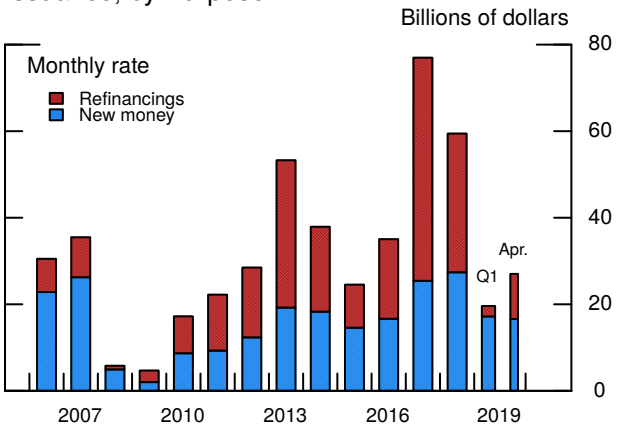
Note: Commercial and industrial loan data for May are estimates. Leveraged loan data for April and May are estimates.
* Period-end basis.
Source: Mergent Fixed Income Securities Database; Thomson Reuters LPC; Federal Reserve Board; Depository Trust & Clearing Corporation.

Gross Issuance of Nonfinancial Corporate Bonds



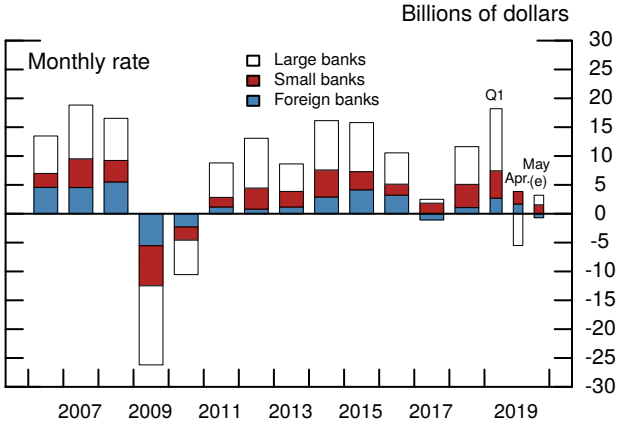
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.
Source: Mergent Fixed Income Securities Database.

Institutional Leveraged Loan Gross Issuance, by Purpose



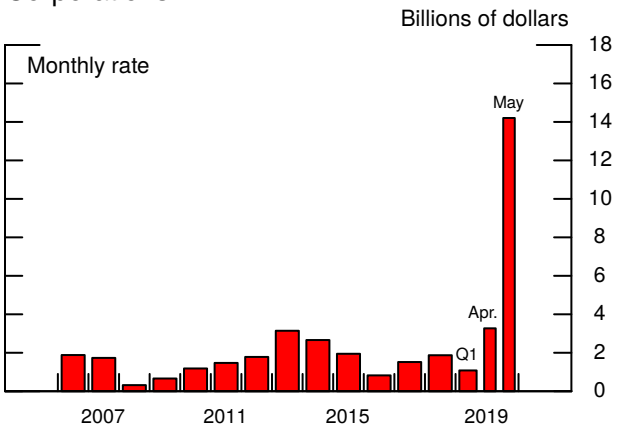
Source: Thomson Reuters LPC.

Commercial and Industrial Loans



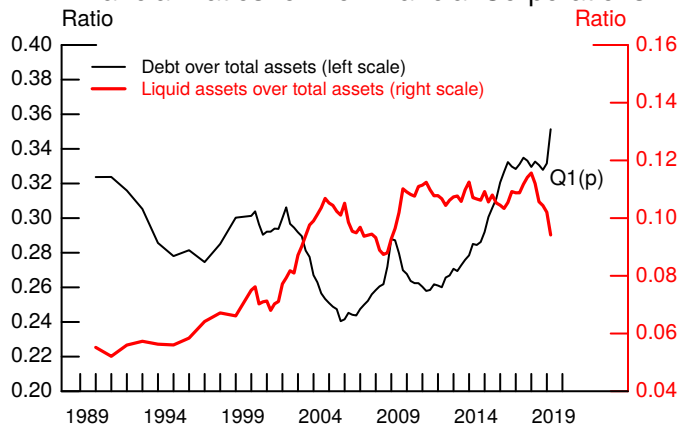
Note: Data are calculated from changes in banks' outstanding commercial and industrial loan balances at period end. Large banks are defined as the 25 largest banks by assets. Data are seasonally adjusted by Board staff.
e Estimate.
Source: Federal Reserve Board.

IPO Issuance by Nonfinancial Corporations



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

Financial Ratios for Nonfinancial Corporations

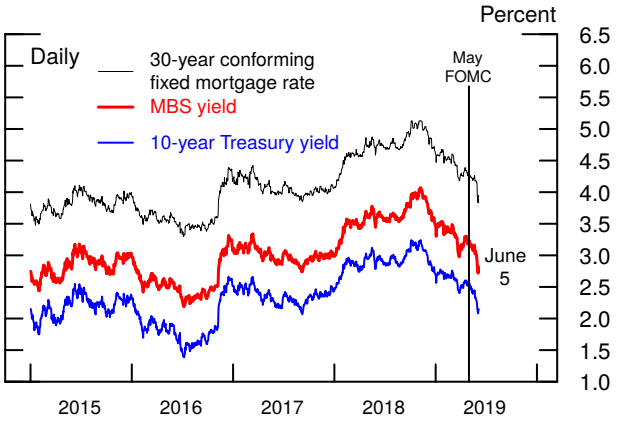


Note: Data are annual through 1999 and quarterly thereafter. Liquid assets are defined as cash and short-term investments.
p Preliminary.
Source: Compustat.

Financing Conditions

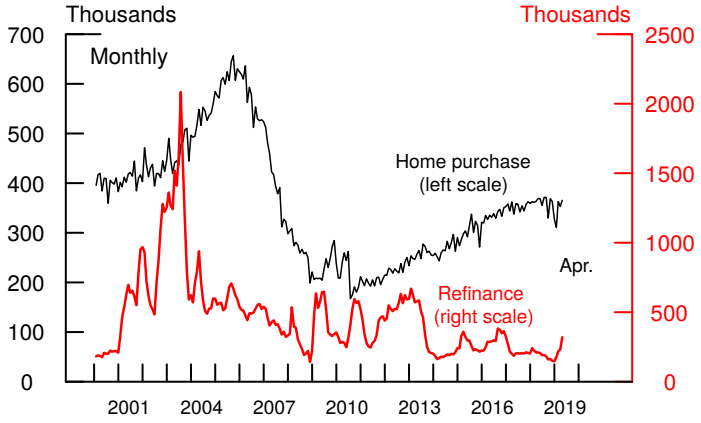
Household Finance

Mortgage Rate and MBS Yield



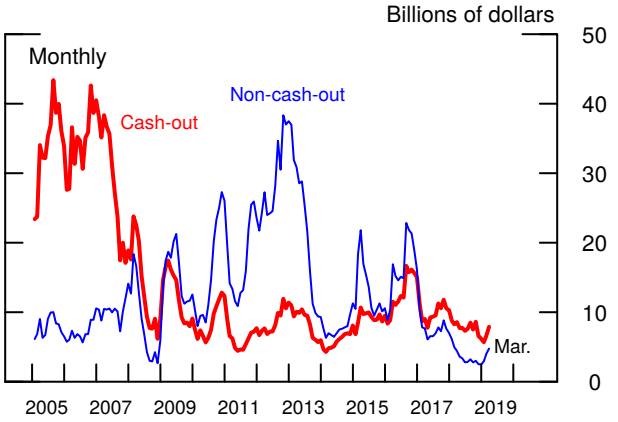
Note: The mortgage-backed securities (MBS) yield is the Fannie Mae 30-year current-coupon rate.
Source: For MBS yield, Barclays; for mortgage rate, Loansifter; for Treasury yield, Federal Reserve Bank of New York and Board staff calculations.

Purchase and Refinance Originations



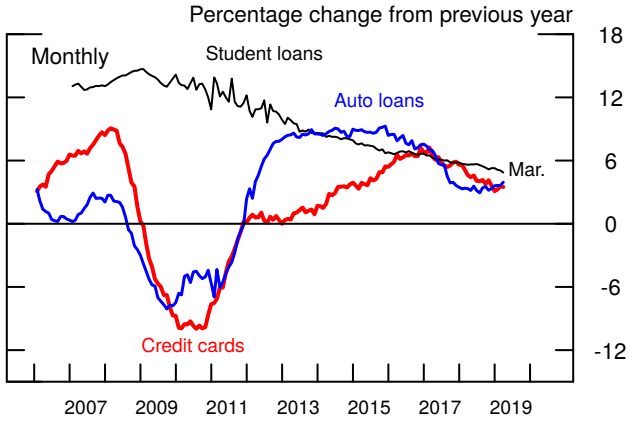
Note: The data are seasonally adjusted by Federal Reserve Board Staff.
Source: For values prior to 2019, data reported under the Home Mortgage Disclosure Act of 1975; for values in 2019, Board staff estimates.

Mortgage Refinances



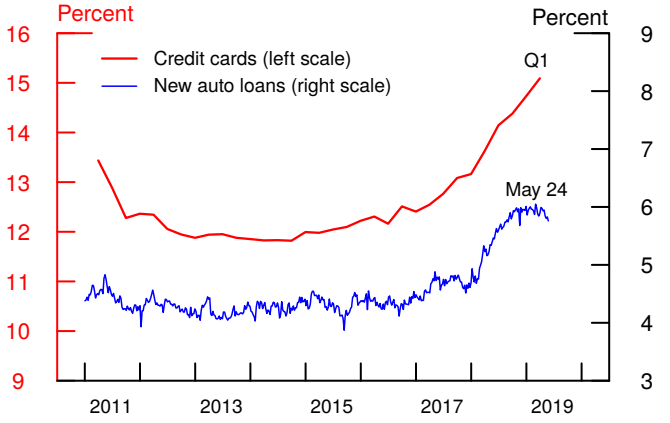
Source: Black Knight.

Consumer Credit



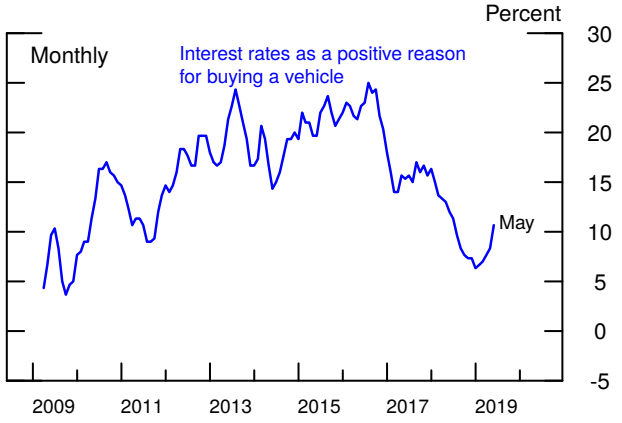
Source: Federal Reserve Board.

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 seasonally adjusted.
Source: For credit cards, Federal Reserve Board; for auto loans, J.D. Power.

Buying Conditions for Vehicles



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

Financing Conditions

Drivers of Recent Changes in Credit Card Interest Rates

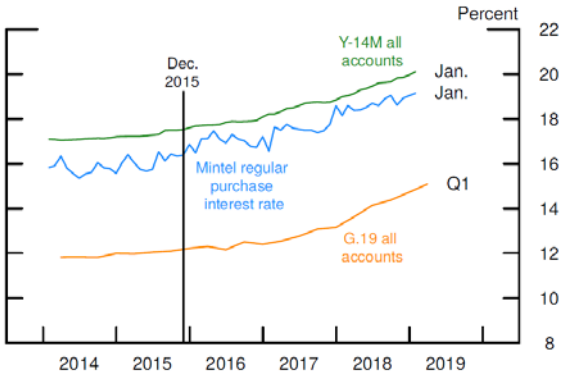
Credit card interest rates, plotted in figure 1, have increased substantially over the past few years and have risen as much as 290 basis points since the December 2015 liftoff of the target federal funds rate from its effective lower bound. They now stand at their highest levels since the first quarter of 2001.

Figure 2 plots the spread of credit card interest rates over the prime rate (the top of the target range for the federal funds rate plus 300 basis points). The vast majority of credit cards have variable rates that are linked to prime rates. The spreads are much flatter than the card interest rates, with increases since December 2015 of about 35 to 65 basis points. Thus, more than three-fourths of the rise in credit card rates since late 2015 reflect increases in the federal funds rate.

The increases in spreads since December 2015 may be related to a greater prevalence of credit card rewards payments and rises in nonprime delinquencies. Supervisory data (the FR Y-14M) show a substantial increase in credit card rewards over the past few years. The increase in rates may help offset greater rewards costs to card issuers. From the second quarter of 2015 through the first quarter of 2019, near-prime and subprime delinquency rates of 30 days or more increased about 75 basis points and 200 basis points, respectively.

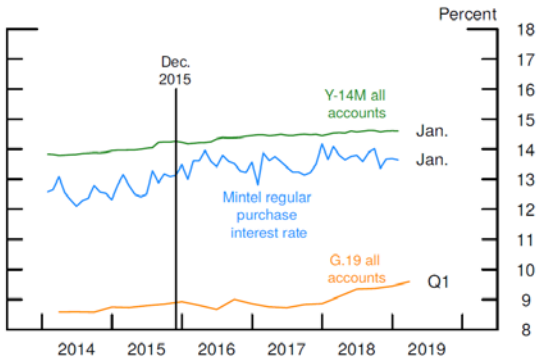
As shown in the table, the changes in spreads differ substantially by credit score, with spreads for prime accounts falling about 20 basis points, but spreads for near-prime and subprime accounts rising about 60 basis points and 85 basis points, respectively. As subprime and near-prime borrowers are more likely to revolve balances and less likely to have cards with rewards than prime borrowers, they are probably bearing the increase in rates more heavily.

Figure 1
Credit Card Interest Rates



Note: Y-14M does not include promotional rates.
Source: Mintel; Federal Reserve Board, Form FR Y-14M, Capital Assessments and Stress Testing; Federal Reserve Board, Statistical Release G.19 "Consumer Credit."

Figure 2
Credit Card Interest Rate Spreads on Prime Rate



Source: Mintel; Federal Reserve Board, Form FR Y-14M, Capital Assessments and Stress Testing; Federal Reserve Board, Statistical Release G.19 "Consumer Credit."

Changes in Prime Spread by Score, Nov. 2015 to Jan. 2019 (basis points)

	All Accounts	Revolving Accounts
Prime	-21	-15
Near Prime	60	45
Subprime	85	82

Source: Federal Reserve Board, Form FR Y-14M, Capital Assessments and Stress Testing.

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."

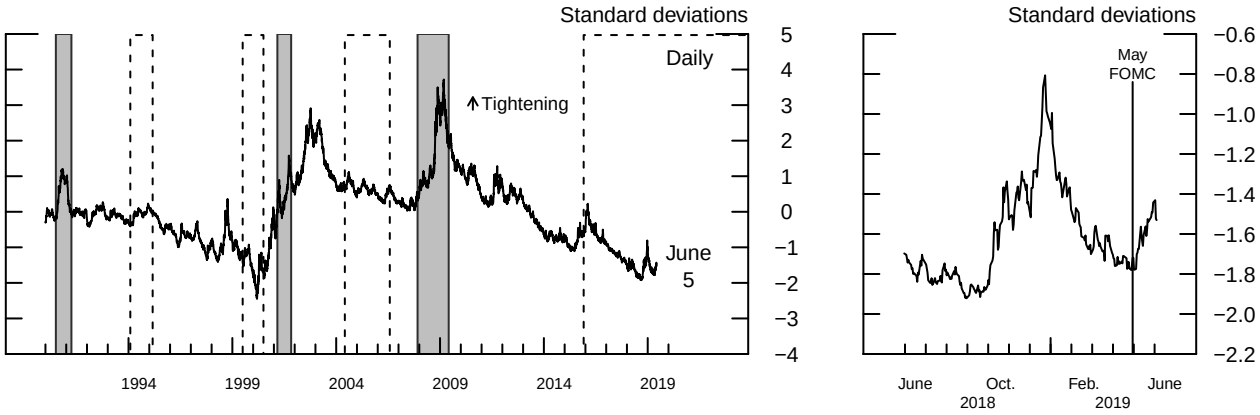
Overview of Selected FCIs

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.

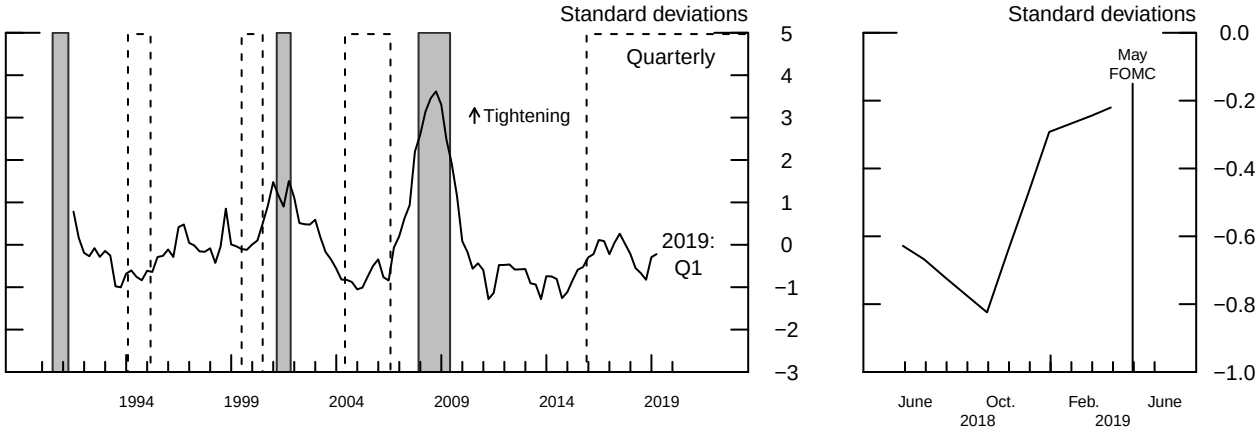
Selected Financial Conditions Indexes

Staff FCI for Nonfinancial Corporations



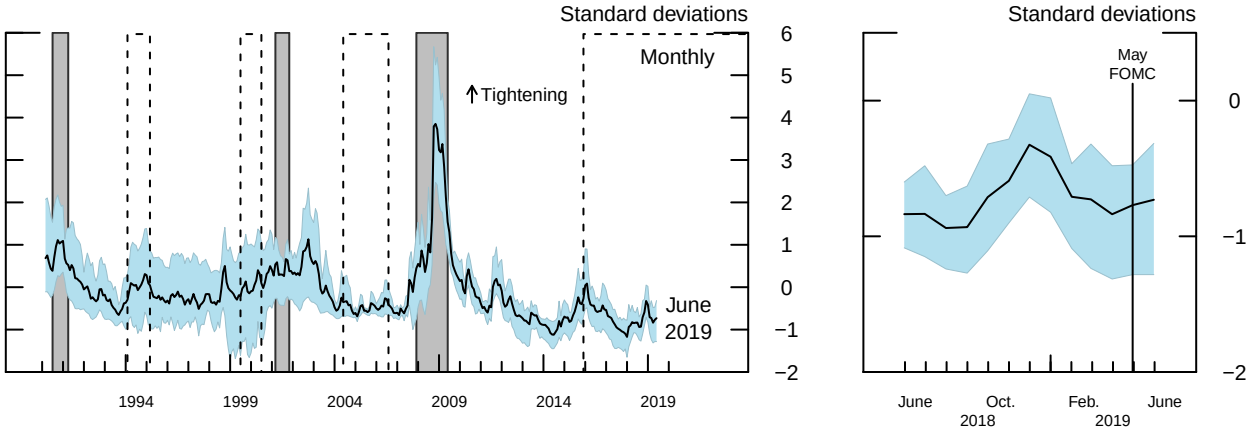
Note: The financial conditions index (FCI) is the deviation from the long−run relation between the systematic components of the cumulative log returns of 2 portfolios of firms with credit ratings above and just below investment grade. The systematic components are derived from the 5−factor Fama−French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

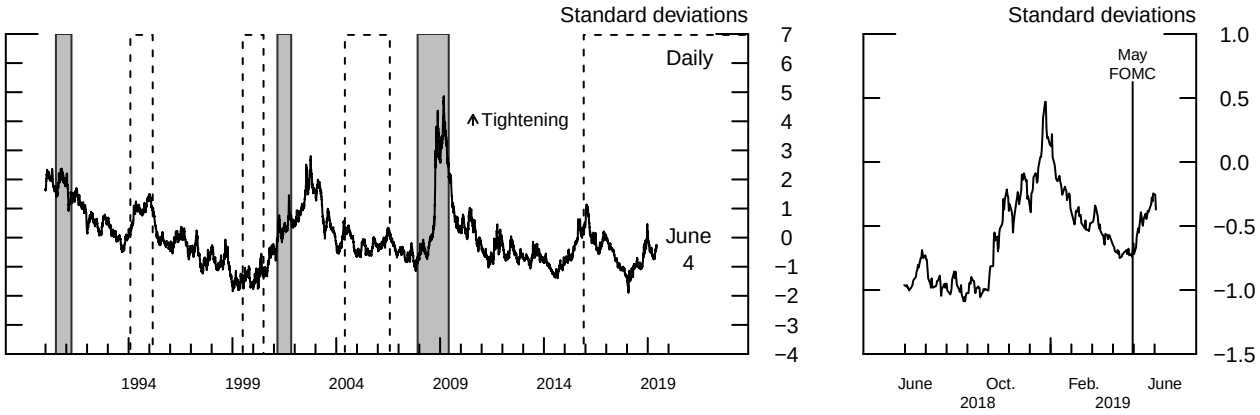


Note: Mean FCI represents the mean of FCIs developed by Goldman Sachs and the Federal Reserve Banks of Chicago, St. Louis, and Kansas City. The blue shaded region represents the range of these 4 standardized FCIs.
Source: Bloomberg; The Federal Reserve Banks of Chicago, St. Louis, and Kansas City.

