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

July 20, 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 July Tealbook projection for real GDP growth is in line with the Blue Chip consensus forecast in 2018 and ¼ percentage point higher in 2019. The staff's unemployment rate forecast is near the Blue Chip consensus in 2018 and 2019. The staff projections for total CPI inflation are below the Blue Chip consensus forecasts in both 2018 and 2019. (Note that projections from the Survey of Professional Forecasters are more than two months old.)

**Comparison of Tealbook and Outside Forecasts**

	2018	2019
GDP (Q4/Q4 percent change)		
July Tealbook	2.9	2.5
Blue Chip (07/10/18)	2.9	2.3
SPF median (05/11/18)	2.8	n.a.
Unemployment rate (Q4 level)		
July Tealbook	3.7	3.4
Blue Chip (07/10/18)	3.7	3.5
SPF median (05/11/18)	3.8	n.a.
CPI inflation (Q4/Q4 percent change)		
July Tealbook	2.3	2.2
Blue Chip (07/10/18)	2.5	2.3
SPF median (05/11/18)	2.5	2.2
PCE price inflation (Q4/Q4 percent change)		
July Tealbook	1.9	1.9
SPF median (05/11/18)	2.1	2.1
Core PCE price inflation (Q4/Q4 percent change)		
July Tealbook	1.9	2.0
SPF median (05/11/18)	2.2	2.1
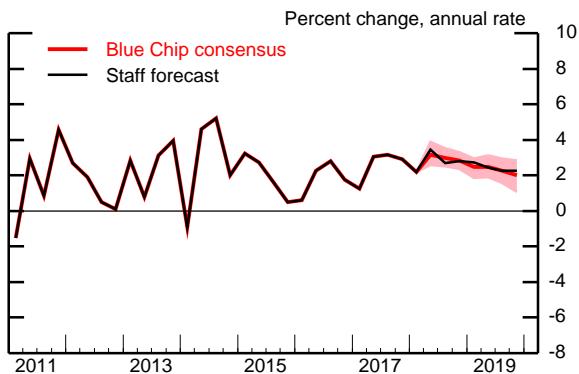
   Note: SPF is the Survey of Professional Forecasters, CPI is the consumer price index, and PCE is personal consumption expenditures. Blue Chip does not provide results for overall and core PCE price inflation. The Blue Chip consensus forecast includes input from about 50 panelists, and the SPF about 40. Roughly 20 panelists contribute to both surveys.
   n.a. Not available.
   Source: Blue Chip Economic Indicators; Federal Reserve Bank of Philadelphia.
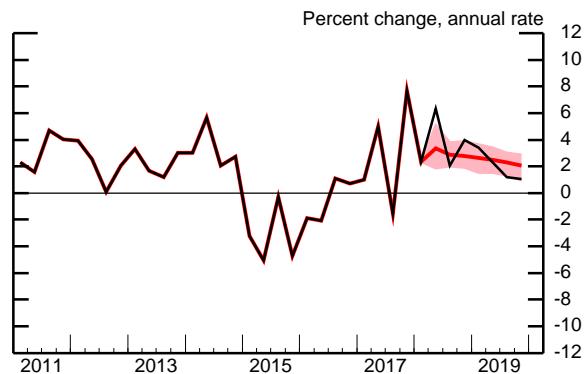
# Tealbook Forecast Compared with Blue Chip
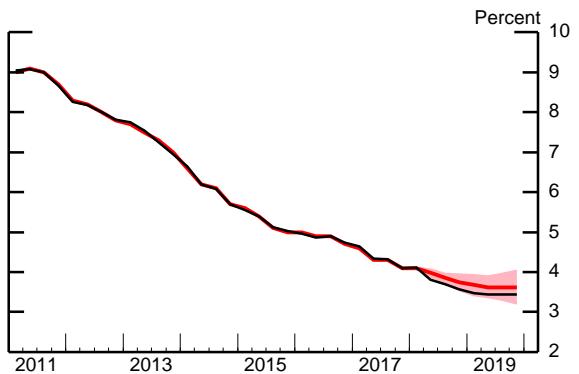
Real GDP

