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 1/12/2024.

Report to the FOMC on Economic Conditions and Monetary Policy

Book A

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

September 14, 2018

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 September Tealbook projection for real GDP growth lies close to both the Blue Chip consensus forecast and the Survey of Professional Forecasters (SPF) median forecast for 2018; all three forecasts step down in 2019 and are within a narrow range. The staff's unemployment rate forecast is in line with the others in 2018 and a touch below the Blue Chip consensus in 2019. The staff projection for total CPI inflation is close to the Blue Chip consensus and SPF median forecasts in both 2018 and 2019.

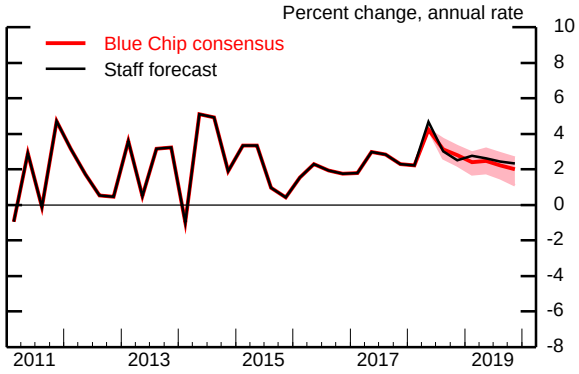
Comparison of Tealbook and Outside Forecasts

	2018	2019
GDP (Q4/Q4 percent change)		
September Tealbook	3.1	2.5
Blue Chip (09/10/18)	3.1	2.3
SPF median (08/10/18)	3.0	2.6
Unemployment rate (Q4 level)		
September Tealbook	3.7	3.3
Blue Chip (09/10/18)	3.7	3.5
SPF median (08/10/18)	3.7	n.a.
CPI inflation (Q4/Q4 percent change)		
September Tealbook	2.5	2.2
Blue Chip (09/10/18)	2.4	2.2
SPF median (08/10/18)	2.4	2.3
PCE price inflation (Q4/Q4 percent change)		
September Tealbook	2.0	1.9
SPF median (08/10/18)	2.1	2.1
Core PCE price inflation (Q4/Q4 percent change)		
September Tealbook	1.9	2.0
SPF median (08/10/18)	2.0	2.1

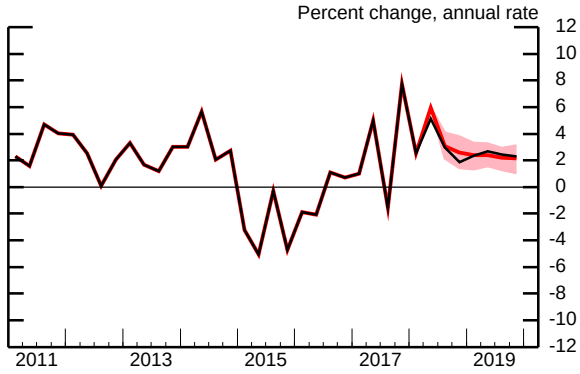
Note: SPF is the Survey of Professional Forecasters, CPI is the consumer price index, and PCE is personal consumption expenditures. Blue Chip does not provide results for overall and core PCE price inflation. The Blue Chip consensus forecast includes input from about 50 panelists, and the SPF about 40.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

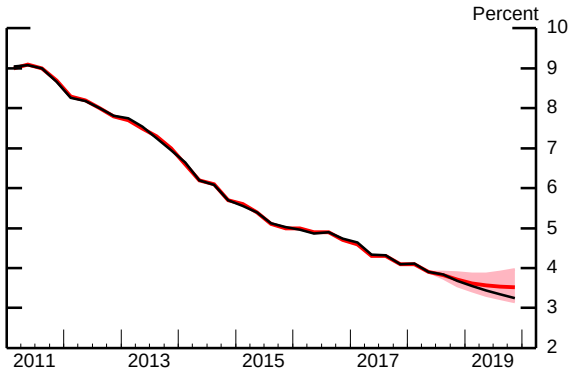
Real GDP



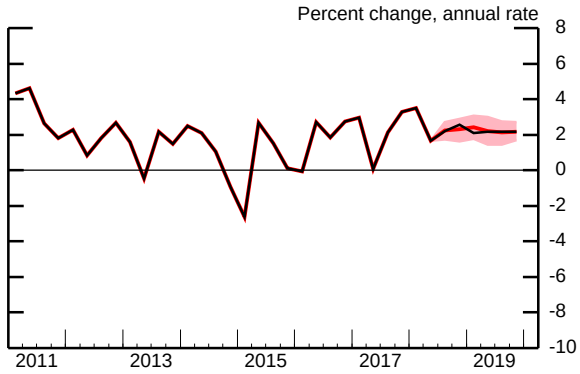
Industrial Production



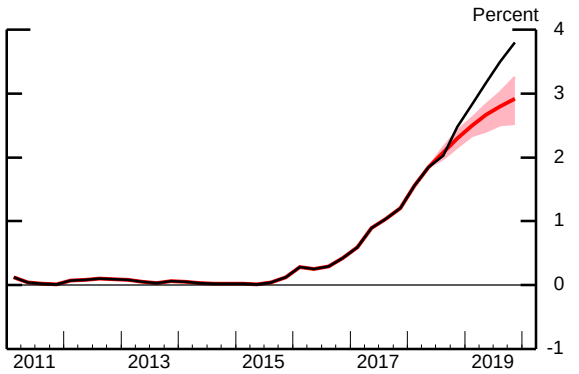
Unemployment Rate



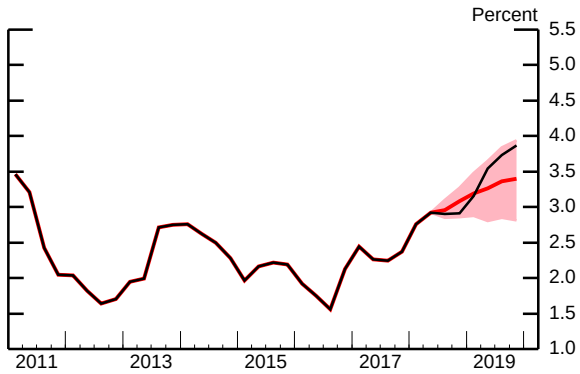
Consumer Price Index



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.

Revisions to the Staff Projection since the Previous SEP

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

Incoming data for real GDP growth have been a bit stronger than we expected in the June Tealbook, although the unemployment rate has come in a touch higher. Our projection for real GDP over the medium term has been revised up slightly, reflecting somewhat more favorable trajectories for both overall financial conditions (primarily, higher equity prices) and personal income. The medium-term forecast for the unemployment rate is revised down a little, partly reflecting our updated assumption that the natural rate of unemployment is 4.6 percent—0.1 percentage point lower than in the June forecast. All told, resource utilization, as measured by the output gap or the unemployment rate gap, is slightly tighter in our medium-term projection than in the June Tealbook.

Our forecasts for both total and core inflation in 2018 and over the medium term are little changed relative to the June Tealbook. We continue to expect core inflation to be close to 2 percent over the next several years; total inflation is forecast to run a bit below core inflation after this year, reflecting a small projected decline in energy prices.

The path for the federal funds rate derived from the inertial version of the Taylor (1999) rule used in our baseline forecast is quite similar to its trajectory in June, although it is a bit steeper in the medium term with the slightly tighter resource utilization in the current projection.

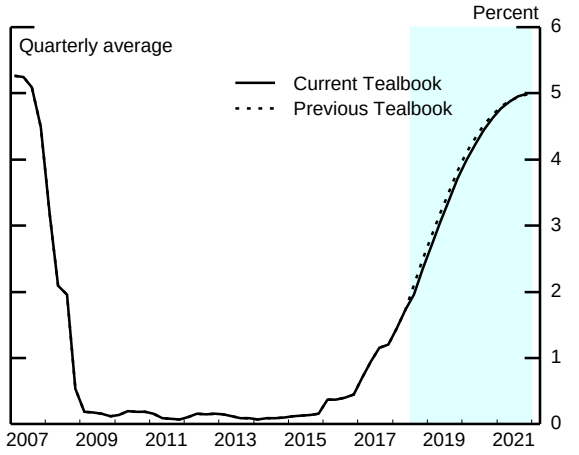
Staff Economic Projections Compared with the June Tealbook

Variable	2018		2018	2019	2020	2021	Longer run
	H1	H2					
Real GDP[1]	3.4	2.8	3.1	2.5	1.9	1.5	1.7
June Tealbook	2.8	2.7	2.8	2.4	1.8	1.5	1.7
Unemployment rate[2]	3.9	3.7	3.7	3.3	3.2	3.4	4.6
June Tealbook	3.8	3.6	3.6	3.4	3.4	3.6	4.7
PCE inflation[1]	2.2	1.8	2.0	1.9	2.0	2.0	2.0
June Tealbook	2.3	1.8	2.1	1.9	2.0	2.0	2.0
Core PCE inflation[1]	2.1	1.6	1.9	2.0	2.1	2.1	n.a.
June Tealbook	2.1	1.7	1.9	2.0	2.1	2.1	n.a.
Federal funds rate[2]	1.74	2.35	2.35	3.71	4.63	5.00	2.50
June Tealbook	1.74	2.52	2.52	3.78	4.54	4.79	2.50
Memo: Federal funds rate, end of period	1.88	2.38	2.38	3.73	4.64	5.00	2.50
June Tealbook	1.77	2.54	2.54	3.80	4.55	4.79	2.50
Output gap[2,3]	1.8	2.4	2.4	3.2	3.2	2.7	n.a.
June Tealbook	1.9	2.5	2.5	3.0	2.9	2.5	n.a.

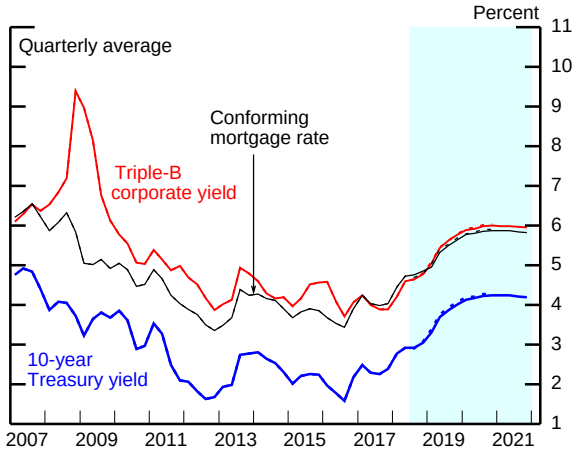
1. Percent change from final quarter of preceding period to final quarter of period indicated.
2. Percent, final quarter of period indicated.
3. Percent difference between actual and potential. A negative number indicates that the economy is operating below potential.
n.a. Not available.

Key Background Factors underlying the Baseline Staff Projection

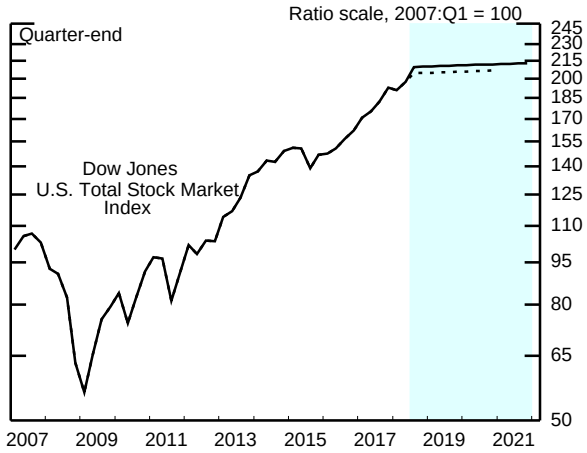
Federal Funds Rate



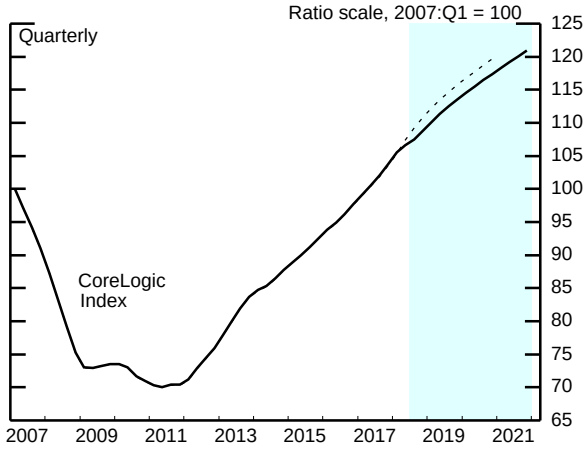
Long-Term Interest Rates



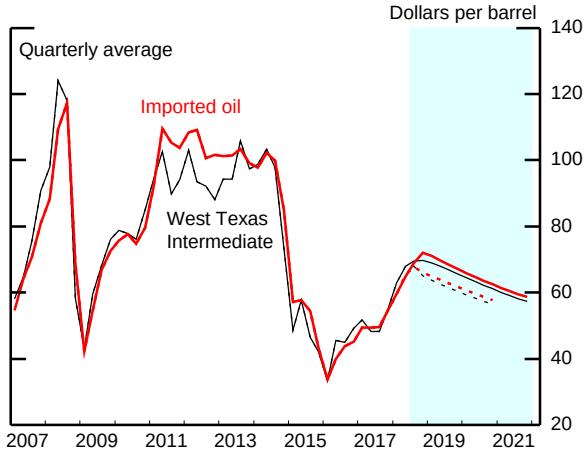
Equity Prices



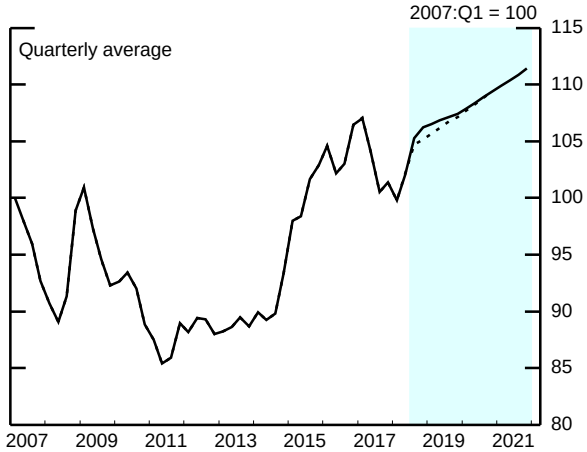
House Prices



Crude Oil Prices



Broad Real Dollar



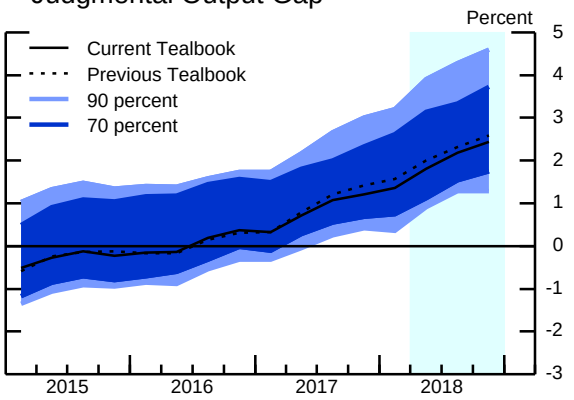
Cyclical Position of the U.S. Economy: Near-Term Perspective

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

Measure	2016	2017	2018	2018 Q2	2018 Q3	2018 Q4
Output gap[1]	**.4**	**1.2**	**2.4**	**1.8**	**2.2**	**2.4**
Previous Tealbook	.3	1.4	2.6	2.0	2.3	2.6
Real GDP	1.9	2.5	3.1	4.7	3.0	2.5
Previous Tealbook	1.8	2.6	2.9	4.8	2.5	2.5
Measurement error in GDP	-.3	.0	.2	1.2	-.2	-.2
Previous Tealbook	-.2	-.1	.1	1.4	-.5	-.3
Potential output	1.6	1.6	1.7	1.7	1.7	1.7
Previous Tealbook	1.6	1.5	1.7	1.7	1.7	1.7

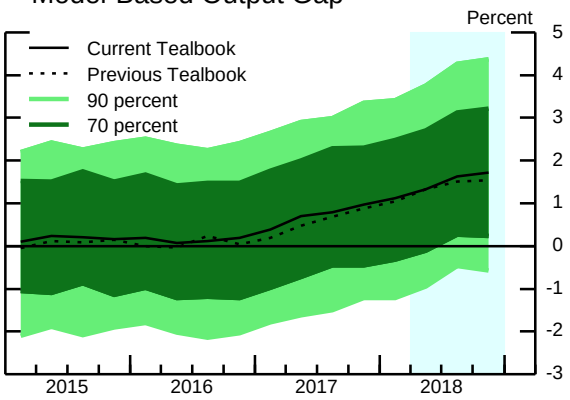
Note: The output gap is the percent difference between actual and potential output; a negative number indicates that the economy is operating below potential. The change in the output gap is equal to real GDP growth less the contribution of measurement error less the growth rate of potential output. 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



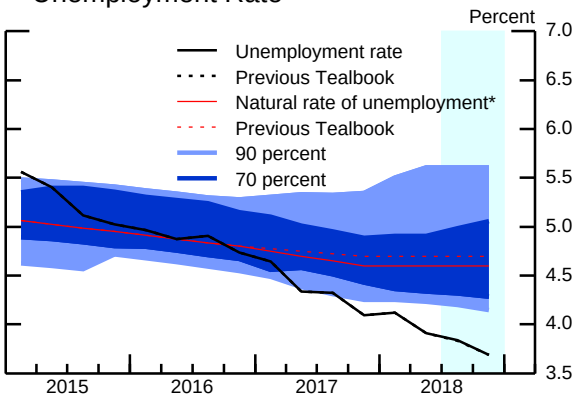
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.

Model-Based Output Gap



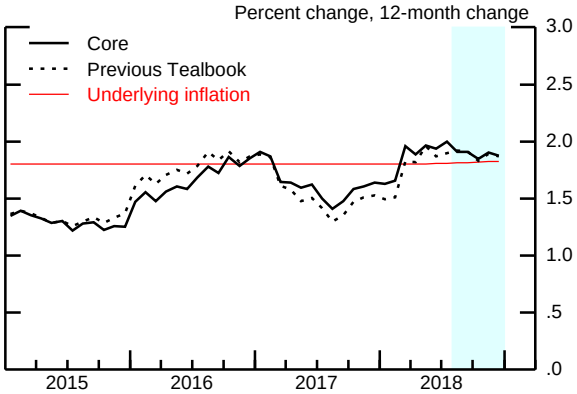
Note: Shaded regions denote model-computed uncertainty bands.
Source: Various macroeconomic data; staff assumptions.

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 EEB.
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.

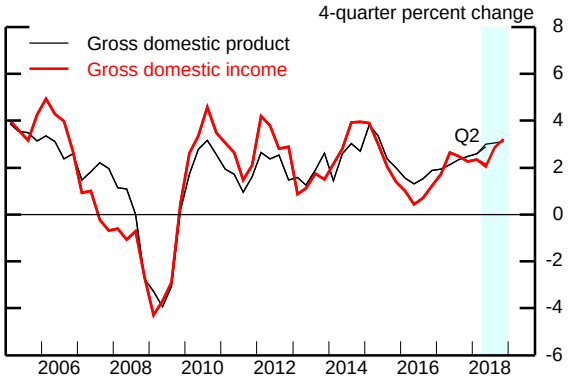
Summary of the Near-Term Outlook for GDP
(Percent change at annual rate except as noted)

Measure	2018:Q2		2018:Q3		2018:H2	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	**4.8**	**4.7**	**2.5**	**3.0**	**2.5**	**2.8**
Private domestic final purchases	3.5	4.6	3.1	2.8	3.0	3.1
Personal consumption expenditures	3.4	4.2	2.7	2.9	2.7	2.8
Residential investment	-1.4	-1.8	-2.1	-2.1	-1.3	-1.2
Nonres. private fixed investment	6.0	8.9	7.3	3.7	6.3	5.8
Government purchases	3.2	2.4	.1	1.1	.9	1.4
Contributions to change in real GDP						
Inventory investment[1]	.0	-.9	.2	1.2	.1	.4
Net exports[1]	1.2	1.2	-.5	-.8	-.4	-.5

1. Percentage points.

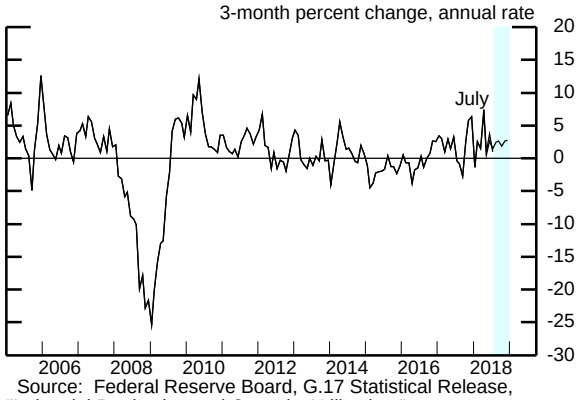
Recent Nonfinancial Developments (1)

Real GDP and GDI



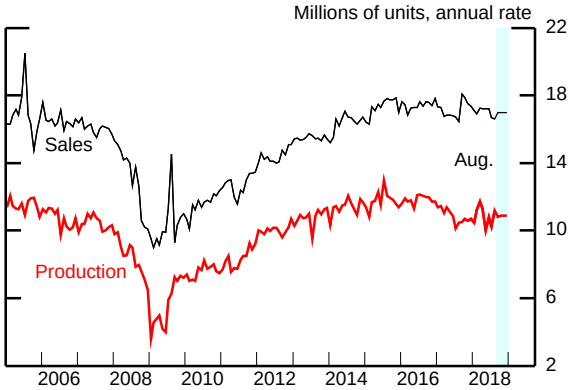
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Manufacturing IP ex. Motor Vehicles and Parts



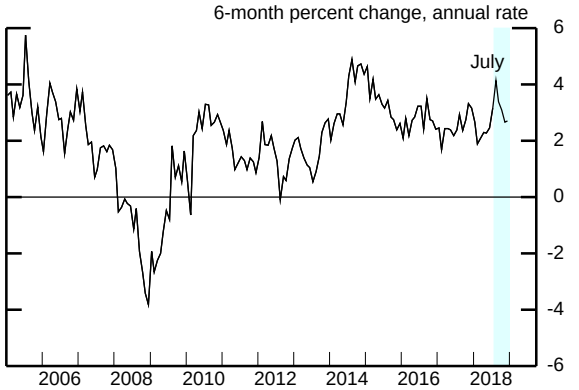
Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."

Sales and Production of Light Motor Vehicles



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

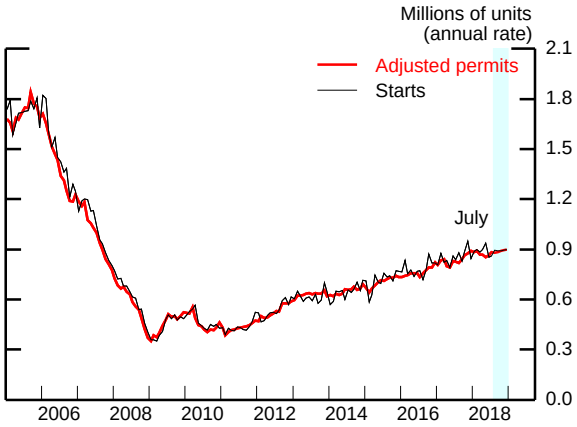
Real PCE Growth



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

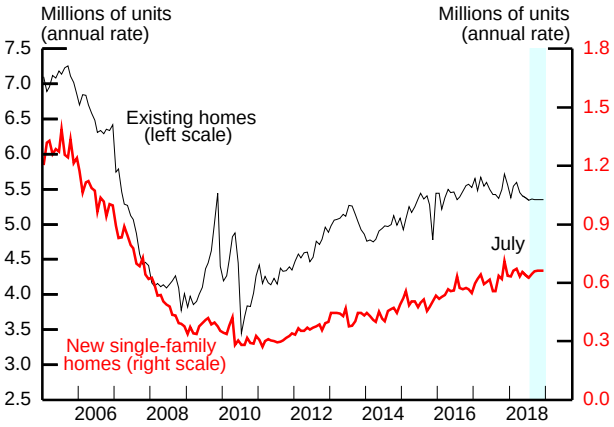
Recent Nonfinancial Developments (2)

Single-Family Housing Starts and Permits



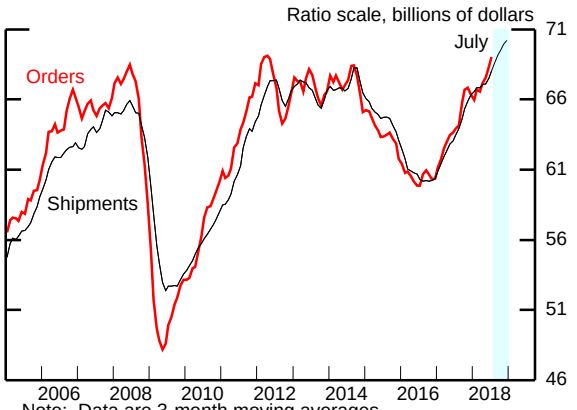
Note: Adjusted permits equal permit issuance plus starts outside of permit-issuing areas.
Source: U.S. Census Bureau.

Home Sales



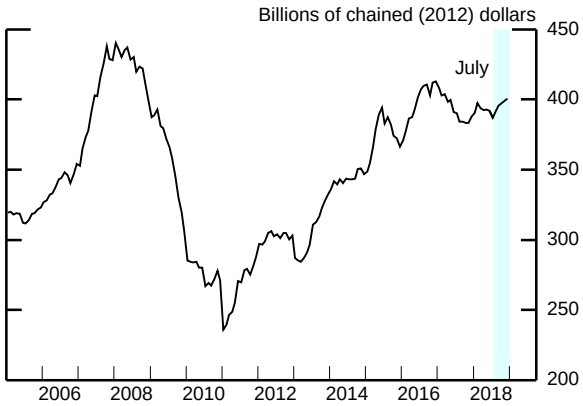
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

Nondefense Capital Goods ex. Aircraft



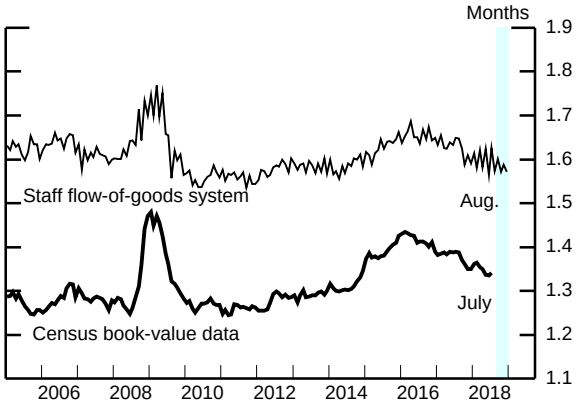
Note: Data are 3-month moving averages.
Source: U.S. Census Bureau.

Nonresidential Construction Put in Place



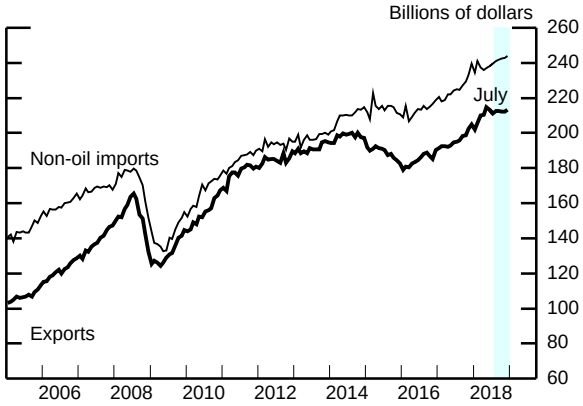
Note: Nominal CPIP deflated by BEA prices through 2018:Q1 and by the staff's estimated deflator thereafter.
Source: U.S. Census Bureau.

Inventory Ratios



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

Exports and Non-oil Imports



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

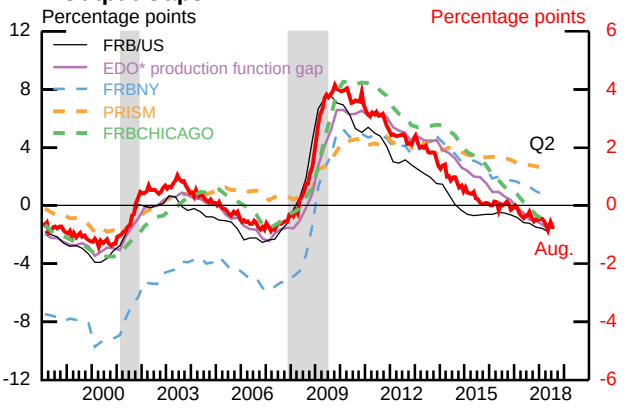
Federal Reserve System Nowcasts of 2018:Q3 Real GDP Growth
(Percent change at annual rate from previous quarter)

Federal Reserve Entity	Type of model	Nowcast as of Sept. 12, 2018
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	3.1
New York	• Factor-augmented autoregressive model combination	3.4
	• Factor-augmented autoregressive model combination, financial factors only	1.9
	• Dynamic factor model	2.2
Cleveland	• Bayesian regressions with stochastic volatility	2.6
	• Tracking model	3.1
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	3.8
Chicago	• Dynamic factor models	3.2
	• Bayesian VARs	2.9
St. Louis	• Dynamic factor models	2.7
	• News index model	4.4
	• Let-the-data-decide regressions	2.7
Kansas City	• Accounting-based tracking estimate	3.5
Board of Governors	• Board staff's forecast (judgmental tracking model)	3.0
	• Monthly dynamic factor models (DFM-45)	3.6
	• Mixed-frequency dynamic factor model (DFM-BM)	2.6
Memo: Median of Federal Reserve System nowcasts		3.1

Alternative Measures of Slack

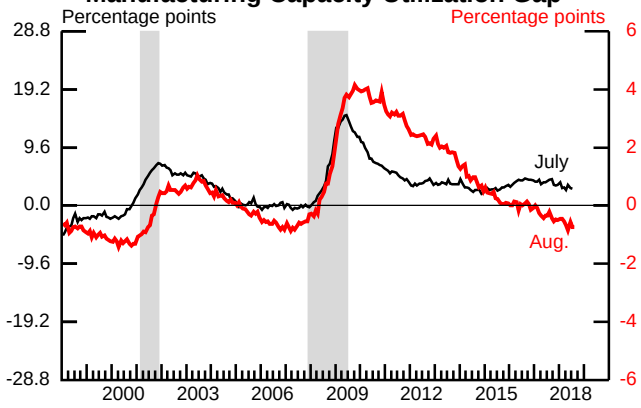
The red line in each panel is the staff's measure of the unemployment rate gap (right axis).

Output Gaps



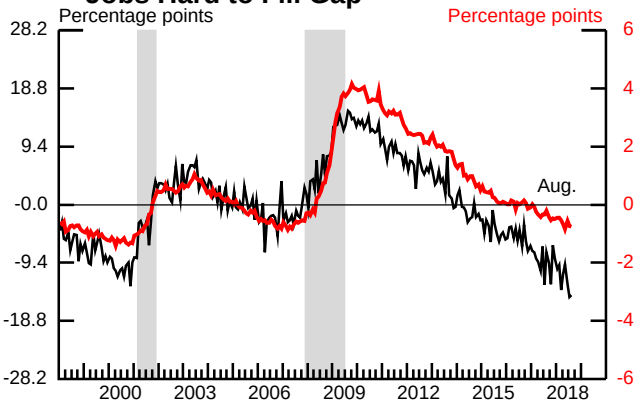
* EDO is Estimated, Dynamic, Optimization-based model.
Source: Federal Reserve Board; PRISM: Federal Reserve Board Bank of Chicago; Federal Reserve Board Bank of Philadelphia, PRISM Model Documentation (June 2011); FRBNY: Federal Reserve Bank of New York Staff Report 618 (May 2013, revised April 2014).

Manufacturing Capacity Utilization Gap*



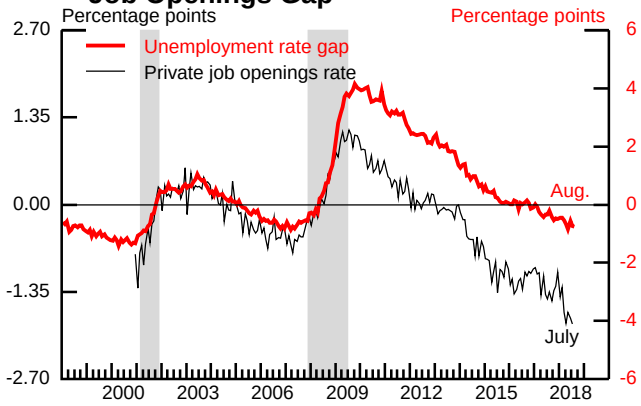
Source: Federal Reserve Board.

Jobs Hard to Fill Gap*



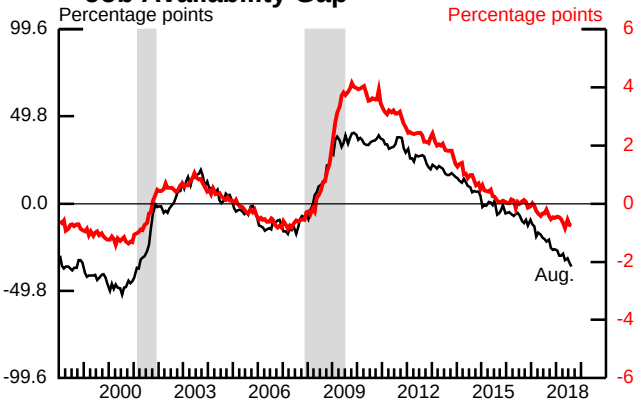
Note: Percent of small businesses surveyed with at least one "hard to fill" job opening. Seasonally adjusted by Federal Reserve Board Staff.
Source: National Federation of Independent Business, Small Business Economic Trends Survey.

Job Openings Gap*



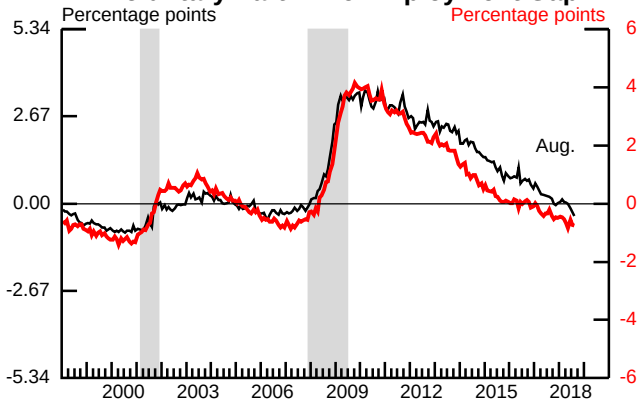
Note: Job openings rate is the number of job openings divided by employment plus job openings.
Source: Job Openings and Labor Turnover Survey; U.S. Department of Labor, Bureau of Labor Statistics, Current Employment Statistics; Conference Board, Help Wanted OnLine.

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.

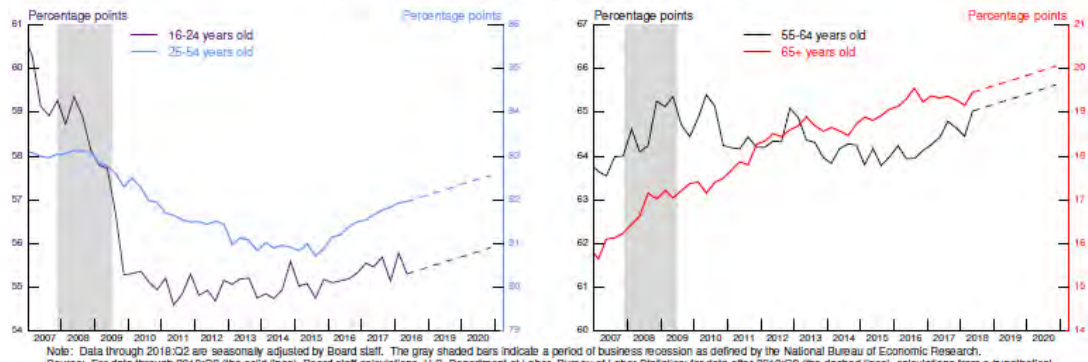
* Plots the negative of the gap to have the same sign as the unemployment rate gap.
Note: The shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research. Output gaps are multiplied by negative 0.52 to facilitate comparison with the unemployment rate gap. Manufacturing capacity utilization gap is constructed by subtracting its average rate from 1972 to 2013. Other gaps were constructed by subtracting each series' average in 2004:Q4 and 2005:Q1.

Sources of Strong Employment Growth in the Staff Forecast

The staff projects that the labor market will tighten further through the end of 2020, with payroll employment rising by nearly 5 million from 2018:Q2 to 2020:Q4—about 2 million more than our estimate of its neutral pace (the pace of job gains needed to maintain labor utilization at its current level).[1] With the labor market already quite tight, how might the strong job growth in the staff forecast be achieved?

The staff expects that about half of these job gains will come from further increases in the labor force. In particular, the labor force participation rate (LFPR) is projected to be about flat, on net, through the end of 2020 even as the staff's estimate of its trend declines almost 0.2 percentage point per year. The remainder of the above-trend job growth is manifest in a further 0.6 percentage point decline in the unemployment rate, to 3.2 percent by 2020:Q4. The important role played by the LFPR relative to the unemployment rate in the staff forecast contrasts with the typical pattern in which a greater portion of job gains are met by reductions in the unemployment rate and reflects the staff's judgment that unusually abundant job openings and rising wages will draw new workers into the labor force and discourage others from leaving.

Figure 1: Labor Force Participation Rates by Age Groups



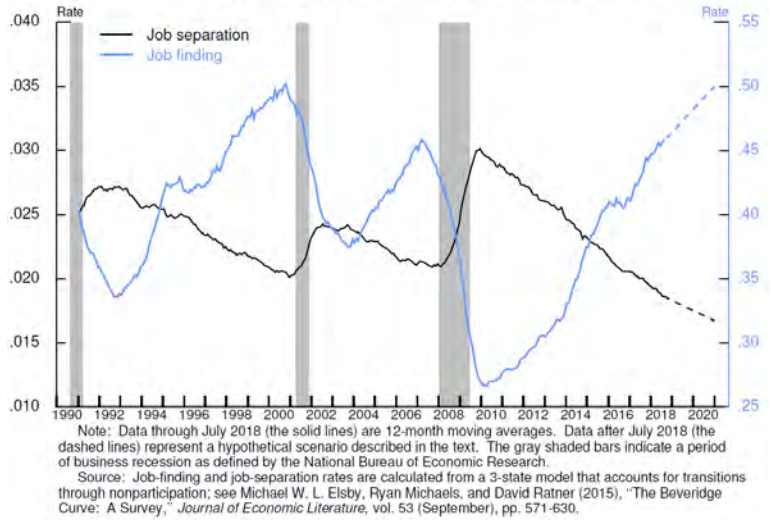
Note: Data through 2018:Q2 are seasonally adjusted by Board staff. The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
Source: For data through 2018:Q2 (the solid lines), Board staff calculations, U.S. Department of Labor, Bureau of Labor Statistics; for data after 2018:Q2 (the dashed lines), calculations from a hypothetical scenario as described in the text.

[1] The staff estimates that the neutral pace of payroll job gains through the medium term is roughly 95,000 per month. This estimate assumes that the unemployment rate remains at its 2018:Q2 value of 3.9 percent, that the LFPR declines in parallel with its trend (about 0.2 percentage point per year), and that the gains in employment as measured in the establishment survey exceed the gains in employment as measured in the household survey by about 15,000 per month (similar to the differential of the past few years and in the staff forecast through 2020).

together lead to a 3.2 percent unemployment rate in 2020:Q4. In this scenario, we assume that the recent pace of improvement in the job-finding and job-separation rates roughly continues through 2020.

Are these improvements in the job-finding and job-separation rates plausible? Because the job-finding rate is currently below the level seen during the late 1990s, it seems likely that at least some of the adjustment will come from the job-finding margin, as firms attempt to fill vacancies by relaxing job requirements and hiring standards, or offering training opportunities to less-qualified hires. Although the job-separation rate is already at a historical low, this low level may reflect structural as well cyclical factors.[4] Moreover, in previous tight labor markets such as the late 1990s, falling separation rates contributed importantly to declines in unemployment. We conclude that these improvements in job-finding and job-separation rates are indeed plausible.