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.

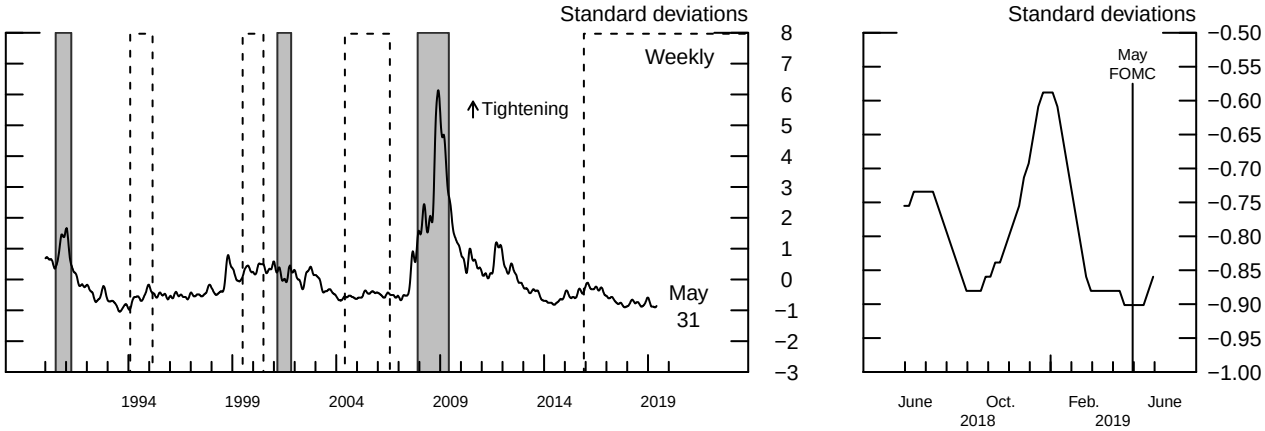
Selected Financial Conditions Indexes (continued)

Goldman Sachs FCI



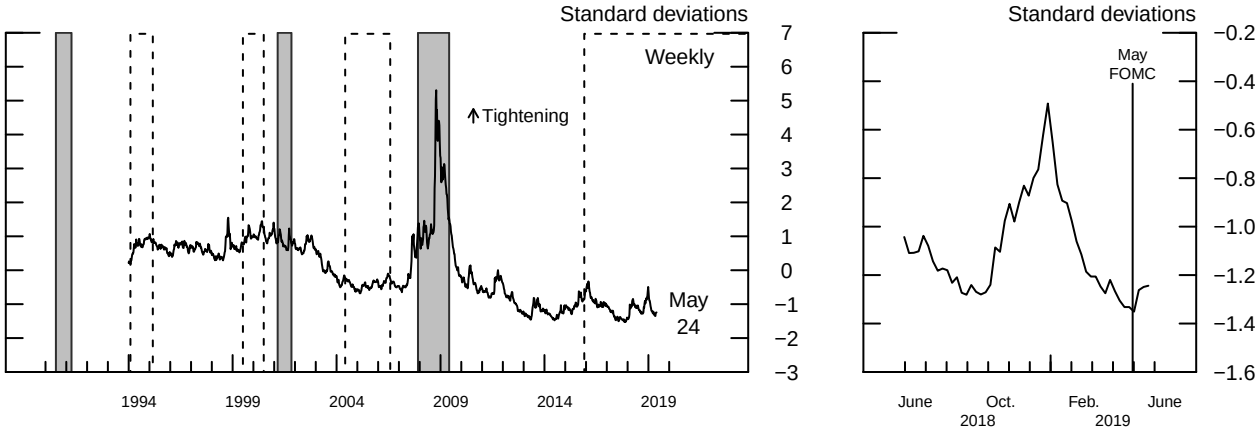
Note: The index is a weighted average of 5 financial variables: the federal funds rate, the 10−year Treasury yield, the triple−B yields spreads to Treasury, the S&P price−to−earnings ratio, the broad value of the U.S. dollar. Weights are pinned down by the contribution of each financial variable on real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

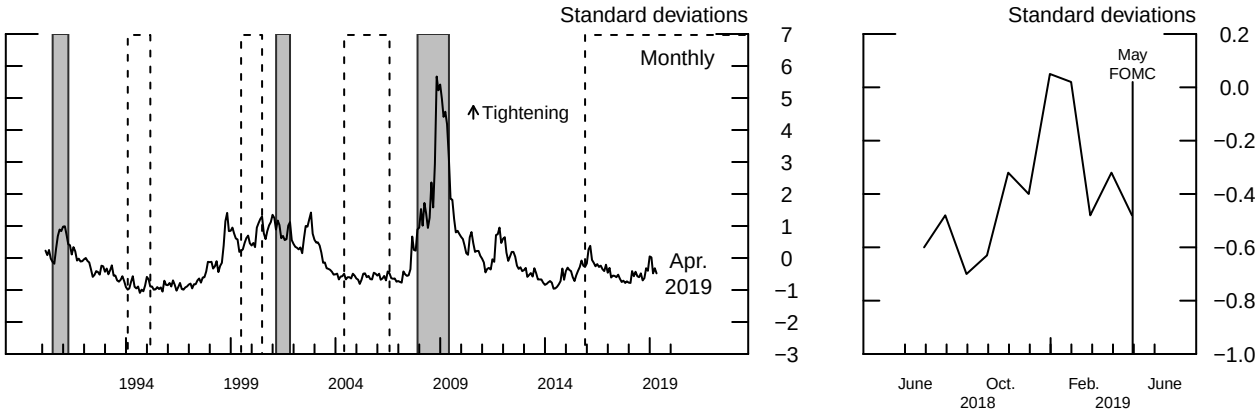


Note: The index is the principal component of 18 variables including short− and long−term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, breakeven inflation rate, and the S&P 500 index.
Source: Federal Reserve Bank of St. Louis.

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.

Financing Conditions

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.

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	.06	.04	.01	.04
Previous Tealbook	.13	.09	.00	.06
Between 1 3/4 and 2 1/4 percent				
Current Tealbook	.27	.24	.41	.24
Previous Tealbook	.25	.24	.23	.25
Less than 1 percent				
Current Tealbook	.11	.18	.02	.20
Previous Tealbook	.10	.15	.17	.16

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	.02	.03	.11	.04
Previous Tealbook	.03	.11	.22	.04
Decrease by 1 percentage point				
Current Tealbook	.08	.03	.02	.05
Previous Tealbook	.14	.02	.01	.06

Probability of Recession Over Next 4 Quarters

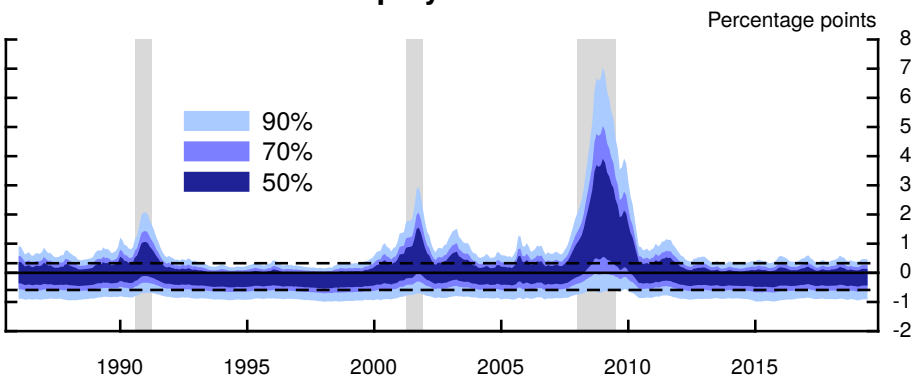
Probability of transitioning into or remaining in a recession	Staff	FRB/US	BMA	Term Spread	Unconditional
Current Tealbook	.08	.11	.51	.67	.23
Previous Tealbook	.08	.13	.16	.60	.23

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 "BMA" model uses model averaging techniques 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.

Risks & Uncertainty

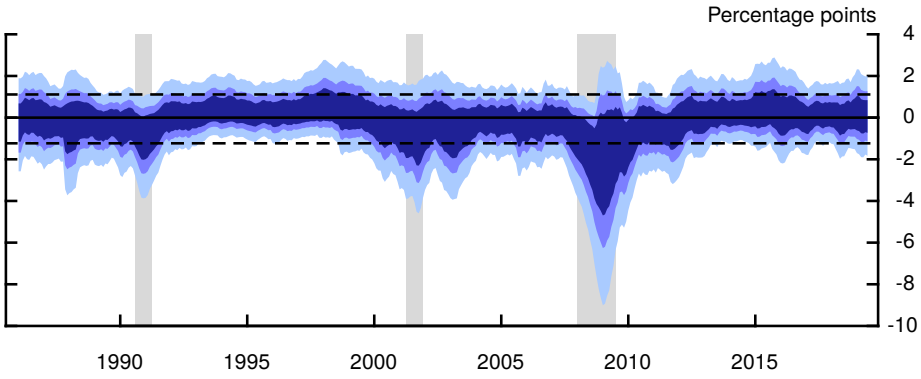
Time-Varying Macroeconomic Risk 1 Year Ahead

Unemployment Rate



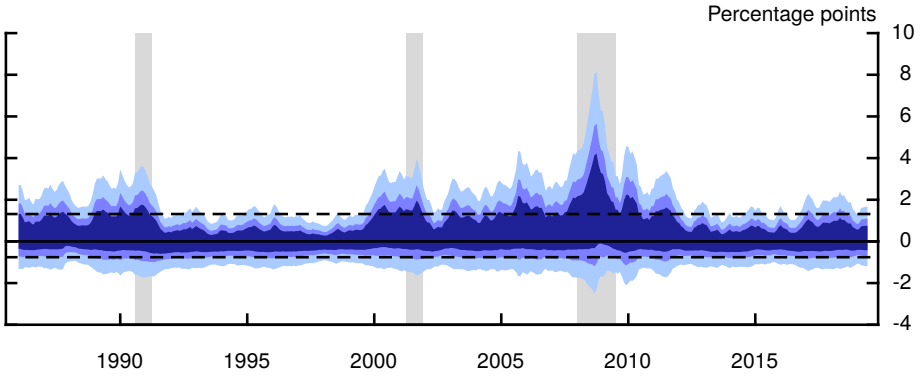
June 2019	
95th	.5
85th	.3
50th	- .1
15th	- .6
5th	- .9

GDP Growth



June 2019	
95th	2.0
85th	1.3
50th	0
15th	-1.1
5th	-1.8

CPI Inflation

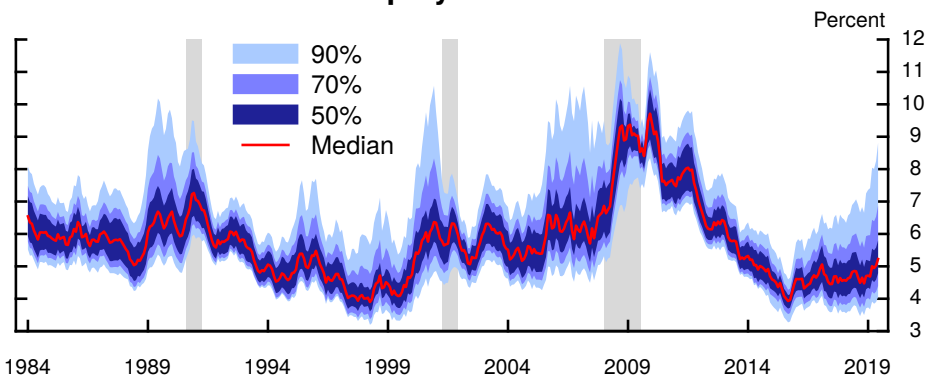


June 2019	
95th	1.7
85th	1.1
50th	.1
15th	- .7
5th	-1.2

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.

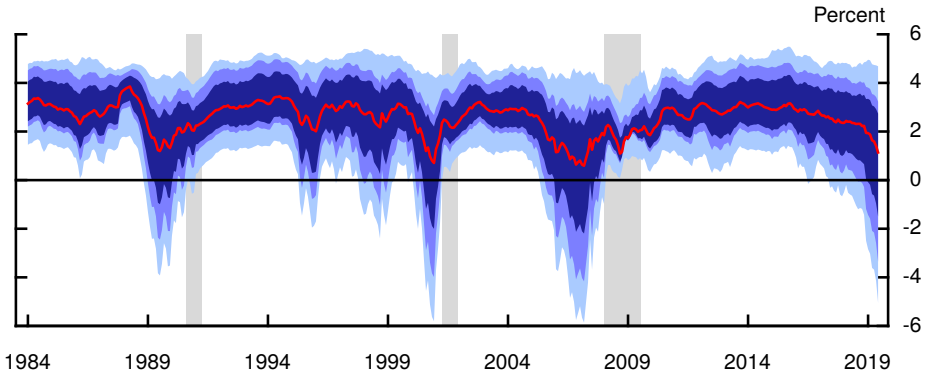
Conditional Distributions of Macroeconomic Variables 2 Years Ahead

Unemployment Rate



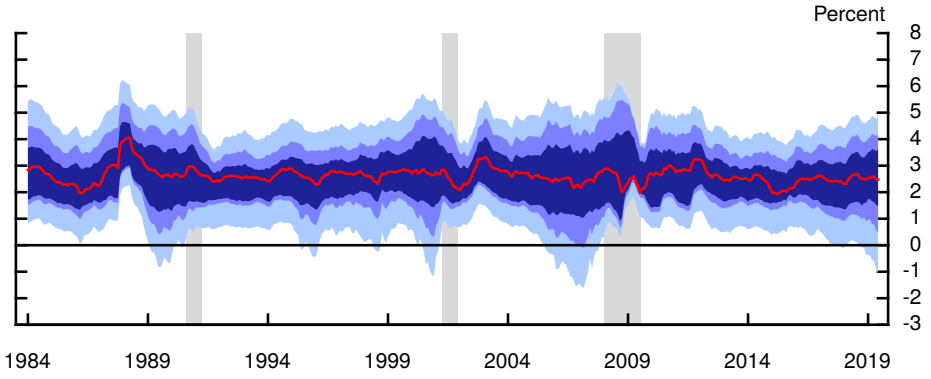
June 2019	
95th	8.8
85th	6.9
50th	5.2
15th	4.4
5th	4.1

GDP Growth



June 2019	
95th	4.7
85th	3.2
50th	1.1
15th	-3.4
5th	-5.1

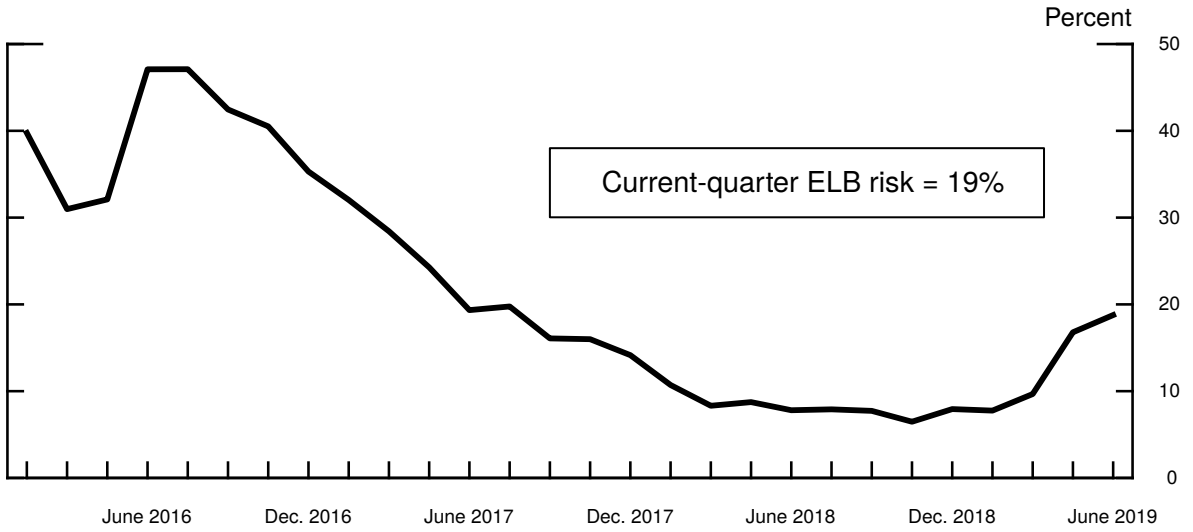
CPI Inflation



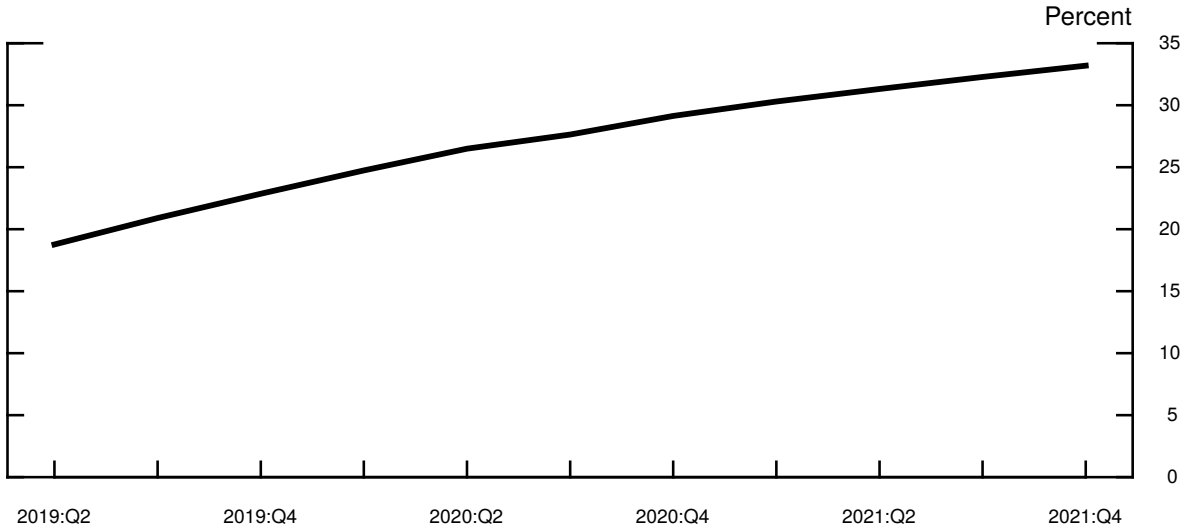
June 2019	
95th	4.8
85th	4.2
50th	2.5
15th	.4
5th	-1.1

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.