Percent change, annual rate

Blue Chip consensus
Staff forecast

Industrial Production

Percent change, annual rate

Unemployment Rate

Percent

## Consumer Price Index

Percent change, annual rate
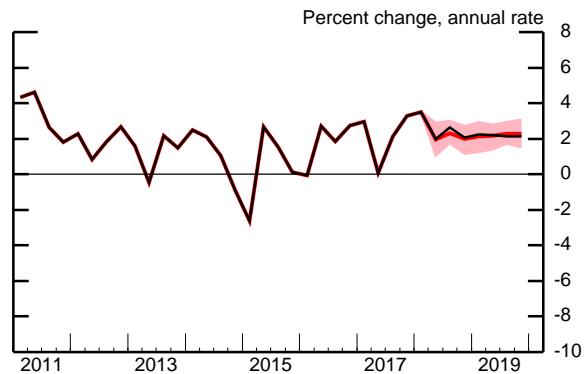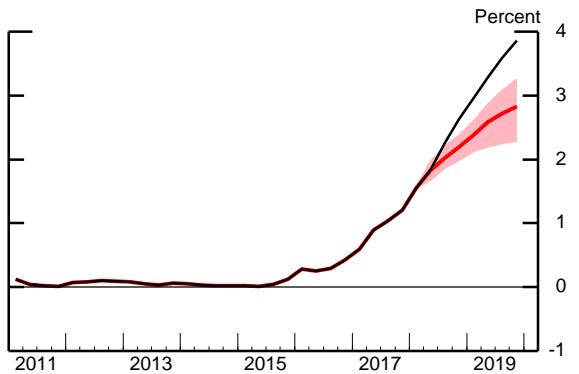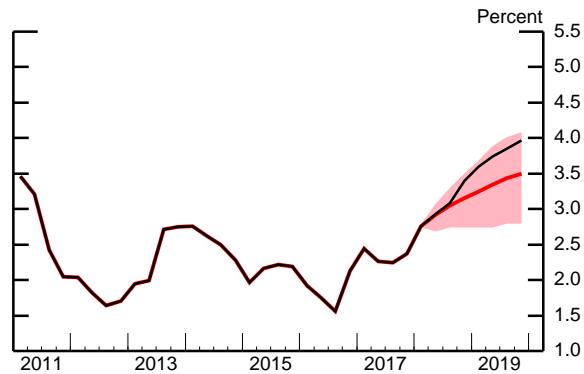
Treasury Bill Rate

Percent

10-Year Treasury Yield

Percent
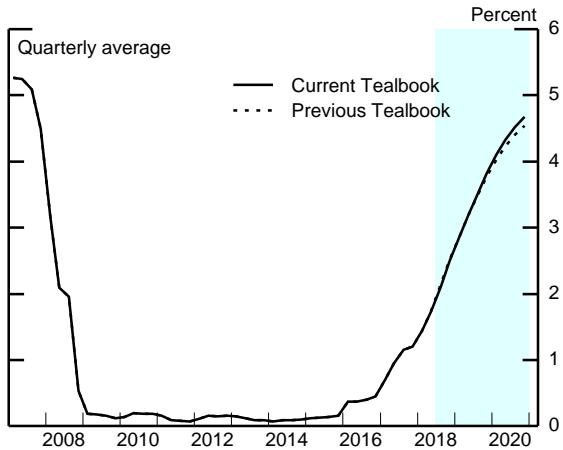
Note: The yield is for on-the-run Treasury securities. Over the forecast period, the staff's projected yield is assumed to be 15 basis points below the off-the-run yield.
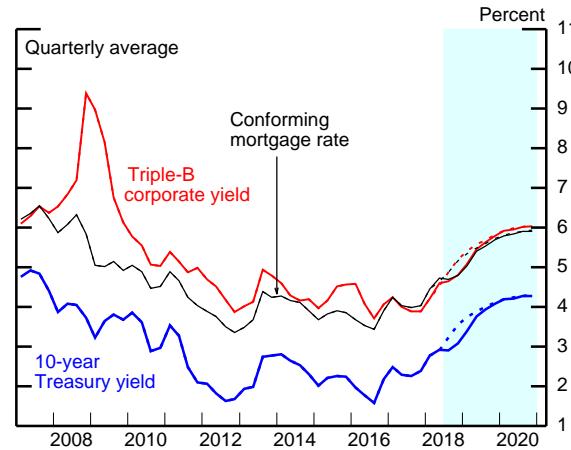
Note: The shaded area represents the area between the Blue Chip top 10 and bottom 10 averages.

Authorized for Public Release

Domestic Econ Devel & Outlook

Key Background Factors underlying the Baseline Staff Projection

Federal Funds Rate

Quarterly average

Percent

—— Current Tealbook
······ Previous Tealbook
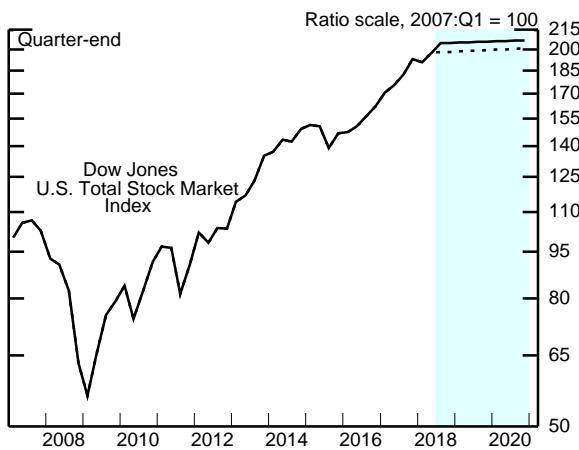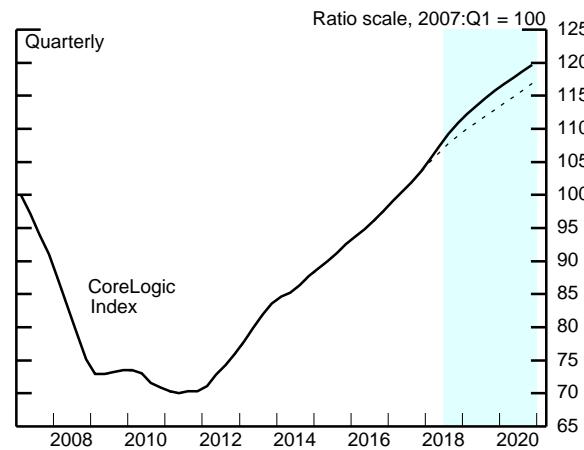
Long-Term Interest Rates