Figure 2: Job-Finding and Job-Separation Rates



Note: Data through July 2018 (the solid lines) are 12-month moving averages. Data after July 2018 (the dashed lines) represent a hypothetical scenario described in the text. The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

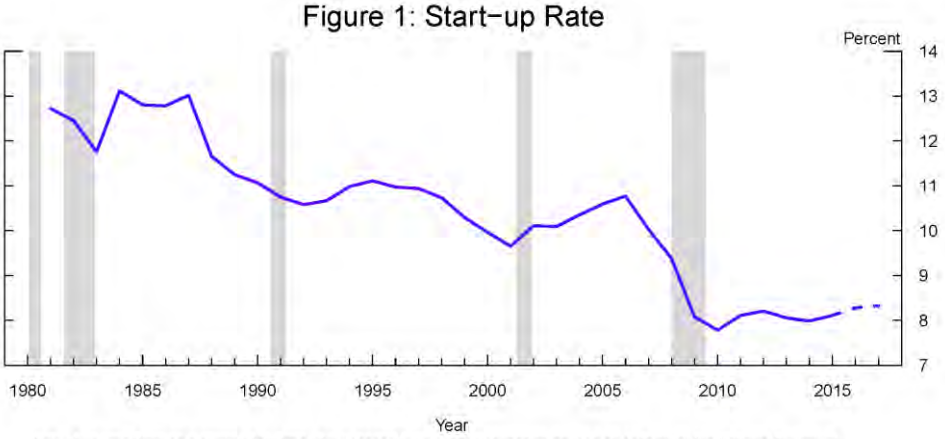
Source: Job-finding and job-separation rates are calculated from a 3-state model that accounts for transitions through nonparticipation; see Michael W. L. Elsby, Ryan Michaels, and David Ratner (2015), "The Beveridge Curve: A Survey," *Journal of Economic Literature*, vol. 53 (September), pp. 571-630.

[4] The declining labor force share of 16-to-24-year-olds (who have a higher-than-average job-separation rate) and the rising labor force share of college-educated workers (who have a lower-than-average job-separation rate) have exerted downward pressure on separation rates over the past few decades and will likely continue doing so.

Aggregate Implications of the Decline in Business Formation

The start-up rate of new businesses (the share of firms less than one year old) fell from about 13 percent in the early 1980s to about 8 percent in 2015, according to the Business Dynamics Statistics (BDS) data shown in figure 1. In part, the decline appears to reflect a longer-run downward trend in business formations that can be partially attributed to demographic change.[1] Moreover, there was also a steep decline in start-ups during the financial crisis that has yet to be reversed: The start-up rate declined more than 25 percent from 2006 to 2010, resulting in a "missing generation" of firms.[2]

Figure 1: Start-up Rate



Note: Age zero firms as a share of all firms. Gray shaded bars indicate recession periods as defined by the National Bureau of Economic Research.
Source: Census Bureau Business Dynamics Statistics (1981–2015). Author's estimates for 2016 and 2017 are based on Bureau of Labor Statistics Business Employment Dynamics.

While start-ups in any given year account for only about 3 percent of aggregate employment, research suggests that changes in new business formation have had important consequences for employment, real GDP, and productivity growth over time.[3] For example, state-level data from 1980 to 2013 indicate that a 1 percent increase in the start-up rate is associated with a contemporaneous increase in real GDP per capita of about 0.1 percent that persists over time. A 25 percent decline in start-ups would thus lead to a 2.5 percent decline in real GDP per capita.[4] Similarly, metropolitan areas with larger declines in business formation during the recession had more gradual recoveries in employment, output, and wages from 2010 to 2014 (figure 2).[5]

[1] See Fatih Karahan, Benjamin Pugsley, and Aysegul Sahin (2018), "Demographic Origins of the Startup Deficit," working paper, May.

[2] Start-ups, as well as young and small firms, were adversely affected by both the decline in aggregate demand and by a steep reduction in the supply of credit during the financial crisis. See, for example, Michael Siemer (forthcoming), "Employment Effects of Financial Constraints during the Great Recession," *Review of Economics and Statistics.*

[3] See, for example, Titan Alon, David Berger, Robert Dent, and Benjamin Pugsley (2018), "Older and Slower: The Startup Deficit's Lasting Effects on Aggregate Productivity Growth," *Journal of Monetary Economics,* vol. 93 (September), pp. 68–85.

[4] See François Gourio, Todd Messer, and Michael Siemer (2016), "Firm Entry and Macroeconomic Dynamics: A State-Level Analysis," *American Economic Review,* vol. 106 (May), pp. 214–18.

[5] The decline in business formation during the financial crisis predicts local employment per capita growth after the financial crisis even after controlling for a large number of other potential explanatory factors, such as the depth of the recession, the declines in house prices and small business lending during the recession, the

Figure 2: Employment Recovery and Change in Start-up Rates Across Metro Areas

Note: The markers for each metropolitan area indicate their relative size as measured by their population in 2007.
Source: Author's calculations based on Business Dynamics Statistics data.

With respect to the aggregate implications of the decline in business formation, a preliminary estimate suggests that if business formation had remained at its 2007 level, then more than 2 million additional jobs may have been created from 2010 to 2014.[6] The intuition behind this finding is that start-ups tend to grow faster than older firms and thus contribute significantly to both gross and net job creation.[7] Therefore, a "missing generation" of start-ups can have a persistent negative effect on the economy. Moreover, a new data set associated with recent research linking applications for employer identification numbers to future business formations suggests that business formation remained low through mid-2018.[8]

Economic research regarding the importance of business formation for economic growth is relatively new and rapidly evolving. Moreover, the above findings suggest that the lack of a substantial recovery in business formation may restrain future economic and productivity growth. What are the implications of the decline in business dynamism for monetary policymakers? The trend decline in business formation may point to ongoing slow growth in potential output that, in turn, will be associated with a low longer-run equilibrium level of the federal funds rate. Whether business formation indeed remains low is therefore one key point of uncertainty regarding the future performance of the economy.

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growth of the gig economy, and the size of new start-ups. Data on business formation at the metropolitan area level from the BDS are only available until 2014.

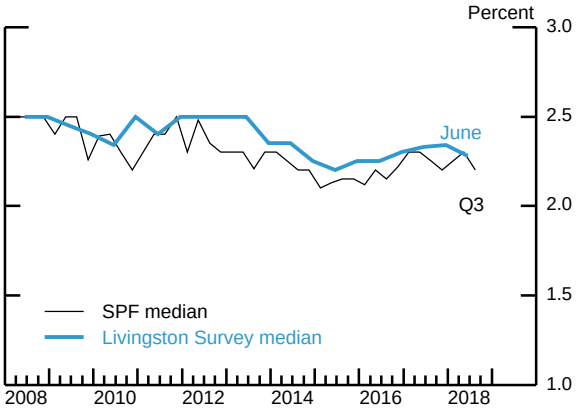
[6] This partial-equilibrium estimate takes into account that other aforementioned factors may have affected the economic recovery. The estimate does not take into account that, in the absence of the decline in business formation, other factors, such as wages and prices, would likely have adjusted.

[7] See John Haltiwanger, Ron S. Jarmin, and Javier Miranda (2013), "Who Creates Jobs? Small versus Large versus Young," *Review of Economics and Statistics*, vol. 95 (May), pp. 347–61.

[8] See Kimberly Bayard, Emin Dinlersoz, Timothy Dunne, John Haltiwanger, Javier Miranda, and John Stevens (2018), "Early-Stage Business Formation: An Analysis of Applications for Employer Identification Numbers," NBER Working Paper Series 24364 (Cambridge, Mass.: National Bureau of Economic Research, March), www.nber.org/papers/w24364; subsequent data updates available at https://www.census.gov/programs-surveys/bfs.html.

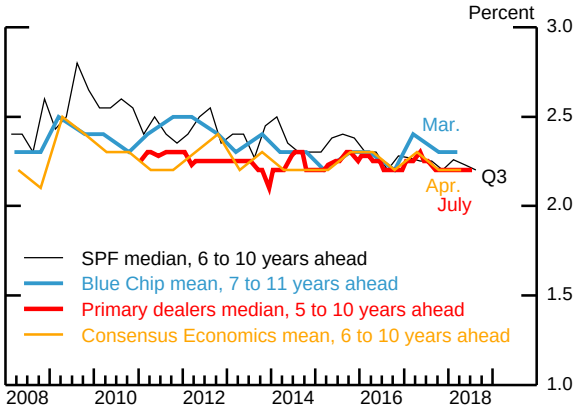
Survey Measures of Longer-Term Inflation Expectations

CPI Next 10 Years



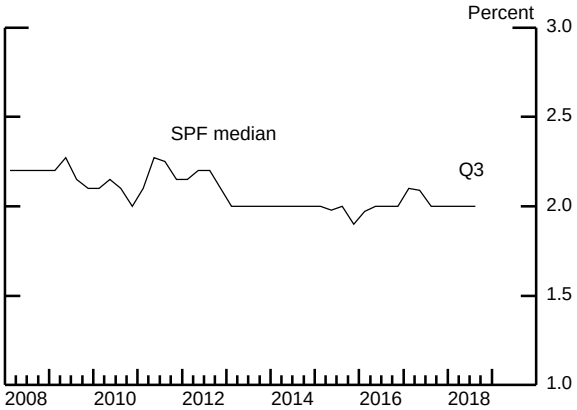
Note: SPF is Survey of Professional Forecasters.
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations



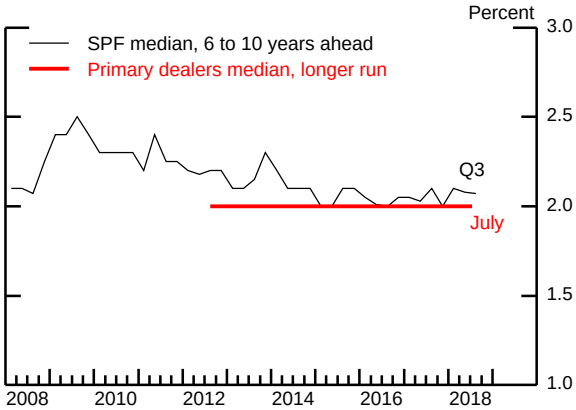
Source: Federal Reserve Bank of Philadelphia; Blue Chip Economic Indicators; Federal Reserve Bank of New York; Consensus Economics.

PCE Next 10 Years



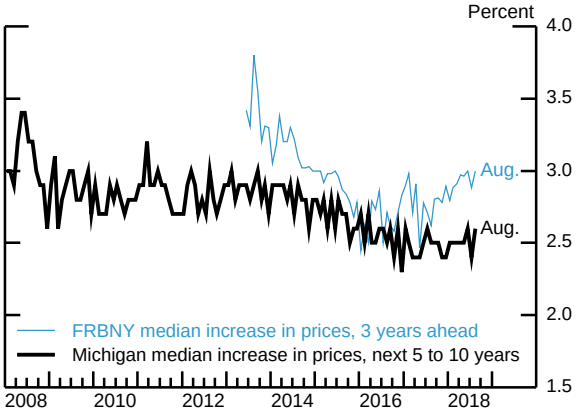
Source: Federal Reserve Bank of Philadelphia.

PCE Forward Expectations



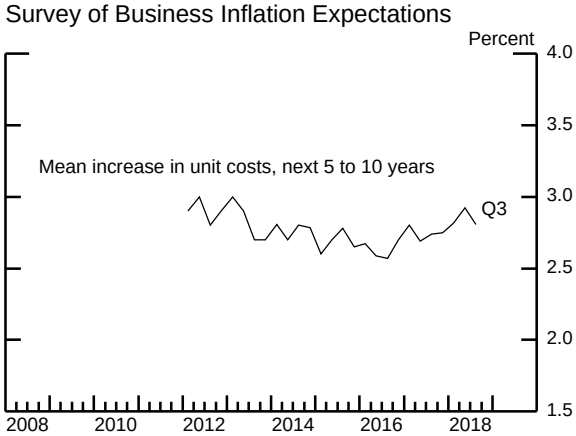
Note: Primary dealers data begin in August 2012.
Source: Federal Reserve Bank of Philadelphia; Federal Reserve Bank of New York.

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

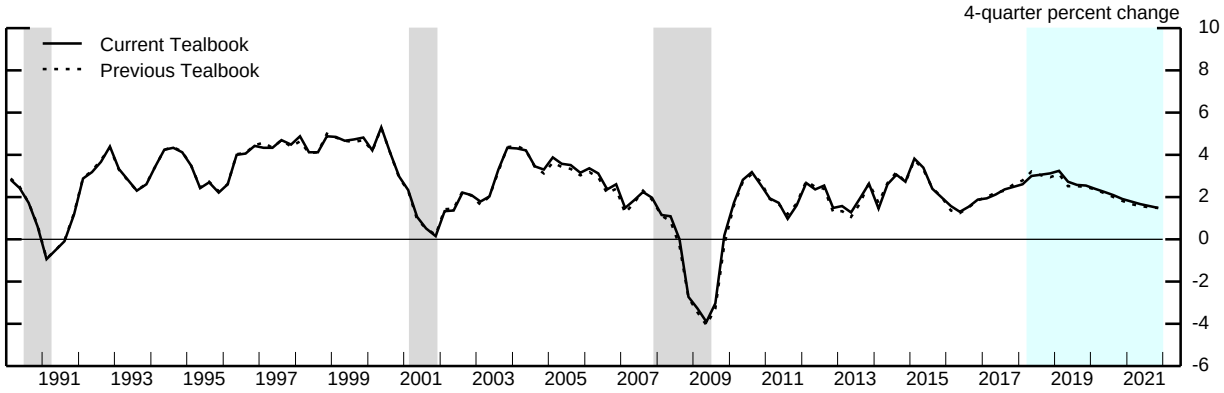


Note: Survey of businesses in the Sixth Federal Reserve District. Data begin in February 2012.
Source: Federal Reserve Bank of Atlanta.

Projections of Real GDP and Related Components
(Percent change at annual rate from final quarter of preceding period except as noted)

Measure	2017	2018		2018	2019	2020	2021
		H1	H2				
Real GDP	**2.5**	**3.4**	**2.8**	**3.1**	**2.5**	**1.9**	**1.5**
Previous Tealbook	2.6	3.4	2.5	2.9	2.5	1.8	1.5
Final sales	2.6	3.8	2.3	3.0	2.5	1.9	1.6
Previous Tealbook	2.9	3.4	2.4	2.9	2.5	1.8	1.6
Personal consumption expenditures	2.7	2.3	2.8	2.6	2.8	2.5	2.1
Previous Tealbook	2.8	2.1	2.7	2.4	2.6	2.3	2.0
Residential investment	3.8	-2.6	-1.2	-1.9	3.4	.4	1.3
Previous Tealbook	2.6	-1.2	-1.3	-1.2	2.3	.9	2.0
Nonresidential structures	2.9	14.1	3.9	8.9	2.5	.0	-1.8
Previous Tealbook	5.0	13.5	6.6	10.0	2.4	.4	-1.6
Equipment and intangibles	7.3	9.1	6.4	7.7	4.2	2.2	1.7
Previous Tealbook	6.7	6.6	6.2	6.4	4.2	2.0	2.3
Federal purchases	1.3	3.2	2.5	2.8	3.1	2.8	1.3
Previous Tealbook	1.0	3.6	1.1	2.4	4.0	3.0	1.6
State and local purchases	-.5	1.3	.7	1.0	1.0	1.0	1.0
Previous Tealbook	.5	1.4	.8	1.1	1.0	1.0	1.0
Exports	4.7	6.2	1.3	3.7	2.9	2.8	2.7
Previous Tealbook	5.0	7.4	2.0	4.7	3.6	2.6	2.6
Imports	5.4	1.2	4.7	3.0	4.8	4.2	3.5
Previous Tealbook	4.7	2.2	4.1	3.2	4.9	4.3	3.6
	Contributions to change in real GDP (percentage points)						
Inventory change	-.1	-.3	.4	.1	.0	.0	-.1
Previous Tealbook	-.3	.0	.1	.1	.0	.0	-.1
Net exports	-.2	.6	-.5	.0	-.4	-.3	-.2
Previous Tealbook	-.1	.6	-.4	.1	-.3	-.3	-.2

Real GDP

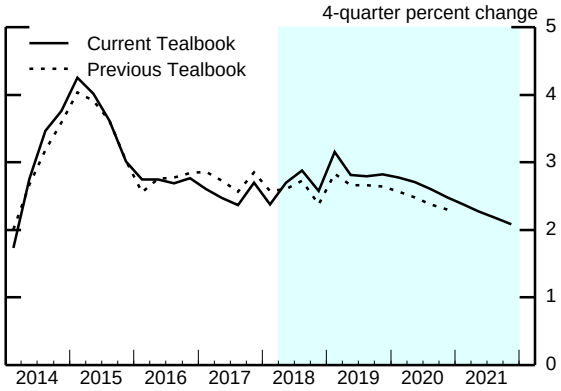


Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

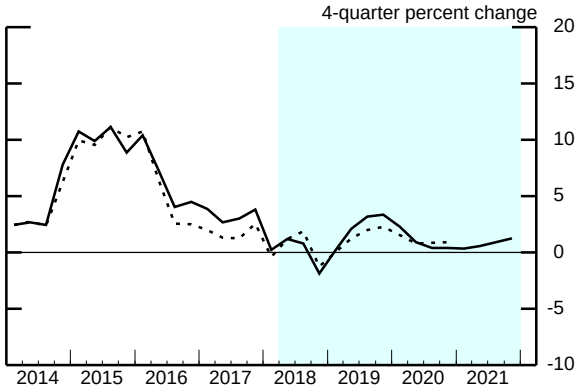
Domestic Econ Devel & Outlook

Components of Final Demand

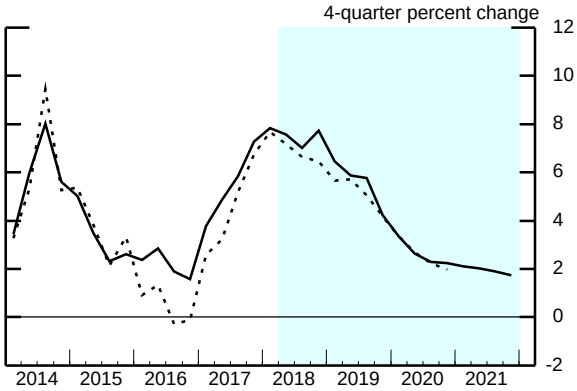
Personal Consumption Expenditures



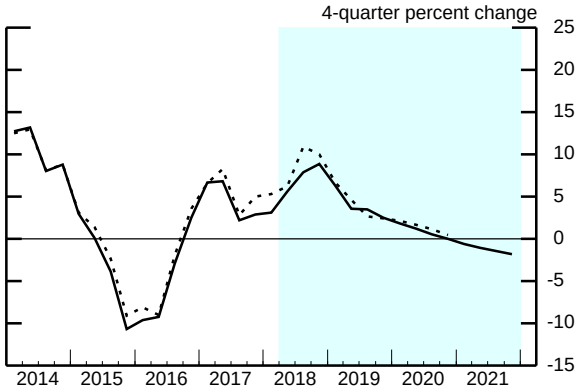
Residential Investment



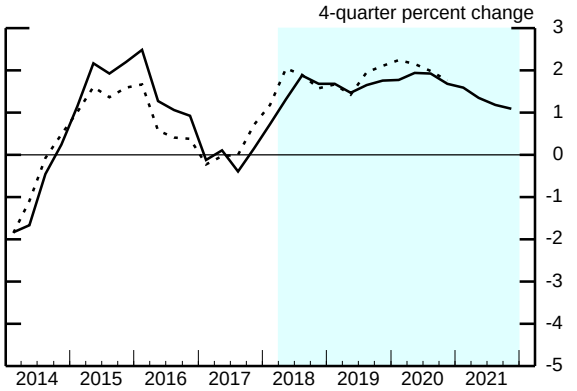
Equipment and Intangibles



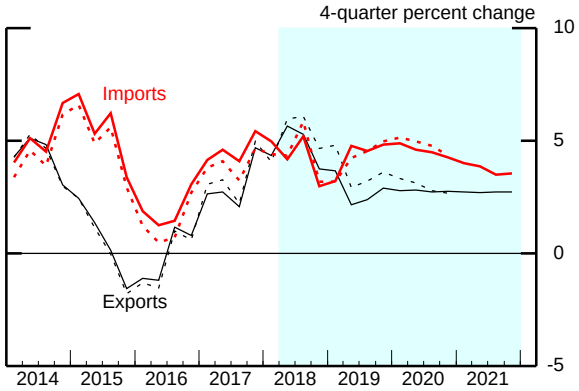
Nonresidential Structures



Government Consumption and Investment



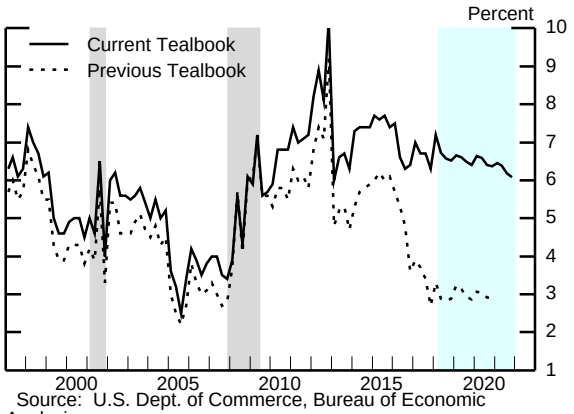
Exports and Imports



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

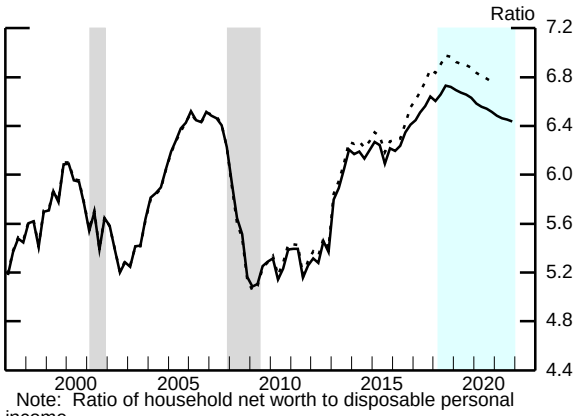
Aspects of the Medium-Term Projection

Personal Saving Rate



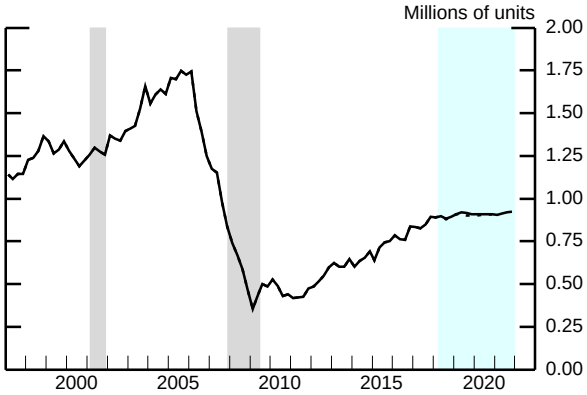
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Wealth-to-Income Ratio



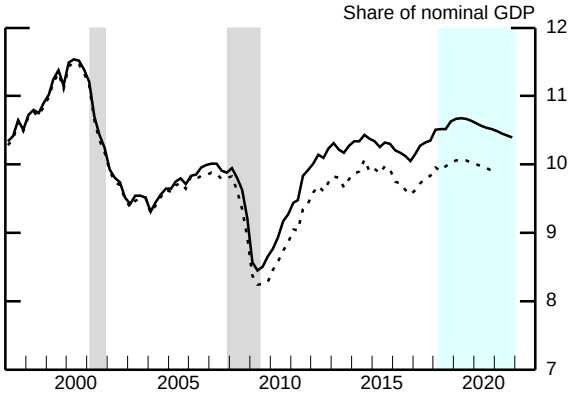
Note: Ratio of household net worth to disposable personal income.
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Single-Family Housing Starts



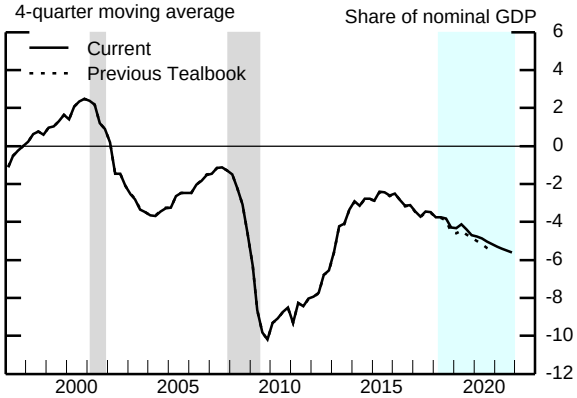
Source: U.S. Census Bureau.

Equipment and Intangibles Spending



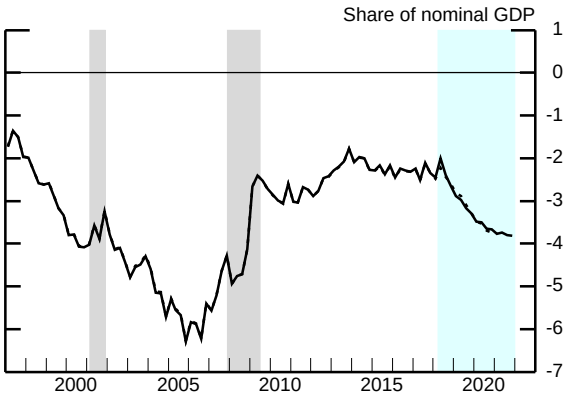
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Federal Surplus/Deficit



Source: *Monthly Treasury Statement.*

Current Account Surplus/Deficit



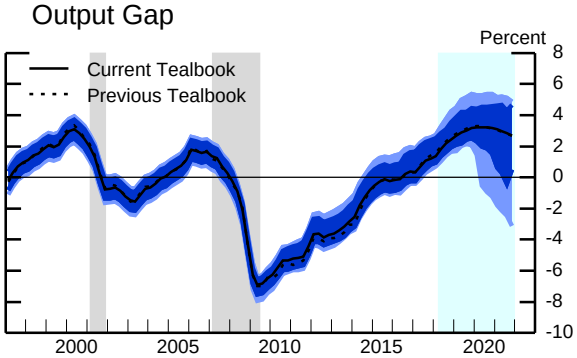
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

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

Domestic Econ Devel & Outlook

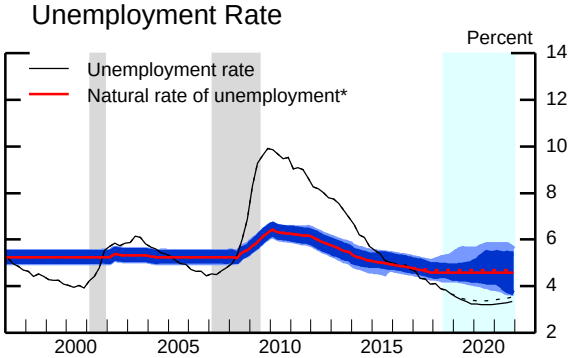
Cyclical Position of the U.S. Economy: Longer-Term Perspective

Output Gap



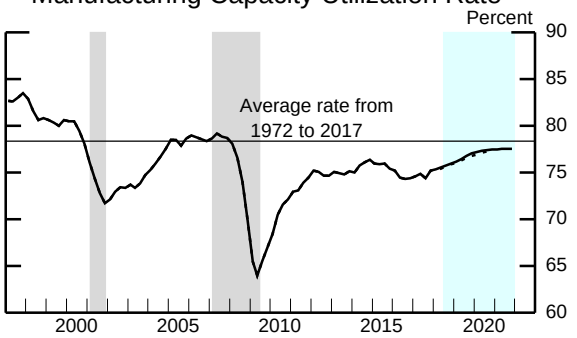
Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.

Unemployment Rate



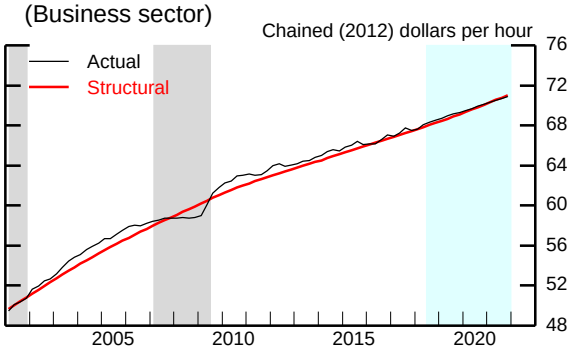
Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the natural rate.
*Staff estimate including the effect of EEB.
Source: Various macroeconomic data; staff assumptions.

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	1.6	1.7	1.8	1.9	1.9
Previous Tealbook	3.1	3.5	2.7	1.8	1.4	1.5	1.7	1.8	1.9	1.9
Selected contributions[1]										
Structural labor productivity[2]	1.7	2.9	2.7	1.8	1.2	1.2	1.2	1.3	1.4	1.4
Previous Tealbook	1.7	3.0	2.7	1.7	1.0	1.1	1.2	1.3	1.4	...
Capital deepening	.7	1.4	1.0	.5	.8	.7	.7	.8	.7	.6
Multifactor productivity	.8	1.1	1.4	1.1	.2	.3	.3	.3	.5	.6
Structural hours	1.5	1.3	.8	.4	.4	.3	.7	.6	.6	.5
Previous Tealbook	1.6	1.0	.8	.4	.5	.2	.7	.6	.6	...
Labor force participation	.4	-.1	-.2	-.5	-.5	-.3	-.3	-.2	-.2	-.2
Previous Tealbook	.4	-.1	-.2	-.5	-.5	-.3	-.3	-.2	-.2	...
Memo:										
Output gap[3]	-1.2	2.5	.3	-5.3	.4	1.2	2.4	3.2	3.2	2.7
Previous Tealbook	-1.5	2.5	.2	-5.5	.3	1.4	2.6	3.3	3.1	2.7

... Not applicable.
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	2017	2018		2018	2019	2020	2021
		H1	H2				
Nonfarm payroll employment[1]	183	218	183	200	177	129	85
Previous Tealbook	183	215	200	207	171	133	...
Private employment[1]	180	215	179	197	166	119	75
Previous Tealbook	180	213	193	203	160	123	...
Labor force participation rate[2]	62.7	62.8	62.8	62.8	62.9	62.8	62.6
Previous Tealbook	62.7	62.8	62.8	62.8	62.8	62.8	...
Civilian unemployment rate[2]	4.1	3.9	3.7	3.7	3.3	3.2	3.4
Previous Tealbook	4.1	3.9	3.7	3.7	3.4	3.4	3.6
Employment to population ratio[2]	60.1	60.4	60.5	60.5	60.8	60.8	60.5
Previous Tealbook	60.1	60.4	60.5	60.5	60.6	60.6	...

... Not applicable.
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

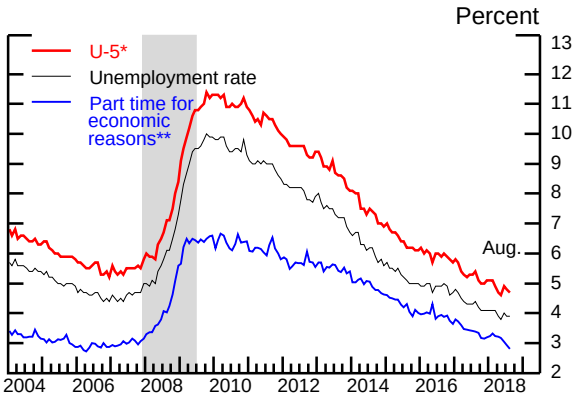
Measure	2017	2018		2018	2019	2020	2021
		H1	H2				
Percent change at annual rate from final quarter of preceding period							
PCE chain-weighted price index	1.8	2.2	1.8	2.0	1.9	2.0	2.0
Previous Tealbook	1.7	2.2	1.6	1.9	1.9	2.0	2.0
Food and beverages	.7	.7	1.3	1.0	2.4	2.6	2.3
Previous Tealbook	.7	.7	1.7	1.2	2.4	2.6	...
Energy	8.1	6.5	6.4	6.5	-.5	-1.2	-.8
Previous Tealbook	7.6	6.5	.9	3.7	-.4	-1.0	...
Excluding food and energy	1.6	2.1	1.6	1.9	2.0	2.1	2.1
Previous Tealbook	1.5	2.1	1.6	1.9	2.0	2.1	2.1
Prices of core goods imports[1]	1.1	1.6	-1.5	.0	.6	.8	.7
Previous Tealbook	1.3	2.1	-1.3	.4	.5	.7	...
	June 2018	July 2018	Aug. 2018[2]	Sept. 2018[2]	Oct. 2018[2]	Nov. 2018[2]	Dec. 2018[2]
12-month percent change							
PCE chain-weighted price index	2.3	2.3	2.2	2.0	2.0	2.0	2.0
Previous Tealbook	2.3	2.3	2.2	1.9	1.9	1.9	1.9
Excluding food and energy	1.9	2.0	1.9	1.9	1.8	1.9	1.9
Previous Tealbook	1.9	1.9	1.9	1.9	1.8	1.9	1.9

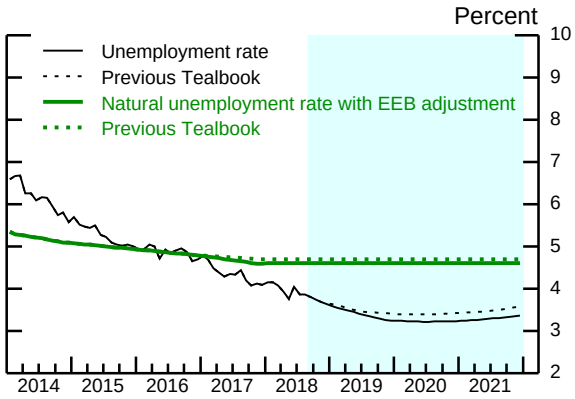
... Not applicable.
1. Core goods imports exclude computers, semiconductors, oil, and natural gas.
2. Staff forecast.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Domestic Econ Devel & Outlook

Labor Market Developments and Outlook (1)

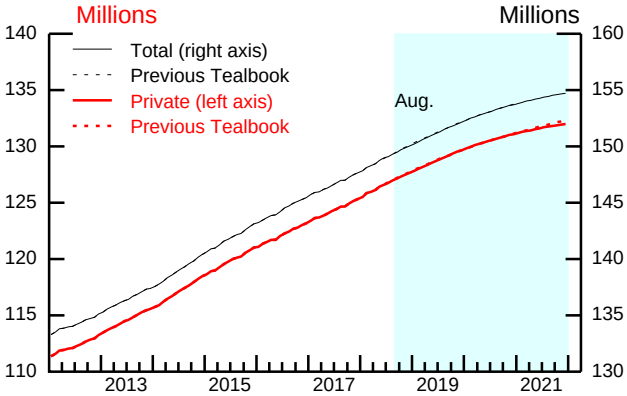
Measures of Labor Underutilization





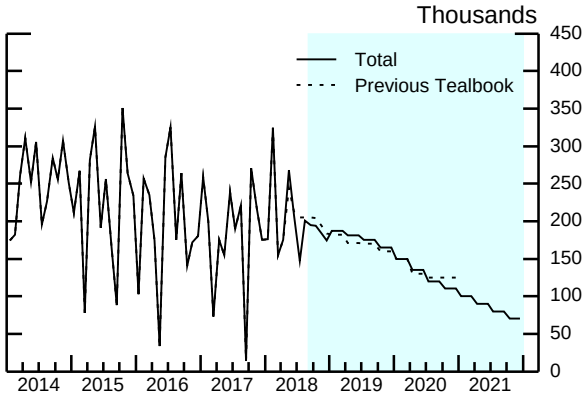
* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.
** Percent of Current Population Survey employment.
EEB Extended and emergency unemployment benefits.
Source: U.S. Department of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

Level of Payroll Employment



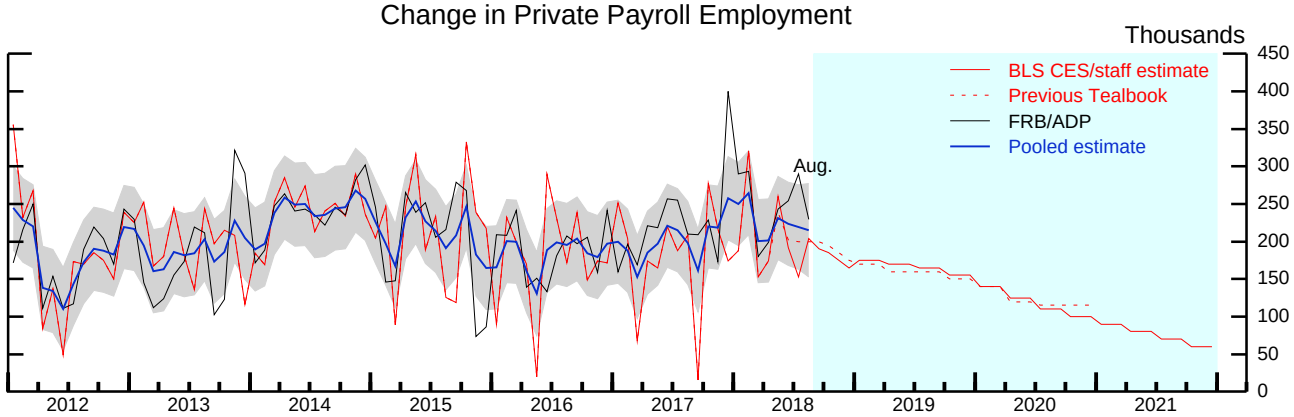
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Change in Total Payroll Employment



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

Change in Private Payroll Employment

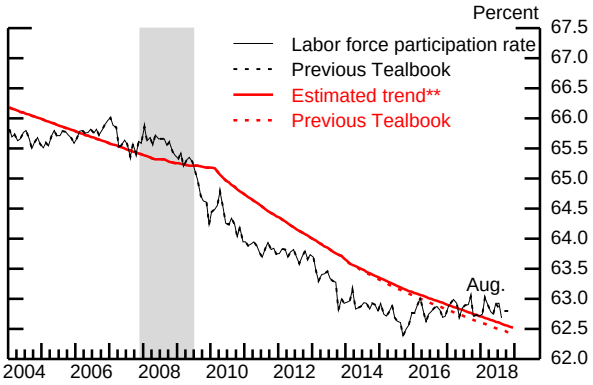


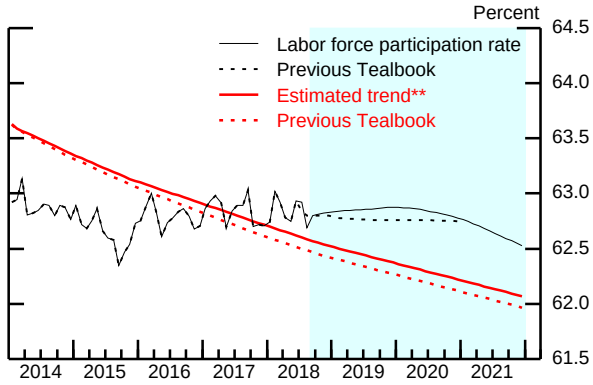
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff calculations using microdata from ADP.
Note: Gray shaded area around blue line is 90 percent confidence interval around pooled estimate.