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	2.4	1.7	2.1	1.7	1.5	1.4
Increased uncertainty	2.4	.7	1.6	1.8	1.8	1.6
Lower inflation expectations	2.4	1.7	2.1	1.7	1.5	1.4
Stronger aggregate supply	2.4	2.4	3.1	2.9	2.7	2.5
Stronger aggregate demand	2.4	3.4	3.0	2.3	1.9	1.6
Escalation of trade tensions	2.4	.3	1.3	1.8	1.8	1.6
Favorable trade deals	2.4	2.1	2.4	1.7	1.4	1.3
Unemployment rate[1]						
Tealbook baseline and extension	3.6	3.7	3.7	3.7	3.8	4.0
Increased uncertainty	3.6	3.9	4.0	3.9	3.9	3.9
Lower inflation expectations	3.6	3.7	3.7	3.7	3.8	4.0
Stronger aggregate supply	3.6	3.6	3.4	3.1	2.9	2.6
Stronger aggregate demand	3.6	3.5	3.2	3.0	3.0	3.3
Escalation of trade tensions	3.6	3.8	4.1	4.1	4.1	4.1
Favorable trade deals	3.6	3.7	3.5	3.5	3.7	4.0
Total PCE prices						
Tealbook baseline and extension	1.4	1.6	1.9	1.9	1.9	2.0
Increased uncertainty	1.4	1.6	1.8	1.9	1.8	1.9
Lower inflation expectations	1.4	1.5	1.6	1.6	1.6	1.6
Stronger aggregate supply	1.4	1.6	1.8	1.7	1.7	1.8
Stronger aggregate demand	1.4	1.6	1.9	1.9	1.9	2.1
Escalation of trade tensions	1.4	3.0	1.6	1.8	1.9	2.1
Favorable trade deals	1.4	1.2	2.0	1.9	1.9	1.9
Core PCE prices						
Tealbook baseline and extension	1.5	2.1	1.9	1.9	1.9	2.0
Increased uncertainty	1.5	2.1	1.9	1.9	1.9	1.9
Lower inflation expectations	1.5	2.0	1.7	1.6	1.6	1.7
Stronger aggregate supply	1.5	2.1	1.8	1.7	1.7	1.8
Stronger aggregate demand	1.5	2.1	1.9	1.9	2.0	2.1
Escalation of trade tensions	1.5	3.5	1.6	1.8	2.0	2.1
Favorable trade deals	1.5	1.7	2.0	1.9	1.9	1.9
Federal funds rate[1]						
Tealbook baseline and extension	2.4	2.4	2.6	2.6	2.6	2.7
Increased uncertainty	2.4	2.3	2.1	2.1	2.2	2.7
Lower inflation expectations	2.4	2.4	2.4	2.4	2.3	2.3
Stronger aggregate supply	2.4	2.2	2.2	2.2	2.3	2.4
Stronger aggregate demand	2.4	2.4	2.7	2.9	3.0	3.2
Escalation of trade tensions	2.4	2.2	1.9	1.9	2.1	2.6
Favorable trade deals	2.4	2.4	2.7	2.8	2.7	2.6

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

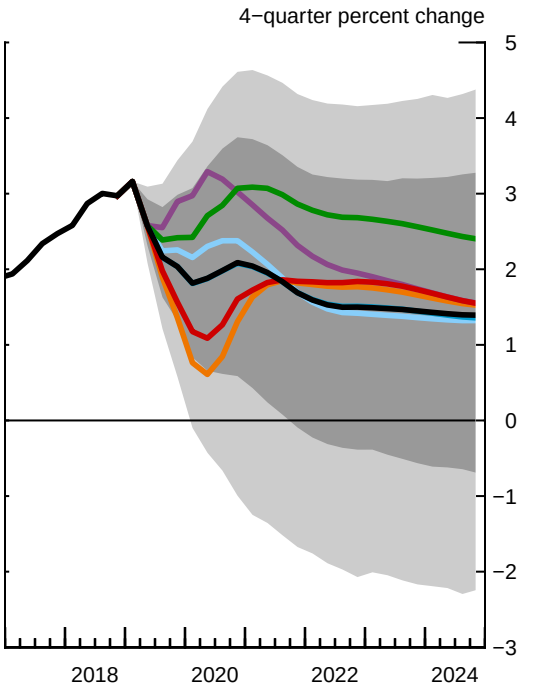
Risks & Uncertainty

Forecast Confidence Intervals and Alternative Scenarios

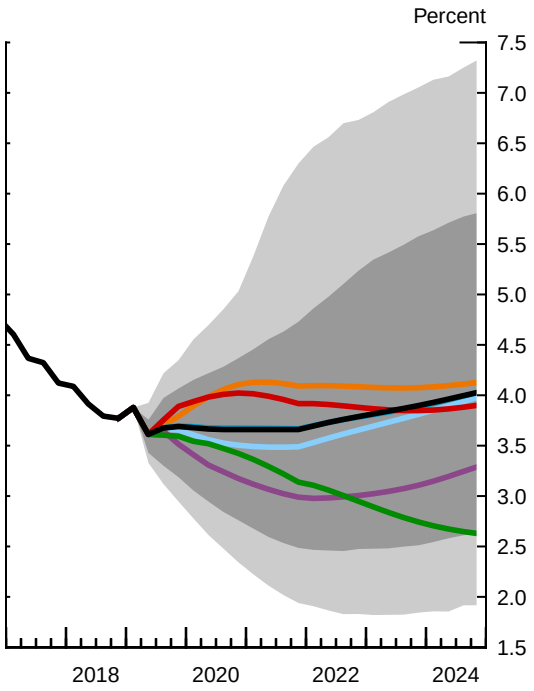
Confidence Intervals Based on FRB/US Stochastic Simulations*

Tealbook baseline and extension
Increased uncertainty
Lower inflation expectations
Stronger aggregate supply
Stronger aggregate demand
Escalation of trade tensions
Favorable trade deals

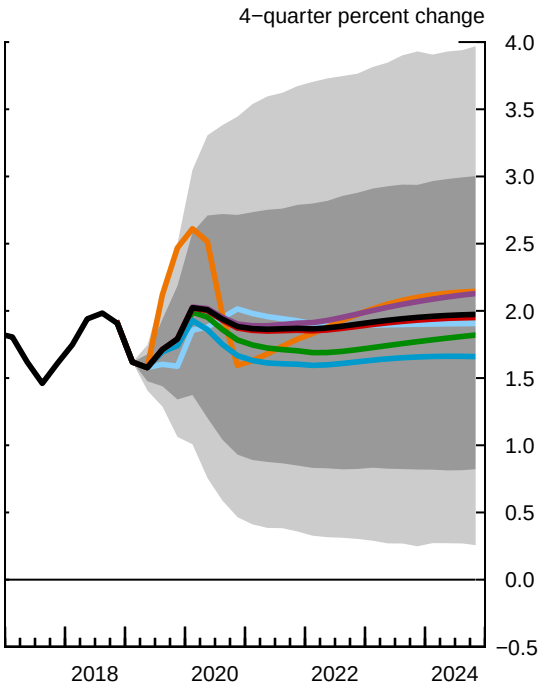
Real GDP



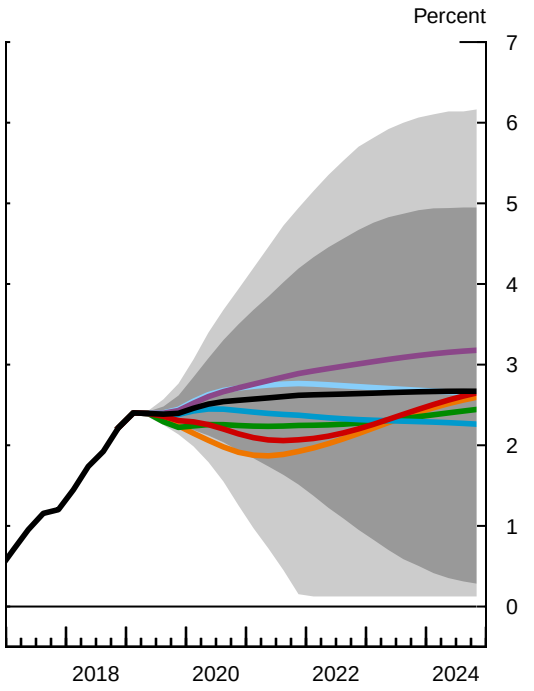
Unemployment Rate



PCE Prices excluding Food and Energy



Federal Funds Rate



* 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.

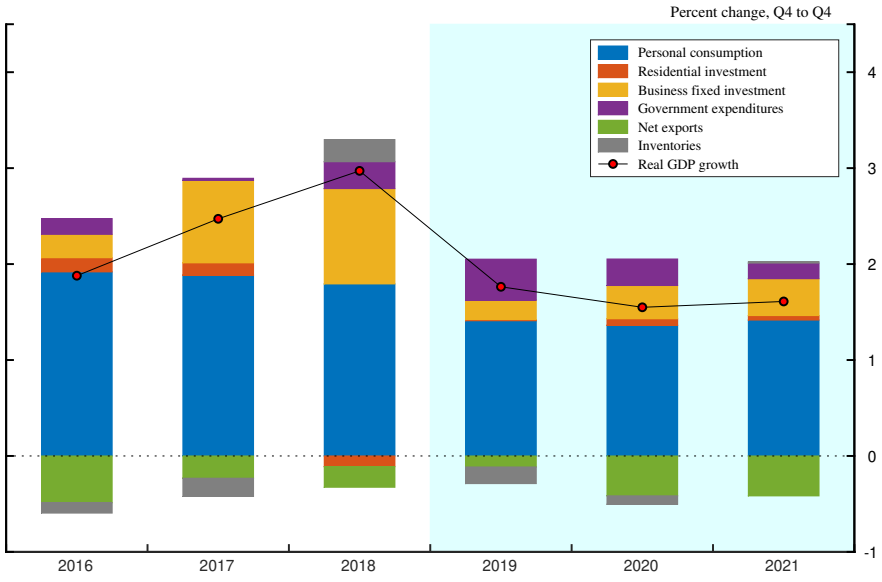
Alternative Model Forecasts

(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	2.2	2.0	2.2	2.1	1.7	1.7
FRB/US	1.5	1.8	1.7	1.5	1.5	1.6
EDO[1]	2.1	2.4	2.1	2.2	2.3	2.3
Unemployment rate[2]						
Staff	3.6	3.7	3.5	3.7	3.5	3.7
FRB/US	4.1	3.8	4.3	4.0	4.5	4.1
EDO[1]	4.2	4.0	4.5	4.3	4.8	4.5
Total PCE prices						
Staff	1.8	1.5	1.8	1.9	1.8	1.9
FRB/US	1.6	1.3	1.9	1.8	2.0	1.9
EDO[1]	1.5	1.6	2.1	1.9	2.2	2.0
Core PCE prices						
Staff	1.8	1.8	1.9	1.9	1.9	1.9
FRB/US	1.6	1.7	2.0	2.0	2.0	2.0
EDO[1]	1.6	1.6	2.1	1.9	2.2	2.0
Federal funds rate[2]						
Staff	2.4	2.4	2.6	2.6	2.7	2.6
FRB/US	2.2	2.3	2.3	2.4	2.5	2.5
EDO[1]	2.9	2.8	3.4	3.3	3.8	3.7

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.

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

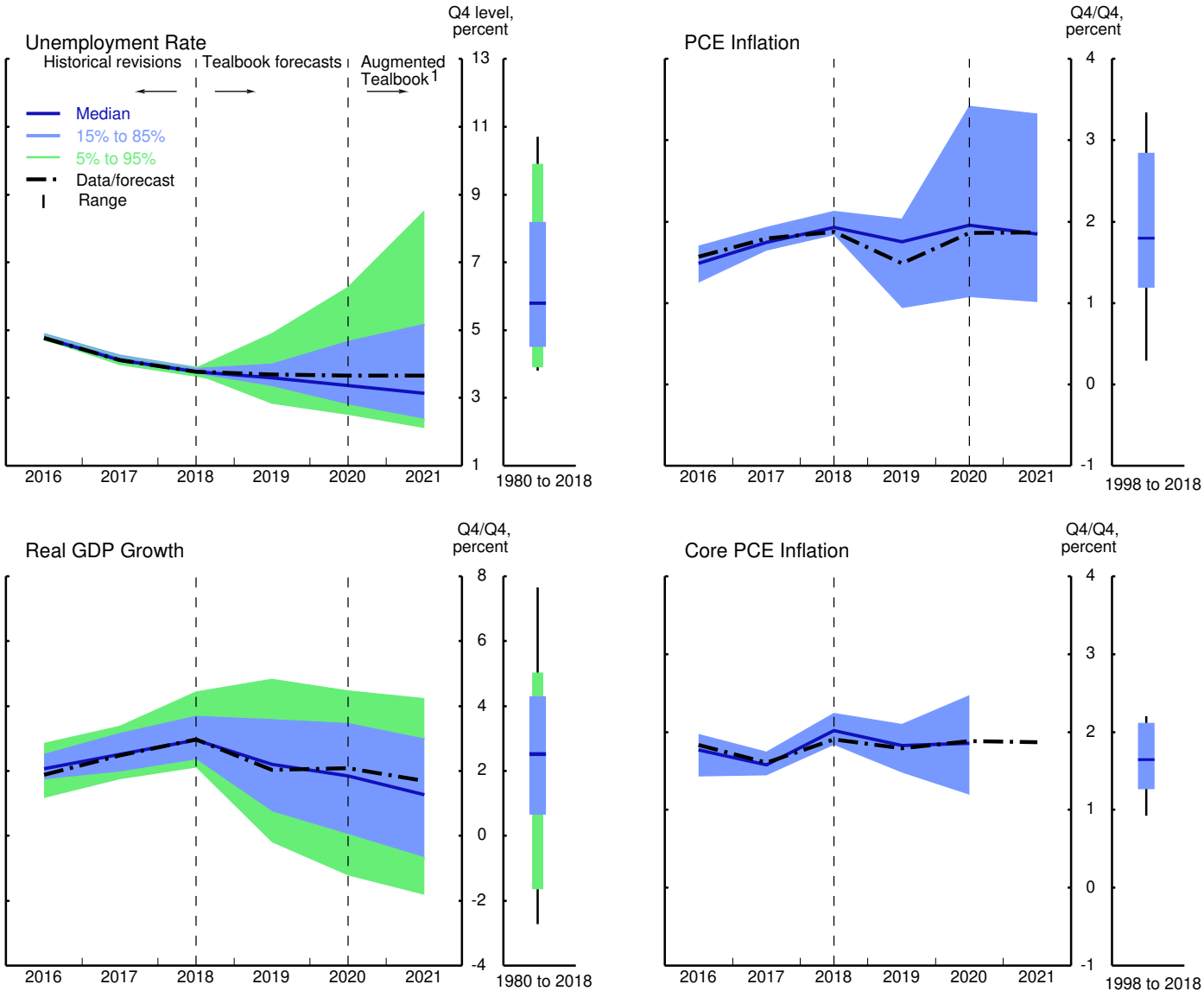
Measure	2019	2020	2021	2022	2023	2024
Real GDP						
(percent change, Q4 to Q4)						
Projection	2.0	2.1	1.7	1.5	1.4	1.4
Confidence interval						
Tealbook forecast errors	.7–3.6	.0–3.5	-.7–3.0	. . .	. . .	. . .
FRB/US stochastic simulations	1.3–3.0	.6–3.7	-.1–3.4	-.4–3.2	-.6–3.2	-.7–3.3
Civilian unemployment rate						
(percent, Q4)						
Projection	3.7	3.7	3.7	3.8	3.9	4.0
Confidence interval						
Tealbook forecast errors	3.3–4.0	2.8–4.7	2.3–5.2	. . .	. . .	. . .
FRB/US stochastic simulations	3.2–4.1	2.8–4.4	2.5–4.7	2.5–5.2	2.5–5.6	2.6–5.8
PCE prices, total						
(percent change, Q4 to Q4)						
Projection	1.5	1.9	1.9	1.9	1.9	2.0
Confidence interval						
Tealbook forecast errors	.9–2.0	1.1–3.4	1.0–3.3	. . .	. . .	. . .
FRB/US stochastic simulations	.9–2.0	.8–2.8	.8–2.9	.7–2.9	.7–3.0	.7–3.1
PCE prices excluding						
food and energy						
(percent change, Q4 to Q4)						
Projection	1.8	1.9	1.9	1.9	2.0	2.0
Confidence interval						
Tealbook forecast errors	1.5–2.1	1.2–2.5	. . .	. . .	. . .	. . .
FRB/US stochastic simulations	1.3–2.2	.9–2.7	.8–2.8	.8–2.9	.8–2.9	.8–3.0
Federal funds rate						
(percent, Q4)						
Projection	2.4	2.6	2.6	2.6	2.7	2.7
Confidence interval						
FRB/US stochastic simulations	2.2–2.6	1.9–3.5	1.5–4.2	1.0–4.7	.5–4.9	.3–4.9

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.

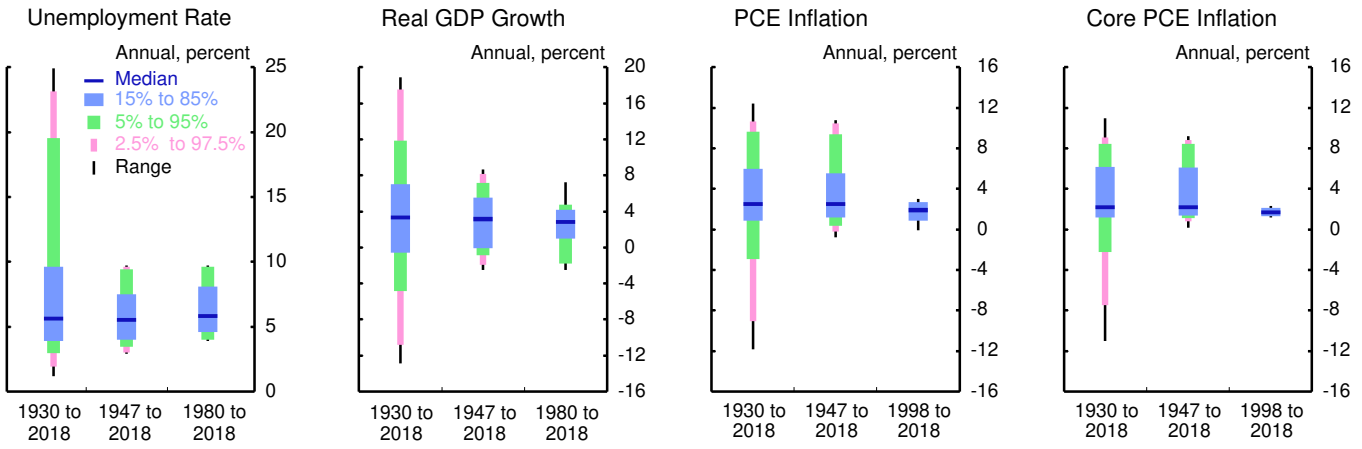
Prediction Intervals Derived from Historical Tealbook Forecast Errors

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.