Quarterly average

Percent

Conforming mortgage rate

Triple-B corporate yield

10-year Treasury yield

Equity Prices

Quarter-end

Ratio scale, 2007:Q1 = 100

Dow Jones U.S. Total Stock Market Index

House Prices

Quarterly

Ratio scale, 2007:Q1 = 100

CoreLogic Index

Crude Oil Prices

Quarterly average

Dollars per barrel

Imported oil

West Texas Intermediate

Broad Real Dollar

Quarterly average

2007:Q1 = 100
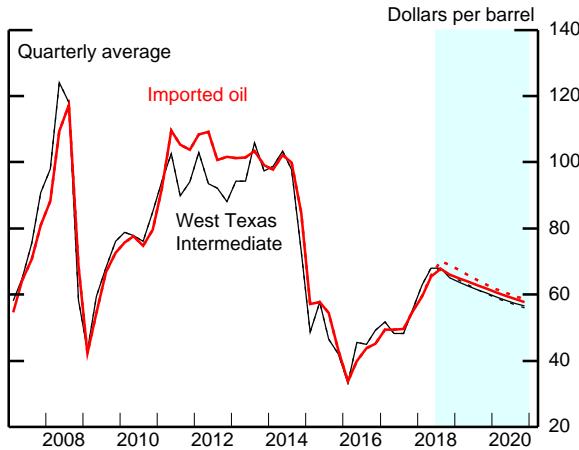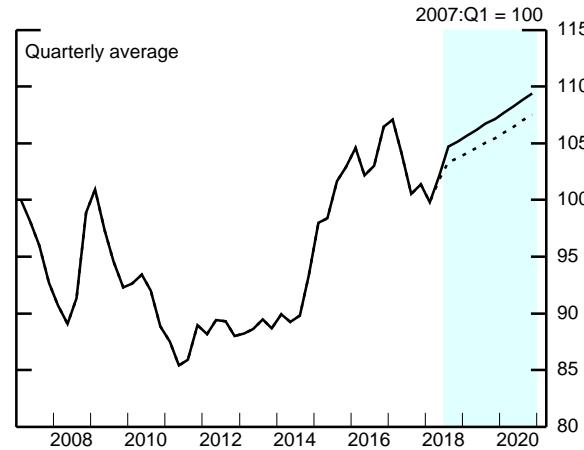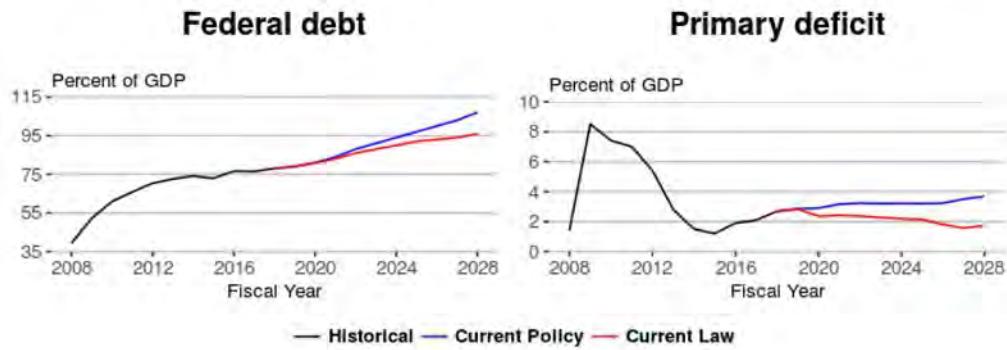
alternative *current policy* baseline where the BBA and the TCJA are extended indefinitely beginning in fiscal 2020, primary deficits are projected to increase to roughly 4 percent of GDP by fiscal 2028 (blue line in the right panel of the figure).[4] As a result, the federal debt is projected to grow to 107 percent of GDP over the next 10 years (blue line in left panel of the figure).