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)

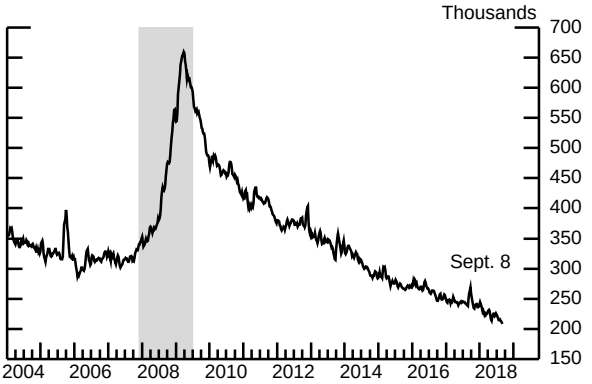
Labor Force Participation Rate*





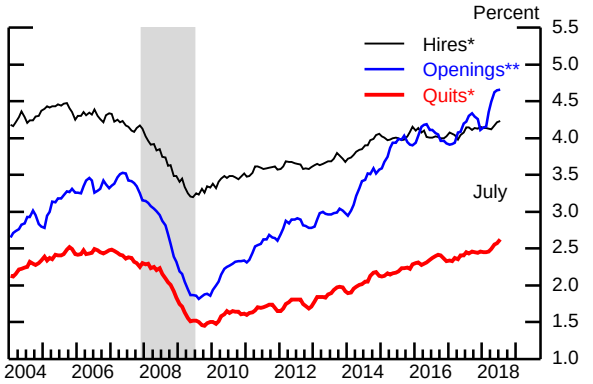
* Published data adjusted by staff to account for changes in population weights.
** Includes staff estimate of the effect of extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Initial Unemployment Insurance Claims*



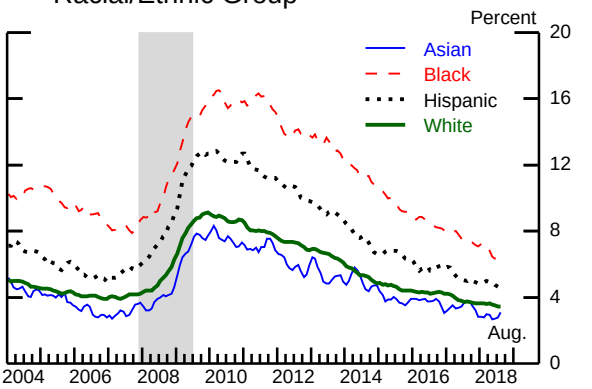
* 4-week moving average.
Source: U.S. Department of Labor, Employment and Training Administration.

Hires, Quits, and Job Openings



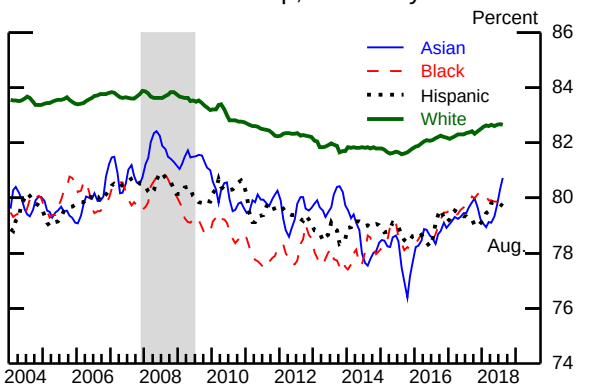
* Percent of private nonfarm payroll employment, 3-month moving average.
** Percent of private nonfarm payroll employment plus unfilled jobs, 3-month moving average.
Source: Job Openings and Labor Turnover Survey.

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

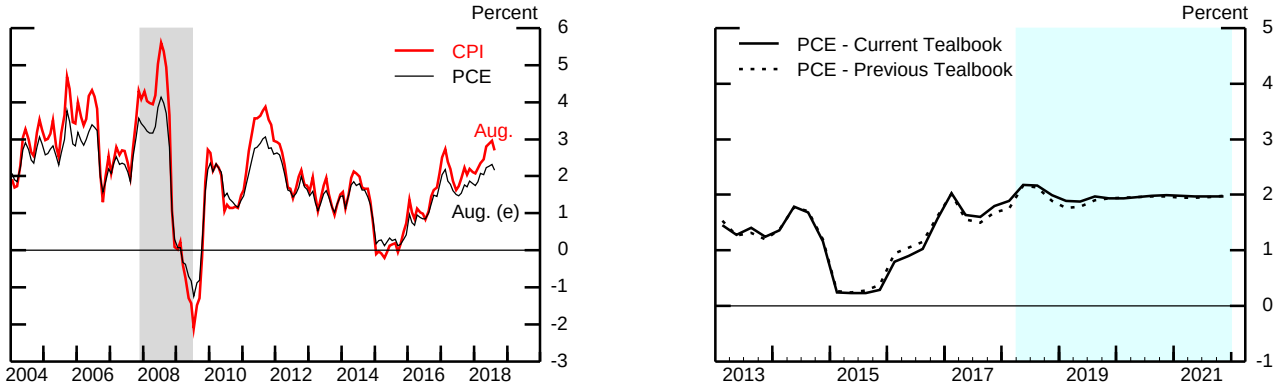


Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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

Inflation Developments and Outlook (1)

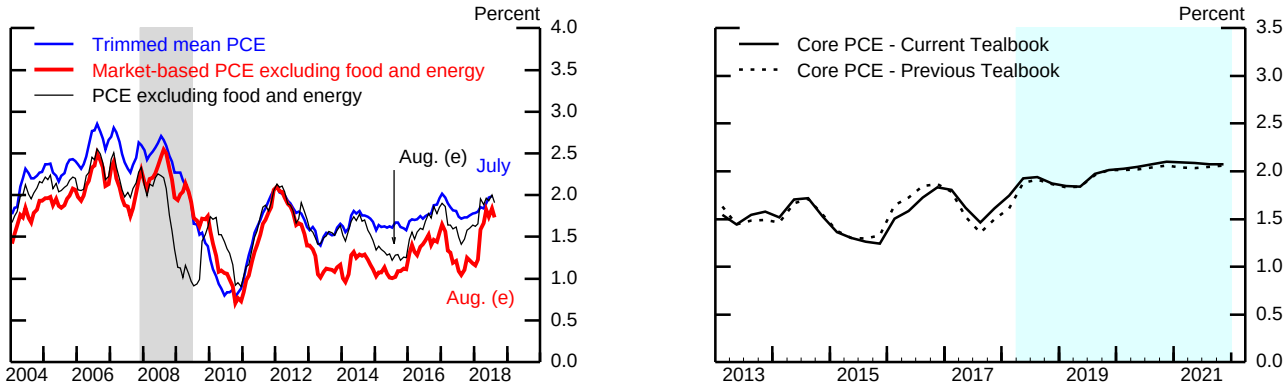
(Percent change from year-earlier period)

Headline Consumer Price Inflation



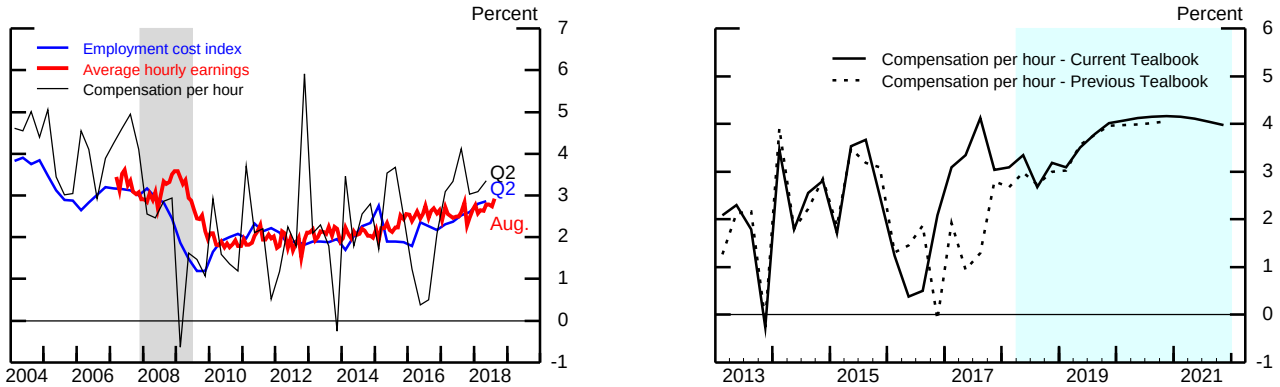
Note: PCE prices from April to August 2018 are staff estimates (e).
Source: For CPI, U.S. Department of Labor, Bureau of Labor Statistics; for PCE, U.S. Department of Commerce, Bureau of Economic Analysis.

Measures of Underlying PCE Price Inflation



Note: Core PCE prices from April to August 2018 are staff estimates (e).
Source: For trimmed mean PCE, Federal Reserve Bank of Dallas; otherwise, U.S. Department of Commerce, Bureau of Economic Analysis.

Labor Cost Growth



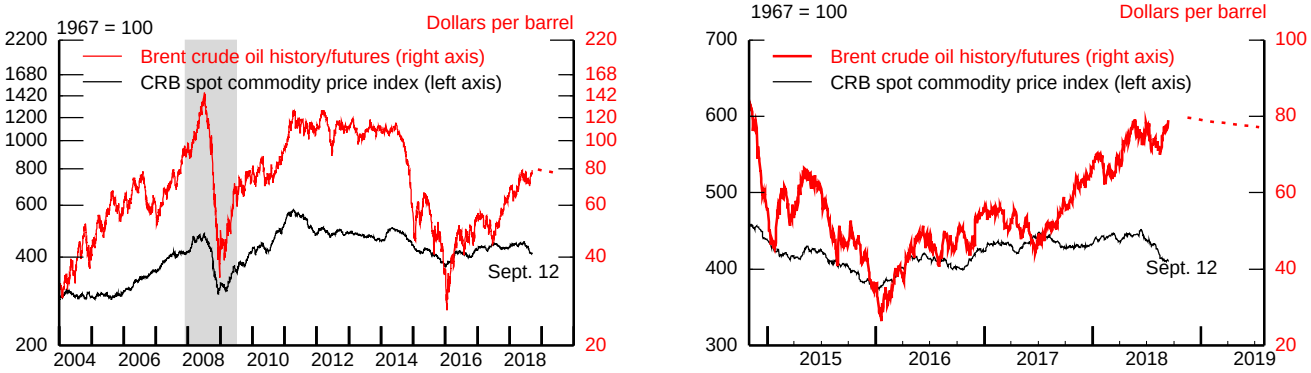
Note: Compensation per hour is for the business sector. Average hourly earnings are for the private nonfarm sector. The employment cost index is for the private sector.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

Inflation Developments and Outlook (2)

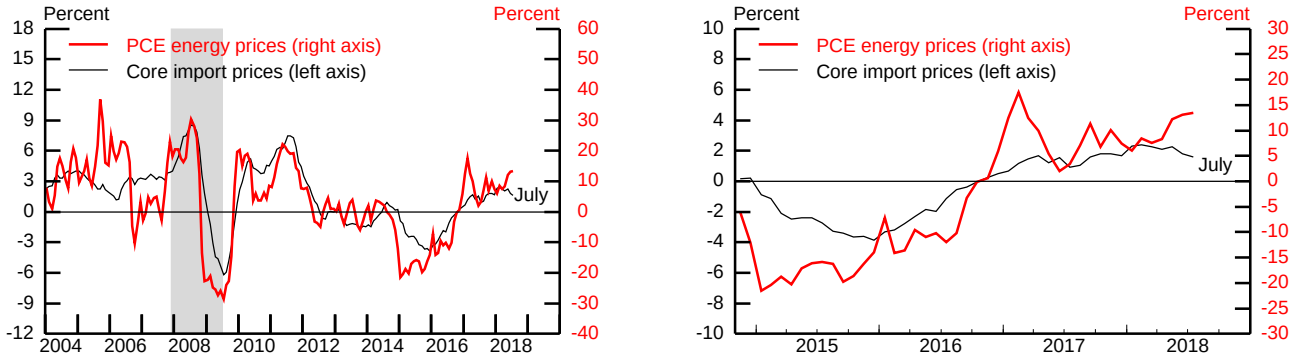
(Percent change from year-earlier period, except as noted)

Commodity and Oil Price Levels



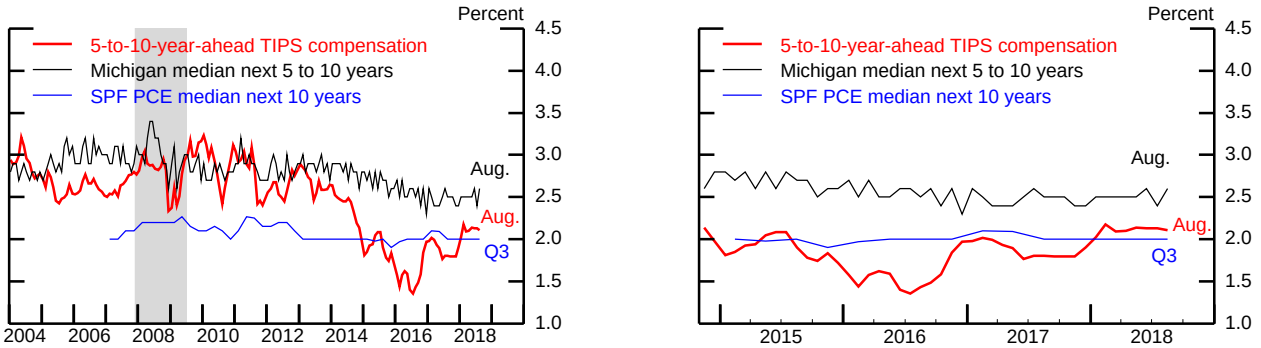
Note: Futures prices (dotted lines) are the latest observations on monthly futures contracts.
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

Energy and Import Price Inflation



Source: For core import prices, U.S. Dept. of Labor, Bureau of Labor Statistics; for PCE, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Long-Term Inflation Expectations and Compensation



Note: Based on a comparison of an estimated TIPS (Treasury Inflation-Protected Securities) yield curve with an estimated nominal off-the-run Treasury yield curve, with an adjustment for the indexation-lag effect.
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.

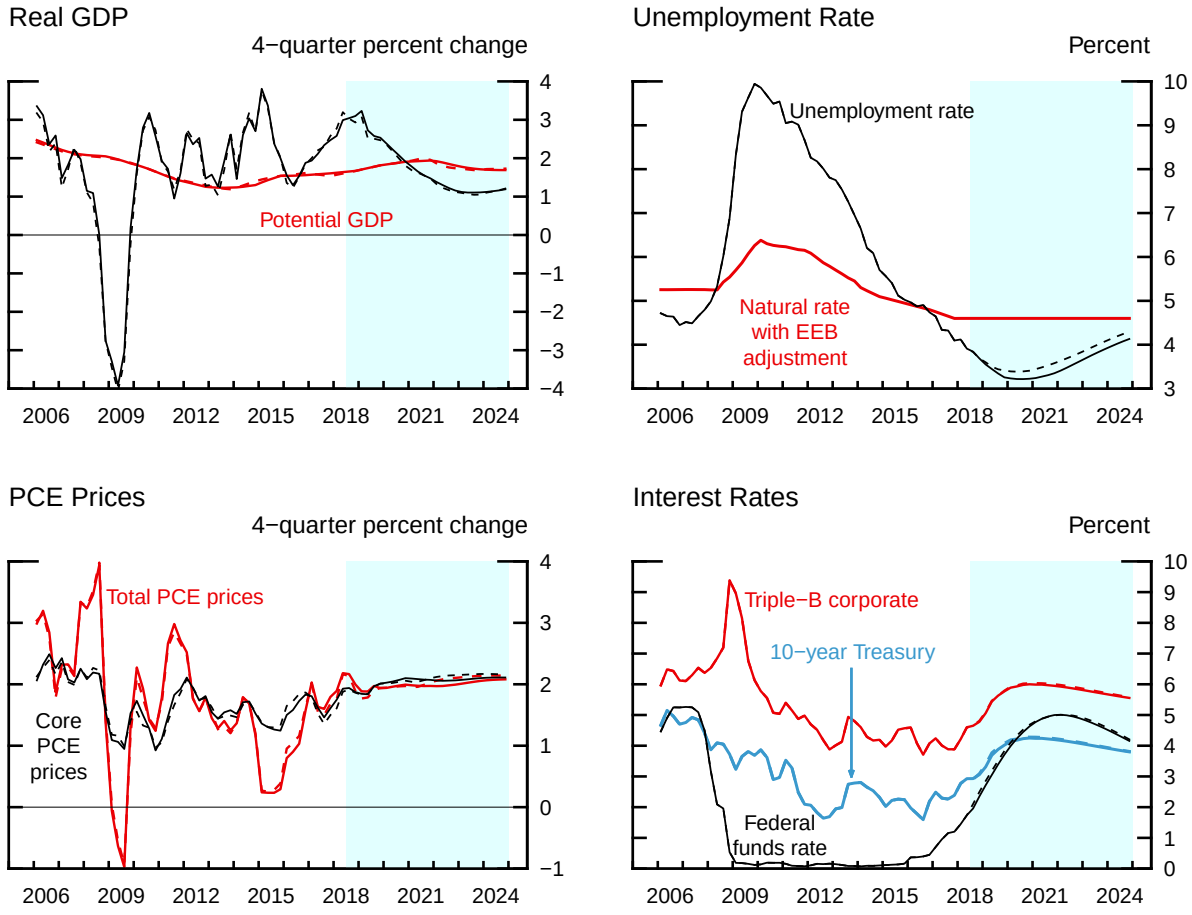
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

The Long−Term Outlook

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

Measure	2018	2019	2020	2021	2022	2023	2024	Longer run
Real GDP	3.1	2.5	1.9	1.5	1.2	1.1	1.2	1.7
Previous Tealbook	2.9	2.5	1.8	1.5	1.1	1.1	1.2	1.7
Civilian unemployment rate[1]	3.7	3.3	3.2	3.3	3.6	3.9	4.1	4.6
Previous Tealbook	3.7	3.4	3.4	3.6	3.8	4.1	4.3	4.7
PCE prices, total	2.0	1.9	2.0	2.0	2.0	2.1	2.1	2.0
Previous Tealbook	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.0
Core PCE prices	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.0
Previous Tealbook	1.9	2.0	2.1	2.1	2.1	2.2	2.2	2.0
Federal funds rate[1]	2.35	3.71	4.63	5.00	4.90	4.57	4.16	2.50
Previous Tealbook	2.50	3.83	4.68	4.99	4.94	4.63	4.21	2.50
10-year Treasury yield[1]	3.1	4.0	4.3	4.2	4.1	3.9	3.8	3.4
Previous Tealbook	3.1	4.1	4.3	4.2	4.1	4.0	3.8	3.4

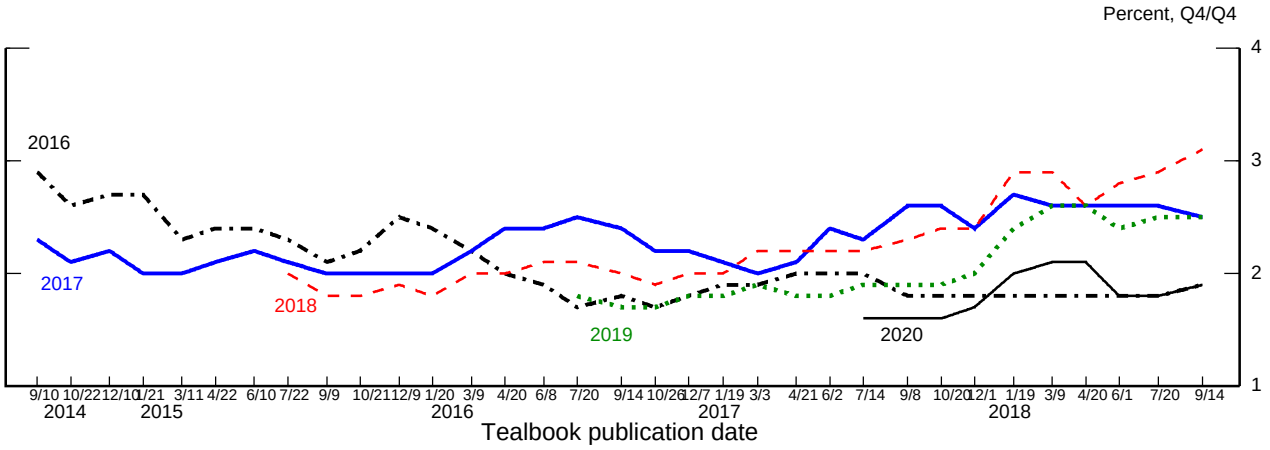
1. Percent, average for the final quarter of the period.



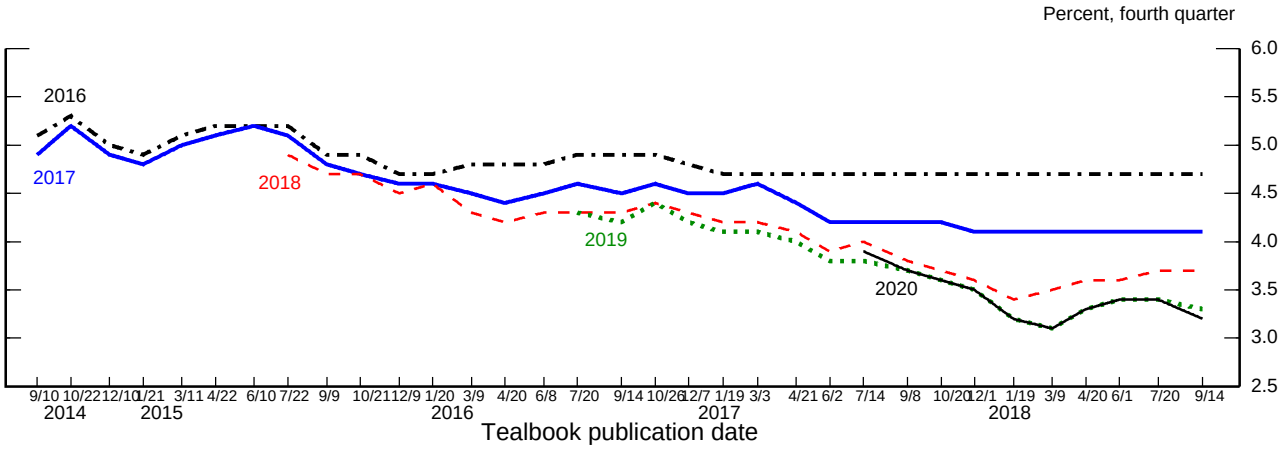
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

Evolution of the Staff Forecast

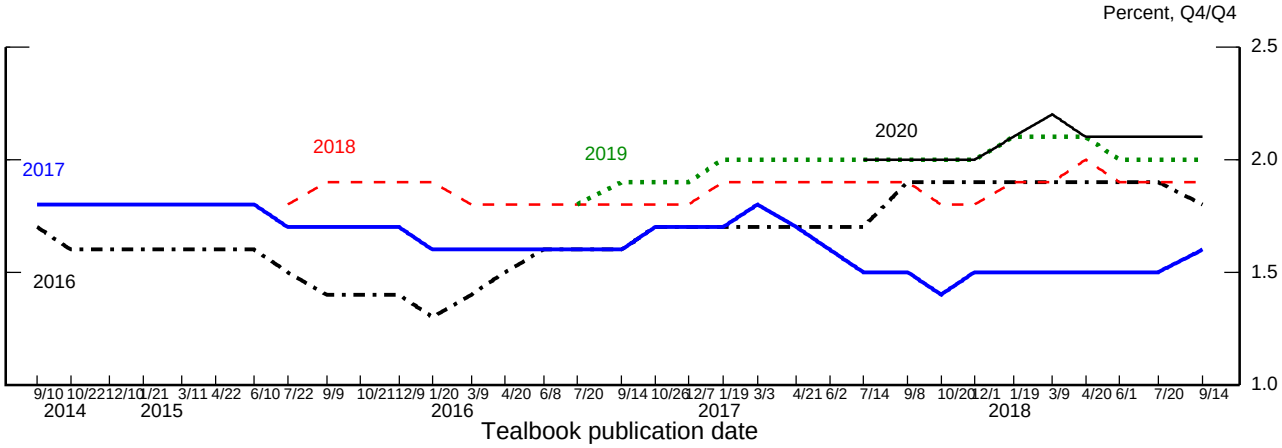
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy

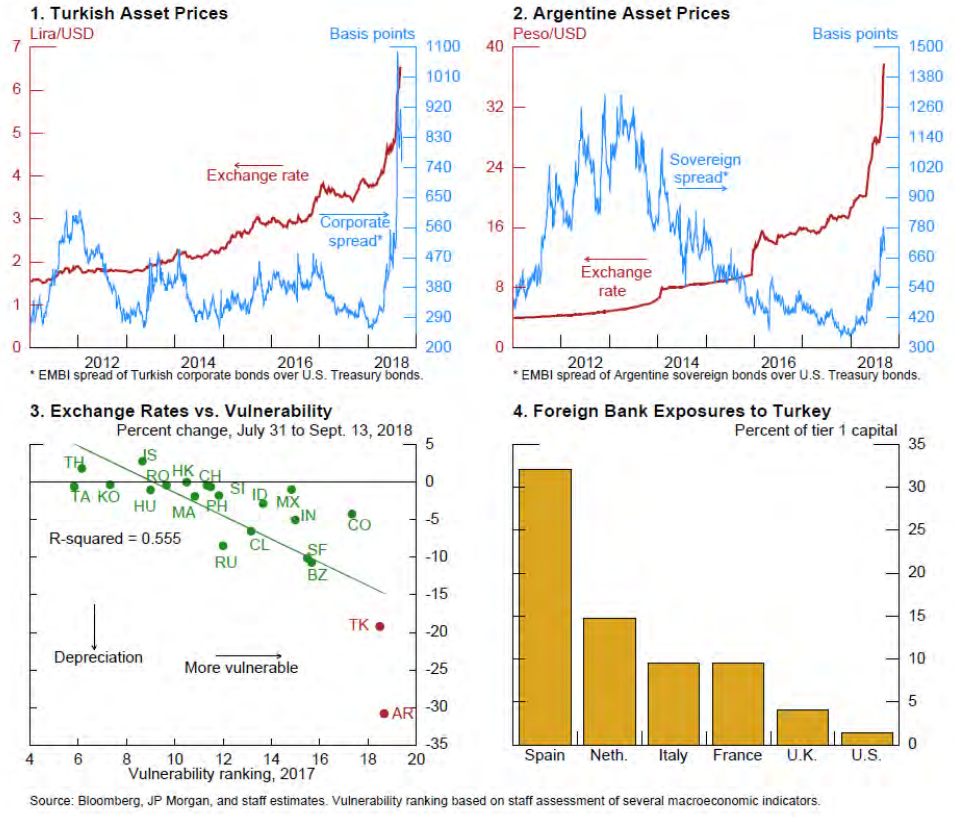


bitter history with global financial markets. As with Turkey, we see Argentina continuing to struggle, its situation complicated by the prospect of popular opposition to austerity ahead of next year's elections.

Financial conditions in other vulnerable economies have also come under pressure. For example, the currencies of Brazil, India, and South Africa have depreciated significantly in recent weeks. However, investors still appear to be differentiating across EMEs in line with their relative macroeconomic vulnerabilities (panel 3).

Despite the grave outlook for Turkey and Argentina, we see limited spillovers to the United States. Direct exposures of U.S. financial institutions to these countries are small, and the real-economy links are limited. Combined, Turkey and Argentina account for about 1 percent of U.S. total exports; U.S. banks' exposures to Turkey represent only 1½ percent of tier 1 capital, and their exposure to Argentina is negligible. Some European banks have larger credit exposures to Turkey (panel 4), and European bank stocks have suffered as a consequence, but these exposures appear to be manageable.

That said, there is some risk that in the context of global policy normalization, further deterioration in these two economies or elsewhere could cause more widespread stress in EMEs. Were these developments to transpire, there could be significant adverse repercussions for the U.S. economy, as discussed in the "EME Turbulence and Stronger Dollar" alternative scenario. Moreover, the instability in Turkey poses geopolitical risks. A further worsening in its relations with the West could damage the cooperation between the European Union and Turkey on the more than 3 million Syrian refugees Turkey has been hosting. A potential flow of refugees to Europe could, in turn, intensify political divisions there.



The Foreign GDP Outlook

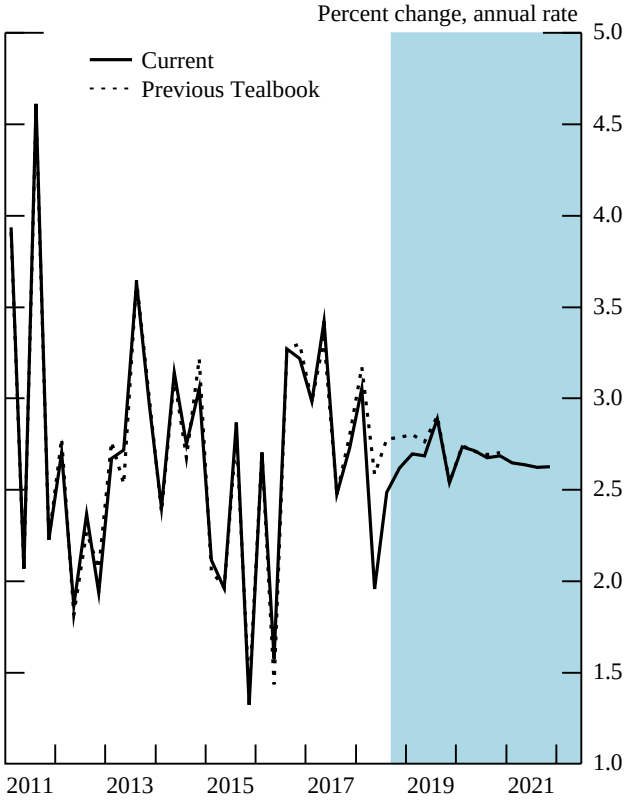
Real GDP* — Percent change, annual rate

	2017	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019	2020	2021
1. Total Foreign	2.9	3.1	2.0	2.5	2.6	2.7	2.7	2.6
Previous Tealbook	2.9	3.2	2.6	2.8	2.8	2.8	2.7	...
2. Advanced Foreign Economies	2.6	1.4	2.4	1.7	1.7	1.7	1.7	1.7
Previous Tealbook	2.6	1.3	2.0	1.9	1.9	1.7	1.7	...
3. Canada	3.0	1.4	2.9	1.8	2.1	2.2	1.8	1.8
4. Euro Area	2.7	1.6	1.5	1.6	1.5	1.5	1.6	1.6
5. Japan	2.0	-.9	3.0	.9	.7	.1	.8	.8
6. United Kingdom	1.3	.9	1.5	1.7	1.7	1.7	1.7	1.6
7. Emerging Market Economies	3.2	4.7	1.6	3.3	3.5	3.7	3.7	3.6
Previous Tealbook	3.2	5.1	3.2	3.6	3.7	3.7	3.7	...
8. China	6.8	7.2	6.5	6.1	6.3	6.2	5.9	5.7
9. Emerging Asia ex. China	4.1	5.5	2.5	3.6	3.8	3.7	3.7	3.5
10. Mexico	1.6	4.0	-.6	2.3	2.6	2.8	2.9	2.9
11. Brazil	2.1	.6	.7	3.5	2.3	2.6	2.8	2.8

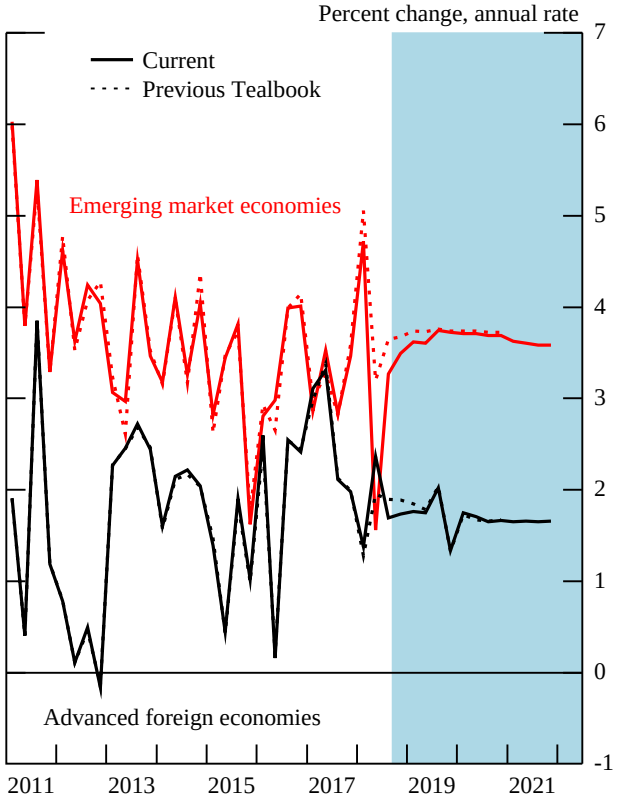
* GDP aggregates weighted by shares of U.S. merchandise exports.
... indicates not applicable. This is the first time we have included a Tealbook forecast for 2021.

Int'l Econ Devel & Outlook

Total Foreign GDP



Foreign GDP



The Foreign Inflation Outlook

Consumer Prices* — Percent change, annual rate

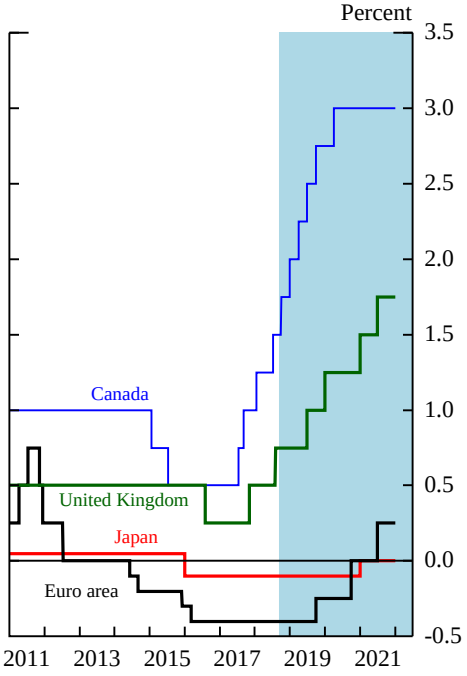
	2017	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019	2020	2021
1. Total Foreign	2.6	2.7	1.7	3.5	2.7	2.7	2.4	2.4
Previous Tealbook	2.6	2.6	1.6	2.7	2.5	2.5	2.4	...
2. Advanced Foreign Economies	1.5	2.6	1.0	2.3	1.8	1.9	1.7	1.7
Previous Tealbook	1.5	2.6	1.0	1.8	1.6	1.8	1.7	...
3. Canada	1.8	3.6	1.1	2.9	2.4	2.3	2.1	2.0
4. Euro Area	1.4	2.1	2.1	2.5	1.7	1.4	1.5	1.7
5. Japan	.6	2.5	-2.3	1.3	1.0	2.3	1.0	1.1
6. United Kingdom	3.0	2.4	1.9	2.5	2.5	2.4	2.2	2.1
7. Emerging Market Economies	3.4	2.7	2.2	4.4	3.3	3.2	3.0	2.9
Previous Tealbook	3.4	2.6	2.1	3.4	3.1	3.0	3.0	...
8. China	1.8	1.5	.7	3.8	2.5	2.5	2.5	2.5
9. Emerging Asia ex. China	2.3	2.2	1.4	1.6	2.8	3.1	3.0	3.0
10. Mexico	6.6	4.1	3.8	6.6	3.6	3.4	3.2	3.2
11. Brazil	2.8	3.1	4.3	6.3	3.4	4.3	4.3	4.3

* CPI aggregates weighted by shares of U.S. non-oil imports.
... indicates not applicable. This is the first time we have included a Tealbook forecast for 2021.

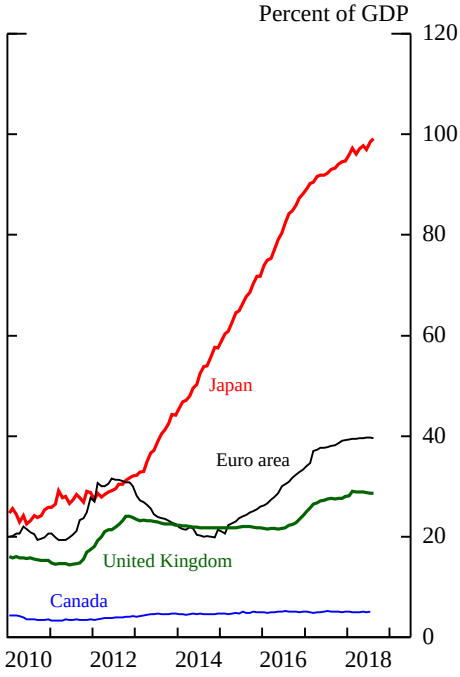
Int'l Econ Devel & Outlook

Foreign Monetary Policy

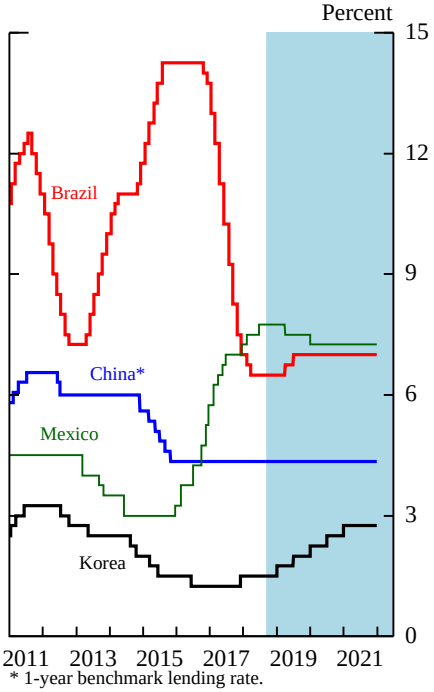
AFE Policy Rates



AFE Central Bank Balance Sheets



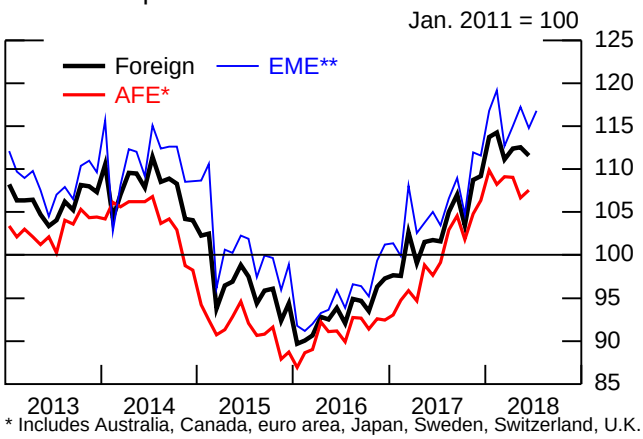
EME Policy Rates



* 1-year benchmark lending rate.

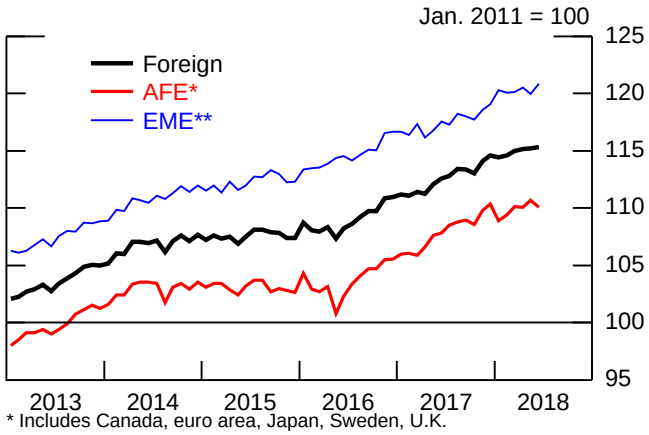
Recent Foreign Indicators

Nominal Exports



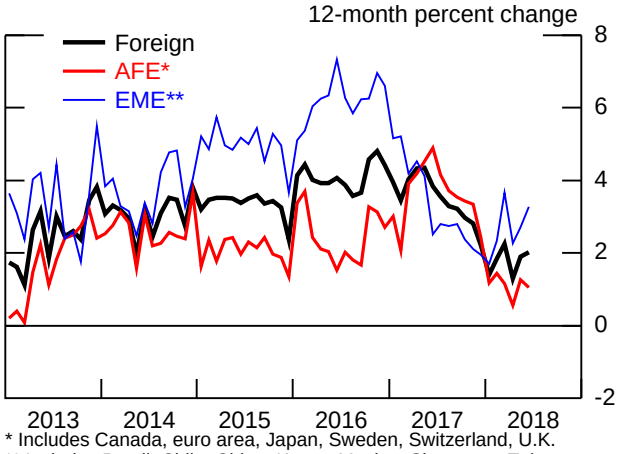
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Singapore, Taiwan, Thailand.