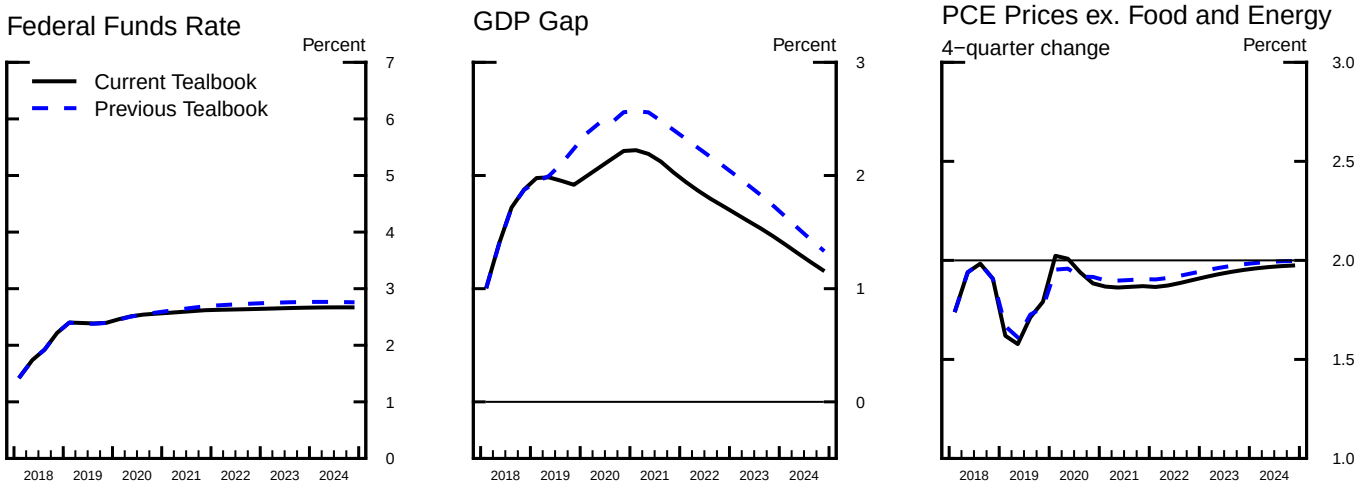
Policy Rules and the Staff Projection

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

(Percent)

	2019:Q3	2019:Q4
Inertial Taylor (1999) rule	**2.63**	**2.85**
Previous Tealbook projection	*2.66*	*2.91*
Taylor (1993) rule	**3.02**	**3.12**
Previous Tealbook projection	*3.12*	*3.24*
First−difference rule	**2.44**	**2.50**
Previous Tealbook projection	*2.60*	*2.74*
Flexible price−level targeting rule	**2.10**	**1.87**
Previous Tealbook projection	*2.11*	*1.87*
Addendum:		
Tealbook baseline	**2.39**	**2.40**

Key Elements of the Staff Projection



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

(Percent)

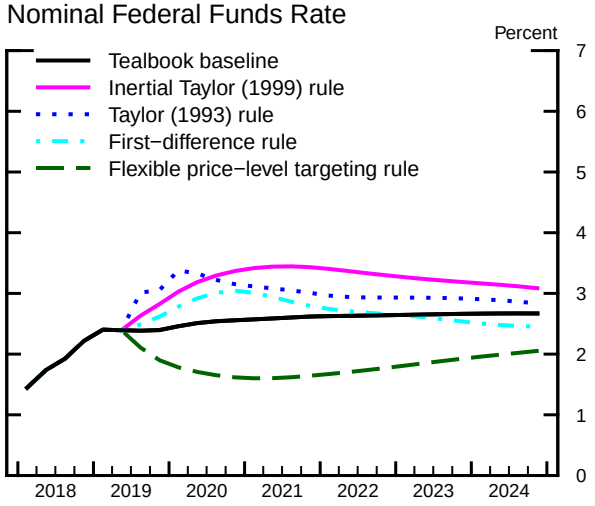
	Current Value	*Previous Tealbook*
Tealbook baseline		
FRB/US *r**	1.79	*2.02*
Average projected real federal funds rate	.68	*.70*
SEP−consistent baseline		
FRB/US *r**	.91	
Average projected real federal funds rate	.54	

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.

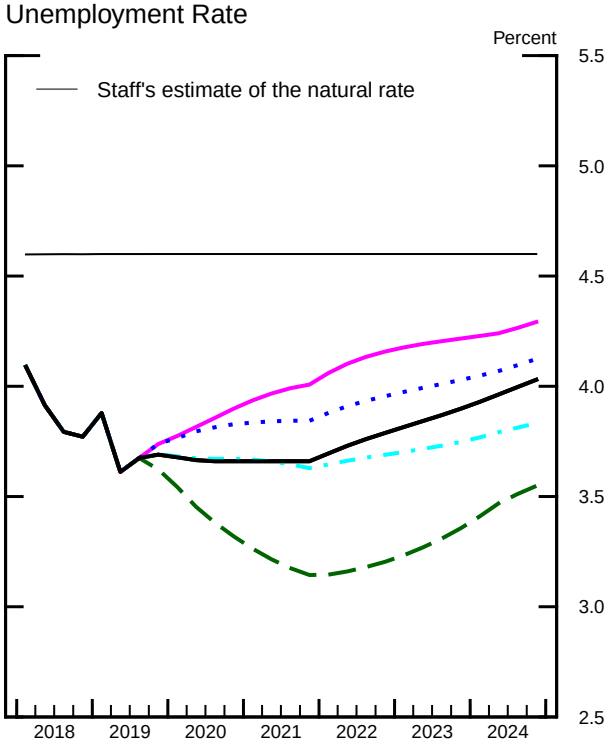
2. The "FRB/US *r**" is the level of the real federal funds rate that, if maintained over a 12−quarter period (beginning in the current quarter) in the FRB/US model, sets the output gap equal to zero in the final quarter of that period given either the Tealbook or SEP−consistent projection. The SEP−consistent baseline corresponds to the March 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**.

Simple Policy Rule Simulations

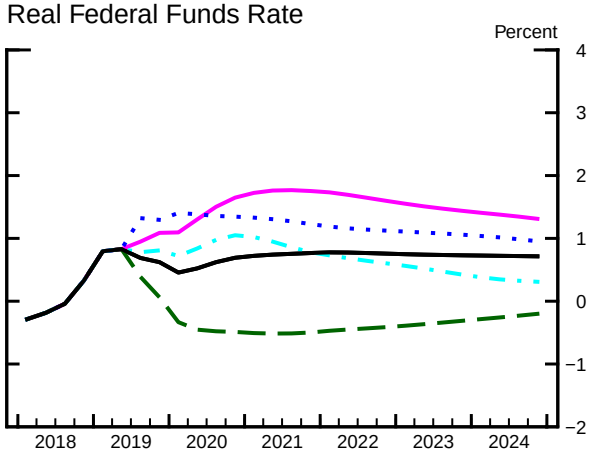
Nominal Federal Funds Rate



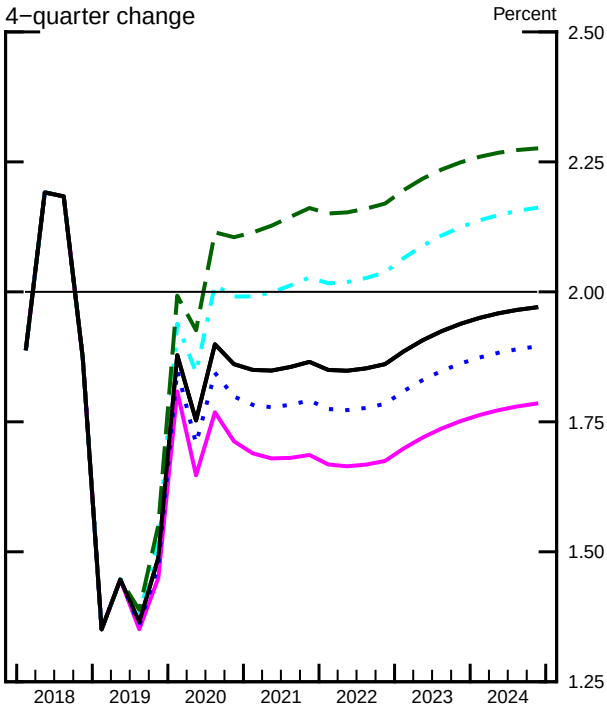
Unemployment Rate



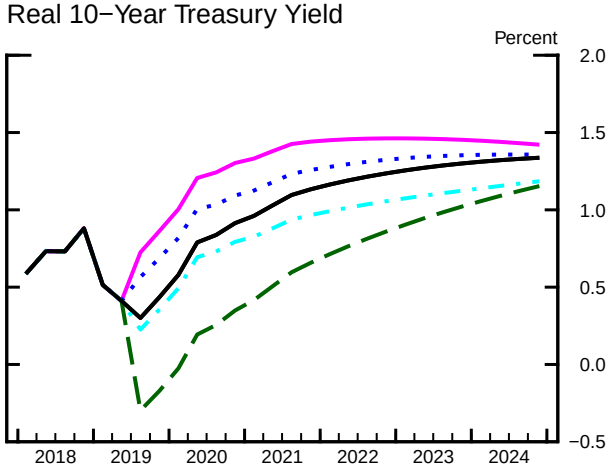
Real Federal Funds Rate



PCE Inflation
4−quarter change

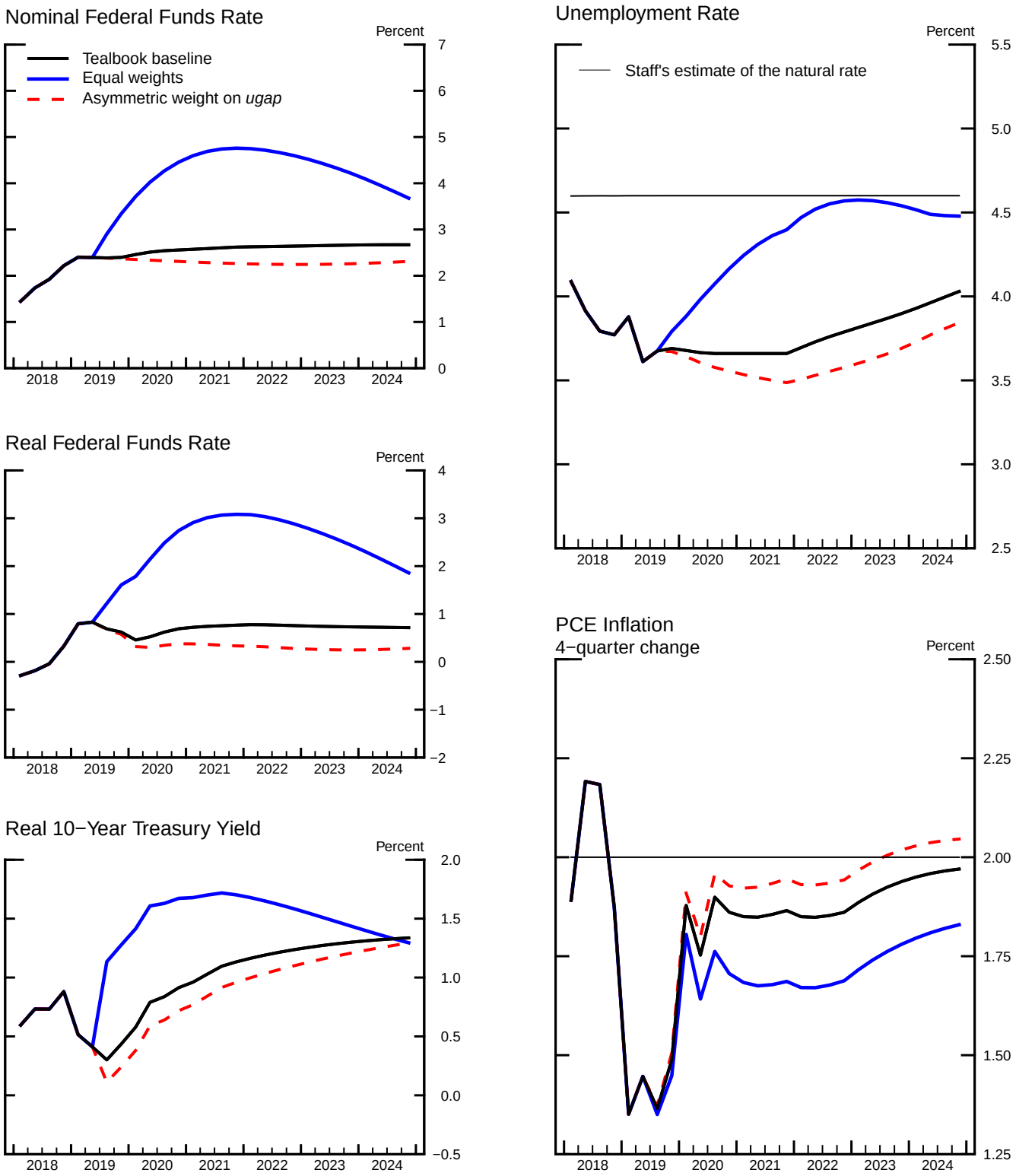


Real 10−Year Treasury Yield



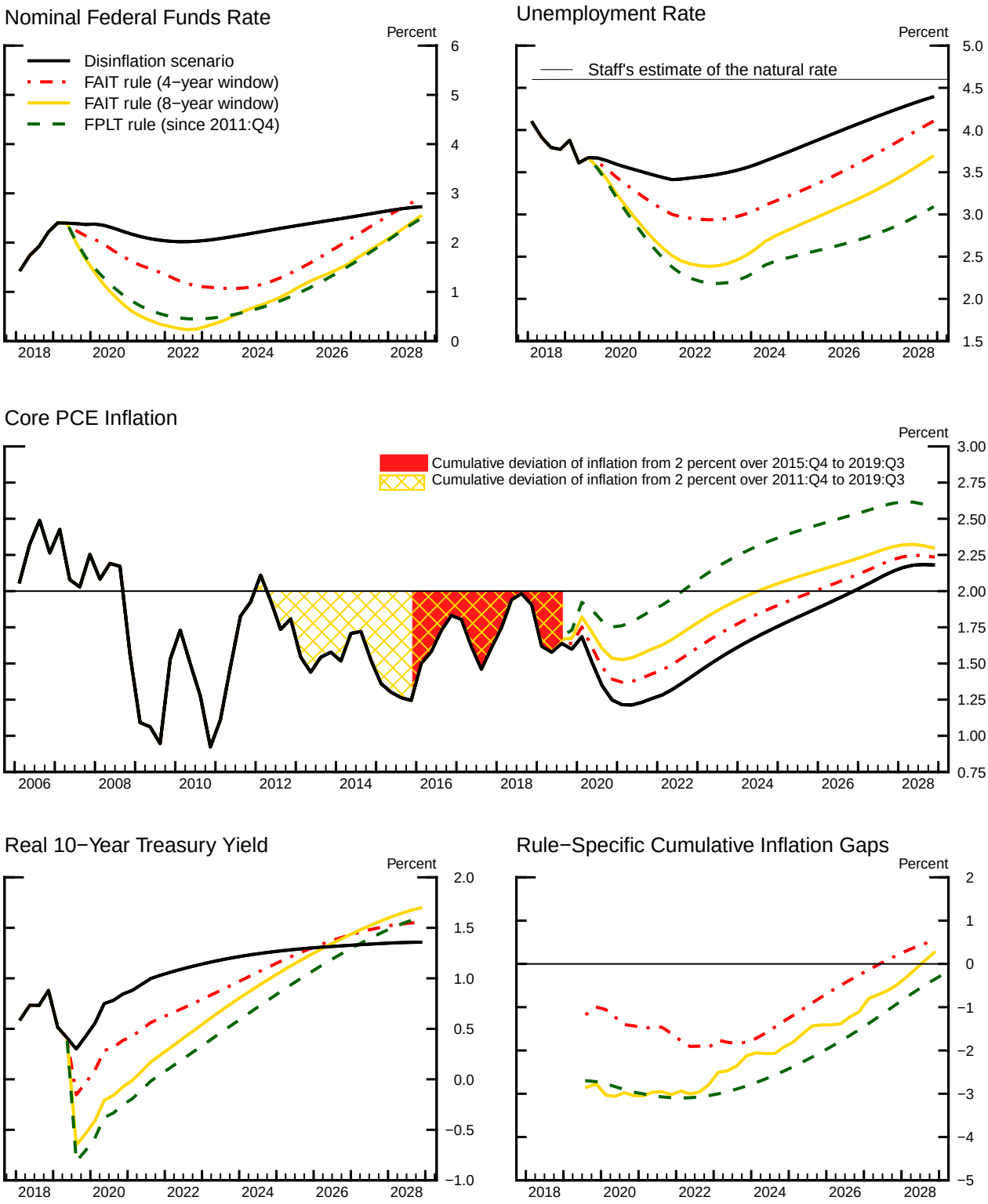
Note: The policy rule simulations in this exhibit are based on rules that respond to core inflation rather than to headline inflation. This choice of rule specification was made in light of a tendency for current and near−term core inflation rates to outperform headline inflation rates as predictors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

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.