Under either scenario, stabilization of the debt-to-GDP ratio will require substantial deficit reduction that is likely to reduce the growth of aggregate demand. Consider the reductions needed to stabilize the debt-to-GDP ratio by eliminating the primary deficit over 10 years (starting in fiscal 2019 and assuming that the interest rate on debt is equal to the growth rate of nominal GDP). Under current law, the required deficit reductions would be, on average, 0.2 percent of GDP per year for a cumulative reduction of 2 percent. Under current policy, the comparable reductions would be, on average, 0.4 percent of GDP per year, for a cumulative reduction of 4 percent of GDP. Holding all else equal, such reductions would be expected to restrain aggregate demand growth each year by magnitudes roughly equal to the deficit effects. Assuming monetary policy is not constrained (for example, by the effective lower bound on the federal funds rate), it could crowd in some of that lost demand. However, such action would leave a smaller buffer available for the Fed to respond to a recession.

Federal Debt and Primary Deficits

Note: Federal debt is debt held by the public, and deficits are adjusted to account for payment timing.

Source: Congressional Budget Office (2018), *The Budget and Economic Outlook 2018 to 2028* (Washington: CBO), https://www.cbo.gov/system/files?file=115th-congress-2017-2018/reports/53651-outlook.pdf; and Congressional Budget Office (2018), *An Analysis of the President's 2019 Budget* (Washington: CBO), https://www.cbo.gov/system/files?file=2018-06/53884-apb2019.pdf.

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[4] The current policy baseline assumes the following beginning in fiscal 2020: Discretionary appropriations grow with inflation (from the elevated levels enacted by the BBA), temporary tax cuts in the TCJA are made permanent, other expiring tax provisions are extended, and postponed/delayed taxes associated with the Affordable Care Act are repealed.

Domestic Econ Devel & Outlook

Federal Reserve System Nowcasts of 2018:Q2 Real GDP Growth
(Percent change at annual rate from previous quarter)

Federal Reserve Entity	Type of model	Nowcast as of July 18, 2018
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	2.6
New York	• Factor-augmented autoregressive model combination	2.2
	• Factor-augmented autoregressive model combination, financial factors only	2.6
	• Dynamic factor model	2.7
Cleveland	• Bayesian regressions with stochastic volatility	3.2
	• Tracking model	5.6
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	4.5
Chicago	• Dynamic factor models	2.0
	• Bayesian VARs	4.0
St. Louis	• Dynamic factor models	3.0
	• News index model	3.5
	• Let-the-data-decide regressions	2.9
Kansas City	• Accounting-based tracking estimate	4.5
Board of Governors	• Board staff's forecast (judgmental tracking model)	4.8
	• Monthly dynamic factor models (DFM-45)	2.8
	• Mixed-frequency dynamic factor model (DFM-BM)	3.0
Memo: Median of Federal Reserve System nowcasts		3.0
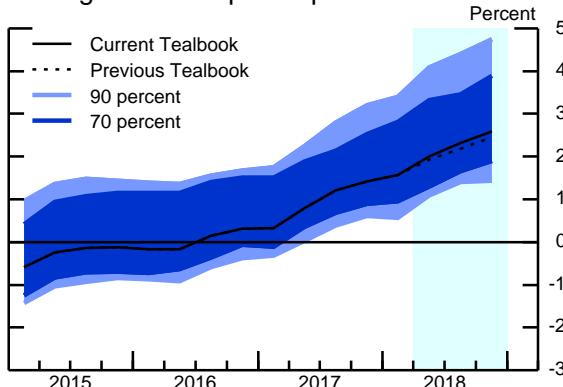
**Cyclical Position of the U.S. Economy: Near-Term Perspective**
(Percent change at annual rate from final quarter
of preceding period except as noted)
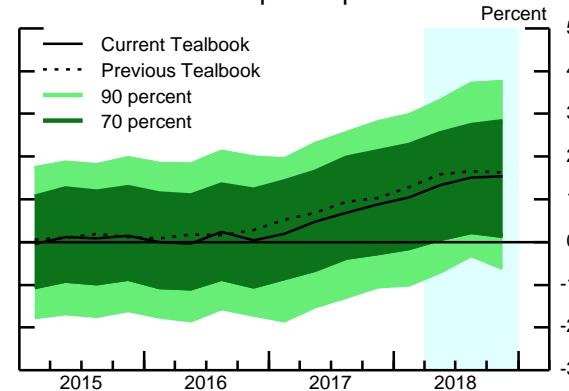
Measure	2015	2016	2017	2018 Q1	2018 Q2	2018 Q3
Output gap[1]	**-.1**	**.3**	**1.4**	**1.6**	**2.0**	**2.3**
Previous Tealbook	-.1	.3	1.4	1.6	1.9	2.2
Real GDP	2.0	1.8	2.6	2.0	4.8	2.5
Previous Tealbook	2.0	1.8	2.6	2.2	3.4	2.7
Measurement error in GDP	-.3	-.2	-.1	-.3	1.4	-.5
Previous Tealbook	-.3	-.2	-.1	-.1	.3	.0
Potential output	1.5	1.6	1.5	1.7	1.7	1.7
Previous Tealbook	1.5	1.6	1.5	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.
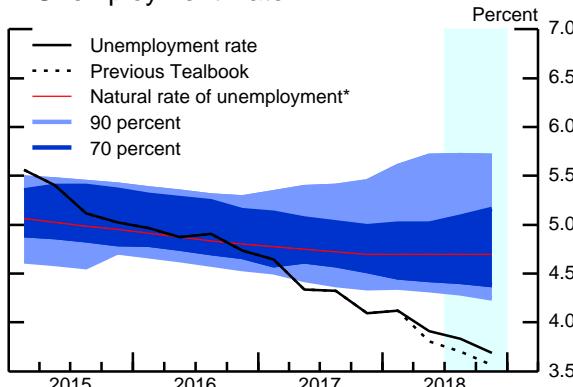
Judgmental Output Gap
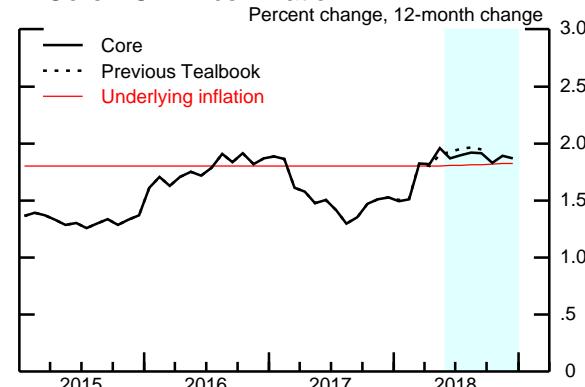
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.
   Source: Various macroeconomic data; staff assumptions.