Industrial Production



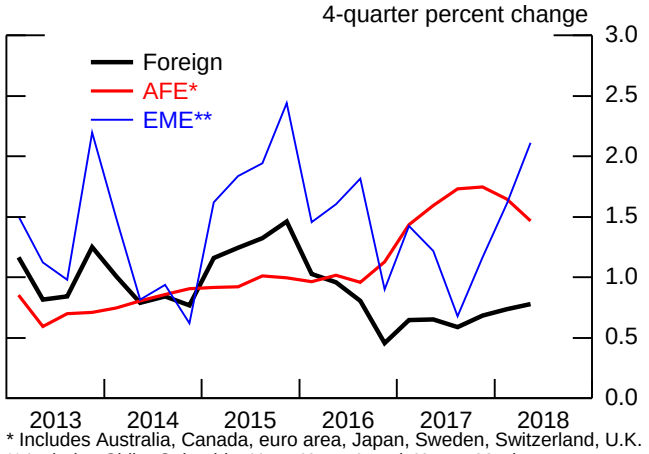
* Includes Canada, euro area, Japan, Sweden, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand.

Retail Sales



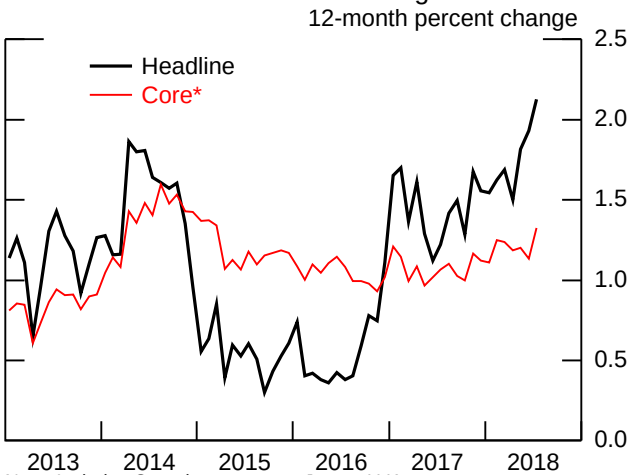
* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, Chile, China, Korea, Mexico, Singapore, Taiwan.

Employment



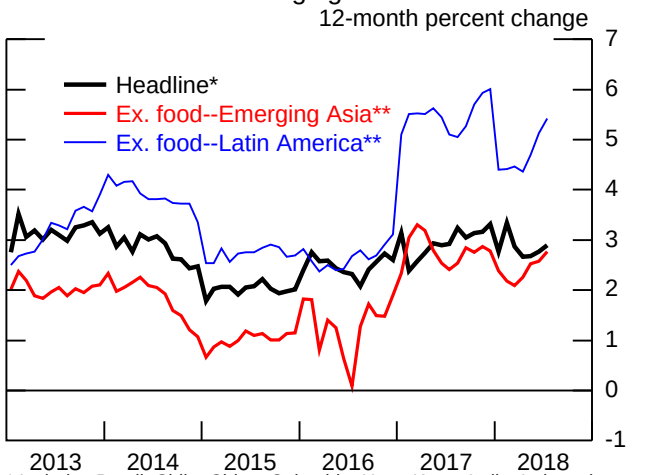
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Chile, Colombia, Hong Kong, Israel, Korea, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand, Turkey.

Consumer Prices: Advanced Foreign Economies



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

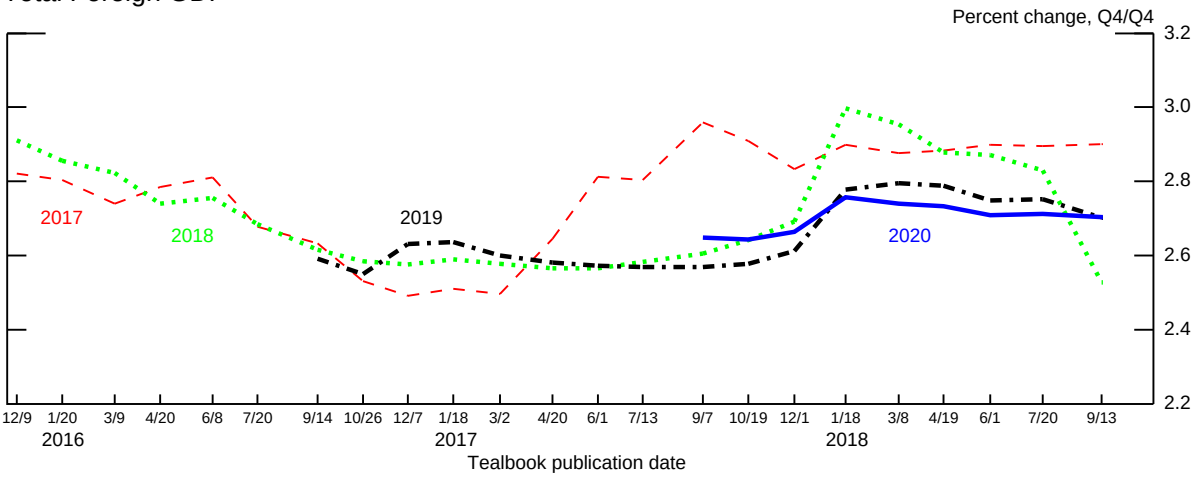
Consumer Prices: Emerging Market Economies



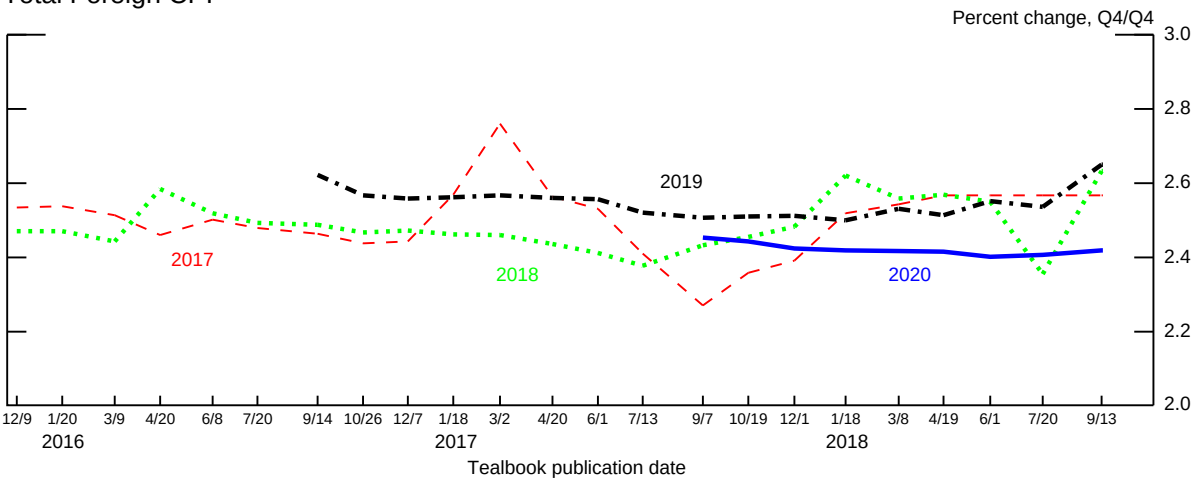
* Includes Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand.
** Excludes all food; staff calculation. Latin America excludes Argentina and Venezuela.

Evolution of Staff's International Forecast

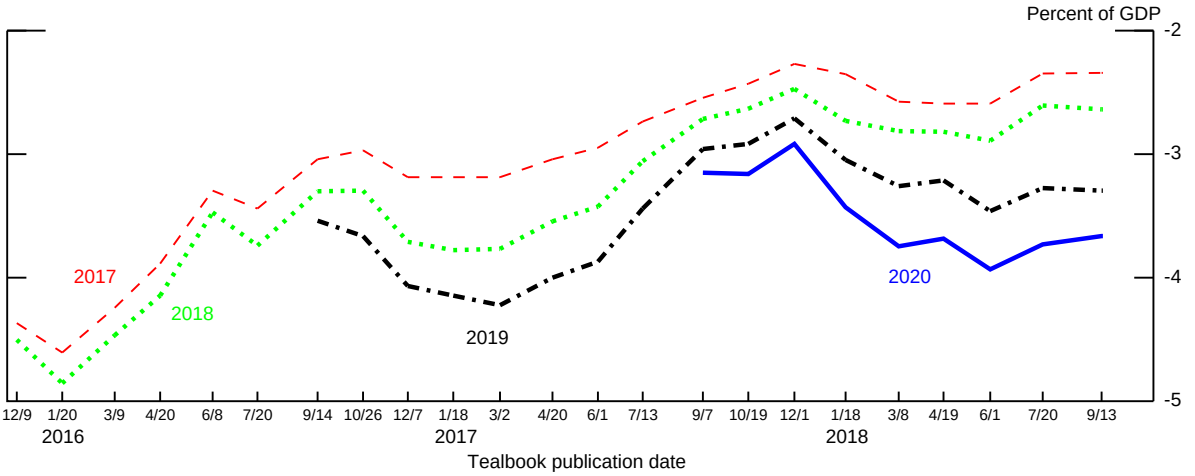
Total Foreign GDP



Total Foreign CPI

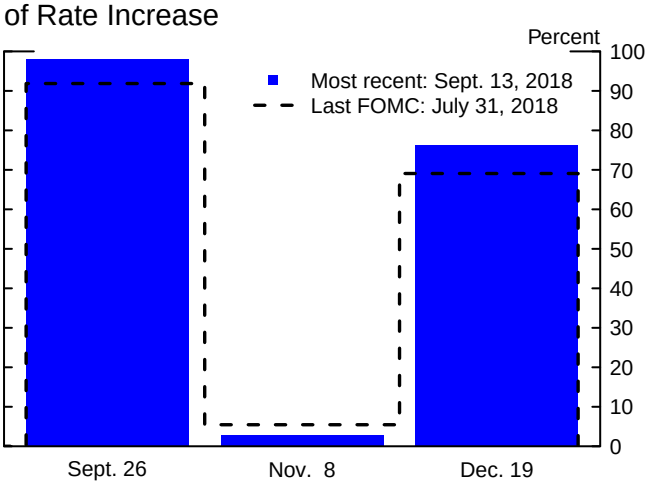


U.S. Current Account Balance



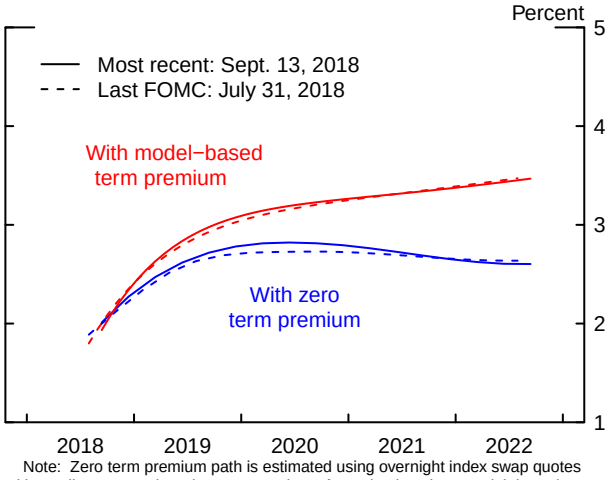
Policy Expectations and Treasury Yields

Market−Implied Probability of Rate Increase



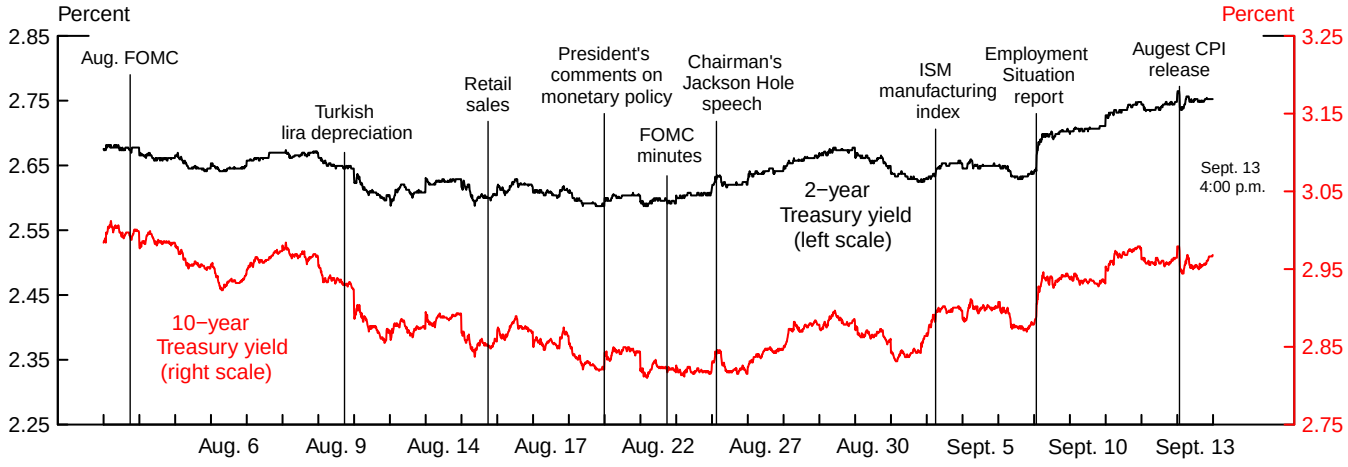
Note: Probabilities implied by a binomial tree fitted to settlement prices on federal funds futures contracts, assuming the policy action at each meeting is either no change or a 25 basis point increase in rates and no intermeeting moves. The effective federal funds rate until the next FOMC meeting is assumed to be equal to the observed rate.
Source: CME Group; Federal Reserve Board staff estimates.

Implied Federal Funds Rate



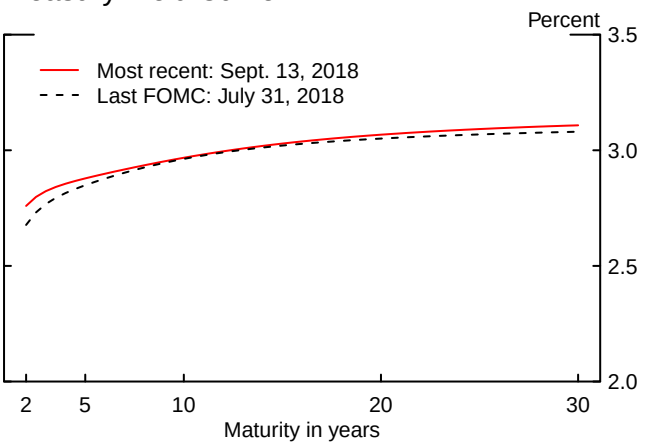
Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points. Model−based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premium.
Source: Bloomberg; Federal Reserve Board staff estimates.

Selected Interest Rates



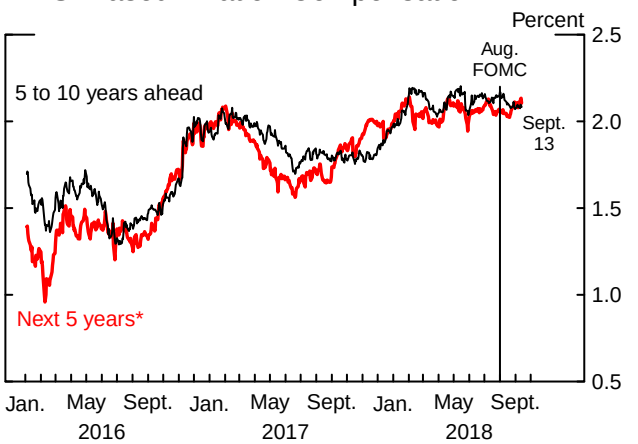
Note: Data are spaced at 5−minute intervals from 8:00 a.m. to 4:00 p.m.
Source: Bloomberg.

Treasury Yield Curve



Note: Smoothed yield curve estimated from off-the-run Treasury coupon securities. Yields shown are those on notional par Treasury securities with semiannual coupons.
Source: Federal Reserve Bank of New York; Federal Reserve Board staff estimates.

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; Federal Reserve Board staff estimates.

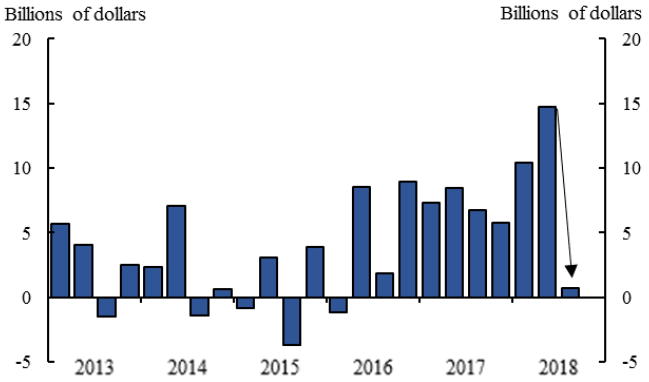
Financial Markets

Will Pension Fund Demand for Long-Dated U.S. Treasury Securities Shift in Mid-September?

Some recent financial market commentaries have suggested that, since the beginning of this year, domestic pension funds have increased their holdings of long-dated Treasury securities, putting downward pressure on long-dated yields. Commentaries have highlighted, in particular, U.S. corporations' incentive to increase contributions to their pension plans to take advantage of deductions based on last year's 35 percent corporate tax rate instead of the 21 percent rate for 2018 under the new tax legislation. Private pension funds can take advantage of this deduction until 8½ months after the end of their pension plan's fiscal year, which will be mid-September for firms that follow a calendar-year plan. Some commentaries have further speculated that when the mid-September deadline passes, the flow effect from the increased demand for Treasury securities may dissipate, putting upward pressure on long-dated yields. The discussion below argues that a material shift in pension fund demand for longer-dated Treasury securities after mid-September seems unlikely to occur.

First, available indicators do not suggest that demand for U.S. Treasury securities by pension funds is presently elevated. Given a lack of comprehensive and timely data on pension fund activity, financial market commentaries frequently use STRIPS (Separate Trading of Registered Interest and Principal of Securities) activity as a proxy to gauge pension fund demand for U.S. Treasury securities.[1] The figure shows that STRIPS activity did rise in the first half of the year, with the total amount of STRIPS outstanding increasing in the first and second quarters. However, the figure

Change in Total STRIPS Outstanding

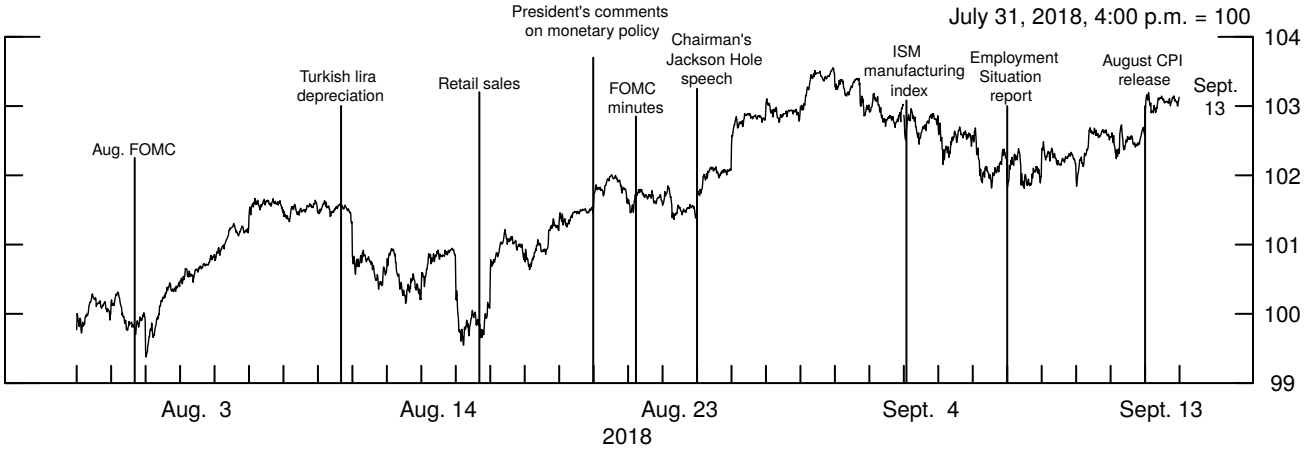


Note: Data for 2018:Q3 are through August 2018.
Source: Bloomberg.

[1] STRIPS are Treasury securities where the coupon and principal payments have been separated. Pension funds typically prefer principal STRIPS because they have no coupon payments and so are longer-duration securities, allowing pension funds to better match their long-duration liabilities. STRIPS data are typically used when looking at pension fund dynamics given the longer time lag for other available data on pension funds.

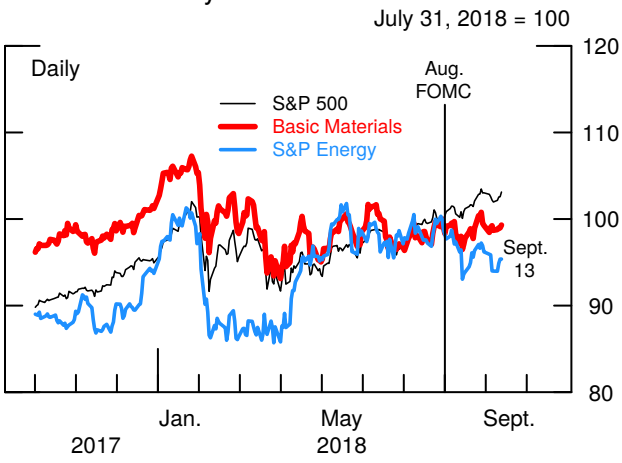
Corporate Asset Market Developments

Intraday S&P 500 Index



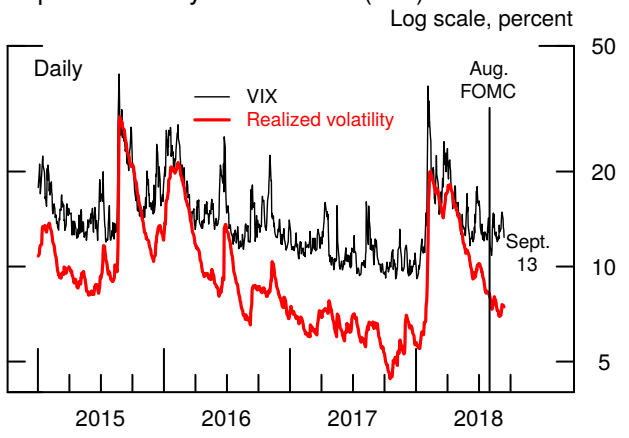
Note: Data are spaced at 5-minute intervals from 9:30 a.m. to 4:00 p.m.
Source: Bloomberg.

S&P 500 Industry Indexes



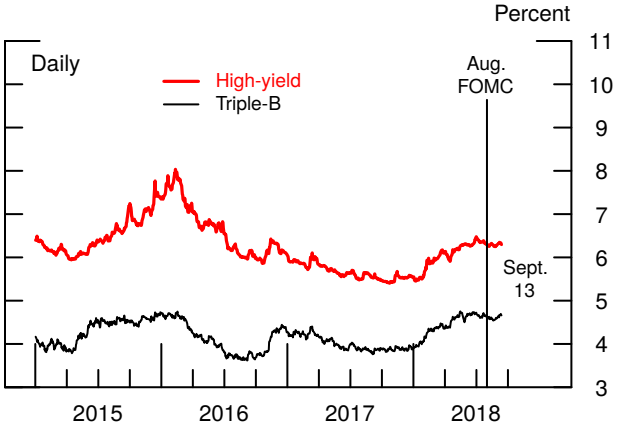
Source: Bloomberg.

Implied Volatility on S&P 500 (VIX)



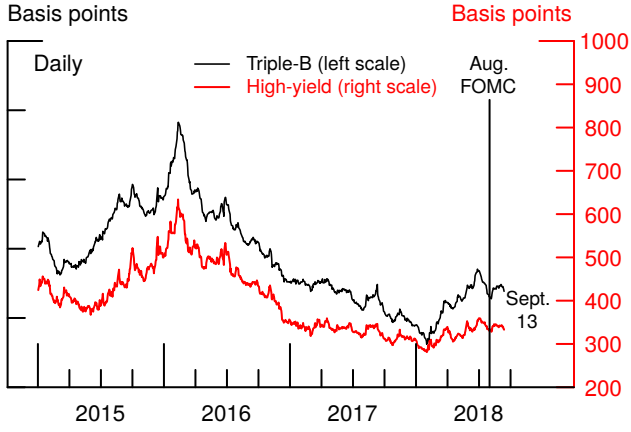
Source: Chicago Board Options Exchange; Bloomberg.

10-Year Corporate Bond Yields



Source: Staff estimates of smoothed yield curves based on Merrill Lynch bond data.

10-Year Corporate Bond Spreads

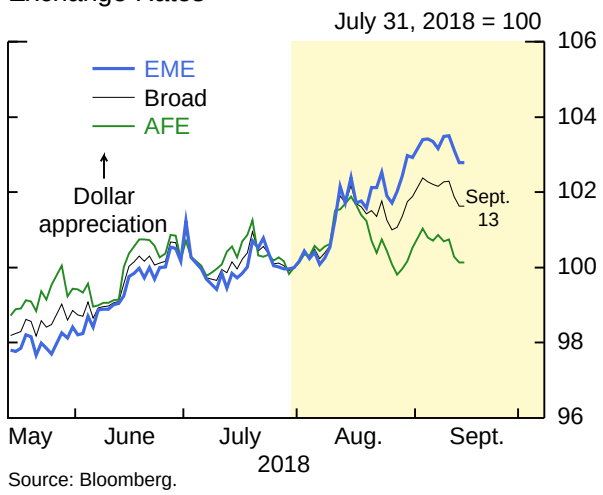


Note: Spreads over 10-year Treasury yield.
Source: Staff estimates of smoothed yield curves based on Merrill Lynch bond data and smoothed Treasury yield curve.

Financial Markets

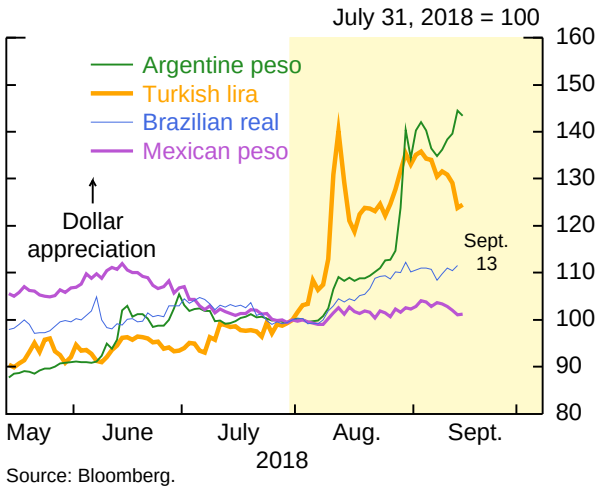
Foreign Developments

Exchange Rates



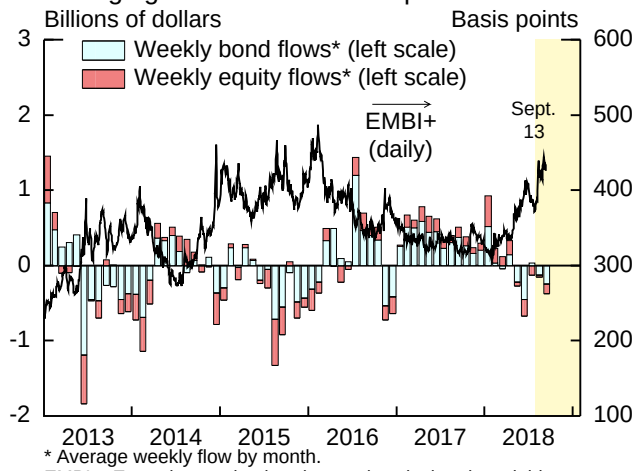
Source: Bloomberg.

EME Currencies



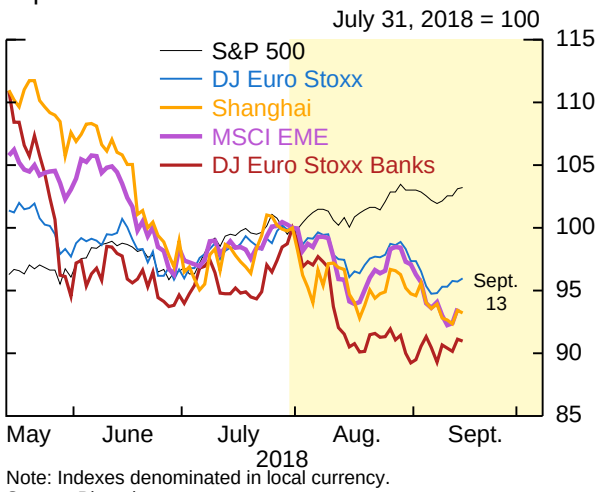
Source: Bloomberg.

Emerging Market Flows and Spreads



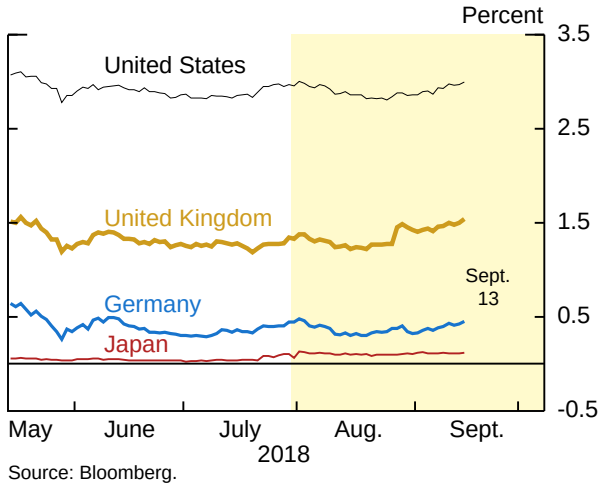
* Average weekly flow by month.
EMBI+: Emerging market bond spreads calculated as yield difference to zero-coupon Treasury securities.
Source: EPFR. Excludes intra-China flows.

Equities



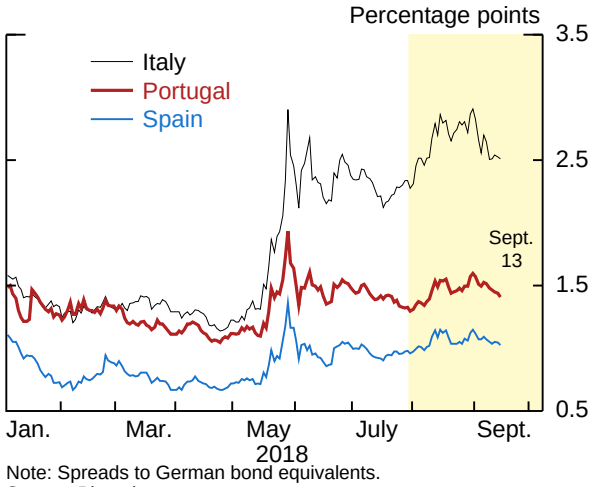
Note: Indexes denominated in local currency.
Source: Bloomberg.

10-Year Nominal Yields



Source: Bloomberg.

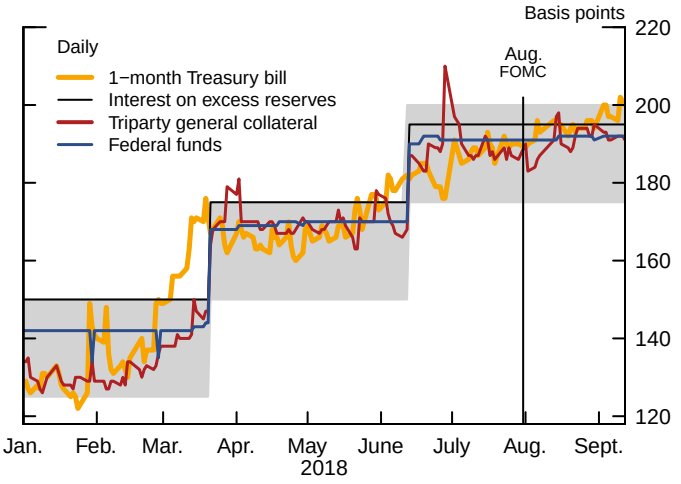
Euro-Area Peripheral Spreads



Note: Spreads to German bond equivalents.
Source: Bloomberg.

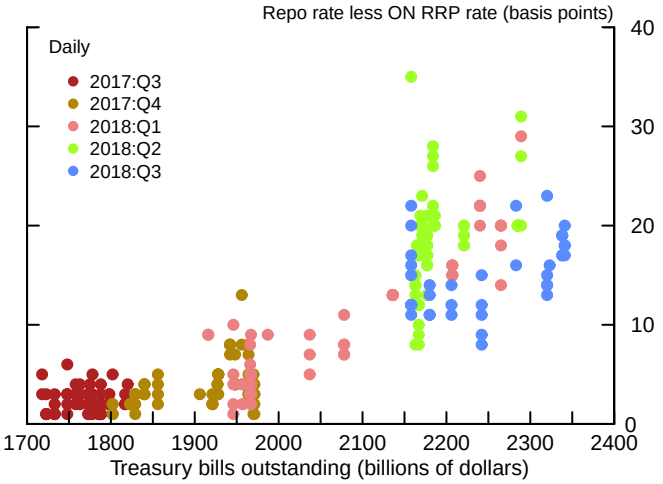
Short−Term Funding Markets

Selected Money Market Rates



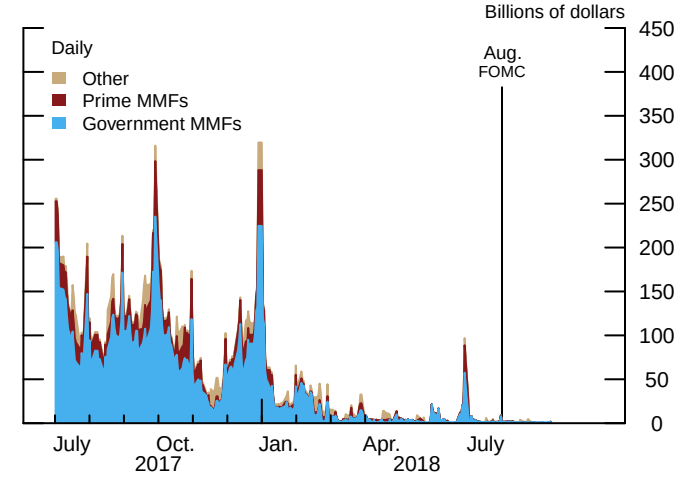
Note: Federal funds rate is a weighted median. Shaded area is the target range for the federal funds rate.
Source: Federal Reserve Board, Form FR 2420, Report of Selected Money Market Rates.

Repo Rate and Treasury Bills Outstanding



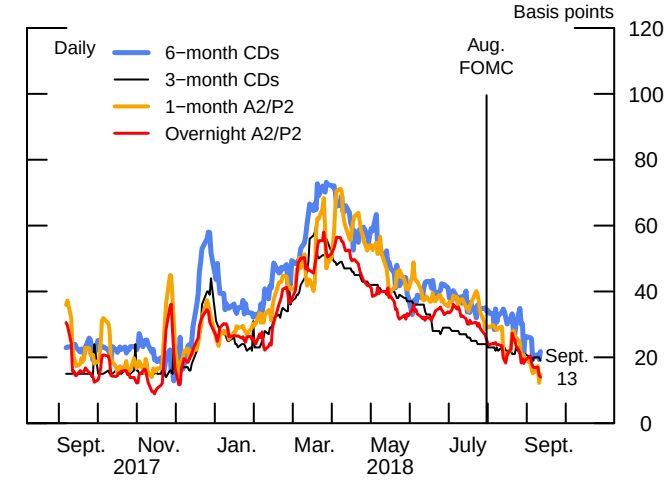
Note: Repo rate is the triparty general collateral rate (TGCR). ON RRP is the overnight reverse repurchase rate.
Source: Federal Reserve Bank of New York; Department of the Treasury.

ON RRP Take−Up by Type



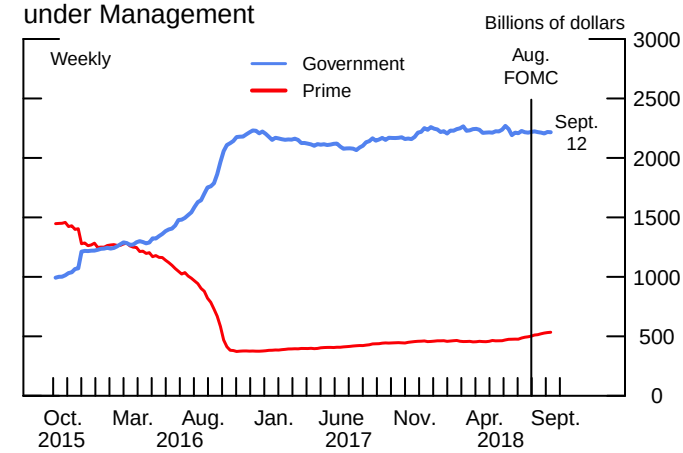
Note: ON RRP is overnight reverse repurchase agreement; MMF is money market fund.
Source: Federal Reserve Bank of New York.

CD and A2/P2 Nonfinancial CP Spreads



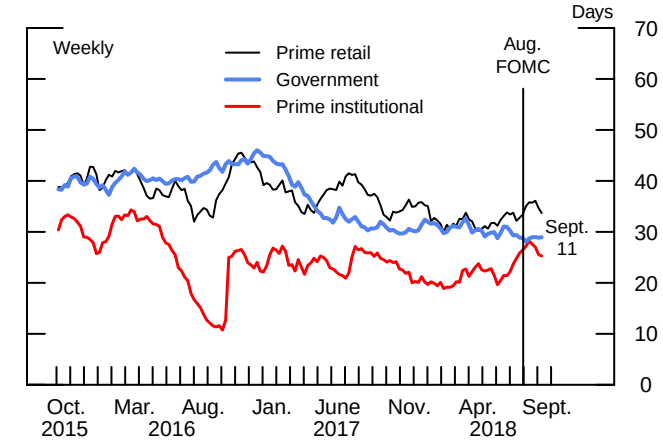
Note: Overnight CP spreads are to federal funds rate. All other spreads are to OIS. CD spreads are a 5−day moving average.
Source: Depository Trust & Clearing Corporation.

Prime and Government MMF Assets under Management



Source: Investment Company Institute.

MMF Weighted−Average Maturities



Note: All statistics are computed on an asset−weighted basis.
Source: iMoneyNet.

How Have Business and Household Borrowing Conditions Changed over the Past Year?

Since September 2017, key interest rates for business and household borrowers have continued to increase, broadly in line with increases in the federal funds rate (table 1). Borrowing conditions overall, however, have not tightened as much as these increases might suggest, in part because nonprice credit terms and standards across several categories of credit have eased.

In the business sector, investor appetite for corporate debt has been supported by lower corporate tax rates and strong corporate earnings over the past year as well as generally strong corporate credit quality. In addition, a rising short-term interest rate environment has particularly increased investor demand for floating-rate corporate debt. This dynamic has contributed to an easing of corporate loan standards and terms, especially in the leveraged loan market, where "covenant lite" loans are common and other terms have continued to ease (figure 1). Partly in response to the increased competition from capital markets and other lenders, banks have eased terms and standards on C&I loans (figure 2).

Indications of credit conditions easing over the past year are also apparent for small businesses. The share of small business owners reporting that it is "easy" or "somewhat easy" to obtain credit over the past 12 months has been steadily trending upward (figure 3).

Nonprice terms and standards in commercial real estate (CRE) markets have also eased a bit. A moderate net share of banks reported in the SLOOS that they have eased standards and terms on nonfarm nonresidential and multifamily CRE loans over the past year. Banks cited increased competition from bank and nonbank lenders and an improved outlook for the sector as reasons for the easing. In the

Table 1. Change in Key Borrowing Rates for Businesses and Households

Interest Rate or Yield	Change since Sept. 19, 2017 (bps)
Federal funds target range	75
5-year Treasury	103
10-year Treasury	72
10-year triple-B bond	88
10-year high-yield bond	109
30-year fixed-rate mortgage	88
Auto loan	91

Note: Changes calculated from Sept. 19, 2017, through Sept. 11, 2018, except for auto loans, which are calculated through Sept. 2, 2018. Recent data on credit card and commercial mortgage rates not available.