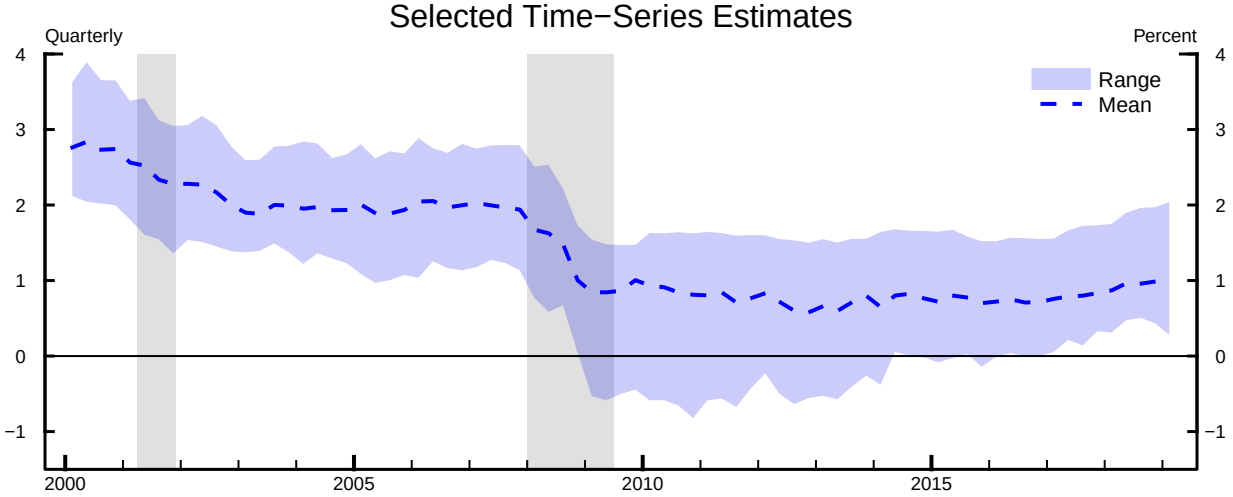
Makeup Strategies in a Disinflation Scenario



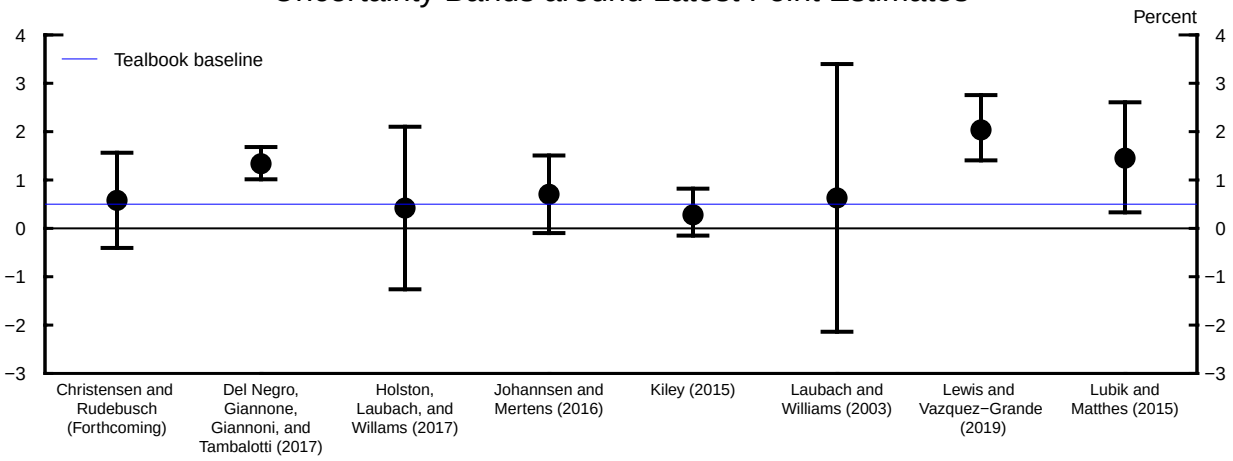
Note: All rules used herein, including the FPLT rule, respond to the output gap with a coefficient of 0.2, the same coefficient as the Tealbook baseline rule. Elsewhere in this section of Tealbook A, the FPLT rule responds to the unemployment gap with a coefficient of −1.

Estimates of the Equilibrium Real Federal Funds Rate in the Longer Run

Selected Time−Series Estimates



Uncertainty Bands around Latest Point Estimates



Longer−Run Values from Selected Forecasters

	Release Date	Percent
Tealbook baseline	June 2019	.50
Median SEP	Mar. 2019	.75
Median Survey of Primary Dealers	Apr. 2019	.75
Median Blue Chip (6−to−10−year)	Mar. 2019	.74
Congressional Budget Office (10−year)	Jan. 2019	1.13

The latest time−series estimates are for 2019:Q1. The shaded vertical areas in the top panel are NBER recessions. The middle panel reports 68 percent uncertainty bands around each point estimate for 2019:Q1. See the technical appendix for sources.

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)	2.8	3.4	3.4	3.3	3.2	3.1
Taylor (1993)	3.1	3.2	3.0	2.9	2.9	2.8
First-difference	2.6	3.0	2.8	2.7	2.5	2.5
Flexible price-level targeting	1.9	1.6	1.6	1.8	1.9	2.1
Extended Tealbook baseline	2.4	2.6	2.6	2.6	2.7	2.7
Real GDP						
Inertial Taylor (1999)	1.9	1.7	1.4	1.5	1.5	1.5
Taylor (1993)	1.9	1.8	1.6	1.5	1.5	1.4
First-difference	2.0	2.1	1.8	1.6	1.6	1.5
Flexible price-level targeting	2.2	2.7	2.1	1.6	1.4	1.3
Extended Tealbook baseline	2.0	2.1	1.7	1.5	1.4	1.4
Unemployment rate[1]						
Inertial Taylor (1999)	3.7	3.9	4.0	4.2	4.2	4.3
Taylor (1993)	3.7	3.8	3.8	4.0	4.0	4.1
First-difference	3.7	3.7	3.6	3.7	3.7	3.8
Flexible price-level targeting	3.6	3.3	3.1	3.2	3.4	3.5
Extended Tealbook baseline	3.7	3.7	3.7	3.8	3.9	4.0
Total PCE prices						
Inertial Taylor (1999)	1.4	1.7	1.7	1.7	1.8	1.8
Taylor (1993)	1.5	1.8	1.8	1.8	1.9	1.9
First-difference	1.5	2.0	2.0	2.0	2.1	2.2
Flexible price-level targeting	1.6	2.1	2.2	2.2	2.2	2.3
Extended Tealbook baseline	1.5	1.9	1.9	1.9	1.9	2.0
Core PCE prices						
Inertial Taylor (1999)	1.8	1.7	1.7	1.7	1.8	1.8
Taylor (1993)	1.8	1.8	1.8	1.8	1.9	1.9
First-difference	1.8	2.0	2.0	2.1	2.1	2.2
Flexible price-level targeting	1.9	2.1	2.2	2.2	2.3	2.3
Extended Tealbook baseline	1.8	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	2.6	2.8	3.0	3.2	3.3	3.4
Taylor (1993)	2.4	2.4	3.0	3.1	3.4	3.3	3.2	3.2
First-difference	2.4	2.4	2.5	2.6	2.8	2.9	3.0	3.0
Flexible price-level targeting	2.4	2.4	2.1	1.9	1.8	1.7	1.7	1.6
Extended Tealbook baseline	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.6
Real GDP								
Inertial Taylor (1999)	3.2	2.6	2.2	1.9	1.6	1.5	1.5	1.7
Taylor (1993)	3.2	2.6	2.2	1.9	1.7	1.6	1.7	1.8
First-difference	3.2	2.6	2.2	2.0	1.8	1.9	2.0	2.1
Flexible price-level targeting	3.2	2.6	2.2	2.2	2.1	2.4	2.6	2.7
Extended Tealbook baseline	3.2	2.6	2.2	2.0	1.8	1.9	2.0	2.1
Unemployment rate[1]								
Inertial Taylor (1999)	3.9	3.6	3.7	3.7	3.8	3.8	3.9	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	3.7	3.7
Flexible price-level targeting	3.9	3.6	3.7	3.6	3.5	3.5	3.4	3.3
Extended Tealbook baseline	3.9	3.6	3.7	3.7	3.7	3.7	3.7	3.7
Total PCE prices								
Inertial Taylor (1999)	1.4	1.4	1.4	1.4	1.8	1.6	1.8	1.7
Taylor (1993)	1.4	1.4	1.4	1.5	1.8	1.7	1.8	1.8
First-difference	1.4	1.4	1.4	1.5	1.9	1.8	2.0	2.0
Flexible price-level targeting	1.4	1.4	1.4	1.6	2.0	1.9	2.1	2.1
Extended Tealbook baseline	1.4	1.4	1.4	1.5	1.9	1.8	1.9	1.9
Core PCE prices								
Inertial Taylor (1999)	1.6	1.6	1.7	1.8	2.0	1.9	1.8	1.7
Taylor (1993)	1.6	1.6	1.7	1.8	2.0	2.0	1.9	1.8
First-difference	1.6	1.6	1.7	1.8	2.1	2.1	2.1	2.0
Flexible price-level targeting	1.6	1.6	1.7	1.9	2.1	2.2	2.2	2.1
Extended Tealbook baseline	1.6	1.6	1.7	1.8	2.0	2.0	1.9	1.9

1. Percent, average for the quarter.

Outcomes of Optimal Control Simulations under Commitment

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

Outcome and strategy	2019	2020	2021	2022	2023	2024
Nominal federal funds rate[1]						
Equal weights	3.3	4.5	4.8	4.6	4.2	3.7
Asymmetric weight on *ugap*	2.4	2.3	2.3	2.2	2.3	2.3
Extended Tealbook baseline	2.4	2.6	2.6	2.6	2.7	2.7
Real GDP						
Equal weights	1.8	1.2	1.2	1.4	1.7	1.7
Asymmetric weight on *ugap*	2.1	2.3	1.8	1.6	1.4	1.4
Extended Tealbook baseline	2.0	2.1	1.7	1.5	1.4	1.4
Unemployment rate[1]						
Equal weights	3.8	4.2	4.4	4.6	4.5	4.5
Asymmetric weight on *ugap*	3.7	3.6	3.5	3.6	3.7	3.8
Extended Tealbook baseline	3.7	3.7	3.7	3.8	3.9	4.0
Total PCE prices						
Equal weights	1.4	1.7	1.7	1.7	1.8	1.8
Asymmetric weight on *ugap*	1.5	1.9	1.9	1.9	2.0	2.0
Extended Tealbook baseline	1.5	1.9	1.9	1.9	1.9	2.0
Core PCE prices						
Equal weights	1.7	1.7	1.7	1.7	1.8	1.8
Asymmetric weight on *ugap*	1.8	2.0	1.9	2.0	2.0	2.0
Extended Tealbook baseline	1.8	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	3.3	3.7	4.0	4.3	4.5
Asymmetric weight on *ugap*	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3
Extended Tealbook baseline	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.6
Real GDP								
Equal weights	3.2	2.6	2.2	1.8	1.4	1.2	1.1	1.2
Asymmetric weight on *ugap*	3.2	2.6	2.2	2.1	1.9	2.0	2.2	2.3
Extended Tealbook baseline	3.2	2.6	2.2	2.0	1.8	1.9	2.0	2.1
Unemployment rate[1]								
Equal weights	3.9	3.6	3.7	3.8	3.9	4.0	4.1	4.2
Asymmetric weight on *ugap*	3.9	3.6	3.7	3.7	3.6	3.6	3.6	3.6
Extended Tealbook baseline	3.9	3.6	3.7	3.7	3.7	3.7	3.7	3.7
Total PCE prices								
Equal weights	1.4	1.4	1.4	1.4	1.8	1.6	1.8	1.7
Asymmetric weight on *ugap*	1.4	1.4	1.4	1.5	1.9	1.8	2.0	1.9
Extended Tealbook baseline	1.4	1.4	1.4	1.5	1.9	1.8	1.9	1.9
Core PCE prices								
Equal weights	1.6	1.6	1.7	1.7	1.9	1.9	1.8	1.7
Asymmetric weight on *ugap*	1.6	1.6	1.7	1.8	2.1	2.1	2.0	2.0
Extended Tealbook baseline	1.6	1.6	1.7	1.8	2.0	2.0	1.9	1.9

1. Percent, average for the quarter.

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

	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate[1]	
Interval	04/19/19	06/07/19	04/19/19	06/07/19	04/19/19	06/07/19	04/19/19	06/07/19	04/19/19	06/07/19
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	3.2	3.5	2.1	3.0	.5	.4	1.2	1.0	3.9	3.9
Q2	4.0	3.7	2.0	1.8	2.7	2.4	1.9	1.9	3.7	3.6
Q3	4.2	3.6	2.2	1.7	1.9	1.2	2.0	2.1	3.7	3.7
Q4	4.3	3.8	2.3	1.7	1.8	2.0	1.9	2.1	3.6	3.7
2020:Q1	4.4	4.1	2.4	2.1	1.9	1.9	2.0	2.0	3.6	3.7
Q2	4.4	4.3	2.2	2.1	1.8	1.9	1.9	1.9	3.6	3.7
Q3	3.9	4.2	1.9	2.1	1.8	1.8	1.9	1.8	3.6	3.7
Q4	4.2	4.1	2.2	2.1	1.8	1.8	1.9	1.8	3.5	3.7
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	3.6	2.0	2.4	1.6	1.4	1.6	1.5	-.1	-.2
Q4	4.2	3.7	2.3	1.7	1.9	1.6	2.0	2.1	-.1	.1
2020:Q2	4.4	4.2	2.3	2.1	1.9	1.9	1.9	1.9	.0	.0
Q4	4.0	4.1	2.1	2.1	1.8	1.8	1.9	1.8	-.1	.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	3.9	3.6	2.2	2.0	1.8	1.5	1.8	1.8	-.2	-.1
2020:Q4	4.2	4.1	2.2	2.1	1.8	1.9	1.9	1.9	-.1	.0
2021:Q4	3.8	3.7	1.7	1.7	1.8	1.9	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	4.2	4.1	2.4	2.5	1.6	1.4	1.7	1.7	3.7	3.7
2020	4.3	4.0	2.2	1.9	1.9	1.8	1.9	2.0	3.6	3.7
2021	3.9	3.9	1.9	1.9	1.8	1.9	1.9	1.9	3.5	3.7

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	3.0	1.8	1.7	1.7	2.1	2.1	2.1	2.1	3.0	2.0	2.1	1.7
Previous Tealbook	4.2	3.4	2.2	2.1	2.0	2.2	2.3	2.4	2.2	1.9	2.2	3.0	2.2	2.2	1.7
Final sales	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
Previous Tealbook	5.4	1.0	2.1	1.9	1.7	3.3	2.9	2.0	2.3	2.0	2.4	2.6	2.4	2.2	1.8
Priv. dom. final purch.	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
Previous Tealbook	4.3	3.0	2.6	1.0	2.3	3.3	2.9	2.4	2.4	2.4	2.4	3.0	2.3	2.4	1.9
Personal cons. expend.	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
Previous Tealbook	3.8	3.5	2.5	1.1	2.6	2.7	2.7	2.6	2.5	2.5	2.4	2.6	2.3	2.5	2.2
Durables	8.6	3.7	3.6	-4.6	9.2	2.0	2.0	1.9	1.9	1.9	1.8	3.4	2.0	1.9	1.6
Nondurables	4.0	4.6	2.1	2.0	4.0	2.8	2.6	2.5	2.5	2.5	2.5	2.7	2.8	2.5	2.3
Services	3.0	3.2	2.4	1.5	1.8	2.2	2.6	2.5	2.5	2.5	2.5	2.4	2.0	2.5	2.3
Residential investment	-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
Previous Tealbook	-1.3	-3.6	-4.7	-.3	-2.6	6.6	6.9	6.2	4.5	.7	-.8	-3.3	2.5	2.6	-2.7
Nonres. priv. fixed invest.	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
Previous Tealbook	8.7	2.5	5.4	.6	2.2	5.4	2.7	.5	1.6	2.4	3.4	7.0	2.7	2.0	1.5
Equipment & intangibles	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
Previous Tealbook	7.1	4.4	8.3	.1	2.3	6.7	3.0	1.1	2.1	3.3	4.6	7.6	3.0	2.8	2.4
Nonres. structures	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
Previous Tealbook	14.5	-3.4	-3.9	2.3	1.8	1.1	1.9	-1.4	-.3	-.6	-.7	4.9	1.8	-.7	-1.5
Net exports[2]	-841	-950	-956	-904	-930	-945	-932	-917	-930	-952	-952	-912	-928	-938	-965
Previous Tealbook[2]	-841	-950	-956	-922	-963	-955	-948	-969	-982	-1002	-996	-912	-947	-987	-1000
Exports	9.3	-4.9	1.8	4.8	-2.1	.6	2.8	4.0	1.9	2.3	2.7	2.3	1.5	2.8	3.1
Imports	-.6	9.3	2.0	-2.5	1.4	2.2	.6	1.2	3.0	4.2	2.0	3.4	.4	2.6	3.0
Gov't. cons. & invest.	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
Previous Tealbook	2.5	2.6	-.4	2.6	2.9	1.6	1.6	1.7	2.5	1.2	.9	1.5	2.2	1.6	1.0
Federal	3.7	3.5	1.1	-.1	9.2	3.1	2.9	2.9	5.3	1.1	.8	2.7	3.7	2.5	.8
Defense	6.0	4.9	6.3	4.0	4.0	2.7	2.4	2.7	3.0	3.0	1.2	5.0	3.3	2.5	.6
Nondefense	.5	1.6	-6.1	-5.9	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	1.6	-.1	.4	.9	.9	.9	1.0	.8	1.6	.9	1.0
Change in priv. inventories[2]	-37	90	97	126	107	104	66	38	29	46	41	45	101	38	45
Previous Tealbook[2]	-37	90	97	107	124	69	40	61	56	51	45	45	85	53	41

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	2.0	2.1	1.7
Previous Tealbook	1.5	2.6	2.7	2.0	1.9	2.5	3.0	2.2	2.2	1.7
Final sales	1.9	2.0	3.0	1.9	2.1	2.6	2.6	2.2	2.2	1.7
Previous Tealbook	1.9	2.0	3.0	1.9	2.1	2.6	2.6	2.4	2.2	1.8
Priv. dom. final purch.	2.6	2.6	4.3	2.7	2.7	3.3	3.0	1.9	2.3	1.9
Previous Tealbook	2.6	2.6	4.3	2.7	2.7	3.3	3.0	2.3	2.4	1.9
Personal cons. expend.	1.6	1.9	3.8	3.0	2.8	2.7	2.6	2.2	2.4	2.2
Previous Tealbook	1.6	1.9	3.8	3.0	2.8	2.7	2.6	2.3	2.5	2.2
Durables	6.3	5.0	9.2	6.0	6.8	7.7	3.4	2.0	1.9	1.6
Nondurables	.7	2.8	3.0	3.0	2.0	3.0	2.7	2.8	2.5	2.3
Services	1.2	1.1	3.2	2.6	2.4	1.8	2.4	2.0	2.5	2.3
Residential investment	15.4	7.1	7.8	8.9	4.5	3.8	-3.3	1.7	2.5	-3.4
Previous Tealbook	15.4	7.1	7.8	8.9	4.5	3.8	-3.3	2.5	2.6	-2.7
Nonres. priv. fixed invest.	5.6	5.4	6.4	-.7	1.8	6.3	7.0	.6	1.8	1.5
Previous Tealbook	5.6	5.4	6.4	-.7	1.8	6.3	7.0	2.7	2.0	1.5
Equipment & intangibles	6.1	5.1	5.6	2.6	1.6	7.3	7.6	1.0	2.8	2.3
Previous Tealbook	6.1	5.1	5.6	2.6	1.6	7.3	7.6	3.0	2.8	2.4
Nonres. structures	4.0	6.7	8.8	-10.7	2.5	2.9	4.9	-.6	-1.8	-1.3
Previous Tealbook	4.0	6.7	8.8	-10.7	2.5	2.9	4.9	1.8	-.7	-1.5
Net exports[1]	-569	-533	-578	-725	-786	-859	-912	-928	-938	-965
Previous Tealbook[1]	-569	-533	-578	-725	-786	-859	-912	-947	-987	-1000
Exports	2.1	6.0	3.0	-1.6	.8	4.7	2.3	1.5	2.8	3.1
Imports	.6	3.0	6.7	3.4	3.1	5.4	3.4	.4	2.6	3.0
Gov't. cons. & invest.	-2.1	-2.4	.2	2.2	.9	.1	1.5	2.4	1.5	.9
Previous Tealbook	-2.1	-2.4	.2	2.2	.9	.1	1.5	2.2	1.6	1.0
Federal	-2.6	-6.1	-1.2	1.2	.2	1.3	2.7	3.7	2.5	.8
Defense	-4.7	-6.5	-3.6	-.2	-.7	1.3	5.0	3.3	2.5	.6
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	1.6	.9	1.0
Change in priv. inventories[1]	71	109	87	129	23	23	45	101	38	45
Previous Tealbook[1]	71	109	87	129	23	23	45	85	53	41