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.

Domestic Econ Devel & Outlook

Summary of the Near-Term Outlook for GDP
(Percent change at annual rate except as noted)
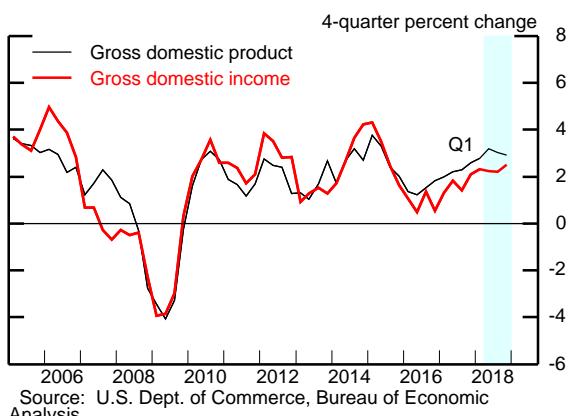
Measure	2018:Q1		2018:Q2		2018:H2	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	**2.2**	**2.0**	**3.4**	**4.8**	**2.7**	**2.5**
Private domestic final purchases	2.1	2.1	3.2	3.5	2.9	3.0
Personal consumption expenditures	1.0	.9	2.9	3.4	2.3	2.7
Residential investment	-1.7	-1.1	-.9	-1.4	.3	-1.3
Nonres. private fixed investment	9.2	10.4	6.1	6.0	6.7	6.3
Government purchases	1.1	1.3	1.0	3.2	1.8	.9
Contributions to change in real GDP						
Inventory investment[1]	.1	.0	.3	.0	-.1	.1
Net exports[1]	.1	.0	.2	1.2	.0	-.4
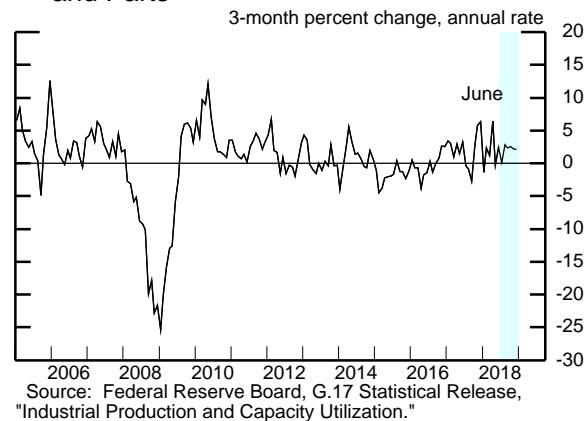
1. Percentage points.

Recent Nonfinancial Developments (1)

Real GDP and GDI

4-quarter percent change

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.
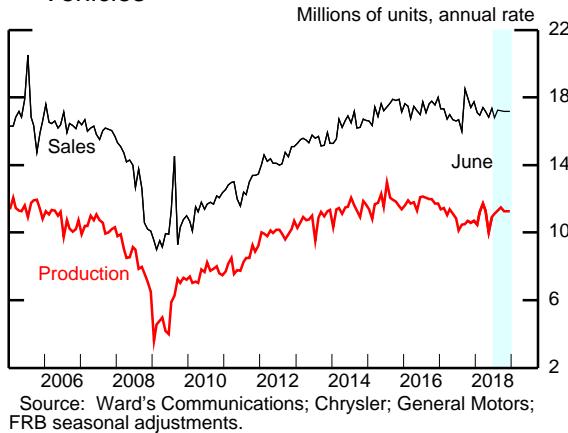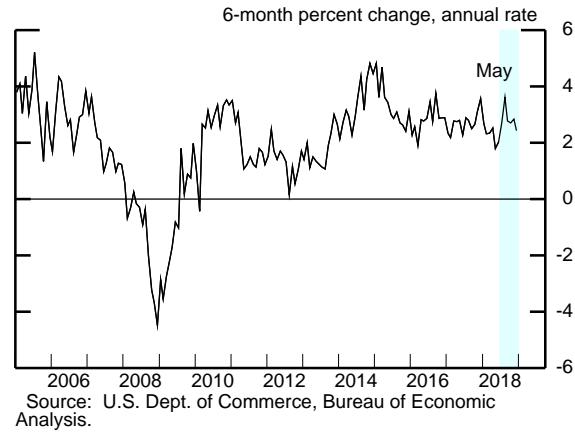
Manufacturing IP ex. Motor Vehicles and Parts