Source: Federal Reserve Bank of New York; Federal Reserve Board staff estimates (Treasury yields); staff estimates of yield curves based on Merrill Lynch bond data (triple-B and high-yield rates), LoanSifter (mortgage rate), and J.D. Power (auto loan rates).

CMBS market, the share of interest-only loans has increased (figure 4), although underwriting on other dimensions has remained stable.

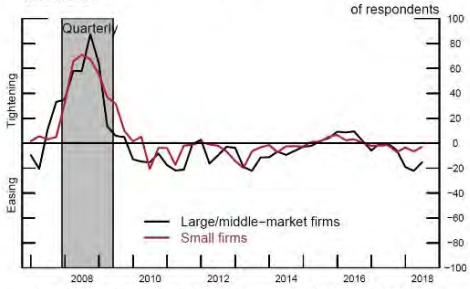
Terms and standards have also eased in residential mortgage lending. The maximum debt-service-to-income ratio available on mortgage loans for subprime borrowers, for example, has been easing steadily for the past several years (figure 5). One factor contributing to the easing is that mortgage lenders face strong incentives to keep up the volume of originations in order to cover their high fixed costs. The rise in interest rates has depressed mortgage refinancing originations, so lenders have an incentive to ease terms so that more borrowers qualify. Meanwhile, extremely low delinquency rates on mortgage loans may have also contributed to lender willingness to ease mortgage standards and terms.

In contrast, in credit card and auto lending markets, lender risk appetite for extending credit to subprime consumers appears to have diminished a bit, perhaps because of rising (though still low) delinquency rates among these consumers. A significant net share of banks reported in July 2018 that their standards on both subprime credit cards (figure 6) and subprime auto loans were at the tighter end of the range of standards on such loans since 2005. However, standards for prime borrowers in both markets appear broadly unchanged over the past year.

Figure 1. Percent of Covenant Lite Leveraged Loans

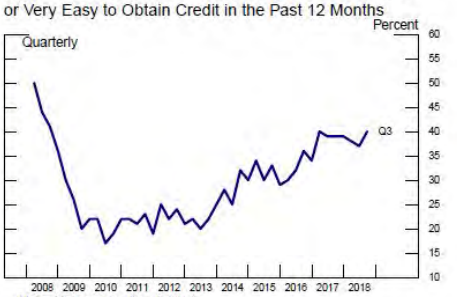
Note: Reported by Market Weight.
Source: J.P. Morgan Markets; JPM Leveraged Loan Index.

Figure 2. C&I Loans: Changes in Standards



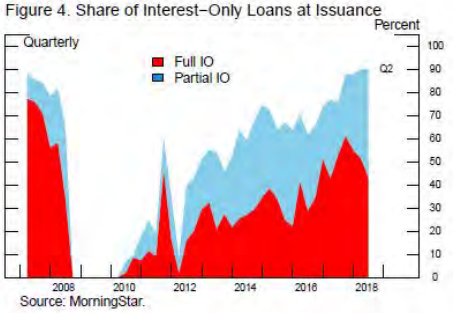
Note: Responses are weighted by respondents' holdings of C&I loans. The shaded region represents the 2008–09 recession.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Figure 3. Small Businesses Reporting It was Somewhat or Very Easy to Obtain Credit in the Past 12 Months



Note: Not seasonally adjusted.
Source: Wells Fargo Small Business Survey, https://wellsfargobusinessinsights.com/research/small-business-index.

Figure 4. Share of Interest-Only Loans at Issuance

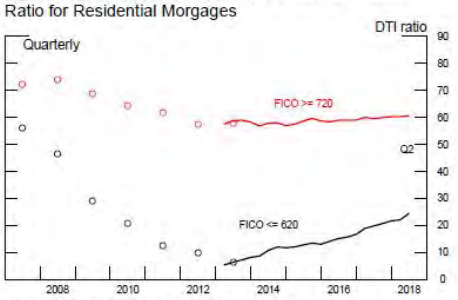


Source: MorningStar.

Financing Conditions

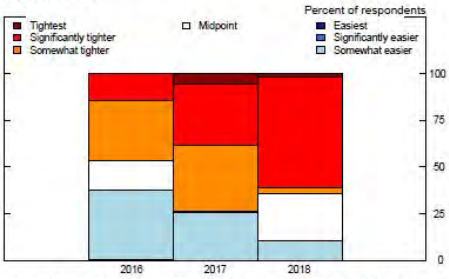
Taken together, these indicators suggest that the effects of the rise in interest rates on broad financing conditions have been offset to some degree by an easing of terms and standards in many markets.[1] While there is no definitive summary statistic to characterize the aggregate net effect of rising rates and easing availability, the net effect of these developments on a given borrower may depend on that borrower's characteristics. A stylized fact in the academic literature is that the borrowing decisions of those with easy access to credit are primarily governed by interest rates, whereas terms and standards have a larger effect on credit-constrained borrowers. If so, given that interest rates are still low by historical standards, the increasing availability of credit in several markets may imply that credit conditions have eased, on net, for many credit-constrained borrowers.

Figure 5. Maximum Allowed Debt-Service-to-Income Ratio for Residential Mortgages



Note: DTI is debt service to income.
Source: For frontiers shown with circles, McDash and CoreLogic; for frontiers shown with solid lines, Optimal Blue.

Figure 6. Level of Standards on Subprime Credit Cards



Note: Responses are weighted by survey respondents' holdings of relevant loan types, as reported on the Q1 Call Reports from 2016 to 2018 where relevant.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

[1] This discussion assumes that an increase in interest rates represents a tightening of financing conditions. To the extent that interest rates have risen because firms' expected returns on investment have increased, financing conditions are not necessarily tighter relative to productive opportunities.

Financial Conditions Indexes

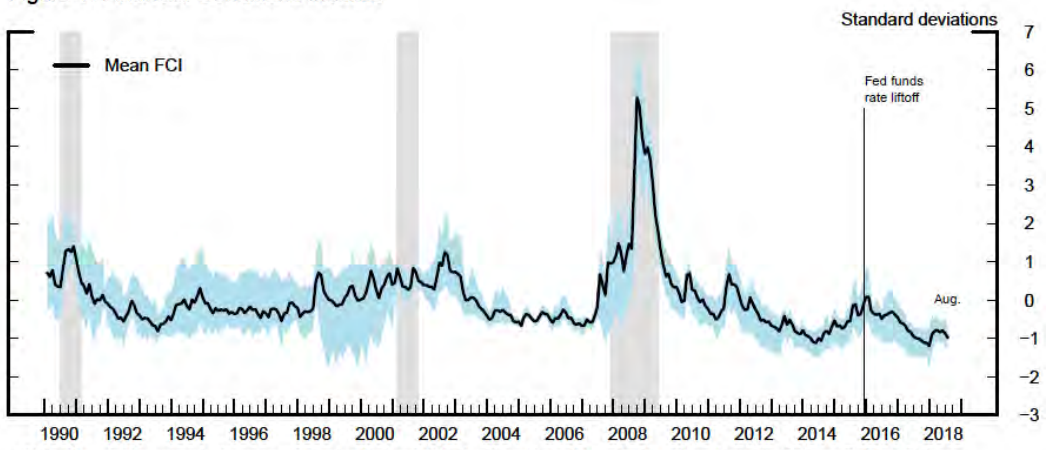
Over the past decade, market participants, academics, and policy institutions have created an increasing number of financial conditions indexes (FCIs).[1] These indexes were developed for three main purposes: to summarize overall financial market developments, to assess how monetary policy is transmitted to financial conditions, and to gauge what financial conditions presage for future economic activity.

The blue shaded region in figure 1 displays the range of values over time across five publicly available FCIs, developed by Goldman Sachs; Bloomberg; and the Federal Reserve Banks of Chicago, Kansas City, and St. Louis. The mean of these indexes is plotted as the black line.[2]

Although they are based on different numbers and types of financial variables, these indexes share broadly similar variations, especially during periods of widespread financial market stress such as the financial crisis of 2007–09.[3] They all point to a broad easing of financial conditions since December 2015, even as the FOMC has gradually raised the federal funds rate from its lower bound.

The existing FCIs are typically constructed by aggregating financial variables into one summary series using methods such as principal component analysis, weighted averages, and dynamic factor models.[4] While these composite indexes provide a useful summary of broad financial market movements, they share two main drawbacks when used to assess the link between financial

Figure 1: Financial Conditions Indexes



Note: Mean FCI represents the mean of the standardized FCIs developed by Goldman Sachs, Bloomberg, the Chicago Fed, the St. Louis Fed,and the Kansas City Fed. The indexes are shown in standard deviation units from their respective means. The blue shaded region represents the range of these five standardized FCIs. The gray shaded regions represent NBER–dated recessions.
Source: FRED, Bloomberg.

[1] A partial list of widely used FCIs includes those developed by Goldman Sachs; Deutsche Bank; Citi; Bloomberg; IMF; OECD; and the Federal Reserve Banks of Chicago, Kansas City, and St. Louis.

[2] To facilitate the comparison, each index is normalized by subtracting its mean and then dividing by its standard deviation. Values of the indexes above (below) zero indicate tighter (looser) financial conditions than on average. An index value of 1.0 denotes financial conditions that are tighter than average by one standard deviation.

[3] The number of variables included in the FCIs ranges from 5 in the Goldman Sachs index to more than 100 in the Chicago Fed index.

[4] For example, the highly watched GS-FCI is a weighted average of five financial variables (the federal funds rate, the 10-year Treasury yield, the corporate BBB–Treasury yields spread, the S&P price-to-earnings ratio, and the broad value of the U.S. dollar), with weights chosen based on the effects of these variables on real GDP growth using a VAR model.

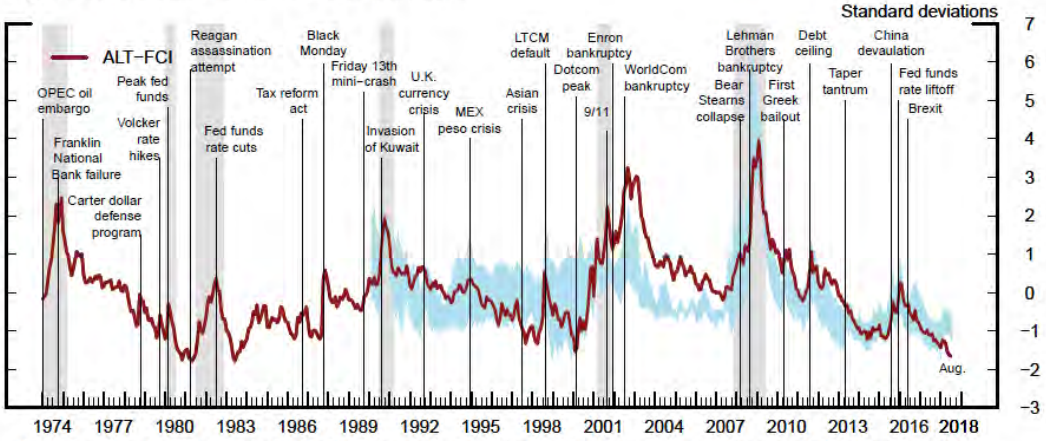
markets, the real economy, and monetary policy. First, the weights used to aggregate financial variables are typically determined by statistical methods rather than justified by how these variables affect economic activity. Second, these indexes do not differentiate between the various channels—such as the wealth channel, the credit condition channel, and the terms-of-trade channel—through which financial variables affect the real economy.

In an attempt to overcome these shortcomings, the staff recently developed an alternative index that is designed to measure financing conditions for nonfinancial corporations. This index uses only information from firms' stock returns and credit ratings. Roughly speaking, it is constructed as the difference in equity returns between two portfolios of firms with credit ratings above and just below investment grade.[5] Due to credit market imperfections, speculative-grade firms are more sensitive to changes in overall financing conditions than comparable investment-grade firms. To the extent that financing condition risks are priced in the equity market, investment-grade firms can be expected to outperform speculative-grade firms when financing conditions tighten, leading to a wider returns differential.

This alternative staff index has three main properties. First, by focusing on the cost and availability of funding to nonfinancial corporations, this index captures a well-defined channel through which financial conditions affect the economy. Second, it provides a clean measure of changes in financing conditions by comparing two groups of firms that mainly differ in their access to capital markets. Third, it has better in-sample forecasting power for economic activity than other available financial conditions indexes (not shown).[6]

As shown by the red line in figure 2, the staff's index exhibits countercyclical variations and effectively captures several episodes of stress in the U.S. financial system. It co-moves with the range of other FCIs, and, like the other FCIs, indicates that financing conditions have eased since liftoff.

Figure 2: Alternative Financial Conditions Index



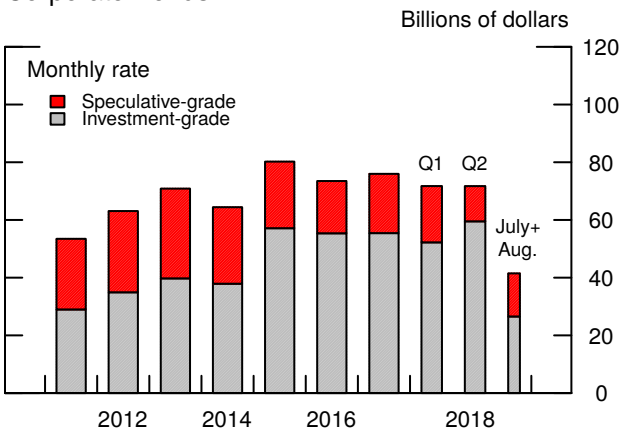
Note: The alternative FCI is standardized; values above (below) zero represent tighter (easier) than average financial conditions. The blue shaded region represents the range of five standardized FCIs: Goldman Sachs, Bloomberg, the Chicago Fed, the St. Louis Fed, and the Kansas City Fed. The indexes are shown in standard deviation units from their respective means. The gray shaded regions represent NBER-dated recessions.
Source: Staff calculations, CRSP, Moody's.

[5] Technically, this index is calculated as the deviation from the long-run relation between the systematic components of the cumulative log returns of the two portfolios. The systematic components are derived from the Fama-French five-factor asset pricing model, augmented with the momentum and quality/junk factors.

[6] One important limitation of this index is that it does not capture changes in financing conditions for private nonfinancial firms, financial institutions, or households. Another limitation of this index is that firms in both groups are assumed to have similar exposure to nonfinancing conditions shocks.

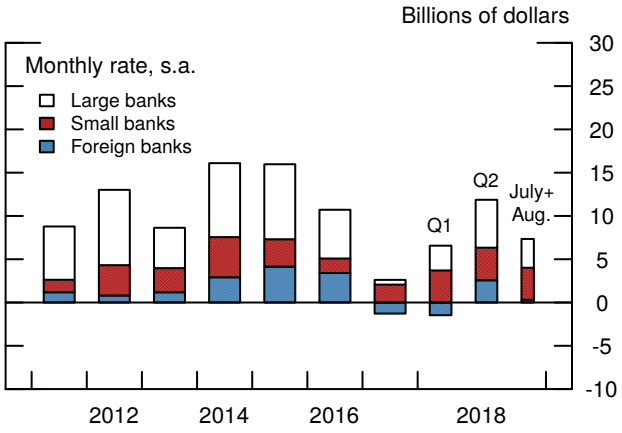
Business Finance

Gross Issuance of Nonfinancial Corporate Bonds



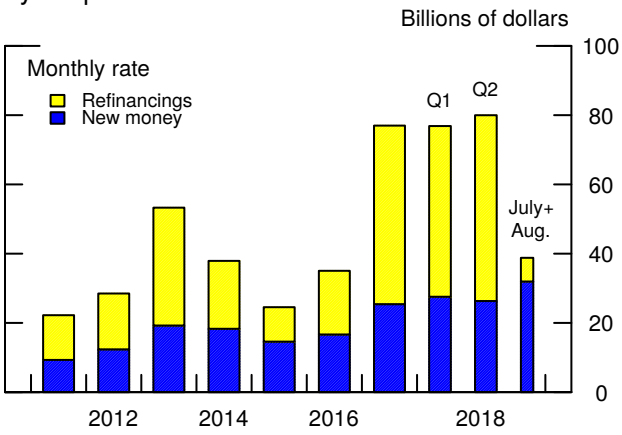
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.
Source: Mergent Fixed Income Securities Database.

Commercial and Industrial Loans



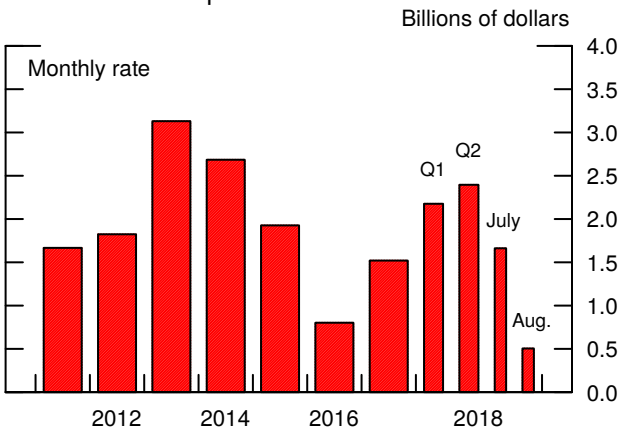
Source: Staff calculations, Federal Reserve Board, Form FR 2644, Weekly Report of Selected Assets and Liabilities of Domestically Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks.

Institutional Leveraged Loan Issuance, by Purpose



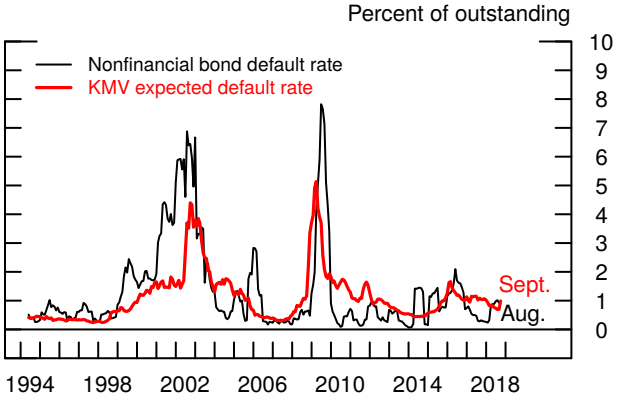
Source: Thomson Reuters LPC LoanConnector.

IPO Issuance by Domestic Nonfinancial Corporations



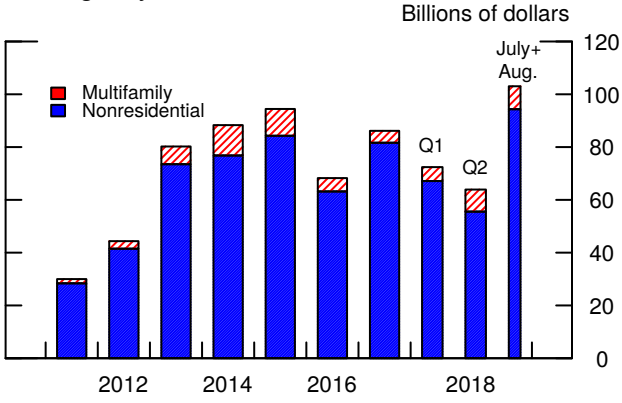
Source: Securities Data Company.

Realized and Expected Nonfinancial Bond Default Rates



Note: For realized nonfinancial bond default rate, 6-month trailing defaults divided by beginning-of-period outstanding, at an annual rate.
Source: For realized default rate, Moody's Investors Service. Expected default rate is calculated using firm-level data from Moody's KMV.

Non-agency CMBS Issuance

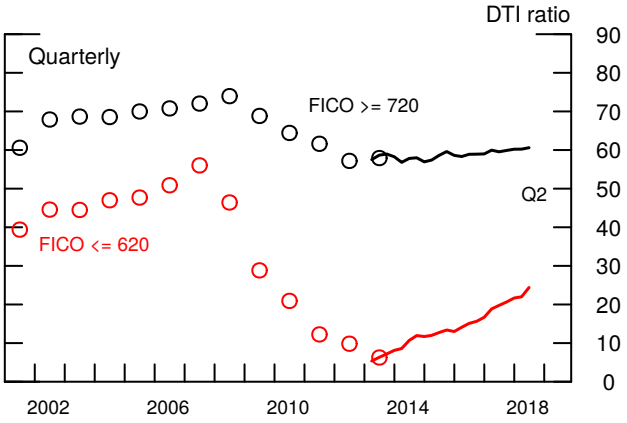


Note: Multifamily excludes agency issuance. CMBS is commercial mortgage-backed securities.
Source: Consumer Mortgage Alert.

Financing Conditions

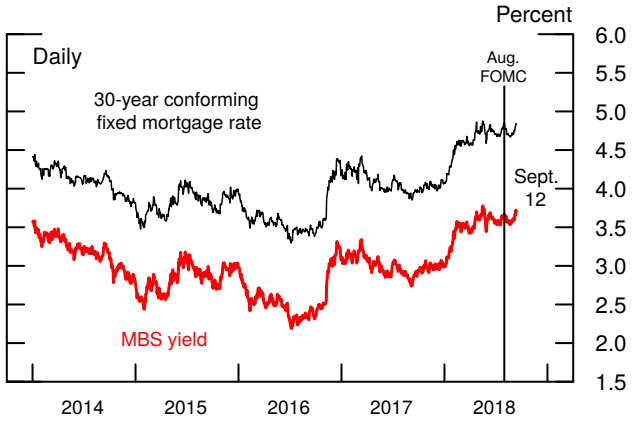
Household Finance

Maximum Allowed Debt-Service-to-Income Ratio for Residential Morgages



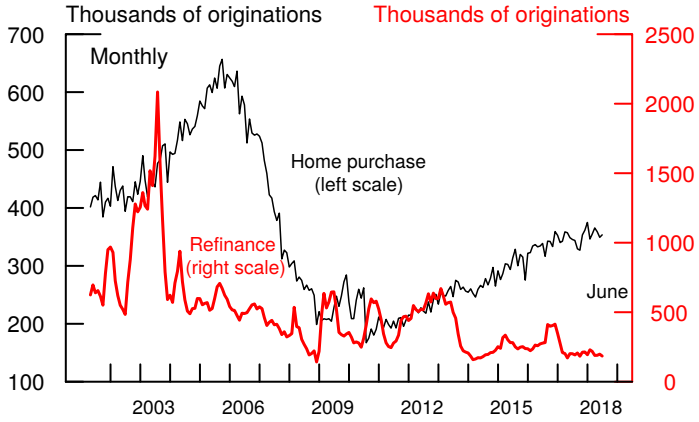
Note: DTI is debt service to income.
Source: For frontiers shown with circles, McDash and CoreLogic; for frontiers shown with solid lines, Optimal Blue.

Mortgage Rate and MBS Yield



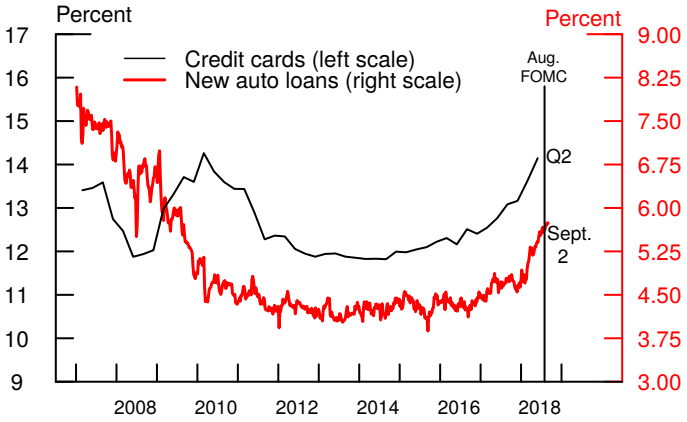
Note: The mortgage-backed securities (MBS) yield is the Fannie Mae 30-year current-coupon rate.
Source: For MBS yield, Barclays; for mortgage rate, Optimal Blue.

Purchase and Refinance Activity



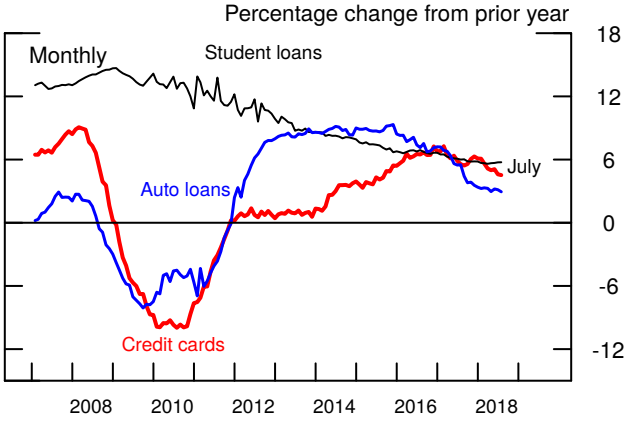
Note: The data are seasonally adjusted by Federal Reserve Board staff.
Source: For values prior to 2017, data reported under the Home Mortgage Disclosure Act of 1975; for values in and after 2017, staff estimates.

Consumer Interest Rates



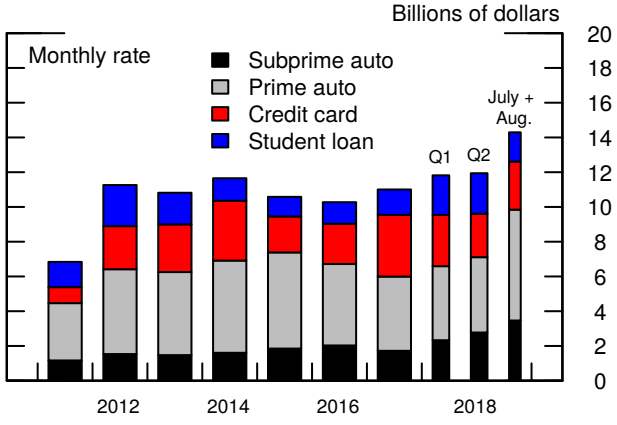
Note: Credit card data reflect rates at commercial banks on all credit card plans; data are reported quarterly and not seasonally adjusted. Auto loans data are reported weekly and seasonally adjusted.
Source: For credit cards, Federal Reserve Board; for auto loans, J.D. Power.

Consumer Credit



Source: Federal Reserve Board.

Gross Consumer ABS Issuance



Source: Bloomberg.

Financing Conditions

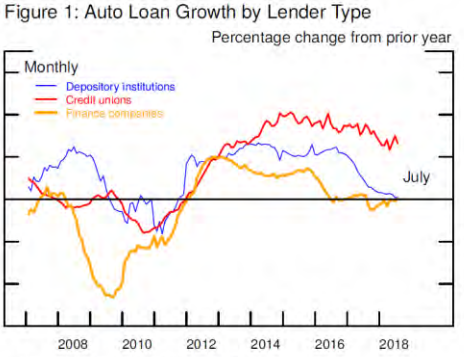
Recent Auto Loan Growth at U.S. Credit Unions

Auto lending has recovered strongly, on balance, since 2012. Nominal outstanding loan balances rebounded from their post-crisis nadir of $700 billion to over $1.1 trillion in 2018:Q2. This discussion highlights that auto loan growth at credit unions was particularly strong and persistent over this period, resulting in a notable expansion in credit unions' share of the U.S. auto loan market. The expansion of credit unions' auto lending appears to be concentrated among borrowers with better credit scores and so does not appear to represent a loosening of lending standards.

Over the past five years, the average annual growth of auto loans from credit unions was about 13 percent, more than that from depository institutions (about 7 percent) and finance companies (about 3 percent).[1] Moreover, although auto lending at banks and finance companies has moderated over the past two years as interest rates gradually rose, growth at credit unions has remained strong (figure 1). Indeed, had auto lending growth at credit unions been the same as that for other types of lenders, total auto loans outstanding would currently be 10 percent (about $120 billion) lower.

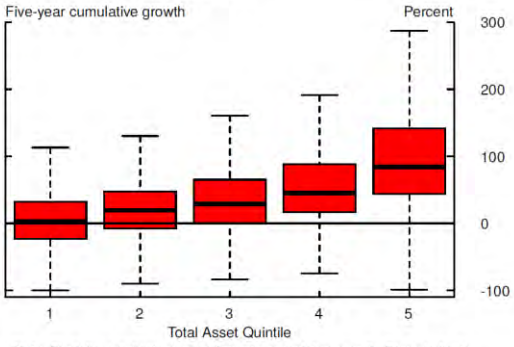
Growth in auto lending within the credit union sector has been highly concentrated among the largest credit unions. As shown in figure 2, median five-year cumulative auto loan growth was merely 3 percent for credit unions in the bottom size quintile of the total assets distribution but was 80 percent for credit unions in the top size quintile.

Figure 1: Auto Loan Growth by Lender Type



Note: The data are not seasonally adjusted.
Source: Federal Reserve Board.

Figure 2: 2013:Q1 to 2018:Q1 Growth of Credit Union Auto Loans by Asset Quintile



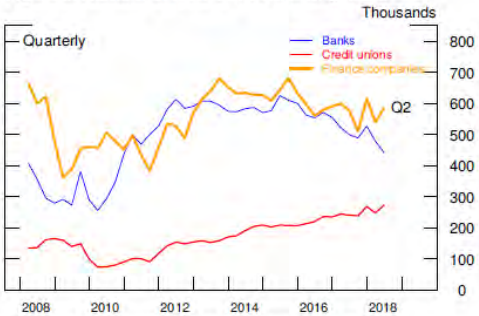
Note: Black lines indicate median five-year cumulative growth. Boxes indicate interquartiles of the cumulative growth. Whiskers indicate 1.5 times interquartile range.
Source: National Credit Union Administration, Call Report.

[1] As of July 2018, auto loan balances at depository institutions, credit unions, and finance companies were about $450 billion, $370 billion, and $300 billion, respectively.

The number of auto loans originated by credit unions grew much faster than that of other types of lenders. Loans originated to finance new car purchases rose 80 percent over the past five years at credit unions but stayed about flat, on net, at banks and finance companies (figure 3).[2] Over the same period, the average size of credit union auto loans rose 17 percent, about in line with other lenders.[3]

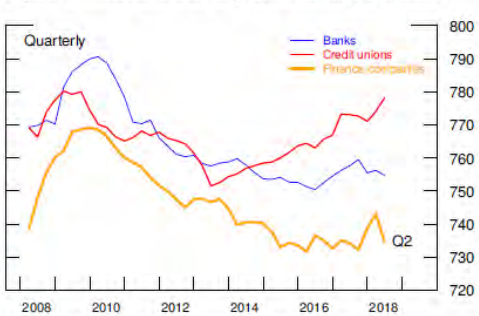
As shown in figure 4, the average credit score of new originations from credit unions increased appreciably while staying roughly flat at other lenders.[4] Partly due to the higher average credit quality of their borrowers, credit union loans, on average, have lower interest rates than those from banks and finance companies. Moreover, even with borrower credit scores held constant, loans extended by credit unions tend to have a lower average interest rate (figure 5), potentially due, in part, to credit unions' stable deposit bases and their nonprofit status. As a result, despite the larger amounts financed, the monthly payments of credit union auto loans are about the same as those of other lenders.[5] Finally, despite the rapid expansion, delinquency rates on credit union auto loans have remained low and stable in recent years (figure 6).

Figure 3: Number of New-Car Loans Originated



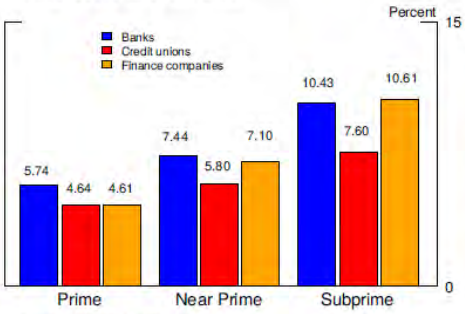
Source: Experian Automotive, seasonally adjusted by Board staff.

Figure 4: Credit Score at Origination of New-Car Loans



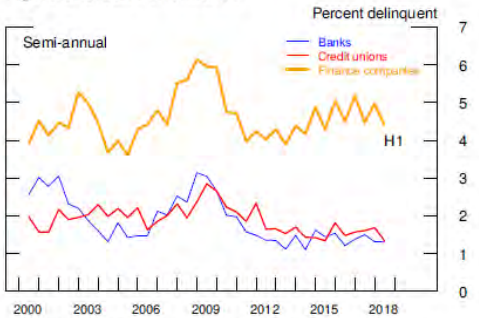
Source: Experian Automotive, seasonally adjusted by Board staff.

Figure 5: Average Rate for New-Car Loans by VantageScore as of 2018:Q2



Source: Experian Automotive.

Figure 6: Credit Performance



Source: FRBNY-CCP/Equifax auto loan tradeline data.

[2] The analysis presented focuses on new-car loans, but the pattern is qualitatively similar for used car loans.

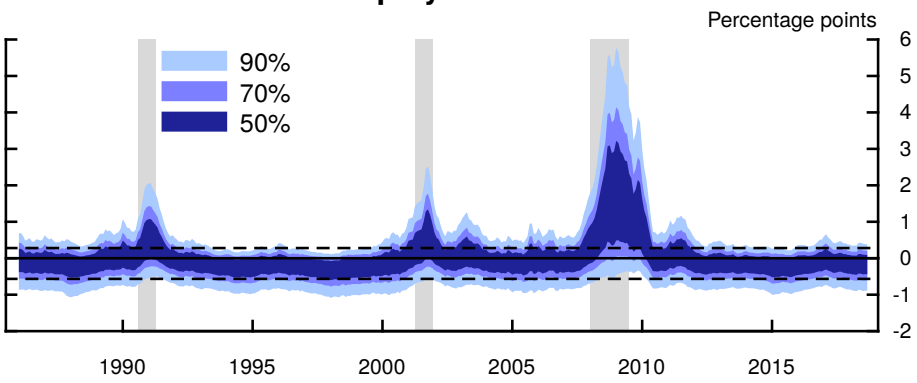
[3] As of 2018:Q2, the average size of credit union new-car loans was $33,000, higher than $31,000 for banks and $30,000 for finance companies.

[4] The lower percentiles of the distribution of credit scores of auto loans originated by credit unions also trended up, and the share of subprime loans at credit unions remained low.

[5] Credit union loans have longer average maturities, further lowering monthly payments.

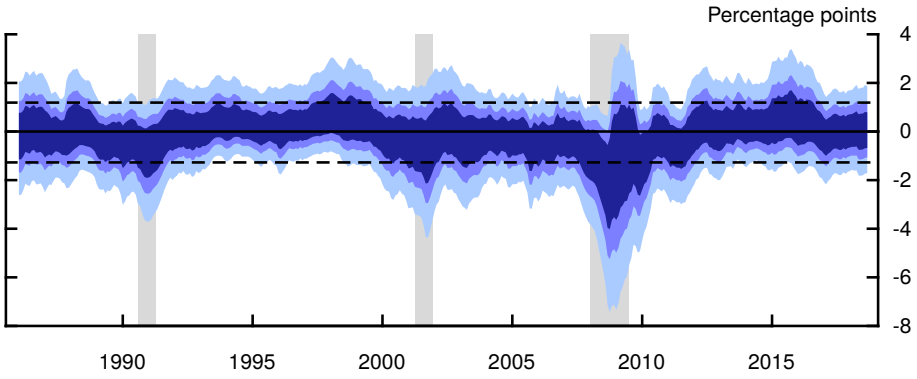
Time-Varying Macroeconomic Risk

Unemployment Rate



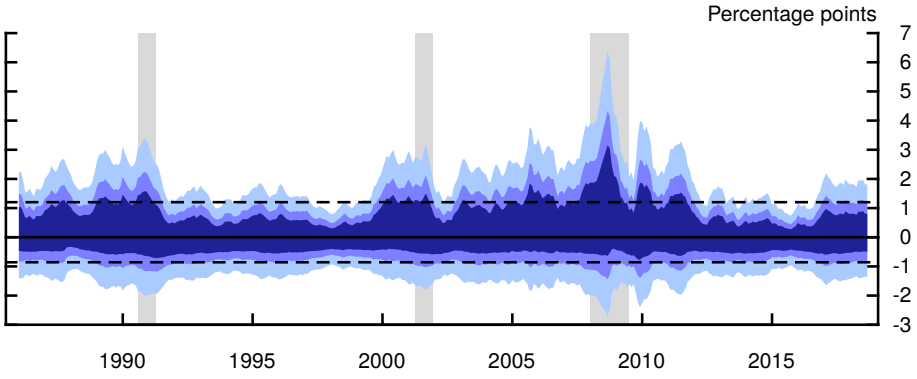
September 2018	
95th	0.4
85th	0.2
50th	-0.2
15th	-0.6
5th	-0.9

GDP Growth



September 2018	
95th	1.9
85th	1.2
50th	0.0
15th	-1.1
5th	-1.7

CPI Inflation

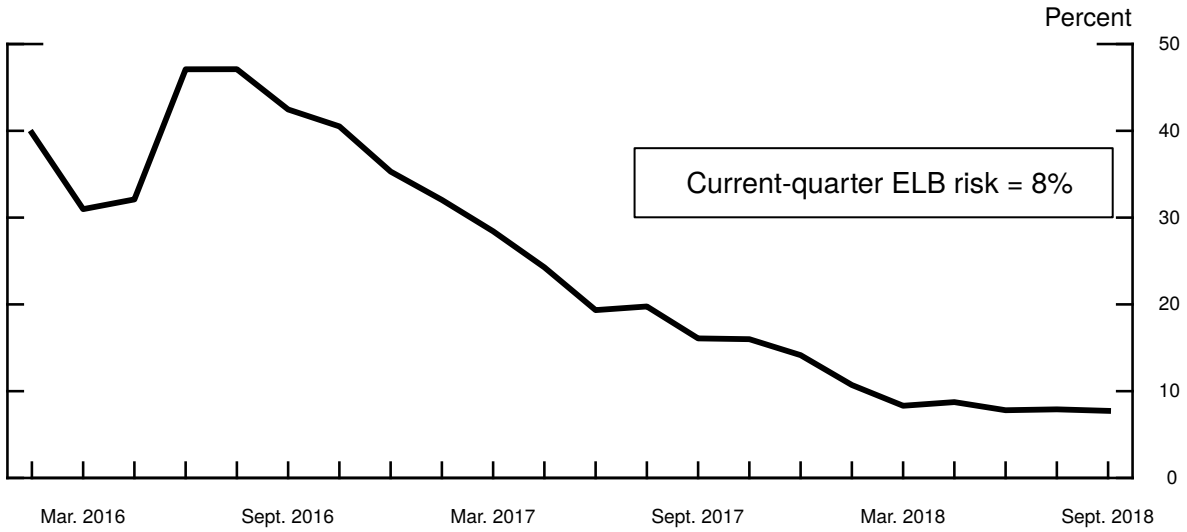


September 2018	
95th	1.8
85th	1.2
50th	0.1
15th	-0.8
5th	-1.4

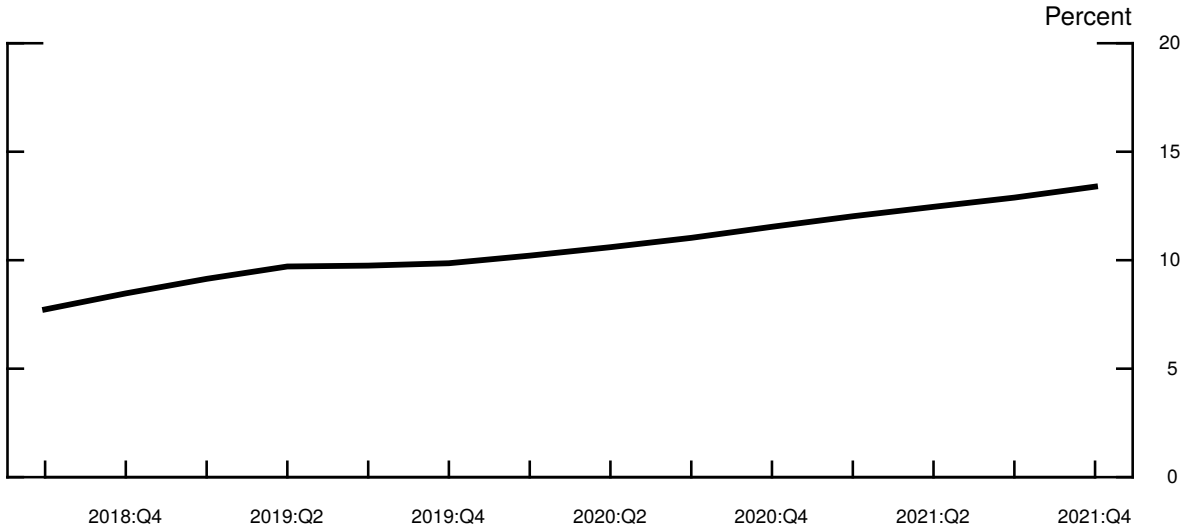
Note: The exhibit shows estimates of quantiles of the distribution of errors for four-quarter-ahead staff forecasts. The estimates are conditioned on indicators of real activity, inflation, financial market strain, and the volatility of high-frequency macroeconomic indicators. The tables show selected 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.