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	3.0	1.8	1.7	1.7	2.1	2.1	2.1	2.1	3.0	2.0	2.1	1.7
Previous Tealbook	4.2	3.4	2.2	2.1	2.0	2.2	2.3	2.4	2.2	1.9	2.2	3.0	2.2	2.2	1.7
Final sales	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
Previous Tealbook	5.3	1.0	2.1	1.9	1.7	3.3	2.9	2.0	2.3	2.0	2.4	2.6	2.4	2.2	1.8
Priv. dom. final purch.	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
Previous Tealbook	3.7	2.6	2.2	.8	1.9	2.8	2.5	2.1	2.1	2.1	2.1	2.5	2.0	2.1	1.6
Personal cons. expend.	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
Previous Tealbook	2.6	2.4	1.7	.8	1.7	1.8	1.8	1.7	1.7	1.7	1.7	1.8	1.5	1.7	1.5
Durables	.6	.3	.3	-.3	.6	.1	.1	.1	.1	.1	.1	.2	.1	.1	.1
Nondurables	.6	.6	.3	.3	.6	.4	.4	.3	.3	.3	.3	.4	.4	.3	.3
Services	1.4	1.5	1.1	.7	.9	1.0	1.2	1.2	1.2	1.2	1.2	1.1	1.0	1.2	1.1
Residential investment	-.1	-.1	-.2	-.1	.0	.2	.3	.3	.2	.0	-.1	-.1	.1	.1	-.1
Previous Tealbook	-.1	-.1	-.2	.0	-.1	.2	.3	.2	.2	.0	.0	-.1	.1	.1	-.1
Nonres. priv. fixed invest.	1.2	.4	.7	.4	-.1	.1	-.1	.1	.2	.3	.4	.9	.1	.2	.2
Previous Tealbook	1.2	.4	.7	.1	.3	.7	.4	.1	.2	.3	.5	.9	.4	.3	.2
Equipment & intangibles	.7	.5	.9	.3	.1	.0	.0	.2	.2	.3	.4	.8	.1	.3	.2
Previous Tealbook	.7	.5	.9	.0	.2	.7	.3	.1	.2	.3	.5	.8	.3	.3	.2
Nonres. structures	.4	-.1	-.1	.1	-.2	.1	-.1	-.1	.0	.0	.0	.1	.0	-.1	.0
Previous Tealbook	.4	-.1	-.1	.1	.1	.0	.1	.0	.0	.0	.0	.1	.1	.0	.0
Net exports	1.2	-2.0	-.1	1.0	-.5	-.2	.2	.3	-.2	-.3	.0	-.2	.1	-.1	-.1
Previous Tealbook	1.2	-2.0	-.1	.6	-.7	.2	.2	-.4	-.2	-.3	.1	-.2	.1	-.2	.0
Exports	1.1	-.6	.2	.6	-.3	.1	.3	.5	.2	.3	.3	.3	.2	.3	.4
Imports	.1	-1.4	-.3	.4	-.2	-.3	-.1	-.2	-.4	-.6	-.3	-.5	-.1	-.4	-.4
Gov't. cons. & invest.	.4	.4	-.1	.5	.7	.2	.2	.3	.4	.2	.2	.3	.4	.3	.2
Previous Tealbook	.4	.4	-.1	.4	.5	.3	.3	.3	.4	.2	.2	.3	.4	.3	.2
Federal	.2	.2	.1	.0	.6	.2	.2	.2	.3	.1	.1	.2	.2	.2	.1
Defense	.2	.2	.2	.2	.2	.1	.1	.1	.1	.1	.0	.2	.1	.1	.0
Nondefense	.0	.0	-.2	-.2	.4	.1	.1	.1	.2	.0	.0	.0	.1	.1	.0
State & local	.2	.2	-.1	.5	.2	.0	.0	.1	.1	.1	.1	.1	.2	.1	.1
Change in priv. inventories	-1.2	2.3	.1	.6	-.4	-.1	-.7	-.5	-.2	.3	-.1	.4	-.1	-.1	.0
Previous Tealbook	-1.2	2.3	.1	.2	.3	-1.0	-.6	.4	-.1	-.1	-.1	.4	-.3	.0	.0

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

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

Item	2018			2019				2020				2018[1]	2019[1]	2020[1]	2021[1]
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
GDP chain-wt. price index	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
Previous Tealbook	3.0	1.8	1.7	1.3	2.0	1.9	1.9	2.0	2.2	2.0	1.9	2.1	1.8	2.0	2.0
PCE chain-wt. price index	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
Previous Tealbook	2.0	1.6	1.5	.5	2.7	1.9	1.8	1.9	1.8	1.8	1.8	1.9	1.8	1.8	1.8
Energy	.7	3.3	-2.0	-16.8	15.8	-19.2	-1.2	-.1	.0	.1	-.1	3.5	-6.3	-.1	.3
Previous Tealbook	.7	3.3	-2.0	-17.0	23.3	-2.4	-1.4	-1.7	-1.5	-1.3	-1.4	3.5	-.4	-1.5	-.9
Food	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
Previous Tealbook	1.2	.4	.3	3.0	2.9	3.1	2.6	2.6	2.6	2.6	2.6	.5	2.9	2.6	2.6
Ex. food & energy	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
Previous Tealbook	2.1	1.6	1.8	1.2	1.9	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.8	1.9	1.9
Ex. food & energy, market based	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
Previous Tealbook	2.2	1.2	1.5	1.6	1.5	2.0	1.7	1.9	1.8	1.7	1.7	1.7	1.7	1.8	1.8
CPI	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
Previous Tealbook	2.1	2.0	1.5	.9	3.8	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2
Ex. food & energy	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
Previous Tealbook	1.9	2.0	2.2	2.3	2.4	2.5	2.3	2.4	2.3	2.3	2.3	2.2	2.4	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	2.4	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	3.4	1.8	-.4	.5	1.3	1.1	1.3	1.3	1.8	1.3	1.3	1.2
Previous Tealbook	3.4	1.4	1.2	1.9	.2	.9	1.1	1.4	1.1	1.1	1.4	1.7	1.0	1.3	1.2
Compensation per hour	.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
Previous Tealbook	.3	3.2	3.7	2.7	3.4	3.6	3.8	3.7	3.7	3.7	3.7	2.9	3.4	3.7	3.7
Unit labor costs	-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
Previous Tealbook	-3.0	1.8	2.4	.8	3.2	2.7	2.7	2.2	2.5	2.5	2.2	1.2	2.3	2.4	2.5
Core goods imports chain-wt. price index[3]	.6	-1.2	.1	-.7	.6	.6	.7	1.1	1.0	.7	.7	.5	.3	.9	.8
Previous Tealbook[3]	.6	-1.2	.1	-.5	1.3	1.4	1.2	1.2	1.1	1.0	1.0	.5	.9	1.1	.9

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

Changes in Prices and Costs

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

Item	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	1.6	2.0	2.0
Previous Tealbook	2.1	1.8	1.6	.9	1.5	2.0	2.1	1.8	2.0	2.0
PCE chain-wt. price index	1.8	1.2	1.2	.3	1.6	1.8	1.9	1.5	1.9	1.9
Previous Tealbook	1.8	1.2	1.2	.3	1.6	1.8	1.9	1.8	1.8	1.8
Energy	2.1	-2.9	-6.9	-16.4	2.1	8.1	3.5	-6.3	-.1	.3
Previous Tealbook	2.1	-2.9	-6.9	-16.4	2.1	8.1	3.5	-.4	-1.5	-.9
Food	1.3	.7	2.8	.3	-1.8	.7	.5	2.3	2.6	2.6
Previous Tealbook	1.3	.7	2.8	.3	-1.8	.7	.5	2.9	2.6	2.6
Ex. food & energy	1.8	1.6	1.5	1.2	1.8	1.6	1.9	1.8	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	1.7	1.7
Previous Tealbook	1.5	1.1	1.2	1.1	1.5	1.2	1.7	1.7	1.8	1.8
CPI	1.9	1.2	1.2	.4	1.8	2.1	2.2	1.8	2.2	2.2
Previous Tealbook	1.9	1.2	1.2	.4	1.8	2.1	2.2	2.2	2.1	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	2.4	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	1.3	1.3	1.2
Previous Tealbook	.1	1.8	.2	.7	1.1	.7	1.7	1.0	1.3	1.2
Compensation per hour	5.9	-.3	2.8	2.5	2.1	3.1	2.2	3.3	3.6	3.6
Previous Tealbook	5.9	-.3	2.8	2.5	2.1	3.0	2.9	3.4	3.7	3.7
Unit labor costs	5.7	-2.0	2.7	1.8	1.0	2.3	.5	1.9	2.3	2.4
Previous Tealbook	5.7	-2.0	2.7	1.8	1.0	2.3	1.2	2.3	2.4	2.5
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	.9	1.1	.9

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	155	163	145	177	222	39	131	223	159	142	99
Unemployment rate[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
Previous Tealbook[3]	3.9	3.8	3.8	3.9	3.7	3.7	3.6	3.6	3.6	3.6	3.5	3.8	3.6	3.5	3.5
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	60.6	60.6	60.6	60.6	60.5
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	2.0	2.0	1.9	2.0	2.1	2.1	2.2	1.9	1.9	2.2	2.0
Previous Tealbook[4]	1.4	1.7	1.9	1.9	2.0	2.1	2.2	2.4	2.5	2.5	2.6	1.9	2.2	2.6	2.4
Industrial production[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
Previous Tealbook[5]	4.6	5.2	4.0	-.3	.8	1.9	1.3	1.8	1.8	1.1	1.0	4.0	.9	1.4	1.0
Manufacturing industr. prod.[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
Previous Tealbook[5]	2.0	3.6	1.7	-1.1	.3	1.1	1.2	1.6	1.7	1.6	1.3	2.2	.4	1.6	1.1
Capacity utilization rate - mfg.[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
Previous Tealbook[3]	76.4	76.9	77.0	76.6	76.4	76.3	76.3	76.5	76.7	76.8	76.9	77.0	76.3	76.9	77.4
Housing starts[6]	1.3	1.2	1.2	1.2	1.2	1.3	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	16.8	16.9	16.9	16.9	16.8	16.8	16.8	17.2	16.8	16.8	16.8
Income and saving															
Nominal GDP[5]	7.6	4.9	4.1	3.5	3.7	3.6	3.8	4.1	4.3	4.2	4.1	5.2	3.6	4.1	3.7
Real disposable pers. income[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
Previous Tealbook[5]	1.8	2.6	4.3	4.9	1.8	1.0	1.9	3.2	2.0	1.4	2.1	3.3	2.4	2.2	1.9
Personal saving rate[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
Previous Tealbook[3]	6.7	6.4	6.8	7.6	7.4	7.0	6.8	7.0	6.9	6.6	6.6	6.8	6.8	6.6	6.3
Corporate profits[7]	12.5	14.7	-1.7	-10.9	.5	2.6	-8.4	-3.9	3.3	5.7	4.5	7.4	-4.2	2.3	2.9
Profit share of GNP[3]	10.8	11.1	10.9	10.5	10.5	10.5	10.1	10.0	9.9	10.0	10.0	10.9	10.1	10.0	9.9
Gross national saving rate[3]	18.5	18.8	18.4	18.3	17.8	18.4	18.1	18.0	18.0	18.0	18.0	18.4	18.1	18.0	17.9
Net national saving rate[3]	3.3	3.6	3.1	3.3	2.6	3.2	2.8	2.5	2.5	2.4	2.5	3.1	2.8	2.5	2.2

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	159	142	99
Unemployment rate[2]	7.8	7.0	5.7	5.0	4.8	4.1	3.8	3.7	3.7	3.7
Previous Tealbook[2]	7.8	7.0	5.7	5.0	4.8	4.1	3.8	3.6	3.5	3.5
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	60.6	60.5
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	1.9	2.2	2.0
Previous Tealbook[3]	-3.8	-3.0	-1.0	-.4	.1	.9	1.9	2.2	2.6	2.4
Industrial production	2.1	2.3	3.4	-3.4	-.3	3.6	4.0	-.2	1.4	1.1
Previous Tealbook	2.1	2.3	3.4	-3.4	-.3	3.6	4.0	.9	1.4	1.0
Manufacturing industr. prod.	1.4	1.1	1.4	-1.7	.3	2.5	2.2	-.8	1.4	1.1
Previous Tealbook	1.4	1.1	1.4	-1.7	.3	2.5	2.2	.4	1.6	1.1
Capacity utilization rate - mfg.[2]	74.2	74.5	75.8	74.9	74.2	75.8	77.0	75.4	76.0	76.7
Previous Tealbook[2]	74.2	74.5	75.8	74.9	74.2	75.8	77.0	76.3	76.9	77.4
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	16.8	16.8	16.8
Income and saving										
Nominal GDP	3.6	4.4	4.4	2.9	3.4	4.5	5.2	3.6	4.1	3.7
Real disposable pers. income	4.9	-2.5	5.2	3.1	1.6	2.8	3.0	2.4	2.1	1.9
Previous Tealbook	4.9	-2.5	5.2	3.1	1.6	2.8	3.3	2.4	2.2	1.9
Personal saving rate[2]	10.2	6.3	7.4	7.4	6.4	6.3	6.5	6.6	6.3	6.0
Previous Tealbook[2]	10.2	6.3	7.4	7.4	6.4	6.3	6.8	6.8	6.6	6.3
Corporate profits[5]	.7	3.9	5.9	-10.7	7.6	3.3	7.4	-4.2	2.3	2.9
Profit share of GNP[2]	11.9	11.8	12.0	10.4	10.8	10.7	10.9	10.1	10.0	9.9
Gross national saving rate[2]	18.8	19.2	20.2	19.4	18.3	18.3	18.4	18.1	18.0	17.9
Net national saving rate[2]	3.7	4.0	5.1	4.3	3.0	3.1	3.1	2.8	2.5	2.2

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	3,493	3,684	3,837	736	1,121	865	814
Outlays	3,853	3,982	4,109	4,417	4,653	4,901	1,108	1,140	1,078	1,164
Surplus/deficit	-585	-665	-779	-923	-969	-1,064	-372	-19	-213	-350
				Percent of GDP						
Surplus/deficit	-3.2	-3.5	-3.9	-4.4	-4.4	-4.7	-7.2	-.4	-4.0	-6.6
Previous Tealbook	*-3.2*	*-3.5*	*-3.9*	*-4.2*	*-4.3*	*-4.3*	*-7.2*	*.2*	*-4.1*	*-6.7*
Primary surplus/deficit	-1.9	-2.1	-2.2	-2.6	-2.5	-2.6	-5.4	1.8	-2.9	-4.5
Net interest	1.3	1.4	1.6	1.7	1.9	2.1	1.7	2.2	1.2	2.1
Cyclically adjusted surplus/deficit	-3.0	-3.6	-4.4	-5.2	-5.4	-5.7	-8.0	-1.3	-5.0	-7.5
Federal debt held by public	76.4	76.1	77.8	77.0	79.9	81.8	78.1	77.6	77.0	80.0
Government in the NIPA[2]				Real percent change, annual rate						
Purchases	.9	.1	1.5	2.4	1.5	.9	2.8	4.4	1.1	1.3
Consumption	.9	-.1	1.4	1.8	1.1	.6	.2	4.1	1.4	1.4
Investment	.7	1.4	2.3	5.1	3.0	2.1	14.2	5.5	-.2	1.2
State and local construction	1.8	-2.9	.4	5.6	1.0	1.0	29.7	5.0	-6.0	-3.0
Real disposable personal income	1.6	2.8	3.0	2.4	2.1	1.9	2.2	2.5	3.3	1.6
Contribution from transfers[3]	.3	.2	.5	.9	.6	.8	2.7	.4	.0	.5
Contribution from taxes[3]	-.1	-.6	.1	-.7	-.5	-.5	-1.5	.0	-.9	-.4
Government employment				Average net change in monthly payrolls, thousands						
Federal	3	-2	0	3	0	1	2	5	9	-4
State and local	14	9	8	7	9	9	7	2	9	9
Fiscal indicators[2]				Percentage point contribution to change in real GDP, annual rate						
Fiscal effect (FE)[4]	.4	.1	.4	.9	.6	.5	1.1	1.4	.5	.5
Discretionary policy actions (FI)	.3	.2	.6	.7	.5	.2	.8	1.0	.4	.4
Previous Tealbook	*.3*	*.2*	*.6*	*.6*	*.5*	*.2*	*.8*	*.8*	*.5*	*.5*
Federal purchases	.0	.1	.2	.2	.2	.1	.0	.6	.2	.2
State and local purchases	.1	-.1	.1	.2	.1	.1	.5	.2	.0	.0
Taxes and transfers	.1	.1	.3	.3	.2	.0	.3	.3	.2	.2
Cyclical	-.1	-.1	-.2	-.1	.0	.0	-.1	-.1	-.1	-.1
Other	.2	.1	.0	.3	.2	.3	.4	.5	.1	.1