3-month percent change, annual rate

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

Sales and Production of Light Motor Vehicles

Millions of units, annual rate

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

Real PCE Growth

6-month percent change, annual rate

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.
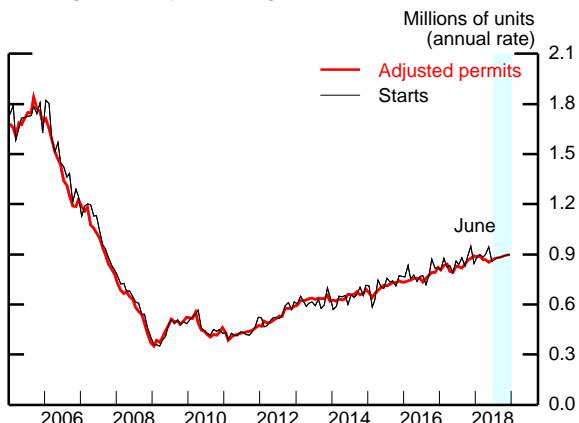
Recent Nonfinancial Developments (2)
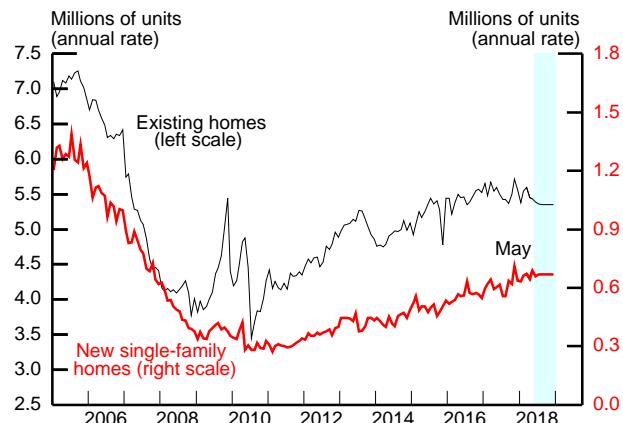
Single-Family Housing Starts and Permits

Millions of units (annual rate)

— Adjusted permits
— Starts

June

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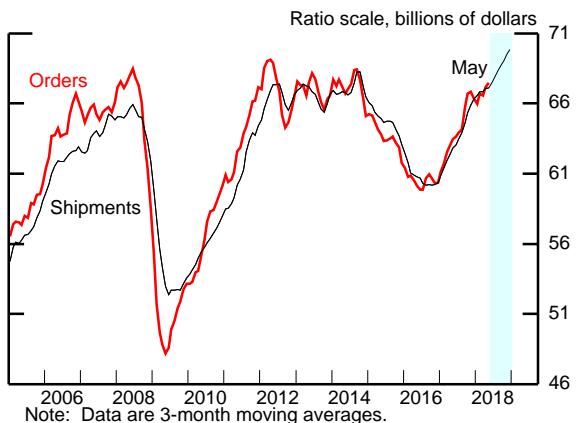
Home Sales

Millions of units (annual rate)

Millions of units (annual rate)

Existing homes (left scale)

May

New single-family homes (right scale)

Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.
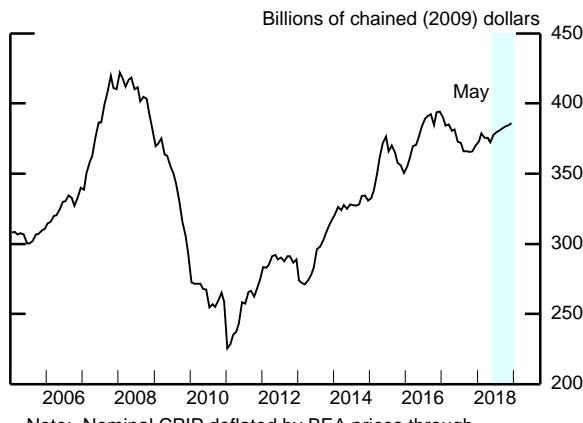
Nondefense Capital Goods ex. Aircraft