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)

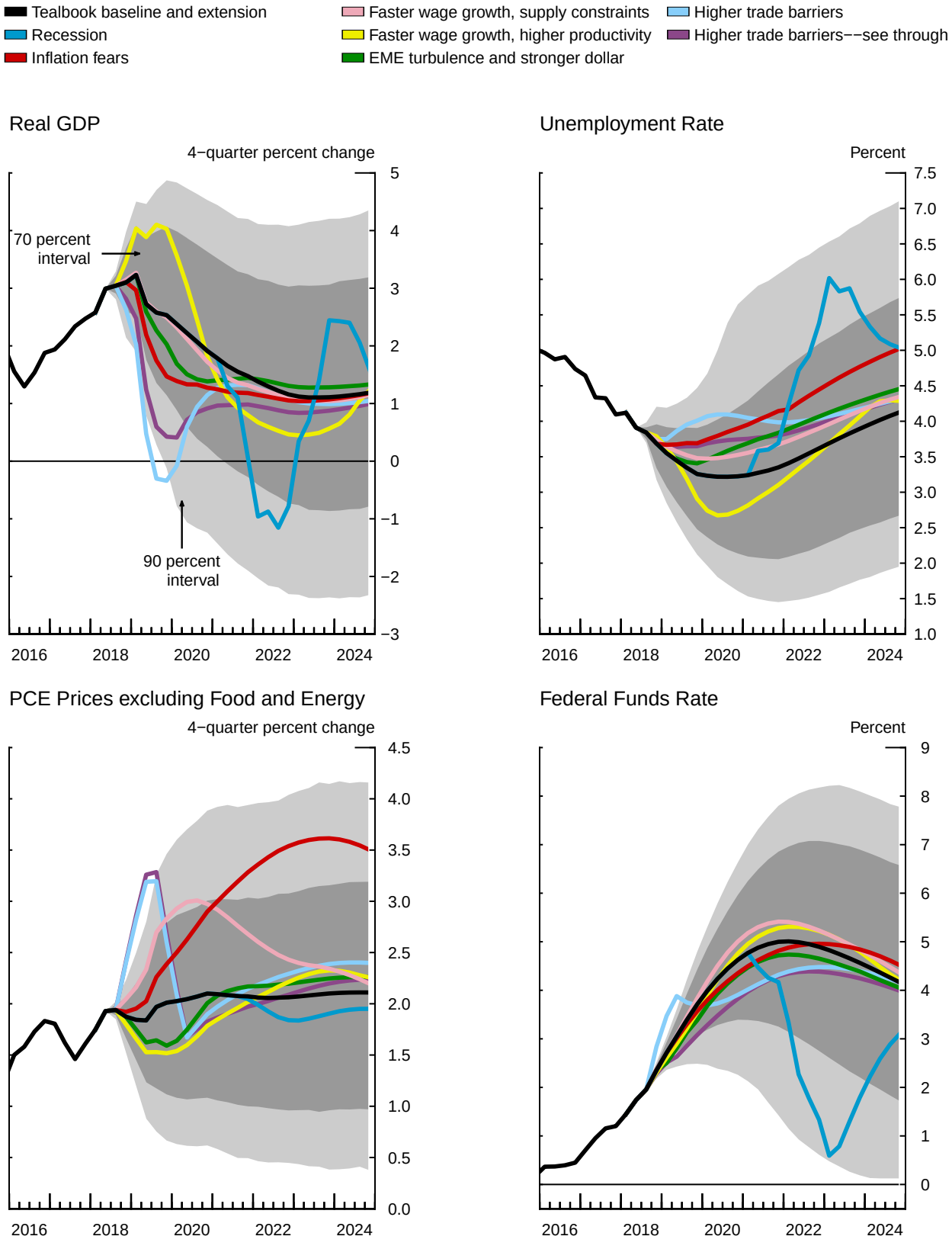
Measure and scenario	2018 H2	2019	2020	2021	2022	2023-24
Real GDP						
Tealbook baseline and extension	2.8	2.5	1.9	1.5	1.2	1.1
Recession	2.8	2.5	1.9	.1	-.8	2.0
Inflation fears	2.8	1.5	1.3	1.2	1.1	1.1
Faster wage growth, supply constraints	2.9	2.5	1.7	1.3	1.1	1.1
Faster wage growth, higher productivity	3.5	4.0	1.8	.8	.5	.9
EME turbulence and stronger dollar	2.8	2.0	1.4	1.4	1.3	1.3
Higher trade barriers	1.8	-.3	1.1	1.3	1.1	1.0
Higher trade barriers--see through	2.2	.4	.9	1.0	.8	.9
Unemployment rate[1]						
Tealbook baseline and extension	3.7	3.3	3.2	3.3	3.6	4.1
Recession	3.7	3.3	3.2	3.7	5.4	5.0
Inflation fears	3.7	3.7	3.9	4.1	4.4	5.0
Faster wage growth, supply constraints	3.7	3.5	3.5	3.7	3.9	4.3
Faster wage growth, higher productivity	3.8	2.9	2.7	3.1	3.6	4.3
EME turbulence and stronger dollar	3.7	3.4	3.6	3.8	4.1	4.5
Higher trade barriers	3.7	4.0	4.1	4.0	4.0	4.3
Higher trade barriers--see through	3.7	3.6	3.7	3.8	4.0	4.3
Total PCE prices						
Tealbook baseline and extension	1.8	1.9	2.0	2.0	2.0	2.1
Recession	1.8	1.9	2.0	1.9	1.8	1.9
Inflation fears	1.9	2.3	2.8	3.2	3.5	3.5
Faster wage growth, supply constraints	2.1	2.8	2.9	2.6	2.4	2.2
Faster wage growth, higher productivity	1.6	1.4	1.7	1.9	2.1	2.3
EME turbulence and stronger dollar	1.8	1.3	1.9	2.1	2.2	2.2
Higher trade barriers	2.9	2.5	1.8	2.0	2.2	2.4
Higher trade barriers--see through	2.9	2.6	1.7	1.9	2.0	2.2
Core PCE prices						
Tealbook baseline and extension	1.6	2.0	2.1	2.1	2.1	2.1
Recession	1.6	2.0	2.1	2.0	1.8	1.9
Inflation fears	1.7	2.4	2.9	3.3	3.5	3.6
Faster wage growth, supply constraints	2.0	2.8	3.0	2.7	2.4	2.3
Faster wage growth, higher productivity	1.5	1.5	1.8	2.0	2.2	2.3
EME turbulence and stronger dollar	1.6	1.6	2.0	2.2	2.2	2.3
Higher trade barriers	2.7	2.6	1.9	2.1	2.3	2.4
Higher trade barriers--see through	2.7	2.7	1.8	2.0	2.1	2.2
Federal funds rate[1]						
Tealbook baseline and extension	2.4	3.7	4.6	5.0	4.9	4.2
Recession	2.4	3.7	4.6	4.2	1.3	3.1
Inflation fears	2.4	3.6	4.4	4.8	5.0	4.5
Faster wage growth, supply constraints	2.3	3.8	5.0	5.4	5.2	4.3
Faster wage growth, higher productivity	2.3	3.6	4.8	5.3	5.2	4.2
EME turbulence and stronger dollar	2.4	3.4	4.3	4.7	4.7	4.0
Higher trade barriers	2.8	3.7	3.9	4.3	4.5	4.2
Higher trade barriers--see through	2.3	3.1	3.8	4.3	4.4	4.0

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



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

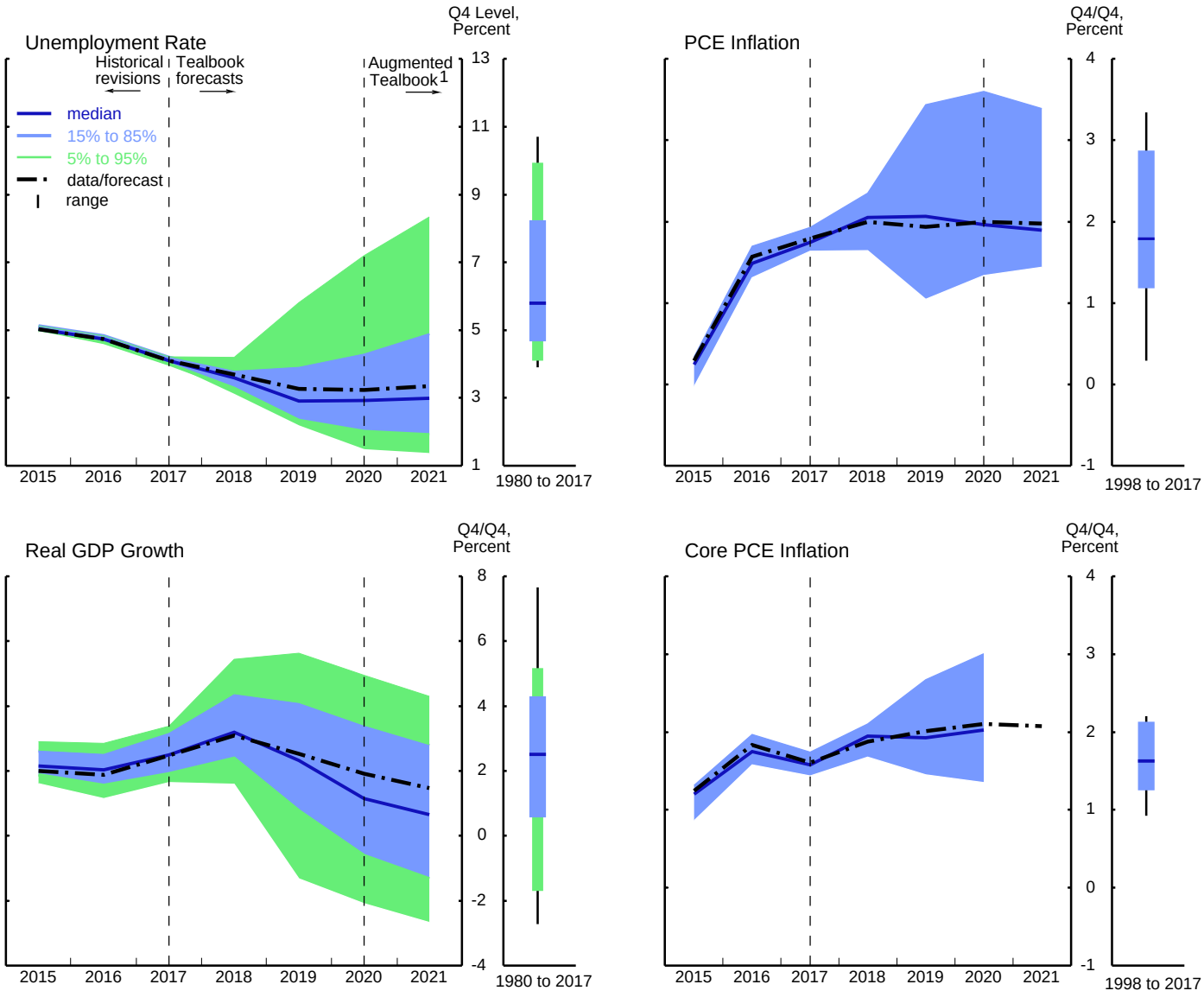
Measure	2018	2019	2020	2021	2022	2023	2024
Real GDP							
(percent change, Q4 to Q4)							
Projection	3.1	2.5	1.9	1.5	1.2	1.1	1.2
Confidence interval							
Tealbook forecast errors	2.4–4.4	.8–4.1	-.6–3.4	-1.3–2.8	. . .	. . .	. . .
FRB/US stochastic simulations	2.6–3.7	1.1–4.1	.2–3.6	-.3–3.2	-.7–3.0	-.9–3.1	-.8–3.2
Civilian unemployment rate							
(percent, Q4)							
Projection	3.7	3.3	3.2	3.3	3.6	3.9	4.1
Confidence interval							
Tealbook forecast errors	3.3–3.8	2.3–3.9	2.0–4.3	1.9–4.9	. . .	. . .	. . .
FRB/US stochastic simulations	3.3–4.0	2.5–3.9	2.1–4.2	2.1–4.7	2.2–5.1	2.5–5.4	2.7–5.7
PCE prices, total							
(percent change, Q4 to Q4)							
Projection	2.0	1.9	2.0	2.0	2.0	2.1	2.1
Confidence interval							
Tealbook forecast errors	1.6–2.4	1.0–3.4	1.3–3.6	1.4–3.4	. . .	. . .	. . .
FRB/US stochastic simulations	1.7–2.3	.9–2.8	.9–3.0	.8–3.0	.8–3.1	.8–3.2	.9–3.2
PCE prices excluding food and energy							
(percent change, Q4 to Q4)							
Projection	1.9	2.0	2.1	2.1	2.1	2.1	2.1
Confidence interval							
Tealbook forecast errors	1.7–2.1	1.4–2.7	1.4–3.0	. . .	. . .	. . .	. . .
FRB/US stochastic simulations	1.7–2.1	1.1–2.8	1.1–3.0	1.0–3.0	1.0–3.1	1.0–3.2	1.0–3.2
Federal funds rate							
(percent, Q4)							
Projection	2.4	3.7	4.6	5.0	4.9	4.6	4.2
Confidence interval							
FRB/US stochastic simulations	2.3–2.5	3.1–4.4	3.4–6.0	3.3–6.9	2.8–7.1	2.2–6.9	1.7–6.6

Note: Shocks underlying FRB/US stochastic simulations are randomly drawn from the 1969–2017 set of model equation residuals. Intervals derived from Tealbook forecast errors are based on projections made from 1980 to 2017 for real GDP and unemployment and from 1998 to 2017 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.

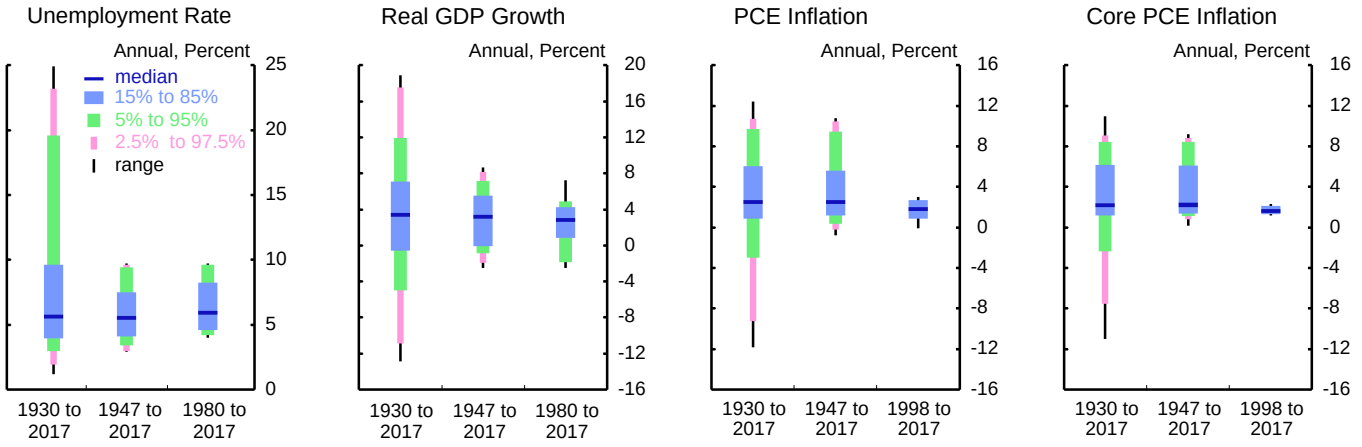
Prediction Intervals Derived from Historical Tealbook Forecast Errors

Forecast Error Percentiles

Historical Distributions



Historical Distributions



Note: See the technical note in the appendix for more information on this exhibit.

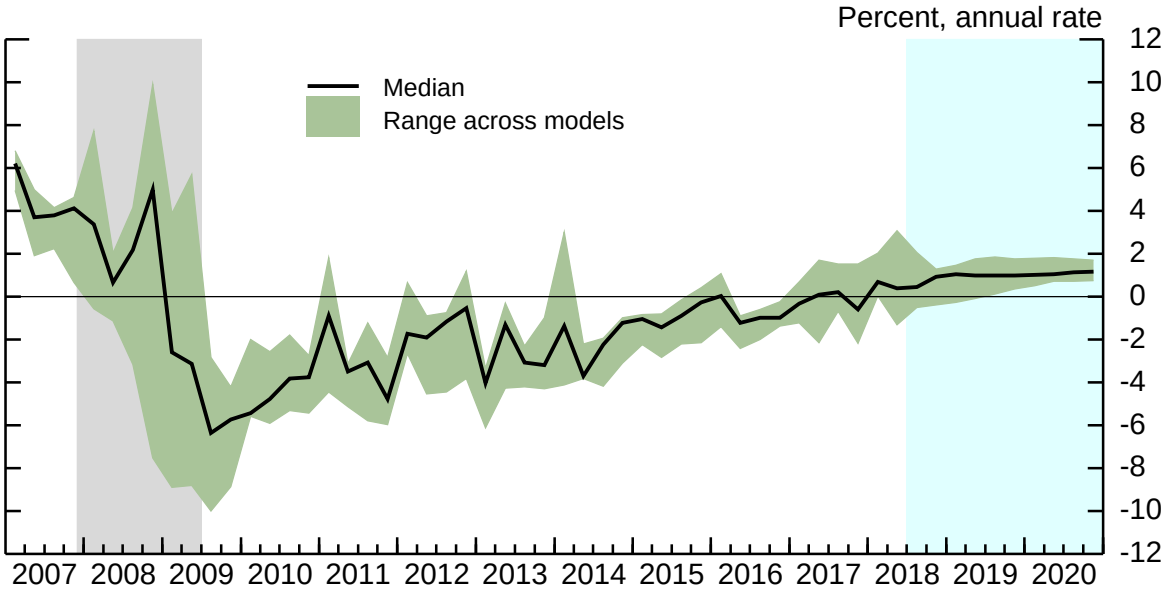
1. Augmented Tealbook prediction intervals use 2- and 3-year-ahead forecast errors from Blue Chip, CBO, and CEA to extend the Tealbook prediction intervals through 2021.

Alternative Model Forecasts
(Percent change, Q4 to Q4, except as noted)

Measure and projection	2018		2019		2020	
	June Tealbook	Current Tealbook	June Tealbook	Current Tealbook	June Tealbook	Current Tealbook
Real GDP						
Staff	2.8	3.1	2.4	2.5	1.8	1.9
FRB/US	2.5	3.2	1.7	1.3	1.3	1.1
EDO	2.8	3.2	2.3	2.2	2.3	2.1
Unemployment rate[1]						
Staff	3.6	3.7	3.4	3.3	3.4	3.2
FRB/US	3.8	3.8	3.8	4.3	4.0	4.7
EDO	4.0	4.0	4.2	4.2	4.5	4.6
Total PCE prices						
Staff	2.1	2.0	1.9	1.9	2.0	2.0
FRB/US	2.2	1.9	1.8	1.8	1.8	1.9
EDO	2.0	1.9	1.8	1.8	1.9	2.1
Core PCE prices						
Staff	1.9	1.9	2.0	2.0	2.1	2.1
FRB/US	2.0	1.8	1.9	1.9	1.9	2.1
EDO	1.9	1.8	1.8	1.8	1.9	2.1
Federal funds rate[1]						
Staff	2.5	2.4	3.8	3.7	4.5	4.6
FRB/US	2.4	2.3	3.1	3.1	3.4	3.3
EDO	2.4	2.2	3.1	3.0	3.5	3.5

1. Percent, average for Q4.

Estimates of the Short-Run Real Natural Rate of Interest



Note: Estimates are based on the four models from the System DSGE project; for more information, see the box "Estimates of the Short-Run Real Natural Rate of Interest" in the March 2016 Tealbook. The gray shaded bar indicates a period of recession as defined by the National Bureau of Economic Research.

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	.10	.07	.02	.03
Previous Tealbook	.06	.08	.02	.09
Less than 1 percent				
Current Tealbook	.12	.18	.12	.26
Previous Tealbook	.16	.11	.12	.12

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	.00	.11	.18	.03
Previous Tealbook	.01	.08	.15	.03
Decrease by 1 percentage point				
Current Tealbook	.26	.01	.03	.08
Previous Tealbook	.18	.01	.04	.10

Probability of Near-Term Recession

Probability that real GDP declines in the next two quarters	Staff	FRB/US	EDO	BVAR	Factor Model
Current Tealbook	.01	.02	.04	.02	.00
Previous Tealbook	.01	.02	.04	.02	.02

Note: "Staff" represents stochastic simulations in FRB/US around the staff baseline; baselines for FRB/US, BVAR, EDO, and the factor model are generated by those models themselves, up to the current-quarter estimate. Data for the current quarter are taken from the staff estimate for the second Tealbook in each quarter; if the second Tealbook for the current quarter has not yet been published, the preceding quarter is taken as the latest historical observation.

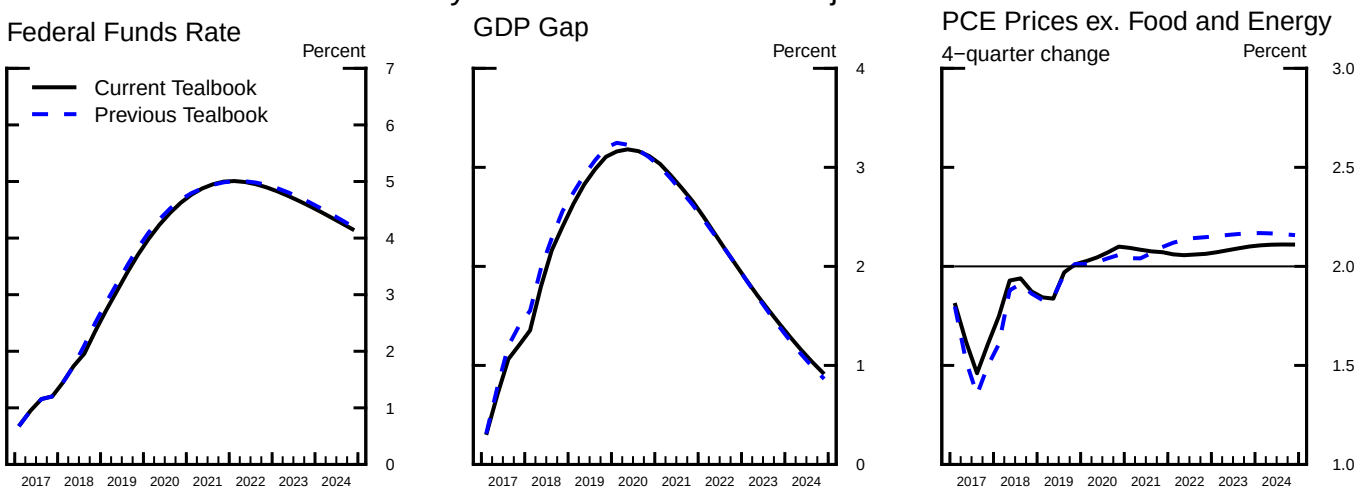
Policy Rules and the Staff Projection

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

(Percent)

	2018:Q4	2019:Q1
Taylor (1999) rule	**4.69**	**4.87**
Previous Tealbook	*4.83*	*4.97*
Taylor (1993) rule	**3.49**	**3.56**
Previous Tealbook	*3.55*	*3.59*
First−difference rule	**2.34**	**2.69**
Previous Tealbook projection	*2.32*	*2.64*
Flexible price−level targeting rule	**1.78**	**1.65**
Previous Tealbook projection	*1.78*	*1.64*
Addendum:		
Tealbook baseline	**2.35**	**2.71**

Key Elements of the Staff Projection



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

(Percent)

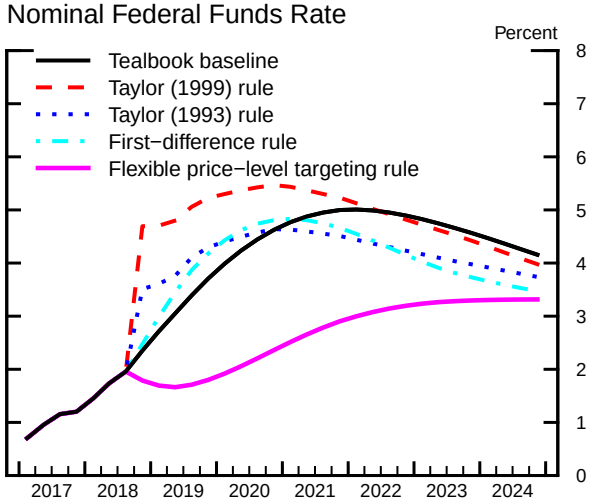
	Current Value	*Previous Tealbook*
Tealbook baseline		
FRB/US *r**	3.29	*3.44*
Average projected real federal funds rate	1.70	*1.82*
SEP−consistent baseline		
FRB/US *r**	1.80	
Average projected real federal funds rate	.88	

1. For rules that have a lagged policy rate as a right−hand−side variable, the lines denoted "Previous Tealbook projection" report prescriptions based on the previous Tealbook's staff outlook for inflation and the output gap, but conditional on the current−Tealbook value of the lagged policy rate.

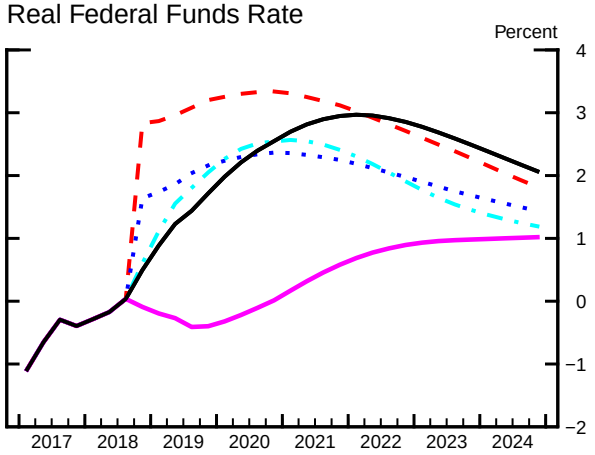
2. The "FRB/US *r**" is the level of the real federal funds rate that, if maintained over a 12−quarter period (beginning in the current quarter) in the FRB/US model, sets the output gap equal to zero in the final quarter of that period given either the Tealbook or SEP−consistent projection. The SEP−consistent baseline corresponds to the June 2018 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

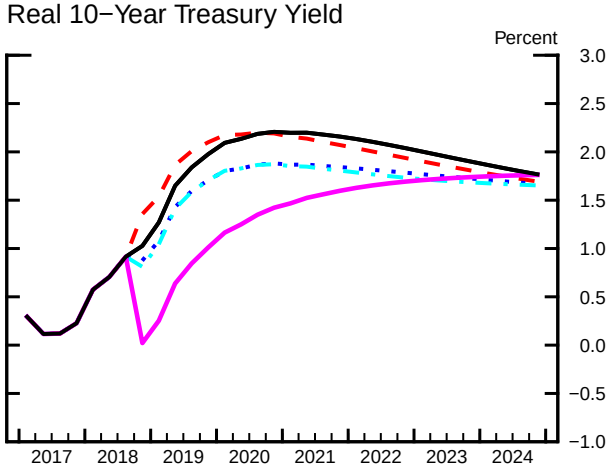
Nominal Federal Funds Rate



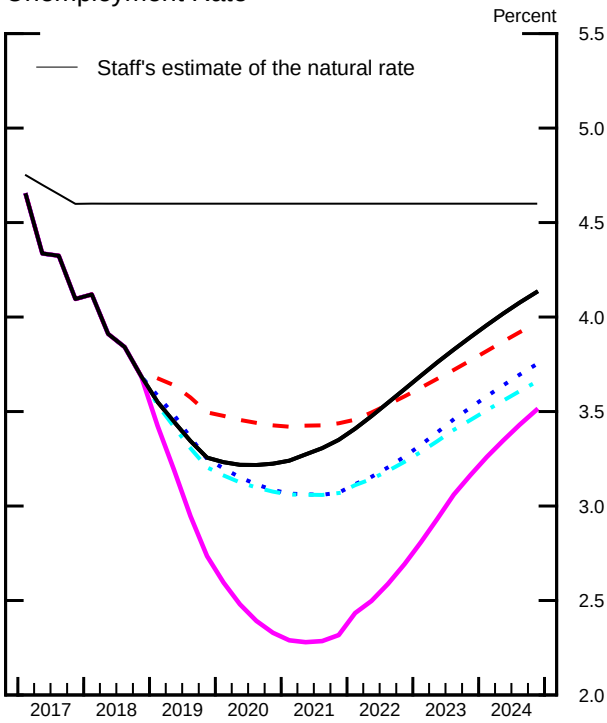
Real Federal Funds Rate



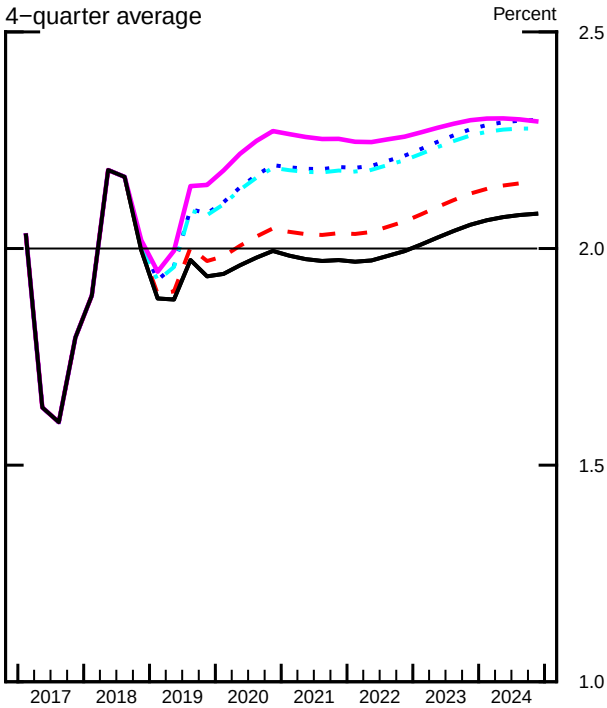
Real 10−Year Treasury Yield



Unemployment Rate

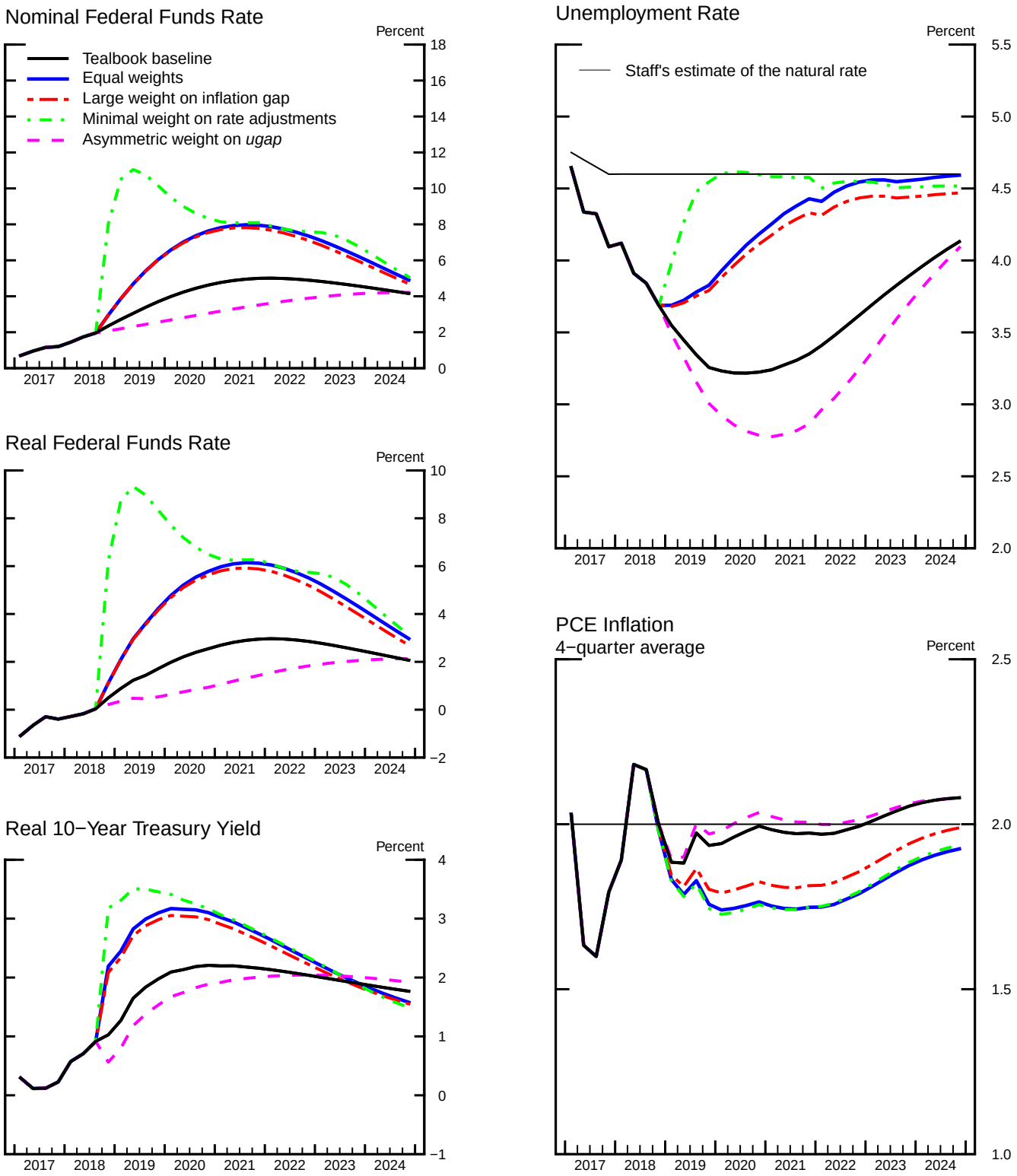


PCE Inflation
4−quarter average



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

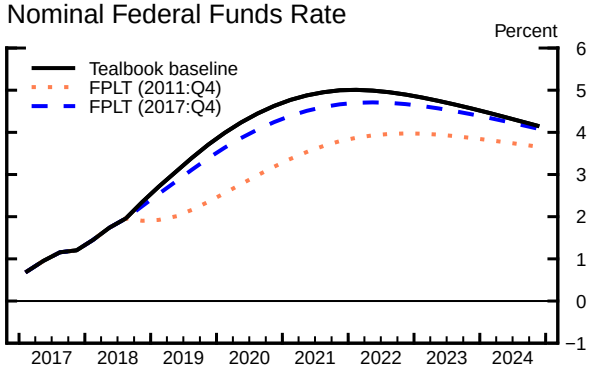


Note: Each set of lines corresponds to an optimal control policy under commitment in which policymakers minimize a discounted weighted sum of squared deviations of 4−quarter headline PCE inflation from the Committee's 2 percent objective, of squared deviations of the unemployment rate from the staff's 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.