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	2020 Q1	2020 Q2	2020 Q3	2020 Q4
***Real GDP*[1]**												
Total foreign	3.3	1.8	2.1	1.5	1.6	2.2	2.3	2.2	2.4	2.5	2.5	2.5
Previous Tealbook	*3.1*	*2.0*	*2.1*	*1.7*	*2.0*	*2.4*	*2.5*	*2.3*	*2.5*	*2.6*	*2.6*	*2.6*
Advanced foreign economies	1.4	2.2	1.1	.7	1.2	1.5	1.5	1.1	1.4	1.5	1.6	1.6
Canada	1.5	2.5	2.1	.3	.4	2.1	1.7	1.6	1.6	1.7	1.7	1.7
Japan	-.3	2.2	-2.5	1.6	2.1	.1	2.1	-1.7	.9	1.1	1.0	.9
United Kingdom	.2	1.6	2.8	.9	2.0	.7	1.2	1.2	1.5	1.6	1.6	1.6
Euro area	1.6	1.6	.5	1.0	1.6	1.2	1.0	1.1	1.2	1.3	1.4	1.5
Germany	1.5	1.8	-.8	.1	1.7	1.4	1.4	1.4	1.3	1.2	1.3	1.3
Emerging market economies	5.3	1.4	3.2	2.3	2.0	3.0	3.1	3.2	3.3	3.4	3.4	3.5
Asia	6.0	4.0	3.8	4.0	4.3	4.2	4.4	4.4	4.3	4.3	4.3	4.3
Korea	3.9	2.3	1.8	3.8	-1.5	1.9	2.3	2.4	2.4	2.4	2.4	2.4
China	7.1	6.5	5.8	6.0	7.3	6.1	5.9	5.9	5.7	5.7	5.7	5.7
Latin America	4.7	-1.6	2.4	.3	-.6	1.6	1.7	2.0	2.2	2.4	2.5	2.6
Mexico	5.4	-1.5	2.7	.1	-.7	1.4	1.6	1.8	2.1	2.3	2.4	2.5
Brazil	2.1	.0	2.0	.4	-.6	1.2	1.7	2.1	2.2	2.4	2.4	2.6
***Consumer prices*[2]**												
Total foreign	2.6	1.8	3.4	1.9	.8	2.9	2.2	2.6	2.3	2.3	2.3	2.3
Previous Tealbook	*2.6*	*1.9*	*3.4*	*1.9*	*.7*	*2.5*	*2.2*	*2.6*	*2.3*	*2.3*	*2.3*	*2.3*
Advanced foreign economies	2.5	1.2	2.5	.7	.7	1.4	1.0	2.3	1.4	1.4	1.4	1.5
Canada	3.3	1.2	2.6	1.1	1.6	2.8	1.7	2.0	1.9	1.9	1.9	1.9
Japan	2.8	-1.6	2.0	-.1	.9	.0	.5	6.0	.7	.9	1.0	1.0
United Kingdom	2.4	2.0	2.7	1.9	.8	2.6	1.9	2.1	2.2	2.2	2.2	2.2
Euro area	2.1	2.3	2.6	.7	.1	1.0	.6	1.3	1.2	1.2	1.2	1.2
Germany	2.1	2.5	2.9	1.1	-.2	1.6	1.0	1.8	1.8	1.9	1.9	2.0
Emerging market economies	2.7	2.2	4.1	2.7	.8	3.9	2.9	2.9	2.9	2.8	2.8	2.8
Asia	2.2	1.4	3.0	1.7	.4	3.7	2.7	2.6	2.6	2.6	2.6	2.6
Korea	1.6	2.2	1.9	1.5	-3.3	2.8	2.3	1.9	2.0	2.1	2.1	2.1
China	1.9	1.1	3.7	2.0	.6	4.0	2.6	2.4	2.5	2.5	2.5	2.5
Latin America	4.1	4.2	6.8	5.4	1.7	4.7	3.6	3.6	3.4	3.4	3.4	3.4
Mexico	4.0	4.0	6.5	4.9	1.1	4.3	3.3	3.3	3.2	3.2	3.2	3.2
Brazil	3.1	4.3	6.6	2.5	2.9	5.8	4.1	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	3.1	2.2	2.1	2.5	2.6
Previous Tealbook	*2.2*	*3.0*	*3.0*	*2.1*	*2.8*	*3.0*	*2.2*	*2.3*	*2.6*	*2.7*
Advanced foreign economies	.3	2.4	2.1	.9	1.8	2.7	1.3	1.3	1.5	1.6
Canada	.7	3.4	2.8	-.4	1.8	2.9	1.6	1.4	1.7	1.7
Japan	.3	2.8	-.4	1.0	1.2	2.3	.2	.6	1.0	.8
United Kingdom	1.6	2.6	3.1	2.2	1.7	1.6	1.4	1.3	1.6	1.6
Euro area	-1.1	.8	1.5	2.0	2.1	2.8	1.2	1.2	1.3	1.7
Germany	.2	1.6	2.3	1.3	1.9	2.8	.6	1.5	1.3	1.5
Emerging market economies	4.2	3.6	3.9	3.2	3.8	3.4	3.1	2.8	3.4	3.6
Asia	5.9	5.4	5.1	4.6	5.1	5.2	4.5	4.3	4.3	4.3
Korea	2.4	3.7	2.6	3.4	2.7	2.8	3.0	1.3	2.4	2.4
China	8.0	7.6	7.1	6.8	6.8	6.7	6.4	6.3	5.7	5.7
Latin America	2.9	1.6	2.8	1.9	2.5	1.7	1.4	1.2	2.4	2.8
Mexico	3.0	1.2	3.4	2.8	3.3	1.5	1.6	1.0	2.3	2.7
Brazil	2.6	2.6	-.1	-5.5	-2.3	2.2	1.1	1.1	2.4	2.8
***Consumer prices*[2]**										
Total foreign	2.3	2.4	2.0	1.4	1.9	2.5	2.4	2.1	2.3	2.3
Previous Tealbook	*2.3*	*2.4*	*2.0*	*1.4*	*1.9*	*2.5*	*2.4*	*2.0*	*2.3*	*2.3*
Advanced foreign economies	1.3	1.0	1.2	.5	.9	1.5	1.7	1.4	1.4	1.5
Canada	1.0	1.0	2.0	1.3	1.4	1.8	2.1	2.0	1.9	1.9
Japan	-.2	1.4	2.6	.1	.3	.6	.8	1.8	.9	1.0
United Kingdom	2.6	2.1	.9	.1	1.2	3.0	2.3	1.8	2.2	2.2
Euro area	2.3	.8	.2	.3	.7	1.4	1.9	.7	1.2	1.3
Germany	2.0	1.4	.4	.5	1.0	1.6	2.1	1.1	1.9	2.1
Emerging market economies	3.1	3.4	2.6	2.0	2.6	3.2	2.9	2.6	2.8	2.8
Asia	2.7	3.2	1.8	1.5	2.1	2.0	2.1	2.3	2.6	2.6
Korea	1.7	1.1	1.0	.9	1.4	1.4	1.8	.9	2.0	2.1
China	2.1	2.9	1.5	1.4	2.1	1.8	2.2	2.4	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	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.

U.S. Current Account

Quarterly Data

	2018				Projected 2019				Projected 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	**-495.7**	**-414.3**	**-506.4**	**-537.5**	**-495.6**	**-531.5**	**-546.4**	**-533.9**	**-546.3**	**-541.9**	**-563.7**	**-558.8**
Previous Tealbook	*-495.7*	*-414.3*	*-506.4*	*-537.5*	*-509.7*	*-569.2*	*-573.5*	*-571.2*	*-610.5*	*-607.3*	*-625.5*	*-617.5*
Current account as percent of GDP	-2.5	-2.0	-2.5	-2.6	-2.4	-2.5	-2.6	-2.5	-2.5	-2.5	-2.5	-2.5
Previous Tealbook	*-2.5*	*-2.0*	*-2.5*	*-2.6*	*-2.4*	*-2.7*	*-2.7*	*-2.6*	*-2.8*	*-2.7*	*-2.8*	*-2.7*
Net goods & services	-625.0	-547.5	-648.1	-667.9	-601.7	-635.0	-619.4	-604.5	-593.2	-594.5	-608.2	-607.0
Investment income, net	258.3	263.2	255.2	255.7	241.3	224.1	199.8	193.3	182.1	173.3	171.2	171.0
Direct, net	310.4	316.3	314.9	314.1	311.9	306.0	293.5	299.4	301.2	306.4	314.3	324.0
Portfolio, net	-52.1	-53.1	-59.6	-58.4	-70.6	-81.9	-93.7	-106.1	-119.2	-133.1	-143.1	-153.0
Other income and transfers, net	-129.0	-129.9	-113.6	-125.4	-135.2	-120.7	-126.8	-122.8	-135.2	-120.7	-126.8	-122.8

Annual Data

	2012	2013	2014	2015	2016	2017	2018	Projected 2019	Projected 2020	Projected 2021
	Billions of dollars									
U.S. current account balance	**-426.8**	**-348.8**	**-365.2**	**-407.8**	**-432.9**	**-449.1**	**-488.5**	**-526.9**	**-552.7**	**-562.5**
Previous Tealbook	*-426.8*	*-348.8*	*-365.2*	*-407.8*	*-432.9*	*-449.1*	*-488.5*	*-555.9*	*-615.2*	*-612.0*
Current account as percent of GDP	-2.6	-2.1	-2.1	-2.2	-2.3	-2.3	-2.4	-2.5	-2.5	-2.4
Previous Tealbook	*-2.6*	*-2.1*	*-2.1*	*-2.2*	*-2.3*	*-2.3*	*-2.4*	*-2.6*	*-2.8*	*-2.6*
Net goods & services	-537.4	-461.1	-489.6	-498.5	-502.0	-552.3	-622.1	-615.1	-600.7	-608.5
Investment income, net	216.1	215.4	229.0	214.7	205.7	235.1	258.1	214.6	174.4	172.3
Direct, net	285.5	283.3	284.2	284.6	272.6	298.4	313.9	302.7	311.5	347.8
Portfolio, net	-69.4	-67.9	-55.3	-70.0	-66.9	-63.3	-55.8	-88.1	-137.1	-175.4
Other income and transfers, net	-105.5	-103.1	-104.6	-123.9	-136.6	-132.0	-124.5	-126.4	-126.4	-126.4

Report to the FOMC on Economic Conditions and Monetary Policy

Book B

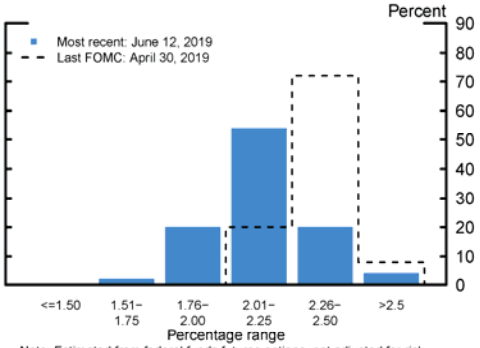
Monetary Policy Alternatives

June 13, 2019

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

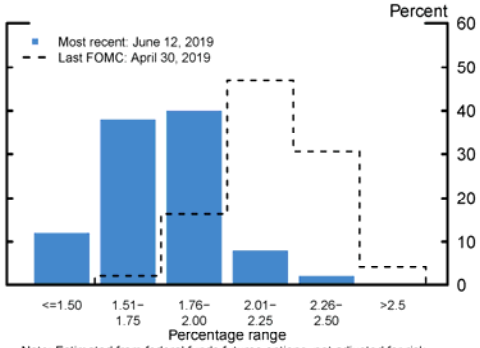
Alternatives

Figure 1: Market-Implied Probability Distribution of the Federal Funds Rate, August 2019



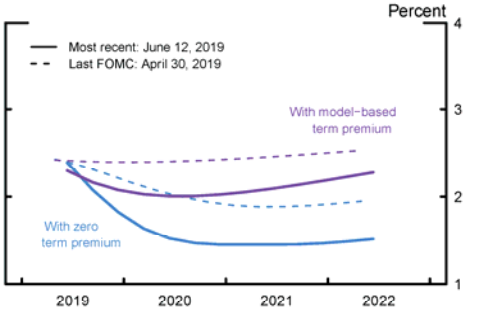
Note: Estimated from federal funds futures options, not adjusted for risk premiums.
The distribution for August provides a read on expectations for policy action at the July FOMC meeting.
Source: CME Group; Federal Reserve Board staff estimates.

Figure 2: Market-Implied Probability Distribution of the Federal Funds Rate, Year-End 2019



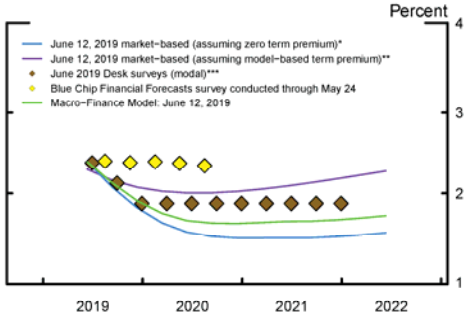
Note: Estimated from federal funds futures options, not adjusted for risk premiums.
Source: CME Group; Federal Reserve Board staff estimates.

Figure 3: Market-Implied Federal Funds Rate Expectations



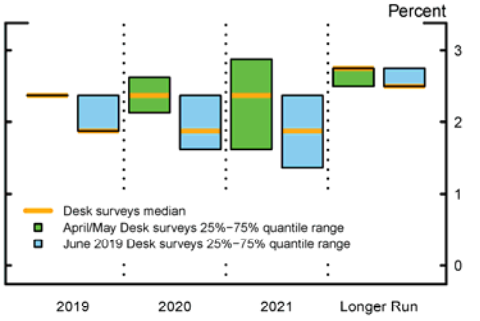
Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points. Model-based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premium.
* Median of respondents' modal paths for the federal funds rate.
Source: Bloomberg; Board staff calculations; FRBNY.

Figure 4: Federal Funds Rate Projections



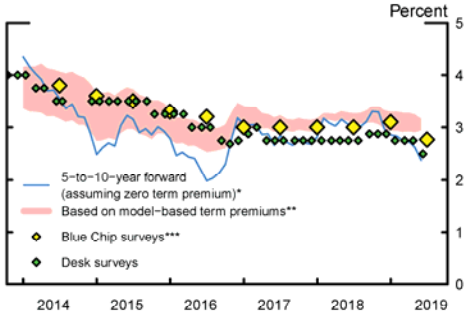
* Estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points.
** Adjusting for premiums using a term structure model maintained by Board staff.
*** Median of respondents' modal paths for the federal funds rate.
Source: Bloomberg; Federal Reserve Board staff estimates; FRBNY.

Figure 5: Desk Surveys Modal Projections for the Year-End Federal Funds Rate



Note: Based on all responses from the April/May and June 2019 Desk surveys.
Source: FRBNY.

Figure 6: Measures of Longer-Run Federal Funds Rate Expectations



* Monthly average 5-to-10-year forward rate derived from prices of Treasury securities.
** Monthly average 5-to-10-year forward rate adjusted for three alternative model-based term premium estimates using Kim and Wright (2005), D'Amico, Kim, and Wei (2018), and Kim and Priebsch (2019).
*** Most recent long-run survey value is from the June 2019 Blue Chip survey.
Source: Blue Chip; FRBNY; Federal Reserve Board staff estimates.

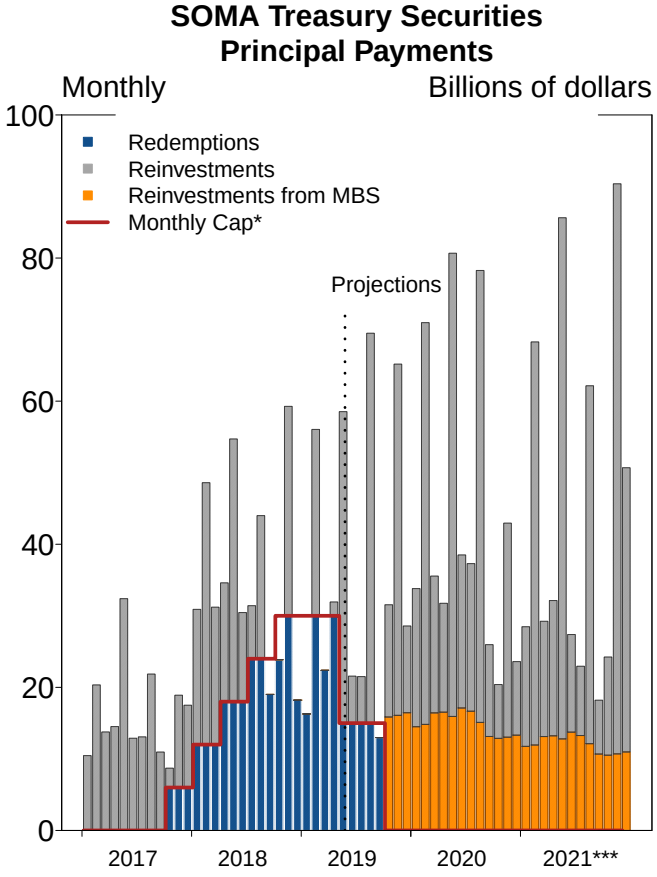
Redemptions and Reinvestments of SOMA Principal Payments

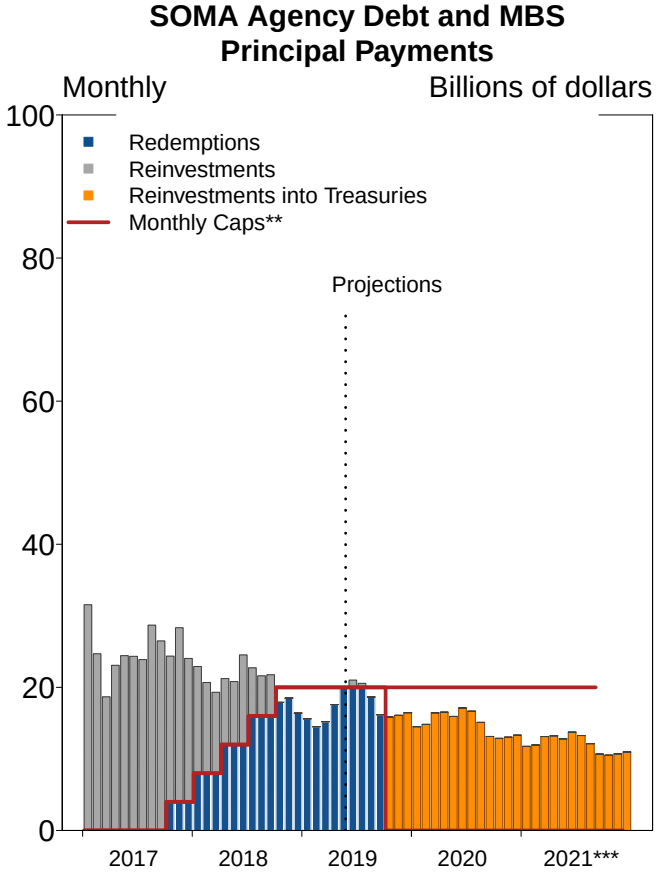
Projections for Treasury Securities
(Billions of dollars)

	Redemptions		Reinvestments*	
	Period	Since Oct. 2017	Period	Since Oct. 2017
2019:Q2	60.1	375.8	51.9	302.2
2019:Q3	43.0	418.8	61.0	363.2
2019:Q4	0.0	418.8	75.4	438.6
2018	229.1	247.1	197.1	224.2
2019	171.7	418.8	214.4	438.6
2020	0.0	418.8	361.6	800.2
2021***	0.0	418.8	344.3	1144.5

Projections for Agency Securities
(Billions of dollars)

	Redemptions		Reinvestments** (Agency/Treasury)	
	Period	Since Oct. 2017	Period	Since Oct. 2017
2019:Q2	57.6	275.7	3.3 / 0.0	155.6 / 0.0
2019:Q3	58.3	334.0	3.0 / 0.0	158.6 / 0.0
2019:Q4	0.0	334.0	0.0 / 53.4	158.6 / 53.4
2018	160.8	172.8	87.6 / 0.0	152.3 / 0.0
2019	161.2	334.0	6.2 / 53.4	158.6 / 53.4
2020	0.0	334.0	0.0 / 187.6	158.6 / 241.0
2021***	0.0	334.0	0.0 / 125.4	158.6 / 366.4





* Starting in May 2019, principal payments from maturing Treasury securities below $15 billion per month are redeemed, while those above are reinvested into Treasury securities. Starting in October 2019, all principal payments from maturing Treasury securities are reinvested into Treasury securities.

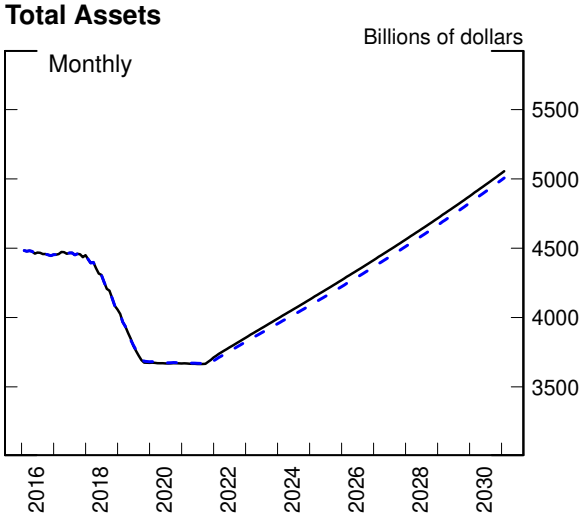
** Starting in October 2019, principal payments from holdings of agency securities below $20 billion per month are reinvested into Treasury securities, while those above are reinvested into agency MBS.

*** Reserves are projected to reach $1 trillion in October 2021. After this date, all principal payments received from all security holdings are reinvested into Treasury securities.