Ratio scale, billions of dollars

Orders

May

Shipments

Note: Data are 3-month moving averages.
Source: U.S. Census Bureau.
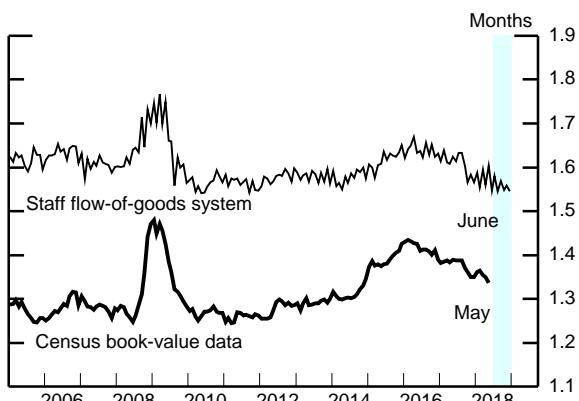
Nonresidential Construction Put in Place

Billions of chained (2009) dollars

May

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

Months

Staff flow-of-goods system

June

Census book-value data

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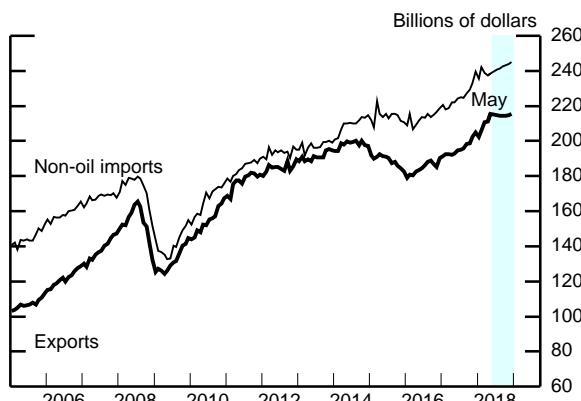
Note: Flow-of-goods system inventories include manufacturing and mining industries and are relative to consumption. Census data cover manufacturing and trade, and inventories are relative to sales.
Source: U.S. Census Bureau; staff calculations.

Exports and Non-oil Imports

Billions of dollars

Non-oil imports

May

Exports

Note: Forecasts are linear interpolations of quarterly values.
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis; U.S. Census Bureau.
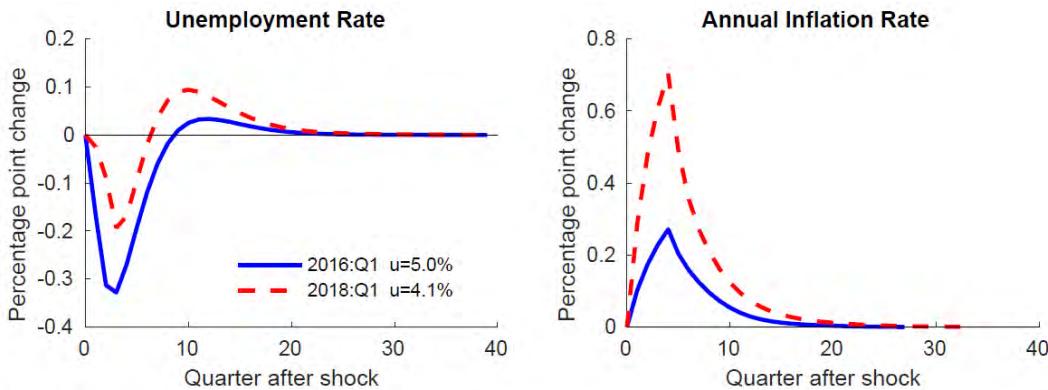
Alternative View: Supply Constraints Will Prevent the Unemployment Rate from Falling Much Further

Here we argue that the staff projection for the unemployment rate is too strong because the labor market is already tight and hence unlikely to improve much further. With the unemployment rate (4.0 percent) well below our estimate of its natural rate (4.7 percent), the typical transmission of an increase in aggregate demand—including that from the recent fiscal policy changes—no longer applies. In particular, we think that the boost to aggregate demand from fiscal stimulus and other factors will have much smaller effects on the unemployment rate than in the staff baseline because of constraints on aggregate supply.

Supply constraints are currently most noticeable in the labor market. Firms are increasingly reporting that it is difficult to find workers. The number of job openings relative to the number of unemployed persons is at an all-time high, and the fraction of small businesses reporting at least one hard-to-fill job opening is close to its all-time high. Anecdotal information on the difficulty of finding workers appears frequently in the news and in the Beige Book.

In search-and-matching models of the labor market, aggregate output is substantially less responsive to expansionary shocks in a booming economy with a very tight labor market than in an economy with average macroeconomic conditions.[1] We demonstrate the quantitative effects of supply constraints in a model similar to one developed in Gertler, Sala, and Trigari (2008).[2] In this model, the scarcity of workers relative to vacant jobs in a tight economy leads to increasingly higher wages and marginal costs. As a consequence, stark nonlinearities in macroeconomic behavior take hold when the pool of available unemployed workers is close to being exhausted.

Figure 1: Nonlinear Impulse Response Functions to a Positive Demand Shock

Source: Authors' calculations.

Note: This alternative view was prepared by Camilo Morales-Jiménez and Matthias Paustian.