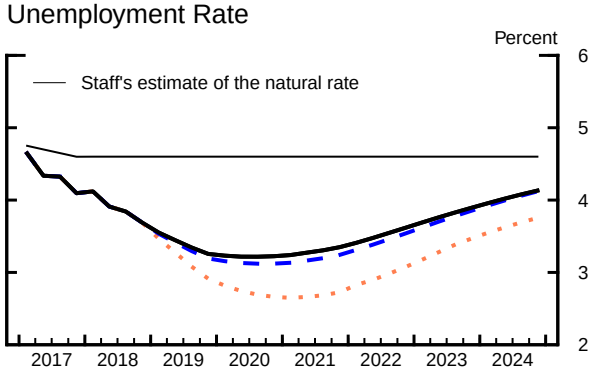
Flexible Price−Level Targeting with Alternative Price−Level Gaps

Tealbook Baseline

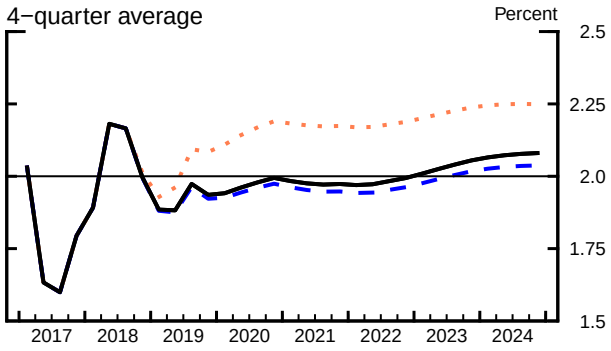
Nominal Federal Funds Rate



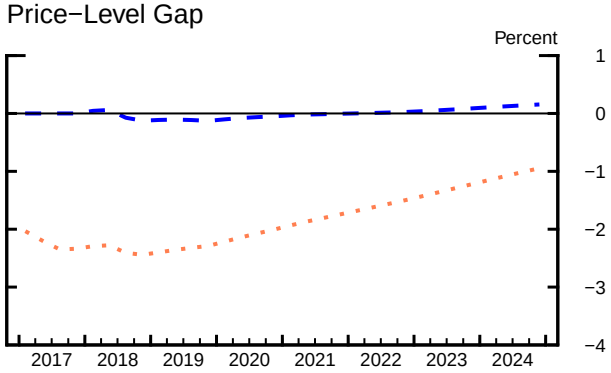
Unemployment Rate



PCE Inflation
4−quarter average

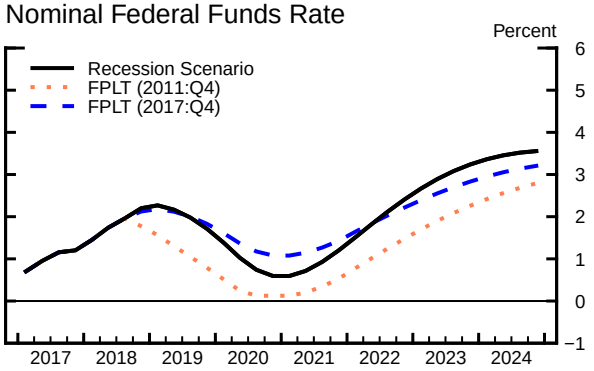


Price−Level Gap

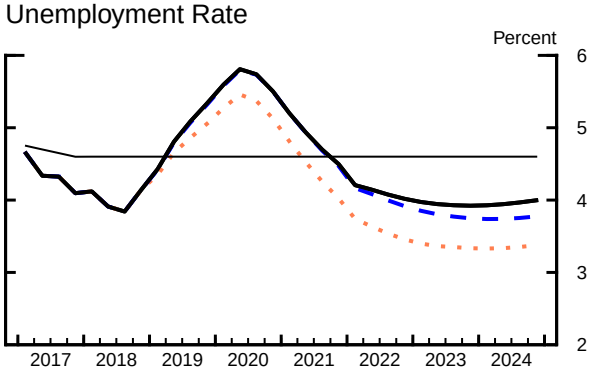


Recession Scenario

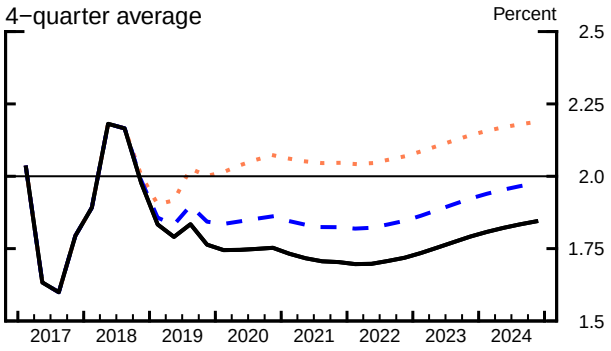
Nominal Federal Funds Rate



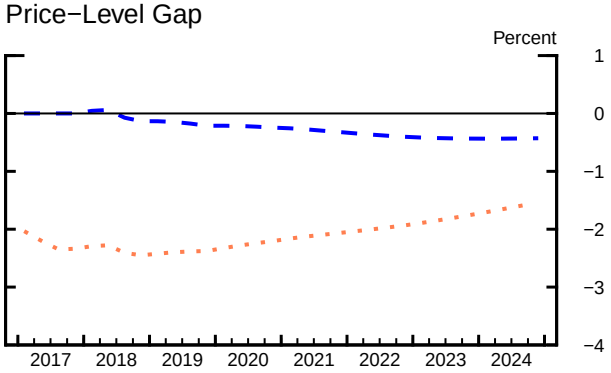
Unemployment Rate



PCE Inflation
4−quarter average



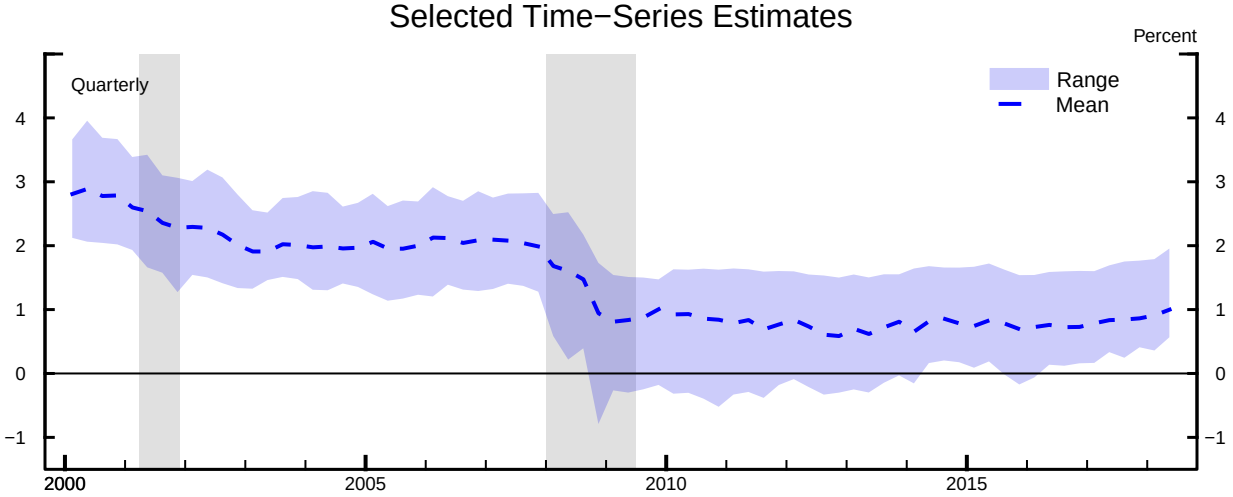
Price−Level Gap



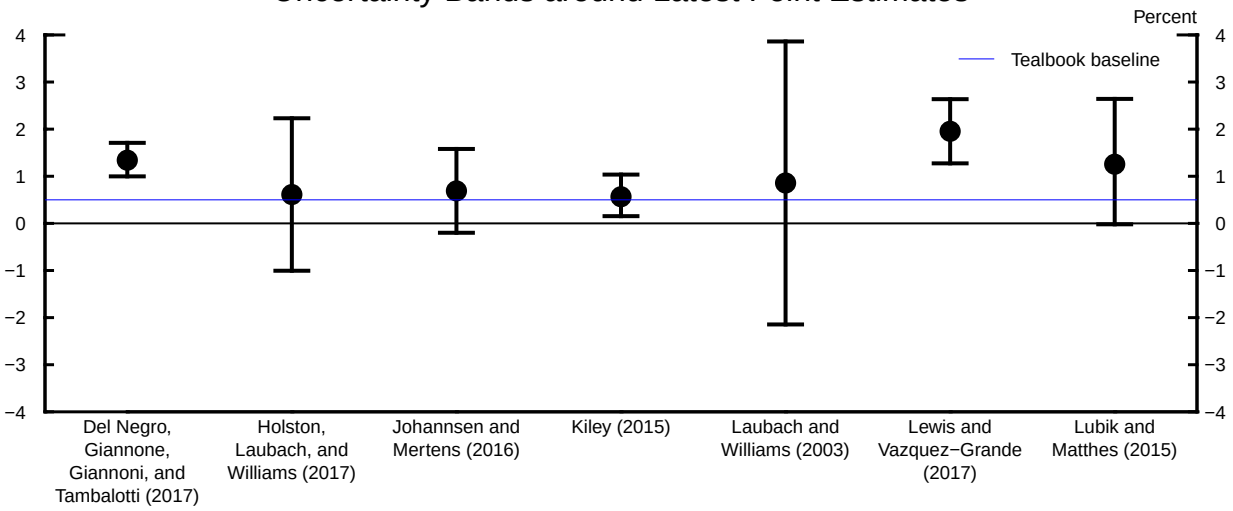
Note: The FPLT rules used herein respond to the unemployment gap with a coefficient of −1.85. We constructed the recession scenario in the FRB/US model by subjecting the Tealbook baseline to a sequence of negative spending shocks starting in the fourth quarter of 2018, the first quarter in the simulation. In constructing the recession scenario, we assumed that the federal funds rate is determined by the inertial Taylor (1999) rule.

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	Sept. 2018	.50
Median SEP	June 2018	.88
Median Survey of Primary Dealers	Aug. 2018	.75
Median Blue Chip (6−to−10−year)	Mar. 2018	.84
Congressional Budget Office (10−year)	Aug. 2018	1.15

Note: All time−series estimates run through 2018:Q2. The shaded vertical areas in the top panel are NBER recessions. In addition to the studies listed in the middle panel, the computation of the mean and the range in the top panel includes estimates from Christensen and Rudebusch (2017). The middle panel reports, where available, 68 percent uncertainty bands around each point estimate for 2018:Q2. See the technical appendix for sources.

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

Interval	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate[1]	
	07/20/18	09/13/18	07/20/18	09/13/18	07/20/18	09/13/18	07/20/18	09/13/18	07/20/18	09/13/18
Quarterly										
2018:Q1	4.2	4.3	2.0	2.2	2.5	2.5	2.3	2.2	4.1	4.1
Q2	7.4	8.1	4.8	4.7	1.9	1.9	2.0	2.1	3.9	3.9
Q3	4.2	4.7	2.5	3.0	1.4	1.5	1.5	1.5	3.8	3.8
Q4	4.5	4.4	2.5	2.5	1.7	2.1	1.7	1.8	3.7	3.7
2019:Q1	4.7	4.8	2.6	2.7	2.0	2.0	2.1	2.1	3.6	3.6
Q2	4.9	5.1	2.5	2.6	2.0	1.9	2.0	2.0	3.5	3.4
Q3	4.5	4.6	2.4	2.4	1.9	1.9	1.9	2.0	3.4	3.3
Q4	4.3	4.3	2.3	2.3	1.9	1.9	1.9	2.0	3.4	3.3
2020:Q1	4.2	4.2	2.1	2.1	2.0	2.0	2.1	2.1	3.4	3.2
Q2	4.2	4.4	1.8	2.0	2.0	2.0	2.1	2.1	3.4	3.2
Q3	3.8	4.0	1.7	1.8	1.9	2.0	2.0	2.1	3.4	3.2
Q4	3.6	3.8	1.6	1.7	1.9	2.0	2.0	2.1	3.4	3.2
Two-quarter[2]										
2018:Q2	5.8	6.2	3.4	3.4	2.2	2.2	2.1	2.1	-.2	-.2
Q4	4.3	4.5	2.5	2.8	1.6	1.8	1.6	1.6	-.2	-.2
2019:Q2	4.8	5.0	2.6	2.7	2.0	2.0	2.1	2.1	-.2	-.3
Q4	4.4	4.5	2.4	2.4	1.9	1.9	1.9	2.0	-.1	-.1
2020:Q2	4.2	4.3	2.0	2.1	2.0	2.0	2.1	2.1	.0	-.1
Q4	3.7	3.9	1.6	1.8	1.9	2.0	2.0	2.1	.0	.0
Four-quarter[3]										
2017:Q4	4.5	4.5	2.6	2.5	1.7	1.8	1.5	1.6	-.6	-.6
2018:Q4	5.1	5.3	2.9	3.1	1.9	2.0	1.9	1.9	-.4	-.4
2019:Q4	4.6	4.7	2.5	2.5	1.9	1.9	2.0	2.0	-.3	-.4
2020:Q4	3.9	4.1	1.8	1.9	2.0	2.0	2.1	2.1	.0	-.1
2021:Q4	...	3.6	1.5	1.5	2.0	2.0	2.1	2.1	.2	.2
Annual										
2017	4.1	4.2	2.3	2.2	1.7	1.8	1.5	1.6	4.4	4.4
2018	5.2	5.3	3.0	2.9	2.0	2.1	1.8	1.9	3.9	3.9
2019	4.7	4.9	2.6	2.8	1.8	1.9	1.9	1.9	3.5	3.4
2020	4.2	4.3	2.1	2.1	2.0	2.0	2.0	2.1	3.4	3.2
2021	...	3.7	1.6	1.6	2.0	2.0	2.0	2.1	3.5	3.3

... Not applicable.
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	4.7	3.0	2.5	2.7	2.6	2.4	2.3	2.1	2.0	1.8	1.7	3.1	2.5	1.9	1.5
Previous Tealbook	4.8	2.5	2.5	2.6	2.5	2.4	2.3	2.1	1.8	1.7	1.6	2.9	2.5	1.8	1.5
Final sales	5.6	1.8	2.8	2.9	2.5	2.3	2.3	2.1	2.0	1.7	1.9	3.0	2.5	1.9	1.6
Previous Tealbook	4.8	2.2	2.5	2.9	2.5	2.2	2.2	2.1	1.8	1.5	1.8	2.9	2.5	1.8	...
Priv. dom. final purch.	4.6	2.8	3.4	3.3	3.2	2.9	2.6	2.4	2.3	2.2	2.1	3.2	3.0	2.3	1.9
Previous Tealbook	3.5	3.1	2.9	3.1	2.9	2.7	2.5	2.3	2.2	2.1	2.0	2.9	2.8	2.1	
Personal cons. expend.	4.2	2.9	2.7	2.8	2.8	2.8	2.8	2.7	2.5	2.4	2.3	2.6	2.8	2.5	2.1
Previous Tealbook	3.4	2.7	2.6	2.7	2.7	2.7	2.6	2.4	2.3	2.3	2.3	2.4	2.6	2.3	...
Durables	8.6	1.7	4.6	2.3	2.3	2.3	2.3	2.1	2.0	1.8	1.7	3.1	2.3	1.9	1.5
Nondurables	3.7	4.0	3.0	2.9	2.9	2.9	2.9	2.7	2.6	2.5	2.4	2.7	2.9	2.6	2.2
Services	3.7	2.8	2.3	2.9	2.9	2.9	2.9	2.7	2.6	2.5	2.4	2.5	2.9	2.5	2.1
Residential investment	-1.8	-2.1	-.2	5.1	5.8	2.2	.4	.7	.4	.2	.3	-1.9	3.4	.4	1.3
Previous Tealbook	-1.4	-2.1	-.4	3.9	3.7	.8	.8	1.1	.7	1.0	.9	-1.2	2.3	.9	...
Nonres. priv. fixed invest.	8.9	3.7	7.9	5.2	4.4	3.4	2.3	1.9	1.7	1.7	1.6	8.0	3.8	1.7	.9
Previous Tealbook	6.0	7.3	5.4	4.9	4.2	3.4	2.5	2.1	1.8	1.4	1.1	7.2	3.8	1.6	...
Equipment & intangibles	7.3	4.1	8.8	5.7	4.9	3.7	2.6	2.2	2.1	2.3	2.3	7.7	4.2	2.2	1.7
Previous Tealbook	4.6	6.4	6.1	5.6	4.7	3.7	2.6	2.3	2.1	1.9	1.6	6.4	4.2	2.0	...
Nonres. structures	14.4	2.5	5.2	3.5	2.8	2.2	1.4	.8	.2	-.4	-.7	8.9	2.5	.0	-1.8
Previous Tealbook	10.8	10.4	2.8	2.8	2.5	2.3	2.2	1.4	.7	.0	-.4	10.0	2.4	.4	...
Net exports[2]	-844	-887	-907	-920	-952	-984	-1001	-1019	-1042	-1075	-1083	-885	-964	-1055	-1121
Previous Tealbook[2]	-605	-627	-641	-641	-661	-687	-705	-717	-738	-767	-776	-633	-673	-750	...
Exports	9.0	2.1	.5	3.1	2.8	3.1	2.5	2.8	2.8	2.7	2.7	3.7	2.9	2.8	2.7
Imports	-.5	6.8	2.7	3.9	5.7	5.9	3.8	4.0	4.6	5.5	2.8	3.0	4.8	4.2	3.5
Gov't. cons. & invest.	2.4	1.1	1.6	1.5	1.6	1.8	2.0	1.6	2.3	1.8	1.1	1.7	1.8	1.7	1.1
Previous Tealbook	3.2	.1	1.7	1.6	2.3	2.2	2.4	2.1	1.9	1.5	1.5	1.6	2.1	1.8	...
Federal	3.7	1.9	3.0	2.5	2.7	3.3	3.8	2.5	4.5	3.1	1.2	2.8	3.1	2.8	1.3
Defense	6.0	2.3	4.1	2.7	3.0	3.8	4.3	2.9	5.2	2.7	1.0	3.8	3.5	3.0	1.0
Nondefense	.5	1.4	1.5	2.3	2.2	2.6	2.9	2.0	3.5	3.6	1.5	1.4	2.5	2.7	1.6
State & local	1.7	.7	.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Change in priv. inventories[2]	-23	37	21	14	19	29	29	31	31	39	29	16	23	32	16
Previous Tealbook[2]	13	24	24	8	9	20	27	29	31	41	30	19	16	33	...

... Not applicable.
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	3.1	2.5	1.9	1.5
Previous Tealbook	1.3	2.7	2.7	2.0	1.8	2.6	2.9	2.5	1.8	1.5
Final sales	1.9	2.0	3.0	1.9	2.1	2.6	3.0	2.5	1.9	1.6
Previous Tealbook	1.7	2.0	2.9	2.0	1.9	2.9	2.9	2.5	1.8	...
Priv. dom. final purch.	2.6	2.6	4.3	2.7	2.7	3.3	3.2	3.0	2.3	1.9
Previous Tealbook	2.3	2.6	4.1	2.9	2.5	3.3	2.9	2.8	2.1	
Personal cons. expend.	1.6	1.9	3.8	3.0	2.8	2.7	2.6	2.8	2.5	2.1
Previous Tealbook	1.3	2.0	3.6	3.0	2.8	2.8	2.4	2.6	2.3	...
Durables	6.3	5.0	9.2	6.0	6.8	7.7	3.1	2.3	1.9	1.5
Nondurables	.7	2.8	3.0	3.0	2.0	3.0	2.7	2.9	2.6	2.2
Services	1.2	1.1	3.2	2.6	2.4	1.8	2.5	2.9	2.5	2.1
Residential investment	15.4	7.1	7.8	8.9	4.5	3.8	-1.9	3.4	.4	1.3
Previous Tealbook	15.7	6.8	6.3	10.3	2.5	2.6	-1.2	2.3	.9	...
Nonres. priv. fixed invest.	5.6	5.4	6.4	-.7	1.8	6.3	8.0	3.8	1.7	.9
Previous Tealbook	5.2	4.8	6.1	.3	.7	6.3	7.2	3.8	1.6	...
Equipment & intangibles	6.1	5.1	5.6	2.6	1.6	7.3	7.7	4.2	2.2	1.7
Previous Tealbook	5.5	4.5	5.3	3.3	-.1	6.7	6.4	4.2	2.0	...
Nonres. structures	4.0	6.7	8.8	-10.7	2.5	2.9	8.9	2.5	.0	-1.8
Previous Tealbook	4.1	5.8	8.8	-9.1	3.5	5.0	10.0	2.4	.4	...
Net exports[1]	-569	-533	-578	-725	-786	-859	-885	-964	-1055	-1121
Previous Tealbook[1]	-447	-405	-428	-545	-586	-622	-633	-673	-750	...
Exports	2.1	6.0	3.0	-1.6	.8	4.7	3.7	2.9	2.8	2.7
Imports	.6	3.0	6.7	3.4	3.1	5.4	3.0	4.8	4.2	3.5
Gov't. cons. & invest.	-2.1	-2.4	.2	2.2	.9	.1	1.7	1.8	1.7	1.1
Previous Tealbook	-2.2	-2.8	.5	1.6	.4	.7	1.6	2.1	1.8	...
Federal	-2.6	-6.1	-1.2	1.2	.2	1.3	2.8	3.1	2.8	1.3
Defense	-4.7	-6.5	-3.6	-.2	-.7	1.3	3.8	3.5	3.0	1.0
Nondefense	1.2	-5.5	2.7	3.4	1.5	1.3	1.4	2.5	2.7	1.6
State & local	-1.7	.2	1.1	2.8	1.4	-.5	1.0	1.0	1.0	1.0
Change in priv. inventories[1]	71	109	87	129	23	23	16	23	32	16
Previous Tealbook[1]	55	79	68	101	33	15	19	16	33	...

... Not applicable.
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	4.7	3.0	2.5	2.7	2.6	2.4	2.3	2.1	2.0	1.8	1.7	3.1	2.5	1.9	1.5
Previous Tealbook	4.8	2.5	2.5	2.6	2.5	2.4	2.3	2.1	1.8	1.7	1.6	2.9	2.5	1.8	1.5
Final sales	5.6	1.9	2.8	2.9	2.5	2.3	2.3	2.1	2.0	1.7	1.9	3.0	2.5	1.9	1.6
Previous Tealbook	4.8	2.2	2.5	2.9	2.5	2.2	2.2	2.1	1.8	1.5	1.8	2.9	2.5	1.8	...
Priv. dom. final purch.	4.0	2.4	2.9	2.8	2.7	2.5	2.2	2.1	2.0	1.9	1.8	2.7	2.6	1.9	1.6
Previous Tealbook	3.1	2.7	2.5	2.6	2.5	2.3	2.1	1.9	1.8	1.8	1.7	2.5	2.4	1.8	...
Personal cons. expend.	2.9	2.0	1.8	1.9	1.9	1.9	1.9	1.8	1.7	1.6	1.6	1.8	1.9	1.7	1.4
Previous Tealbook	2.4	1.8	1.8	1.8	1.8	1.8	1.8	1.6	1.6	1.5	1.5	1.6	1.8	1.6	...
Durables	.6	.1	.3	.2	.2	.2	.2	.1	.1	.1	.1	.2	.2	.1	.1
Nondurables	.5	.6	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.3
Services	1.7	1.3	1.1	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.1	1.2	1.4	1.2	1.0
Residential investment	-.1	-.1	.0	.2	.2	.1	.0	.0	.0	.0	.0	-.1	.1	.0	.0
Previous Tealbook	-.1	-.1	.0	.1	.1	.0	.0	.0	.0	.0	.0	.0	.1	.0	...
Nonres. priv. fixed invest.	1.2	.5	1.1	.7	.6	.5	.3	.3	.2	.2	.2	1.1	.5	.2	.1
Previous Tealbook	.8	.9	.7	.6	.5	.4	.3	.3	.2	.2	.1	.9	.5	.2	...
Equipment & intangibles	.8	.4	.9	.6	.5	.4	.3	.2	.2	.2	.2	.8	.4	.2	.2
Previous Tealbook	.5	.6	.6	.6	.5	.4	.3	.2	.2	.2	.2	.6	.4	.2	...
Nonres. structures	.4	.1	.2	.1	.1	.1	.0	.0	.0	.0	.0	.3	.1	.0	-.1
Previous Tealbook	.3	.3	.1	.1	.1	.1	.1	.0	.0	.0	.0	.3	.1	.0	...
Net exports	1.2	-.8	-.3	-.2	-.5	-.5	-.3	-.3	-.4	-.5	-.1	.0	-.4	-.3	-.2
Previous Tealbook	1.2	-.5	-.3	.0	-.4	-.5	-.3	-.2	-.4	-.5	-.2	.1	-.3	-.3	...
Exports	1.1	.3	.1	.4	.3	.4	.3	.3	.3	.3	.3	.5	.3	.3	.3
Imports	.1	-1.0	-.4	-.6	-.9	-.9	-.6	-.6	-.7	-.8	-.4	-.5	-.7	-.6	-.5
Gov't. cons. & invest.	.4	.2	.3	.3	.3	.3	.3	.3	.4	.3	.2	.3	.3	.3	.2
Previous Tealbook	.6	.0	.3	.3	.4	.4	.4	.4	.3	.3	.3	.3	.4	.3	...
Federal	.2	.1	.2	.2	.2	.2	.2	.2	.3	.2	.1	.2	.2	.2	.1
Defense	.2	.1	.2	.1	.1	.1	.2	.1	.2	.1	.0	.1	.1	.1	.0
Nondefense	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.0	.0	.1	.1	.0
State & local	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
Change in priv. inventories	-.9	1.2	-.3	-.1	.1	.2	.0	.0	.0	.1	-.2	.1	.0	.0	-.1
Previous Tealbook	.0	.2	.0	-.3	.0	.2	.2	.0	.0	.2	-.2	.1	.0	.0	...

... Not applicable.
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	1.6	1.8	2.0	2.4	2.1	2.0	2.1	2.4	2.1	2.0	2.1	2.1	2.2	2.1
Previous Tealbook	2.5	1.7	1.9	2.0	2.3	2.1	1.9	2.1	2.3	2.1	2.0	2.1	2.1	2.1	...
PCE chain-wt. price index	1.9	1.5	2.1	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0
Previous Tealbook	1.9	1.4	1.7	2.0	2.0	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0
Energy	.6	5.0	7.9	1.0	-.8	-.9	-1.2	-1.2	-1.2	-1.3	-1.2	6.5	-.5	-1.2	-.8
Previous Tealbook	.4	.4	1.4	.2	-.5	-.6	-.9	-1.0	-1.0	-1.1	-1.0	3.7	-.4	-1.0	...
Food	1.2	.6	1.9	2.0	2.2	2.6	3.0	2.8	2.6	2.5	2.4	1.0	2.4	2.6	2.3
Previous Tealbook	1.2	1.4	2.0	2.0	2.2	2.6	3.0	2.8	2.6	2.5	2.4	1.2	2.4	2.6	...
Ex. food & energy	2.1	1.5	1.8	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	1.9	2.0	2.1	2.1
Previous Tealbook	2.0	1.5	1.7	2.1	2.0	1.9	1.9	2.1	2.1	2.0	2.0	1.9	2.0	2.1	2.1
Ex. food & energy, market based	2.2	1.2	1.7	1.9	1.8	1.8	1.8	2.0	2.0	1.9	1.9	1.8	1.8	2.0	1.9
Previous Tealbook	2.0	1.3	1.6	1.9	1.9	1.8	1.8	2.0	2.0	1.9	1.9	1.8	1.8	1.9	...
CPI	1.7	2.2	2.6	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.5	2.2	2.3	2.3
Previous Tealbook	1.7	1.9	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.3	...
Ex. food & energy	1.8	2.1	2.1	2.2	2.4	2.4	2.4	2.6	2.6	2.5	2.5	2.2	2.3	2.6	2.6
Previous Tealbook	1.8	2.1	2.2	2.5	2.5	2.4	2.4	2.6	2.6	2.5	2.5	2.3	2.4	2.5	...
ECI, hourly compensation[2]	2.4	2.3	2.3	2.8	2.8	2.8	2.9	3.0	3.0	3.0	3.0	2.8	2.8	3.0	3.0
Previous Tealbook[2]	2.4	2.3	2.3	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.9	2.7	2.8	2.9	...
Business sector															
Output per hour	4.2	1.5	.8	1.3	1.2	1.1	1.0	1.1	1.2	1.2	1.2	1.8	1.1	1.2	1.1
Previous Tealbook	4.4	.9	.1	.9	.9	.9	.9	.9	.9	.9	.9	1.4	.9	.9	...
Compensation per hour	2.3	2.9	3.2	3.9	4.0	4.1	4.1	4.1	4.2	4.2	4.1	3.2	4.0	4.2	4.0
Previous Tealbook	1.8	3.1	3.2	4.0	4.0	4.0	4.0	4.0	4.1	4.1	4.1	3.0	4.0	4.1	...
Unit labor costs	-1.8	1.4	2.3	2.6	2.8	2.9	3.1	3.0	3.0	2.9	2.9	1.4	2.8	3.0	2.8
Previous Tealbook	-2.4	2.2	3.1	3.1	3.0	3.0	3.0	3.0	3.2	3.1	3.2	1.5	3.0	3.1	...
Core goods imports chain-wt. price index[3]	.5	-2.2	-.9	.2	.6	.8	.8	.9	.7	.7	.7	.0	.6	.8	.7
Previous Tealbook[3]	1.4	-1.9	-.7	.4	.5	.6	.6	.8	.6	.6	.6	.4	.5	.7	...

... Not applicable.
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	2.1	2.2	2.1
Previous Tealbook	1.9	1.6	1.6	1.0	1.5	1.9	2.1	2.1	2.1	...
PCE chain-wt. price index	1.8	1.2	1.2	.3	1.6	1.8	2.0	1.9	2.0	2.0
Previous Tealbook	1.8	1.2	1.2	.4	1.6	1.7	1.9	1.9	2.0	2.0
Energy	2.1	-2.9	-6.9	-16.4	2.1	8.1	6.5	-.5	-1.2	-.8
Previous Tealbook	2.3	-2.5	-6.5	-16.2	2.2	7.6	3.7	-.4	-1.0	...
Food	1.3	.7	2.8	.3	-1.8	.7	1.0	2.4	2.6	2.3
Previous Tealbook	1.2	.7	2.6	.3	-1.7	.7	1.2	2.4	2.6	...
Ex. food & energy	1.8	1.6	1.5	1.2	1.8	1.6	1.9	2.0	2.1	2.1
Previous Tealbook	1.8	1.5	1.5	1.3	1.9	1.5	1.9	2.0	2.1	2.1
Ex. food & energy, market based	1.5	1.1	1.2	1.1	1.5	1.2	1.8	1.8	2.0	1.9
Previous Tealbook	1.5	1.1	1.2	1.1	1.5	1.2	1.8	1.8	1.9	...
CPI	1.9	1.2	1.2	.4	1.8	2.1	2.5	2.2	2.3	2.3
Previous Tealbook	1.9	1.2	1.2	.4	1.8	2.1	2.3	2.2	2.3	...
Ex. food & energy	1.9	1.7	1.7	2.0	2.2	1.7	2.2	2.3	2.6	2.6
Previous Tealbook	1.9	1.7	1.7	2.0	2.2	1.7	2.3	2.4	2.5	...
ECI, hourly compensation[1]	1.8	2.0	2.3	1.9	2.2	2.6	2.8	2.8	3.0	3.0
Previous Tealbook[1]	1.8	2.0	2.3	1.9	2.2	2.6	2.7	2.8	2.9	...
Business sector										
Output per hour	.2	1.8	.1	.7	1.1	.8	1.8	1.1	1.2	1.1
Previous Tealbook	-.1	1.9	.1	.7	1.1	.9	1.4	.9	.9	...
Compensation per hour	5.9	-.3	2.8	2.5	2.1	3.0	3.2	4.0	4.2	4.0
Previous Tealbook	5.9	-.1	2.9	3.1	-.1	2.8	3.0	4.0	4.1	...
Unit labor costs	5.7	-2.0	2.7	1.8	1.0	2.3	1.4	2.8	3.0	2.8
Previous Tealbook	6.0	-2.0	2.8	2.4	-1.2	1.9	1.5	3.0	3.1	...
Core goods imports chain-wt. price index[2]	-.4	-2.2	-.4	-4.4	-.7	1.1	.0	.6	.8	.7
Previous Tealbook[2]	.1	-1.5	.3	-3.7	-.2	1.3	.4	.5	.7	...

... Not applicable.

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]	217	181	184	187	181	175	165	150	135	120	110	200	177	129	85
Unemployment rate[3]	3.9	3.8	3.7	3.6	3.4	3.3	3.3	3.2	3.2	3.2	3.2	3.7	3.3	3.2	3.4
Previous Tealbook[3]	3.9	3.8	3.7	3.6	3.5	3.4	3.4	3.4	3.4	3.4	3.4	3.7	3.4	3.4	3.6
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]	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	...
Employment-to-Population Ratio[3]	60.4	60.4	60.5	60.6	60.7	60.8	60.8	60.8	60.8	60.8	60.8	60.5	60.8	60.8	60.5
Employment-to-Population Trend[3]	59.8	59.7	59.7	59.6	59.6	59.6	59.5	59.5	59.4	59.4	59.4	59.7	59.5	59.4	59.2
Output gap[4]	1.8	2.2	2.4	2.7	2.9	3.0	3.2	3.2	3.2	3.2	3.2	2.4	3.2	3.2	2.7
Previous Tealbook[4]	2.0	2.3	2.6	2.8	3.0	3.1	3.3	3.3	3.3	3.2	3.1	2.6	3.3	3.1	...
Industrial production[5]	5.1	3.0	1.9	2.4	2.7	2.5	2.3	2.0	1.4	1.3	1.0	3.1	2.5	1.4	.7
Previous Tealbook[5]	6.0	2.8	2.0	2.3	2.4	2.0	1.9	1.9	1.4	1.3	.9	3.3	2.2	1.4	...
Manufacturing industr. prod.[5]	2.3	2.8	2.5	2.0	2.7	3.0	2.4	1.7	1.5	1.4	1.0	2.4	2.5	1.4	.7
Previous Tealbook[5]	1.9	3.1	2.3	1.8	2.5	2.6	2.1	1.6	1.5	1.4	.9	2.3	2.2	1.4	...
Capacity utilization rate - mfg.[3]	75.5	75.8	76.0	76.1	76.4	76.8	77.0	77.2	77.3	77.4	77.5	76.0	77.0	77.5	77.5
Previous Tealbook[3]	75.4	75.7	75.9	76.0	76.3	76.6	76.8	77.0	77.1	77.2	77.3	75.9	76.8	77.3	...
Housing starts[6]	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Light motor vehicle sales[6]	17.2	16.8	17.0	17.0	17.0	17.0	17.0	16.9	16.8	16.8	16.7	17.0	17.0	16.8	16.6
Income and saving															
Nominal GDP[5]	8.1	4.7	4.4	4.8	5.1	4.6	4.3	4.2	4.4	4.0	3.8	5.3	4.7	4.1	3.6
Real disposable pers. income[5]	2.4	2.3	2.6	3.4	2.5	2.3	2.4	3.7	2.3	1.6	2.2	2.9	2.7	2.4	1.8
Previous Tealbook[5]	1.8	2.5	2.9	4.1	2.2	1.8	2.2	3.2	2.2	1.8	2.2	2.7	2.6	2.3	...
Personal saving rate[3]	6.7	6.6	6.5	6.7	6.6	6.5	6.4	6.6	6.6	6.4	6.4	6.5	6.4	6.4	6.1
Previous Tealbook[3]	2.9	2.8	2.9	3.2	3.1	2.9	2.9	3.1	3.0	2.9	2.9	2.9	2.9	2.9	...
Corporate profits[7]	14.0	8.0	3.6	.1	2.8	.6	-2.4	-2.2	1.0	-.4	-1.9	7.6	.3	-.9	-.4
Profit share of GNP[3]	10.9	11.0	11.0	10.9	10.8	10.7	10.6	10.4	10.3	10.2	10.1	11.0	10.6	10.1	9.7
Gross national saving rate[3]	18.4	18.7	18.7	18.5	18.6	18.5	18.4	18.2	18.2	18.0	18.0	18.7	18.4	18.0	17.6
Net national saving rate[3]	3.8	4.1	3.9	3.6	3.6	3.5	3.2	3.0	2.9	2.7	2.6	3.9	3.2	2.6	2.1

... Not applicable.
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]	179	192	250	226	195	182	200	177	129	85
Unemployment rate[2]	7.8	7.0	5.7	5.0	4.7	4.1	3.7	3.3	3.2	3.4
Previous Tealbook[2]	7.8	7.0	5.7	5.0	4.7	4.1	3.7	3.4	3.4	3.6
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	4.7	4.7	4.7	4.7	...
Employment-to-Population Ratio[2]	58.7	58.5	59.3	59.4	59.8	60.1	60.5	60.8	60.8	60.5
Employment-to-Population Trend[2]	60.3	60.2	60.1	60.0	59.9	59.8	59.7	59.5	59.4	59.2
Output gap[3]	-3.7	-2.8	-.8	-.2	.4	1.2	2.4	3.2	3.2	2.7
Previous Tealbook[3]	-3.9	-3.0	-.9	-.1	.3	1.4	2.6	3.3	3.1	...
Industrial production	2.2	2.3	3.4	-3.3	-.5	3.0	3.1	2.5	1.4	.7
Previous Tealbook	2.2	2.3	3.4	-3.3	-.5	3.0	3.3	2.2	1.4	...
Manufacturing industr. prod.	1.4	1.1	1.4	-1.6	-.1	1.9	2.4	2.5	1.4	.7
Previous Tealbook	1.4	1.1	1.4	-1.6	-.1	1.9	2.3	2.2	1.4	...
Capacity utilization rate - mfg.[2]	74.7	75.1	76.3	75.4	74.4	75.2	76.0	77.0	77.5	77.5
Previous Tealbook[2]	74.7	75.1	76.3	75.4	74.4	75.2	75.9	76.8	77.3	...
Housing starts[4]	.8	.9	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.3
Light motor vehicle sales[4]	14.4	15.5	16.5	17.4	17.5	17.1	17.0	17.0	16.8	16.6
Income and saving										
Nominal GDP	3.6	4.4	4.4	2.9	3.4	4.5	5.3	4.7	4.1	3.6
Real disposable pers. income	4.9	-2.5	5.2	3.1	1.6	2.8	2.9	2.7	2.4	1.8
Previous Tealbook	5.1	-2.8	4.9	3.2	.2	1.9	2.7	2.6	2.3	...
Personal saving rate[2]	10.2	6.3	7.4	7.4	6.4	6.3	6.5	6.4	6.4	6.1
Previous Tealbook[2]	9.2	4.7	5.9	6.1	3.6	2.7	2.9	2.9	2.9	...
Corporate profits[5]	.7	3.9	5.9	-10.7	7.6	3.3	7.6	.3	-.9	-.4
Profit share of GNP[2]	11.9	11.8	12.0	10.4	10.8	10.7	11.0	10.6	10.1	9.7
Gross national saving rate[2]	18.8	19.2	20.2	19.4	18.3	18.3	18.7	18.4	18.0	17.6
Net national saving rate[2]	3.7	4.0	5.1	4.3	3.0	3.1	3.9	3.2	2.6	2.1

... Not applicable.