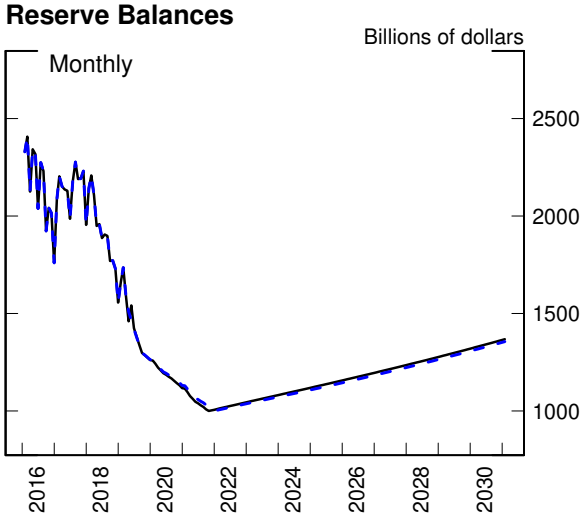
Total Assets and Selected Balance Sheet Items

June Tealbook baseline — April Tealbook baseline

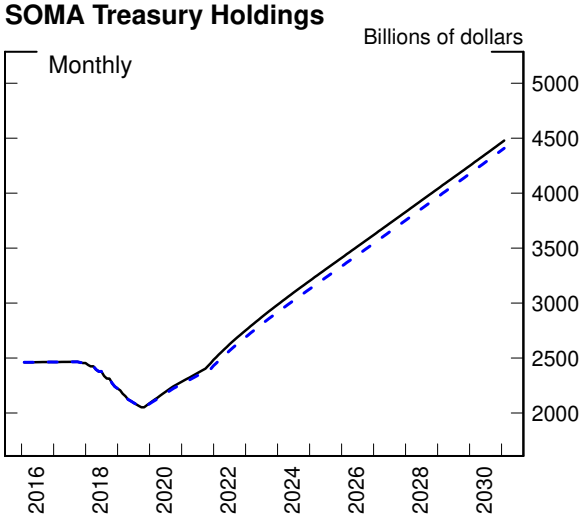
Total Assets



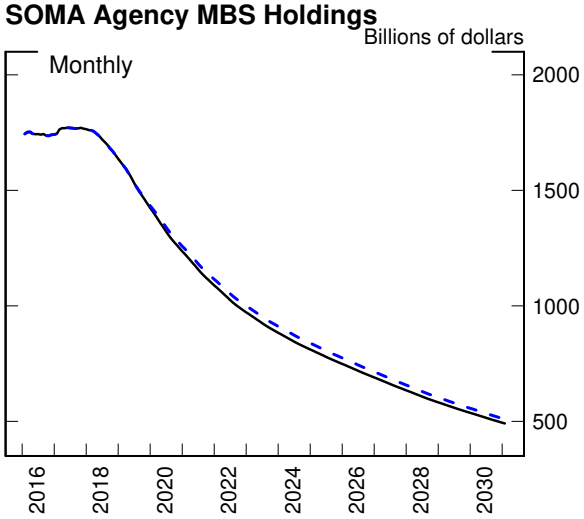
Reserve Balances



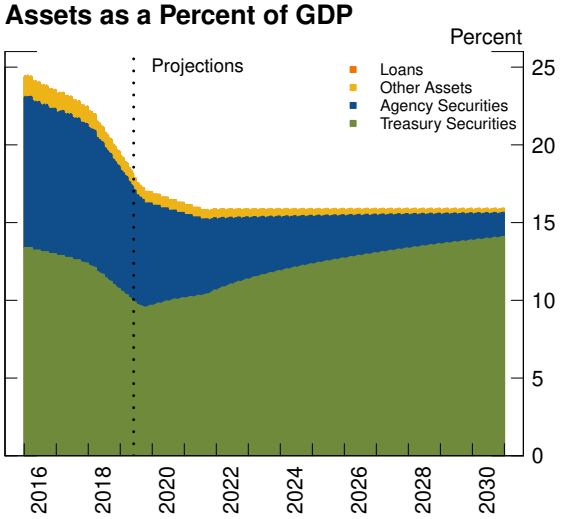
SOMA Treasury Holdings



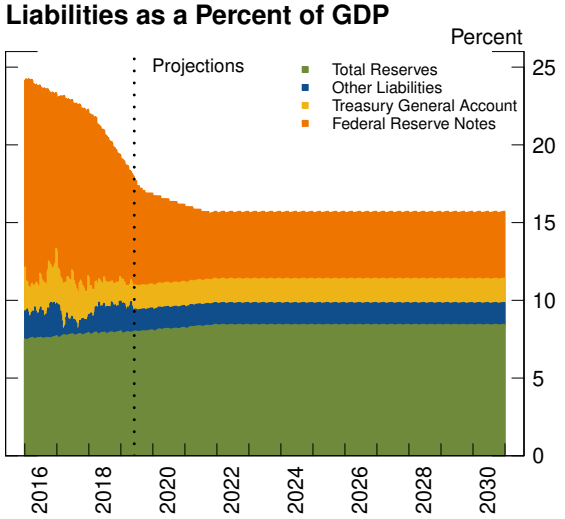
SOMA Agency MBS Holdings



Assets as a Percent of GDP



Liabilities as a Percent of GDP

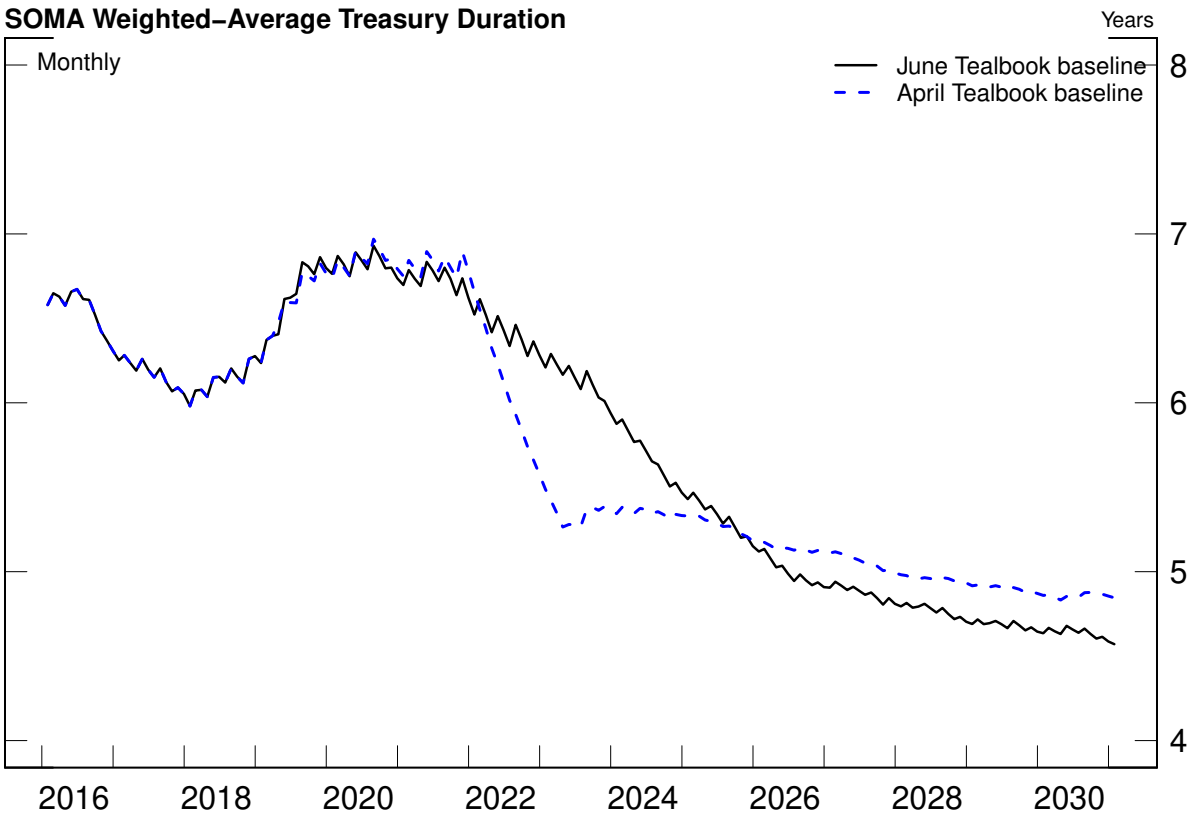


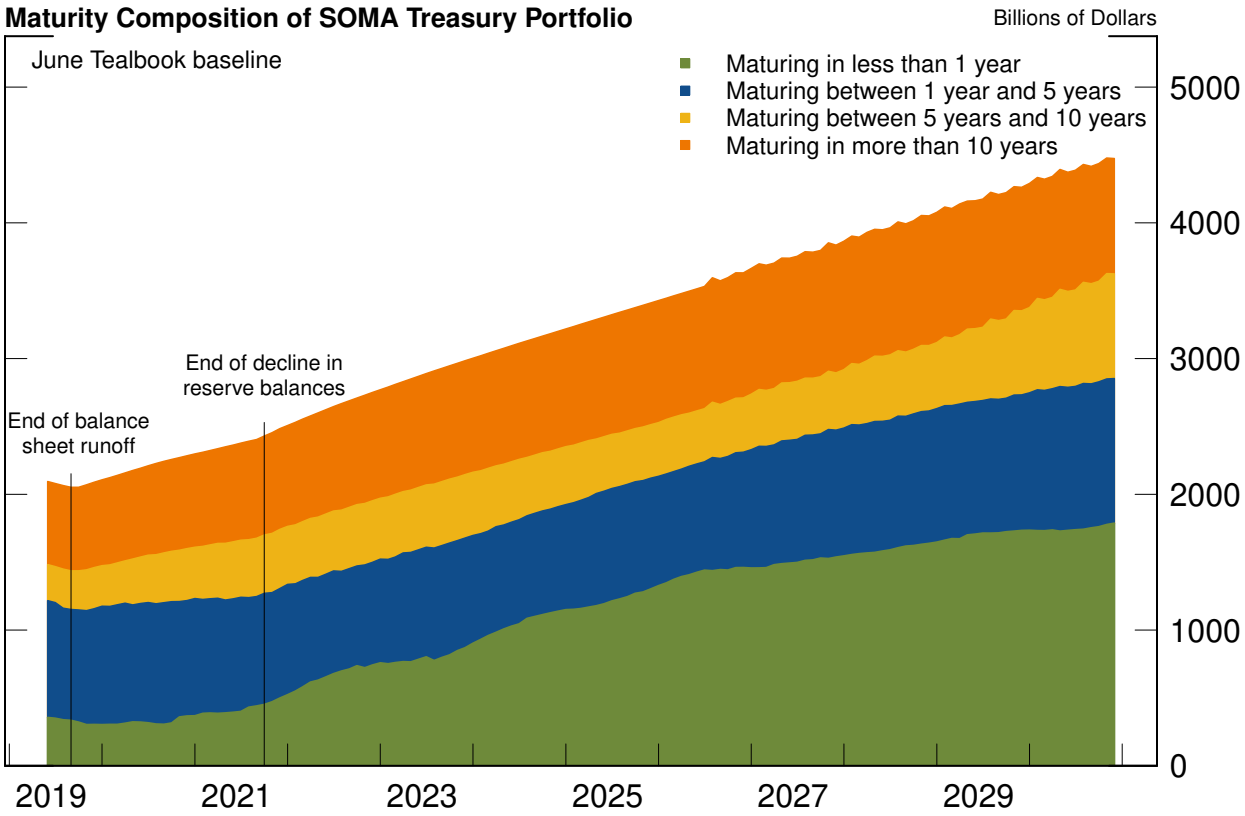
Federal Reserve Balance Sheet
Month-end Projections – June Tealbook
(Billions of dollars)

	Historical*			Projections				
	Aug 2014	Sep 2017	May 2019	Dec 2019	Dec 2020	Dec 2022	Dec 2025	Dec 2030
Total assets	4,416	4,460	3,847	3,673	3,669	3,853	4,269	5,041
Selected assets								
Loans and other credit extensions**	2	6	0	0	0	0	0	0
Securities held outright	4,157	4,240	3,667	3,514	3,522	3,725	4,161	4,957
U.S. Treasury securities	2,437	2,465	2,110	2,088	2,283	2,750	3,410	4,460
Agency debt securities	42	7	2	2	2	2	2	2
Agency mortgage-backed securities	1,678	1,768	1,555	1,424	1,236	972	749	494
Unamortized premiums	209	162	132	123	110	90	67	41
Unamortized discounts	19	14	13	12	12	10	7	5
Total other assets	29	37	34	24	24	29	34	38
Total liabilities	4,360	4,419	3,808	3,652	3,642	3,809	4,219	4,977
Selected liabilities								
Federal Reserve notes in circulation	1,249	1,533	1,690	1,745	1,853	2,042	2,262	2,668
Reverse repurchase agreements	277	432	276	271	282	304	336	397
Deposits with Federal Reserve Banks	2,825	2,447	1,834	1,631	1,502	1,458	1,615	1,905
Reserve balances held by depository institutions	2,762	2,190	1,541	1,261	1,117	1,044	1,156	1,364
U.S. Treasury, General Account	49	176	221	308	320	345	382	451
Other deposits	15	82	72	62	64	69	76	90
Earnings remittances due to the U.S. Treasury	3	2	2	0	0	0	0	0
Total Federal Reserve Bank capital***	56	41	39	39	40	44	50	64

Source: Federal Reserve H.4.l daily data and staff calculations.
Note: Components may not sum to totals due to rounding.
*August 2014 corresponds to the peak month-end value of reserve balances; September 2017 corresponds to the last month-end before the initiation of the normalization program; May 2019 is the most recent historical value
**Loans and other credit extensions includes discount window credit; central bank liquidity swaps; and net portfolio holdings of Maiden Lane LLC.
***Total capital includes capital paid-in and capital surplus accounts.

Projections for the Characterstics of SOMA Treasury Securities Holdings

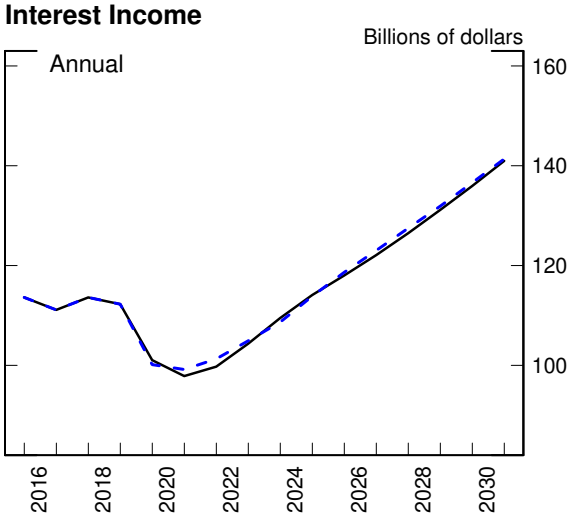




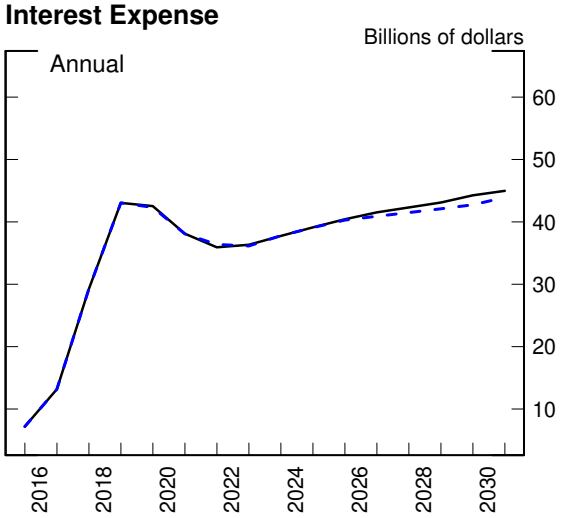
Income Projections

June Tealbook baseline — April Tealbook baseline

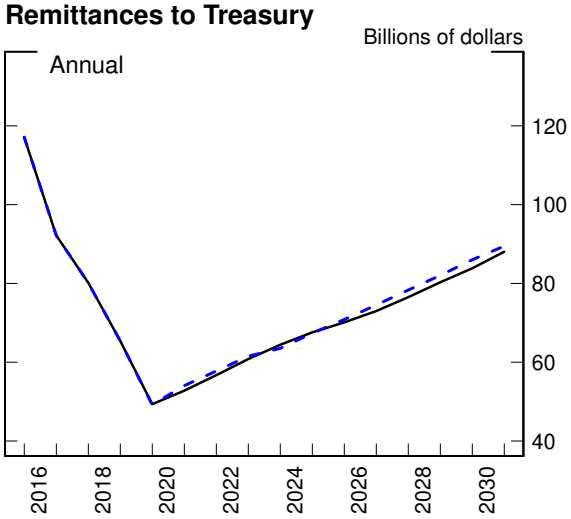
Interest Income



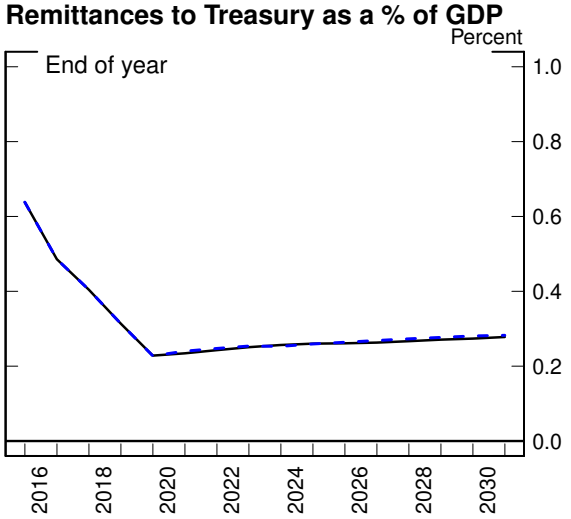
Interest Expense



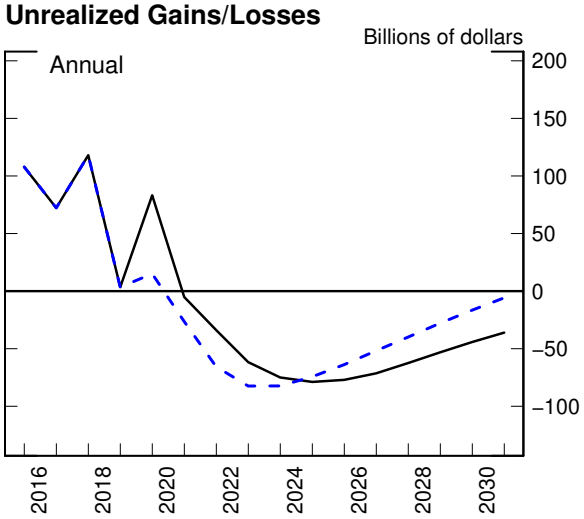
Remittances to Treasury



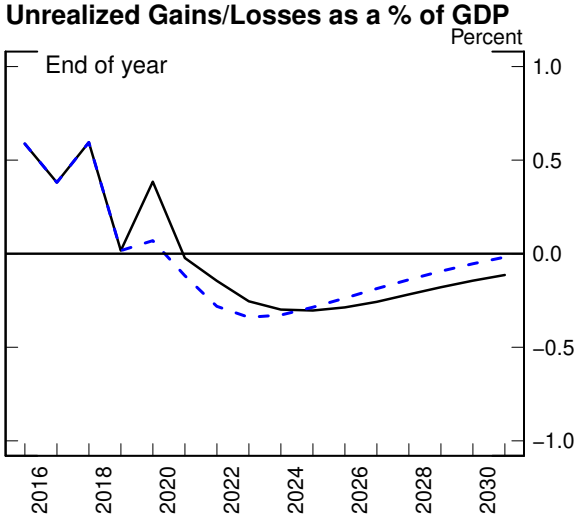
Remittances to Treasury as a % of GDP



Unrealized Gains/Losses



Unrealized Gains/Losses as a % of GDP



Projections for the 10-Year Treasury Total Term Premium Effect (TTPE)
(Basis Points)

Date	June Tealbook	April Tealbook
	Quarterly Averages	
2019:Q2	-134	-131
Q3	-133	-130
Q4	-131	-129
2020:Q4	-126	-123
2021:Q4	-121	-118
2022:Q4	-117	-114
2023:Q4	-112	-112
2024:Q4	-109	-110
2025:Q4	-106	-109
2026:Q4	-103	-107
2027:Q4	-101	-105
2028:Q4	-99	-104
2029:Q4	-97	-102
2030:Q4	-95	-101