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	2018 Q2	2018 Q3	2018 Q4	2019 Q1
Unified federal budget[1]				Nominal dollars, billions						
Receipts	3,268	3,316	3,344	3,471	3,630	3,767	1,044	804	784	726
Outlays	3,853	3,982	4,118	4,408	4,751	5,034	1,051	970	1,119	1,119
Surplus/deficit	-585	-665	-774	-937	-1,121	-1,267	-7	-167	-334	-393
				Percent of GDP						
Surplus/deficit	-3.2	-3.5	-3.8	-4.4	-5.0	-5.5	-.1	-3.3	-6.5	-7.6
Previous Tealbook	*-3.2*	*-3.5*	*-3.9*	*-4.7*	*-5.4*	*-5.3*	*-.1*	*-3.6*	*-7.0*	*-7.7*
Primary surplus/deficit	-1.9	-2.1	-2.2	-2.6	-2.8	-3.1	1.8	-2.1	-4.4	-5.7
Net interest	1.3	1.4	1.6	1.8	2.2	2.4	2.0	1.1	2.1	1.9
Cyclically adjusted surplus/deficit	-3.1	-3.7	-4.5	-5.6	-6.5	-6.9	-.9	-4.2	-7.5	-8.7
Federal debt held by public	76.4	76.1	77.7	77.6	79.7	82.7	77.4	77.7	78.2	78.6
Government in the NIPA[2]				Real percent change, annual rate						
Purchases	.9	.1	1.7	1.8	1.7	1.1	2.4	1.1	1.6	1.5
Consumption	.9	-.1	1.3	1.3	1.2	.7	1.9	.8	1.1	1.1
Investment	1.0	1.1	3.5	3.6	3.4	2.4	5.5	2.6	3.7	3.3
State and local construction	1.8	-2.9	2.4	1.0	1.0	1.0	5.5	.5	.5	1.0
Real disposable personal income	1.6	2.8	2.9	2.7	2.4	1.8	2.4	2.3	2.6	3.4
Contribution from transfers[3]	.3	.2	.5	.8	.5	.6	.4	.3	.5	1.7
Contribution from taxes[3]	-.1	-.6	-.2	-.8	-.6	-.7	-.3	-.9	-.6	-.6
Government employment				Average net change in monthly payrolls, thousands						
Federal	3	-1	1	2	1	1	1	1	2	3
State and local	14	3	3	9	9	9	7	-2	7	9
Fiscal indicators[2]				Percentage point contribution to change in real GDP, annual rate						
Fiscal effect (FE)[4]	.4	.1	.4	.7	.6	.4	.6	.4	.6	.7
Discretionary policy actions (FI)	.3	.2	.6	.6	.5	.2	.8	.5	.6	.6
Previous Tealbook	*.1*	*.2*	*.5*	*.7*	*.5*	*.2*	*.8*	*.3*	*.6*	*.6*
Federal purchases	.0	.1	.2	.2	.2	.1	.2	.1	.2	.2
State and local purchases	.1	-.1	.1	.1	.1	.1	.2	.1	.1	.1
Taxes and transfers	.1	.1	.4	.3	.2	.0	.4	.4	.4	.4
Cyclical	-.1	-.1	-.2	-.2	-.1	.0	-.2	-.2	-.2	-.2
Other	.2	.1	.0	.3	.2	.2	.0	.1	.2	.3

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	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4
	Projected											
***Real GDP*[1]**												
Total foreign	3.1	2.0	2.5	2.6	2.7	2.7	2.9	2.5	2.7	2.7	2.7	2.7
Previous Tealbook	*3.2*	*2.6*	*2.8*	*2.8*	*2.8*	*2.8*	*2.9*	*2.5*	*2.7*	*2.7*	*2.7*	*2.7*
Advanced foreign economies	1.4	2.4	1.7	1.7	1.8	1.7	2.0	1.3	1.7	1.7	1.7	1.7
Canada	1.4	2.9	1.8	2.1	2.2	2.2	2.2	2.1	2.0	1.8	1.8	1.8
Japan	-.9	3.0	.9	.7	.7	.7	3.1	-3.8	.9	.8	.8	.8
United Kingdom	.9	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8
Euro area	1.6	1.5	1.6	1.5	1.4	1.4	1.5	1.6	1.6	1.6	1.6	1.6
Germany	1.5	1.8	1.7	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.4
Emerging market economies	4.7	1.6	3.3	3.5	3.6	3.6	3.7	3.7	3.7	3.7	3.7	3.7
Asia	6.2	4.0	4.6	4.7	4.7	4.7	4.7	4.7	4.6	4.6	4.5	4.5
Korea	4.1	2.4	3.1	3.3	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0
China	7.2	6.5	6.1	6.3	6.3	6.2	6.2	6.1	6.0	6.0	5.9	5.9
Latin America	3.4	-1.0	2.0	2.3	2.6	2.6	2.9	2.9	2.9	2.9	2.9	2.9
Mexico	4.0	-.6	2.3	2.6	2.7	2.7	2.9	2.9	2.9	2.9	2.9	2.9
Brazil	.6	.7	3.5	2.3	2.5	2.5	2.8	2.8	2.8	2.8	2.8	2.8
***Consumer prices*[2]**												
Total foreign	2.7	1.7	3.5	2.7	2.6	2.6	2.5	2.9	2.4	2.4	2.4	2.4
Previous Tealbook	*2.6*	*1.6*	*2.7*	*2.5*	*2.5*	*2.4*	*2.4*	*2.8*	*2.4*	*2.4*	*2.4*	*2.4*
Advanced foreign economies	2.6	1.0	2.3	1.8	1.6	1.6	1.7	2.6	1.6	1.7	1.7	1.7
Canada	3.6	1.1	2.9	2.4	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.0
Japan	2.5	-2.3	1.3	1.0	1.0	.9	1.0	6.3	1.0	1.0	1.0	1.0
United Kingdom	2.4	1.9	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.1
Euro area	2.1	2.1	2.5	1.7	1.3	1.3	1.4	1.5	1.5	1.5	1.5	1.6
Germany	1.2	2.4	2.9	2.5	2.2	2.1	2.2	2.3	2.3	2.3	2.2	2.2
Emerging market economies	2.7	2.2	4.4	3.3	3.3	3.2	3.2	3.1	3.0	3.0	2.9	2.9
Asia	1.8	1.0	3.0	2.6	2.7	2.7	2.7	2.8	2.7	2.7	2.7	2.7
Korea	1.6	1.8	2.0	3.0	3.0	3.1	3.1	3.1	3.1	3.0	3.0	3.0
China	1.5	.7	3.8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Latin America	4.8	4.9	7.8	4.9	4.8	4.4	4.2	4.1	3.7	3.5	3.5	3.4
Mexico	4.1	3.8	6.6	3.6	3.7	3.5	3.3	3.3	3.2	3.2	3.2	3.2
Brazil	3.1	4.3	6.3	3.4	4.3	4.3	4.3	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	2.8	2.1	2.7	2.9	2.5	2.7	2.7	2.6
Previous Tealbook	*2.2*	*3.0*	*2.8*	*2.1*	*2.7*	*2.9*	*2.8*	*2.8*	*2.7*	...
Advanced foreign economies	.3	2.5	2.0	1.2	1.9	2.6	1.8	1.7	1.7	1.7
Canada	.7	3.6	2.5	.3	2.0	3.0	2.1	2.2	1.8	1.8
Japan	.3	2.8	-.3	1.2	1.5	2.0	.9	.1	.8	.8
United Kingdom	1.6	2.6	3.1	2.2	1.7	1.3	1.5	1.7	1.7	1.6
Euro area	-1.1	.8	1.6	1.9	2.0	2.7	1.5	1.5	1.6	1.6
Germany	.2	1.6	2.3	1.3	1.9	2.8	1.6	1.6	1.4	1.4
Emerging market economies	4.1	3.5	3.6	2.9	3.4	3.2	3.3	3.7	3.7	3.6
Asia	5.8	5.4	5.0	4.5	4.9	5.2	4.9	4.7	4.6	4.4
Korea	2.1	3.5	2.8	3.2	2.6	2.8	3.2	3.1	3.0	2.8
China	8.0	7.6	7.1	6.8	6.8	6.8	6.5	6.2	5.9	5.7
Latin America	2.9	1.7	2.5	1.6	2.1	1.5	1.7	2.8	2.9	2.9
Mexico	3.0	1.2	3.4	2.8	3.3	1.6	2.1	2.8	2.9	2.9
Brazil	2.2	2.6	-.1	-5.5	-2.1	2.1	1.7	2.6	2.8	2.8
***Consumer prices*[2]**										
Total foreign	2.3	2.4	2.0	1.4	1.9	2.6	2.6	2.7	2.4	2.4
Previous Tealbook	*2.3*	*2.4*	*2.0*	*1.4*	*1.9*	*2.6*	*2.4*	*2.5*	*2.4*	...
Advanced foreign economies	1.3	1.0	1.2	.4	.9	1.5	1.9	1.9	1.7	1.7
Canada	1.0	1.0	2.0	1.3	1.4	1.8	2.5	2.3	2.1	2.0
Japan	-.2	1.4	2.6	.1	.3	.6	.6	2.3	1.0	1.1
United Kingdom	2.6	2.1	.9	.1	1.2	3.0	2.3	2.4	2.2	2.1
Euro area	2.3	.8	.1	.2	.7	1.4	2.1	1.4	1.5	1.7
Germany	1.9	1.4	.4	.2	1.0	1.6	2.3	2.2	2.2	2.0
Emerging market economies	3.1	3.4	2.7	2.1	2.7	3.4	3.1	3.2	3.0	2.9
Asia	2.6	3.1	1.8	1.5	2.0	2.0	2.1	2.7	2.7	2.7
Korea	1.7	1.1	1.0	.9	1.5	1.5	2.1	3.1	3.0	3.0
China	2.1	2.9	1.5	1.5	2.1	1.8	2.1	2.5	2.5	2.5
Latin America	4.4	4.2	4.9	3.4	4.3	6.7	5.6	4.4	3.5	3.4
Mexico	4.1	3.6	4.2	2.3	3.3	6.6	4.5	3.4	3.2	3.2
Brazil	5.6	5.8	6.5	10.4	7.1	2.8	4.3	4.3	4.3	4.3

... Not applicable.
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 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4
						Billions of dollars, s.a.a.r.						
U.S. current account balance	**-489.9**	**-409.4**	**-494.6**	**-551.8**	**-610.1**	**-638.2**	**-685.8**	**-720.9**	**-769.9**	**-780.6**	**-822.1**	**-834.6**
Previous Tealbook	*-496.4*	*-452.0*	*-500.6*	*-541.0*	*-588.8*	*-613.4*	*-665.4*	*-711.0*	*-764.1*	*-781.1*	*-826.1*	*-842.8*
Current account as percent of GDP	-2.4	-2.0	-2.4	-2.6	-2.9	-3.0	-3.2	-3.3	-3.5	-3.5	-3.6	-3.7
Previous Tealbook	*-2.5*	*-2.2*	*-2.4*	*-2.6*	*-2.8*	*-2.9*	*-3.1*	*-3.3*	*-3.5*	*-3.5*	*-3.7*	*-3.7*
Net goods & services	-616.0	-535.2	-588.2	-622.3	-643.3	-651.3	-672.9	-689.8	-714.1	-718.9	-742.9	-751.3
Investment income, net	261.6	269.3	226.2	199.2	170.7	139.7	119.8	97.6	81.8	64.9	53.4	45.4
Direct, net	316.3	319.2	308.0	303.2	294.1	286.4	291.1	293.7	301.6	309.4	322.6	337.9
Portfolio, net	-54.8	-49.9	-81.8	-104.1	-123.4	-146.7	-171.4	-196.1	-219.8	-244.5	-269.1	-292.5
Other income and transfers, net	-135.5	-143.5	-132.7	-128.7	-137.6	-126.6	-132.7	-128.7	-137.6	-126.6	-132.7	-128.7

Annual Data

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
						Billions of dollars				
U.S. current account balance	**-426.2**	**-349.5**	**-365.1**	**-409.7**	**-434.3**	**-449.1**	**-486.4**	**-663.8**	**-801.8**	**-880.7**
Previous Tealbook	*-426.2*	*-349.5*	*-365.1*	*-409.7*	*-434.3*	*-449.1*	*-497.5*	*-644.6*	*-803.5*	...
Current account as percent of GDP	-2.6	-2.1	-2.1	-2.2	-2.3	-2.3	-2.4	-3.1	-3.6	-3.8
Previous Tealbook	*-2.6*	*-2.1*	*-2.1*	*-2.3*	*-2.3*	*-2.3*	*-2.4*	*-3.0*	*-3.6*	...
Net goods & services	-536.8	-461.9	-489.5	-500.4	-503.5	-552.3	-590.4	-664.3	-731.8	-779.6
Investment income, net	216.1	215.4	229.0	214.7	205.7	235.1	239.1	132.0	61.4	30.3
Direct, net	285.5	283.3	284.2	284.6	272.6	298.4	311.7	291.3	317.9	372.4
Portfolio, net	-69.4	-67.9	-55.3	-70.0	-66.9	-63.3	-72.6	-159.4	-256.5	-342.1
Other income and transfers, net	-105.5	-103.1	-104.6	-123.9	-136.6	-132.0	-135.1	-131.4	-131.4	-131.4

... Not applicable.

Abbreviations

ABS	asset-backed securities
AFE	advanced foreign economy
BBA	Bipartisan Budget Act of 2018
BDS	Business Dynamics Statistics
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BOC	Bank of Canada
BOE	Bank of England
BOJ	Bank of Japan
BOM	Bank of Mexico
C&I	commercial and industrial
CMBS	commercial mortgage-backed securities
CP	commercial paper
CPH	compensation per hour
CPI	consumer price index
CRE	commercial real estate
DSGE	dynamic stochastic general equilibrium
ECB	European Central Bank
ECI	employment cost index
EFFR	effective federal funds rate
EME	emerging market economy
EU	European Union
FCI	financial conditions index
FOMC	Federal Open Market Committee; also, the Committee
FPLT	flexible price-level targeting
FRB/US	A large-scale macroeconometric model of the U.S. economy
GDP	gross domestic product

GEMUS	A simplified version of SIGMA better suited to analyze trade policy issues
GS-FCI	Goldman Sachs Financial Conditions Index
IMF	International Monetary Fund
IOER	interest on excess reserves
LFPR	labor force participation rate
M&A	mergers and acquisitions
MBS	mortgage-backed securities
Michigan survey	University of Michigan Surveys of Consumers
MMF	money market fund
NAFTA	North American Free Trade Agreement
NBER	National Bureau of Economic Research
NIPA	national income and product accounts
OECD	Organisation for Economic Co-operation and Development
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
PBGC	Pension Benefit Guaranty Corporation
PCE	personal consumption expenditures
PMI	purchasing managers index
PPI	producer price index
repo	repurchase agreement
SEP	Summary of Economic Projections
SIGMA	A calibrated multicountry DSGE model
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SOMA	System Open Market Account
S&P	Standard & Poor's
SPF	Survey of Professional Forecasters
STRIPS	separate trading of registered interest and principal of securities
TIPS	Treasury Inflation-Protected Securities
VAR	vector autoregression
VIX	one-month-ahead option-implied volatility on the S&P 500 index

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 1/12/2024.

Report to the FOMC on Economic Conditions and Monetary Policy

Book B

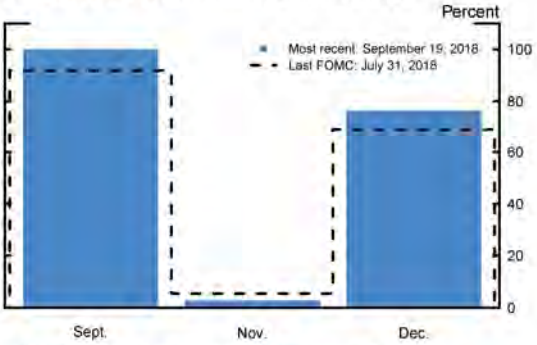
Monetary Policy Alternatives

September 20, 2018

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

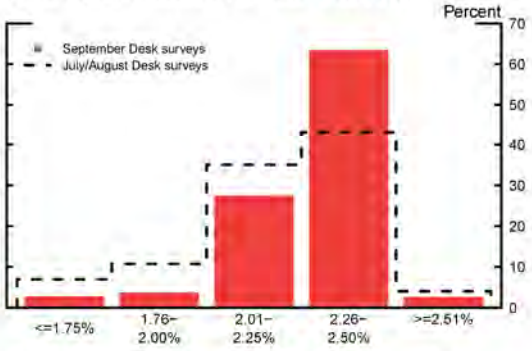
Alternatives

Figure 1: Market-Implied Probability of a Rate Increase at Each of the Next Three FOMC Meetings



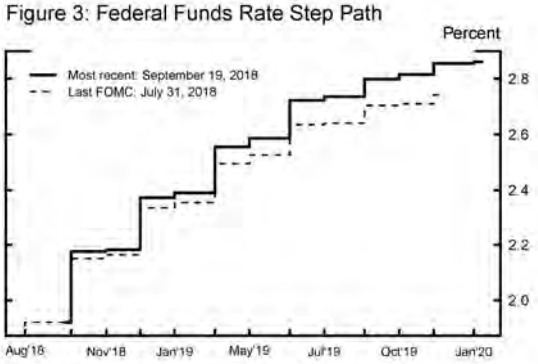
Note: Probabilities implied by a binomial tree fitted to settlement prices on federal funds futures contracts, assuming the policy action at each meeting is either no change or a 25-basis point increase in rates and no intermeeting moves.
Source: CME Group; Federal Reserve Board staff estimates.

Figure 2: Desk Survey Average Probability Distribution of the Federal Funds Rate, Year-End 2018



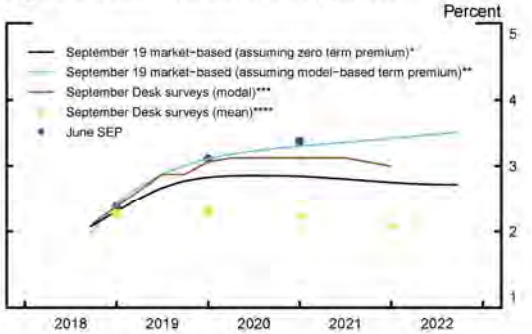
Note: Probabilities are averages of the probabilities assigned by respondents to different ranges of the federal funds rate at the end of 2018.
Source: FRBNY.

Figure 3: Federal Funds Rate Step Path



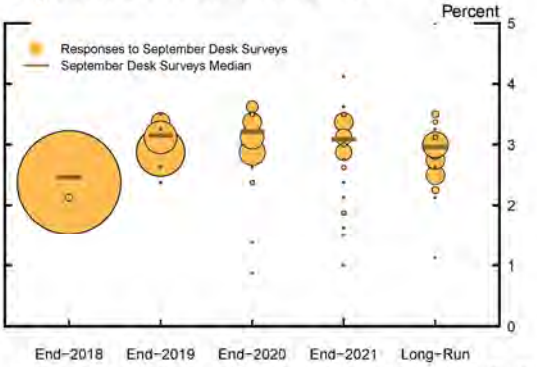
Note: Estimated from settlement prices on federal funds futures contracts without adjusting for risk premiums, and assuming no intermeeting moves.
Source: CME Group; Federal Reserve Board staff estimates.

Figure 4: Federal Funds Rate Projections



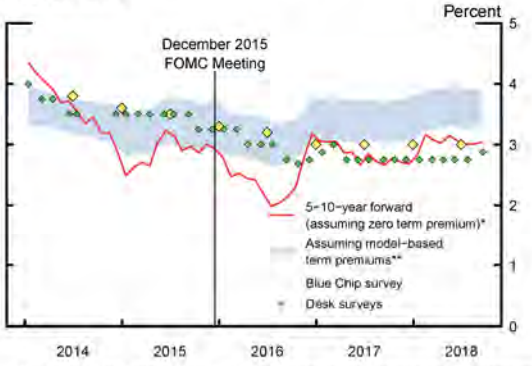
* Estimated using overnight index swap quotes with a spline approach and without adjusting for term premiums.
** Adjusting for premiums using a term structure model maintained by Board staff.
*** Median of respondents' modal paths for the federal funds rate.
**** Estimated from respondents' conditional year-end probability distributions.
Source: Bloomberg; Federal Reserve Board staff estimates; FRBNY; Summary of Economic Projections.

Figure 5: Dispersion of Desk Survey Modal Projections for the Federal Funds Rate



Note: Based on all responses from the September 2018 Desk Surveys. Each dot is centered on a different projected rate and is scaled in size by the number of respondents making that projection.
Source: FRBNY.

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



Note: * Monthly Average 5-10-year forward rate derived from prices of Treasury securities. ** Monthly average 5-10-year forward rate adjusted for alternative model-based term premium estimates.
Source: Blue Chip; FRBNY; Board staff estimates.

Redemptions and Reinvestments of SOMA Principal Payments

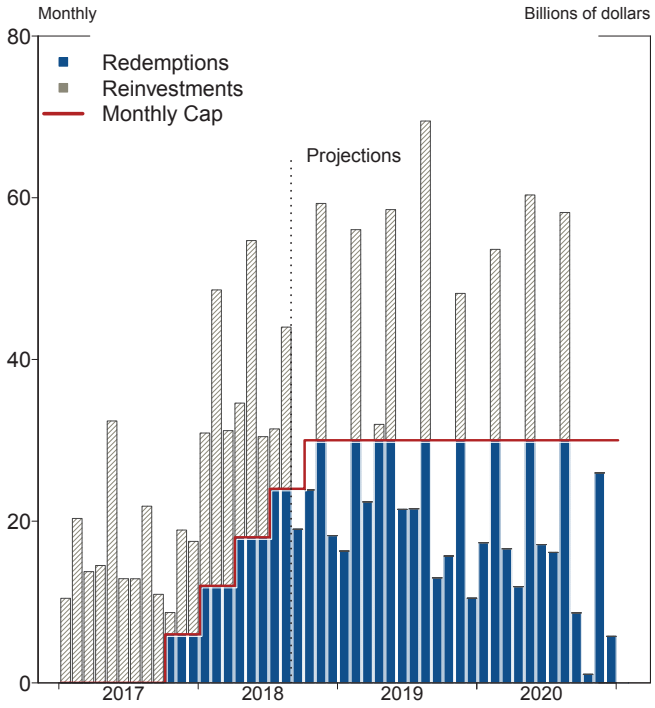
Projections for Treasury Securities
(Billions of dollars)

	Redemptions		Reinvestments	
	Period	Since Oct. 2017	Period	Since Oct. 2017
2018: Q3	67.0	175.0	27.4	195.0
2018: Q4	72.1	247.1	29.3	224.3
2018	229.1	247.1	197.2	224.3
2019	270.8	517.9	114.2	338.5
2020	210.5	728.4	82.1	420.6

Projections for Agency Securities
(Billions of dollars)

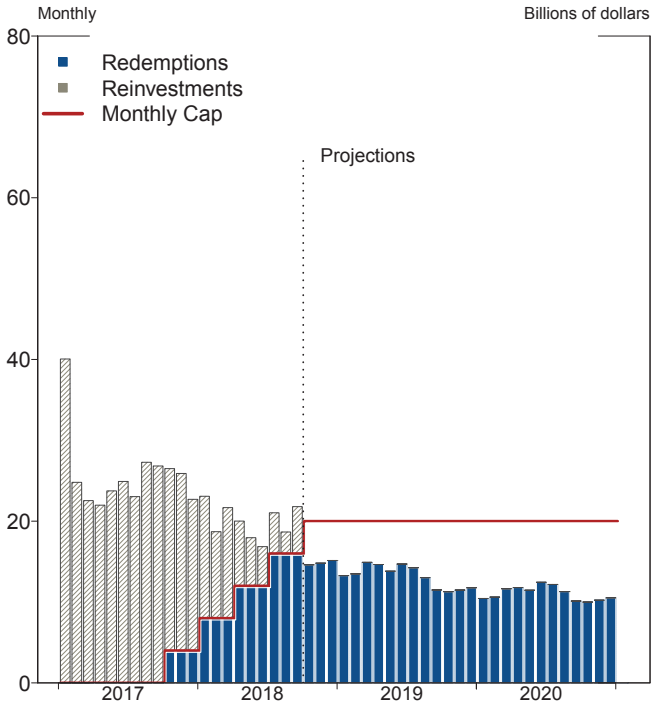
	Redemptions		Reinvestments	
	Period	Since Oct. 2017	Period	Since Oct. 2017
2018: Q3	48.0	120.0	13.5	132.5
2018: Q4	44.5	164.2	0.0	132.5
2018	152.2	164.5	71.8	132.5
2019	158.1	322.6	0.0	132.5
2020	132.7	455.3	0.0	132.5

SOMA Treasury Securities Principal Payments



Note: Projection dependent on assumed distribution of future Treasury issuance.

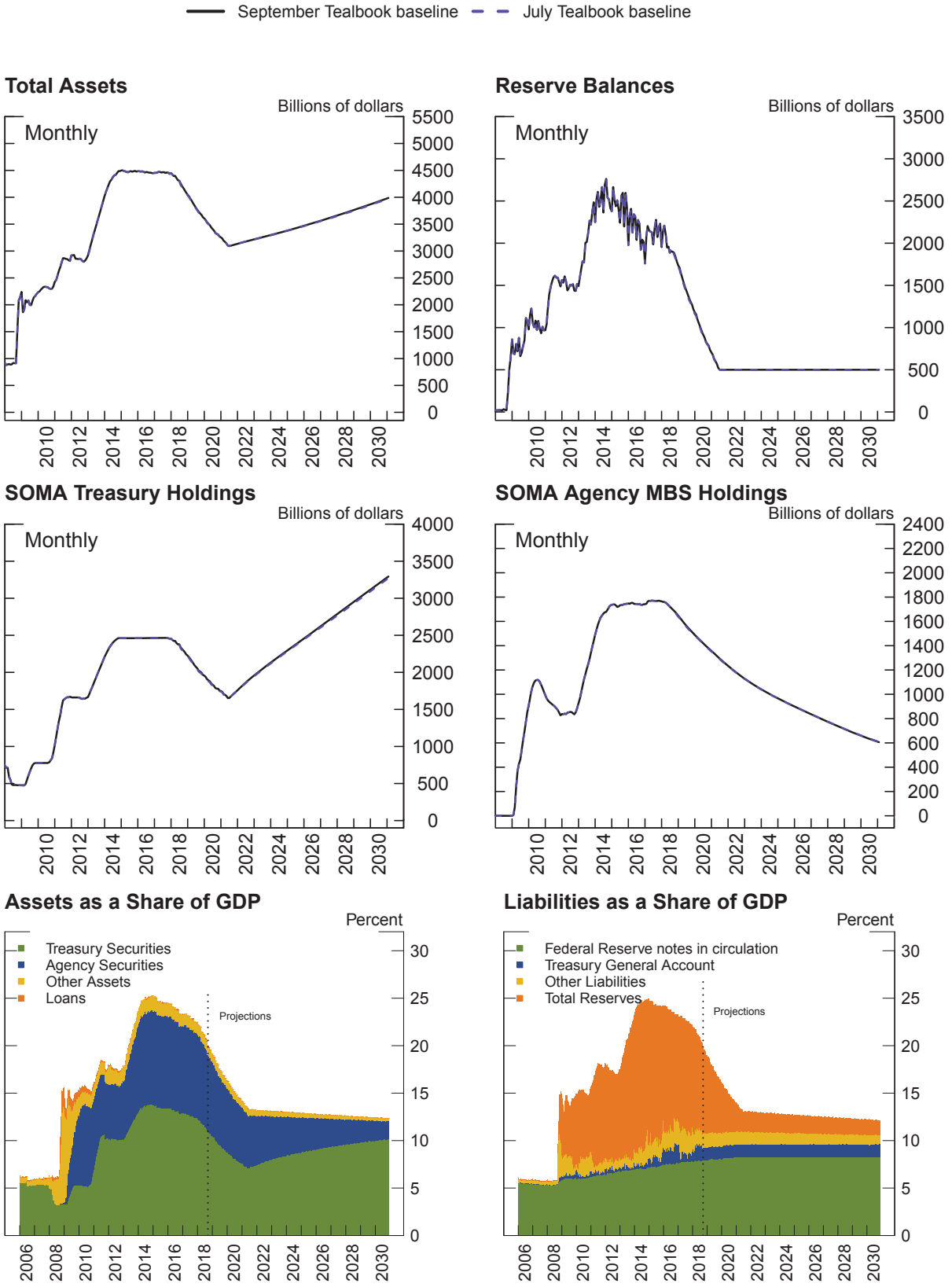
SOMA Agency Debt and MBS Principal Payments



Note: Projection dependent on future interest rates and housing market developments. Sept. 2018 principal payments are preliminary.

Balance Sheet & Income

Total Assets and Selected Balance Sheet Items



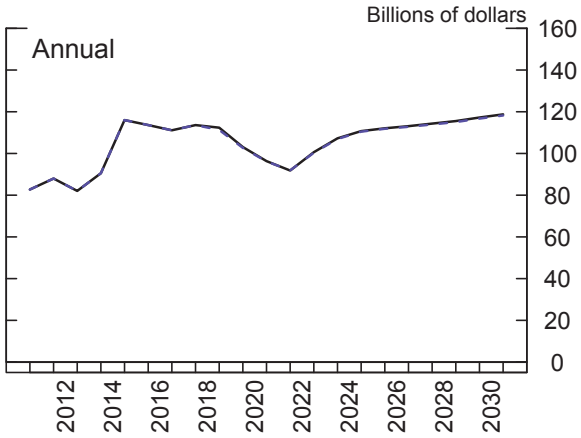
Federal Reserve Balance Sheet
End-of-Year Projections -- September Tealbook
(Billions of dollars)

	Aug 31, 2018	2018	2020	2022	2024	2026	2030
Total assets	4,207	4,047	3,254	3,217	3,380	3,562	3,978
Selected assets							
Loans and other credit extensions*	2	0	0	0	0	0	0
Securities held outright	4,013	3,872	3,106	3,087	3,264	3,458	3,892
U.S. Treasury securities	2,313	2,223	1,748	1,957	2,295	2,620	3,280
Agency debt securities	2	2	2	2	2	2	2
Agency mortgage-backed securities	1,697	1,647	1,356	1,128	966	836	610
Unamortized premiums	146	141	111	90	75	63	43
Unamortized discounts	-14	-13	-10	-8	-7	-6	-5
Total other assets	60	47	47	47	47	47	47
Total liabilities	4,168	4,009	3,215	3,174	3,333	3,511	3,915
Selected liabilities							
Federal Reserve notes in circulation	1,638	1,679	1,892	2,033	2,170	2,323	2,672
Reverse repurchase agreements	239	240	240	240	240	240	240
Deposits with Federal Reserve Banks	2,286	2,086	1,079	897	919	944	1000
Reserve balances held by depository institutions	1,898	1,737	705	500	500	500	500
U.S. Treasury, General Account	318	279	304	327	349	373	429
Other deposits	70	70	70	70	70	70	70
Earnings remittances due to the U.S. Treasury	1	0	0	0	0	0	0
Total Federal Reserve Bank capital**	39	39	39	43	47	52	62

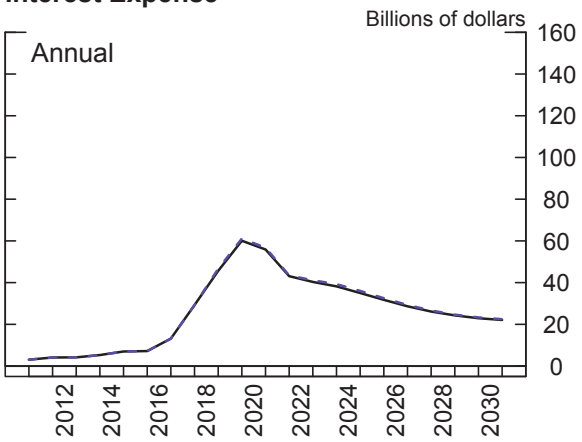
Source: Federal Reserve H.4.1 statistical releases and staff calculations.
Note: Components may not sum to totals due to rounding.
*Loans and other credit extensions includes primary, secondary, and seasonal credit; central bank liquidity swaps; and net portfolio holdings of Maiden Lane LLC.
**Total capital includes capital paid-in and capital surplus accounts.

Income Projections

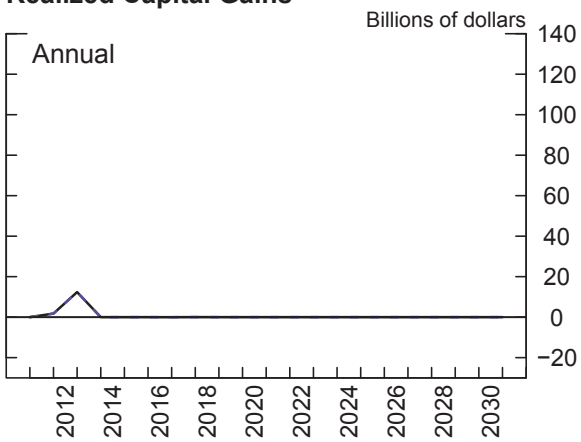
Interest Income



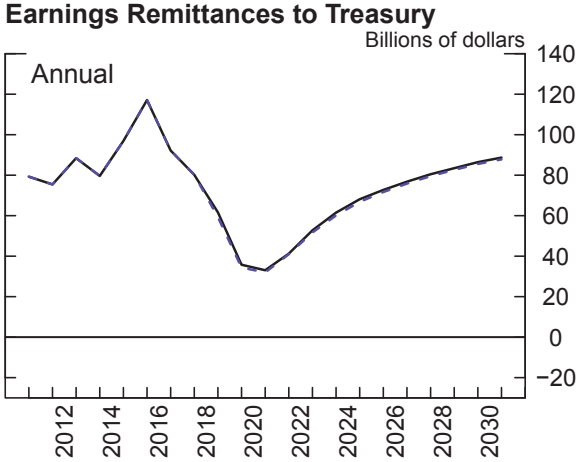
Interest Expense



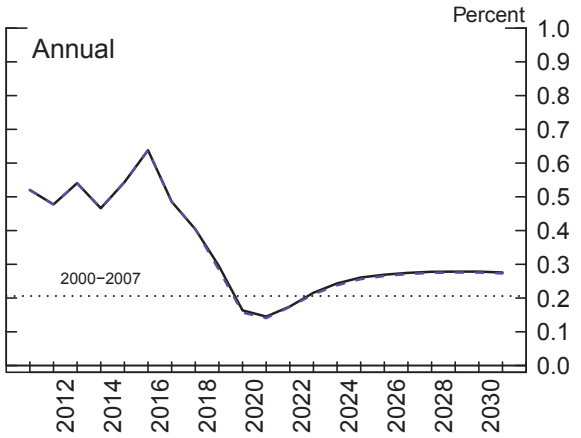
Realized Capital Gains



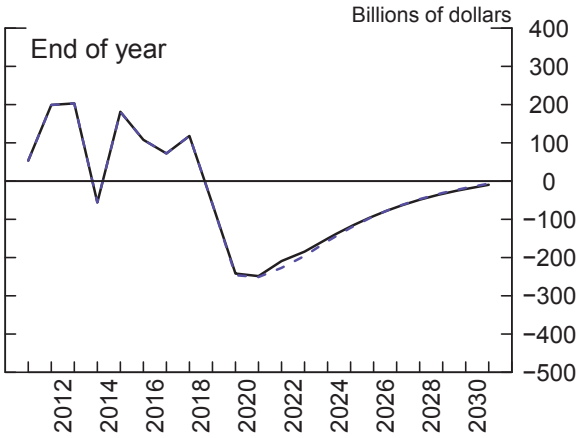
Earnings Remittances to Treasury



Remittances as a Percent of GDP



Memo: Unrealized Gains/Losses



Balance Sheet & Income

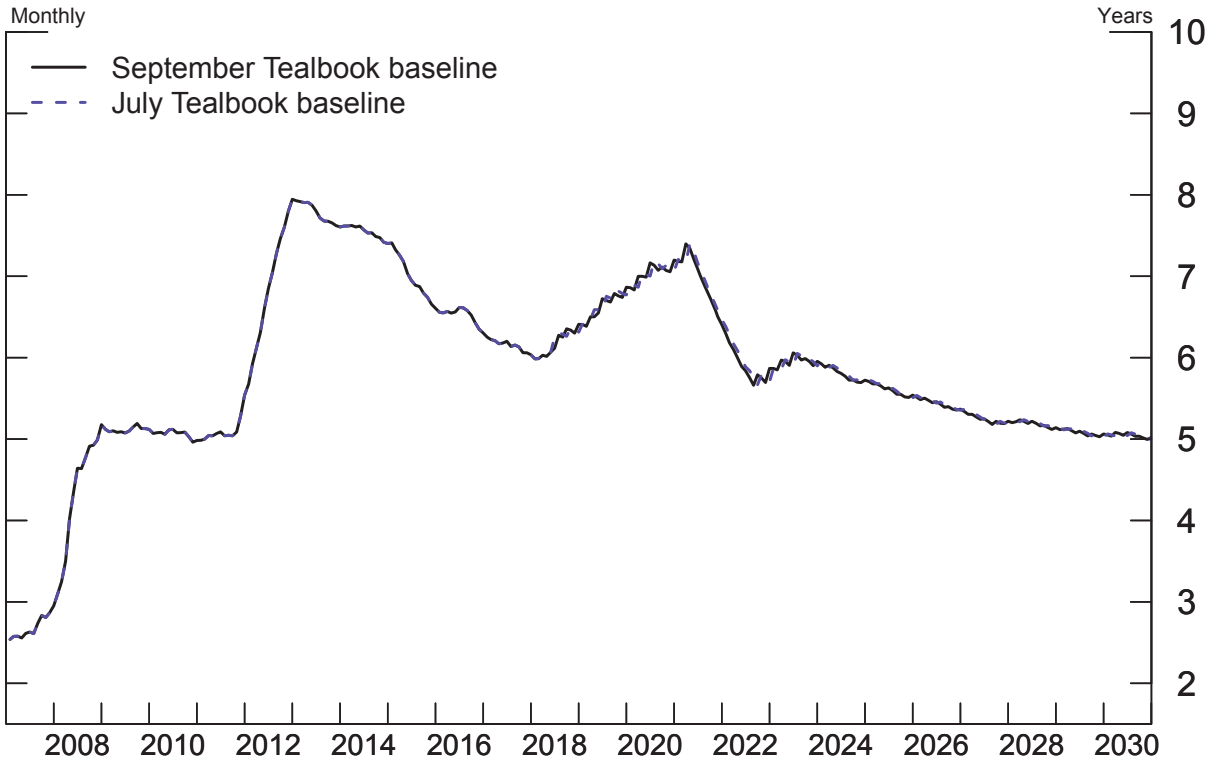
Projections for the 10-Year Treasury Term Premium Effect *
(Basis Points)

Date	September Tealbook	July Tealbook
	Quarterly Averages	
2018:Q3	-78	-78
Q4	-75	-76
2019:Q4	-65	-66
2020:Q4	-58	-58
2021:Q4	-52	-53
2022:Q4	-49	-49
2023:Q4	-46	-46
2024:Q4	-43	-43
2025:Q4	-40	-40
2026:Q4	-38	-38
2027:Q4	-35	-36
2028:Q4	-34	-34
2029:Q4	-32	-32
2030:Q4	-30	-31

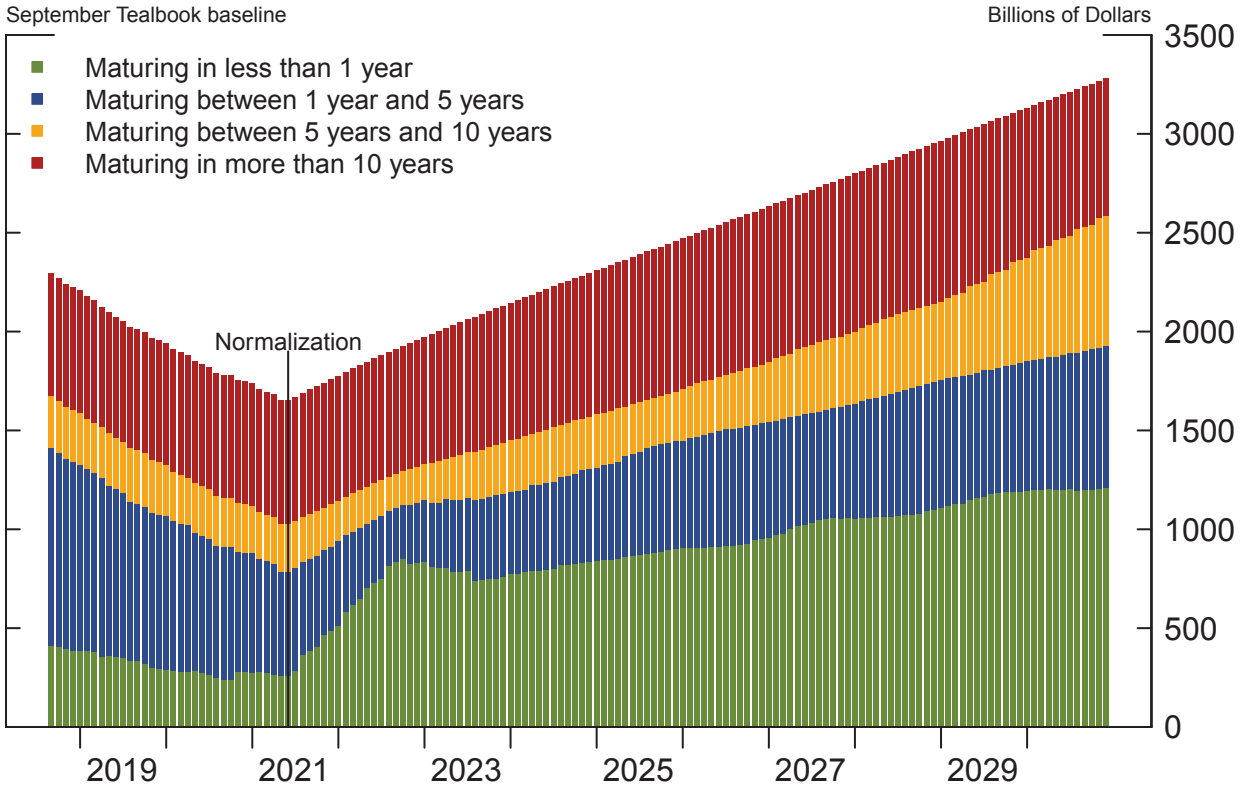
* The figures show the estimated effects on the 10-year Treasury term premium resulting from the Federal Reserve's large-scale asset purchases.

Projections for the Characteristics of SOMA Treasury Securities Holdings

SOMA Weighted-Average Treasury Duration



Maturity Composition of SOMA Treasury Portfolio



Balance Sheet & Income

Abbreviations

ABS	asset-backed securities
AFE	advanced foreign economy
BEA	Bureau of Economic Analysis, Department of Commerce
BHC	bank holding company
CDS	credit default swaps
CFTC	Commodity Futures Trading Commission
C&I	commercial and industrial
CLO	collateralized loan obligation
CMBS	commercial mortgage-backed securities
CPI	consumer price index
CRE	commercial real estate
DEDO	section in Tealbook A: "Domestic Economic Developments and Outlook"
Desk	Open Market Desk
DFMU	Designated Financial Market Utilities
ECB	European Central Bank
ELB	effective lower bound
EME	emerging market economy
EU	European Union
FAST Act	Fixing America's Surface Transportation Act
FDIC	Federal Deposit Insurance Corporation
FOMC	Federal Open Market Committee; also, the Committee
GCF	general collateral finance
GDI	gross domestic income
GDP	gross domestic product
GSIBs	globally systemically important banking organizations
HQLA	high-quality liquid assets
IOER	interest on excess reserves
ISM	Institute for Supply Management

LIBOR	London interbank offered rate
LSAPs	large-scale asset purchases
MBS	mortgage-backed securities
MMFs	money market funds
NBER	National Bureau of Economic Research
NI	nominal income
NIPA	national income and product accounts
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
PCE	personal consumption expenditures
QS	Quantitative Surveillance
repo	repurchase agreement
RMBS	residential mortgage-backed securities
RRP	reverse repurchase agreement
SCOOS	Senior Credit Officer Opinion Survey on Dealer Financing Terms
SEP	Summary of Economic Projections
SFA	Supplemental Financing Account
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SOMA	System Open Market Account
TBA	to be announced (for example, TBA market)
TCJA	Tax Cuts and Jobs Act of 2017
TGA	U.S. Treasury's General Account
TIPS	Treasury inflation-protected securities
TPE	Term premium effects
ZLB	zero lower bound