[1] For example, see Nicolas Petrosky-Nadeau and Lu Zhang (2017), "Solving the Diamond–Mortensen–Pissarides Model Accurately," *Quantitative Economics,* vol. 8 (July), pp. 611–50.
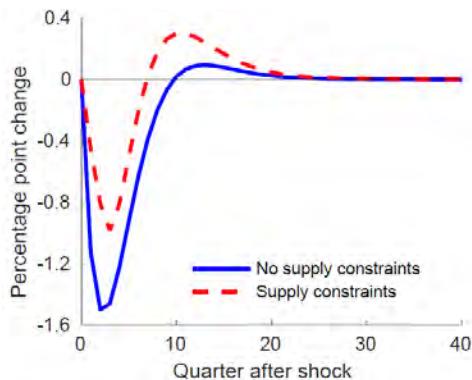
[2] Mark Gertler, Luca Sala, and Antonella Trigari (2008), "An Estimated Monetary DSGE Model with Unemployment and Staggered Nominal Wage Bargaining," *Journal of Money, Credit and Banking,* vol. 40 (December), pp. 1713–64.

In figure 1, we compare impulse responses from a similar increase in aggregate demand in both a "normal" economy and a "tight" economy. The solid blue lines show the responses for a normal economy, such as the first quarter of 2016 when the unemployment rate was 5 percent. This increase in demand lowers the unemployment rate 30 basis points and raises the inflation rate 25 basis points. The dashed lines show the responses for a tight economy, such as the first quarter of 2018 when the unemployment rate was 4.1 percent. The unemployment rate decrease in the tighter labor market is considerably smaller while the inflation response is significantly larger.

In the Tealbook projection, supply constraints play a small role. In the absence of supply constraints, the unemployment rate would bottom out at almost 1½ percentage points below the staff estimate of the natural rate. Supply constraints push up on the unemployment rate by only 0.1 percentage point. We think that this adjustment is too small and should be, instead, around 0.5 percentage point. As figure 2 shows, an increase in demand would lower the unemployment rate 1 percentage point, instead of 1½ percentage points, when supply constraints are taken into account.[3]

Several papers are consistent with our view. Auerbach and Gorodnichenko (2012) find that government spending multipliers are much smaller in booms than in recessions.[4] Also, Baum, Poplawski-Ribeiro, and Weber (2012) find that government revenue multipliers are smaller when the output gap is positive.[5] In sum, we argue that the staff projection has taken too much signal from the fiscal stimulus and other impetuses to aggregate demand and has not accounted enough for the effects of supply constraints.

Figure 2: Unemployment Rate Response to a Positive Demand Shock

Source: Authors' calculations.

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[3] The solid line is the linear impulse response function from our model, which is not state dependent and imposes no limits to the decline in the unemployment rate. The dashed line is the nonlinear impulse response function to the same shock, assuming that the economy is initially in a situation like it was in 2016:Q1.

[4] Alan J. Auerbach and Yuriy Gorodnichenko (2012), "Measuring the Output Responses to Fiscal Policy," *American Economic Journal: Economic Policy,* vol. 4 (May), pp. 1–27.

[5] Anja Baum, Marcos Poplawski-Ribeiro, and Anke Weber (2012), "Fiscal Multiplier and the State of the Economy," IMF Working Paper WP/12/286 (Washington: International Monetary Fund, December), https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Fiscal-Multipliers-and-the-State-of-the-Economy-40146.

difficult, indicators of improvement for two portions of the manufacturing sector softened from 2010 to 2016. Gains in computational speed for leading-edge computing equipment—a barometer for electronics manufacturing more broadly—have slowed markedly (row 3). In addition, output per unit of energy input for key energy-intensive manufacturing industries stalled from 2010 to 2016 (row 4).[4]

3. **Reallocation.** In the final step, labor and capital are reallocated both within and across firms toward the expanded production frontier. Differences in output per worker across firms tend to be narrow when innovations diffuse rapidly and outmoded production processes are eliminated. Yet recent evidence from Census microdata shows that dispersion of productivity across manufacturing firms has risen in the United States, suggesting that innovations may be spreading more slowly and that less-efficient producers are not being winnowed as quickly as previously (row 5).[5]

All told, softening manufacturing productivity growth since 2003 appears to reflect weaker innovation, slower adoption, and less robust reallocation of resources. Because TFP-driven improvements to manufactured equipment and materials spur capital deepening that raises productivity throughout the economy, the importance of productivity growth in manufacturing is much greater than the sector's small size would indicate. Looking ahead, a recent increase in manufacturing patents may herald a TFP pickup in the future. If a rebound in manufacturing TFP were to occur, it would lend credence to our projection of a modest pickup in overall business-sector productivity.

Figure 1. U.S. Productivity Growth
Private Business and Manufacturing
Average Annual Percentage Change

- Private Business Labor Productivity
- Mfg. Labor Productivity
- Mfg. Total Factor Productivity

Source: BLS Major Sector Productivity.
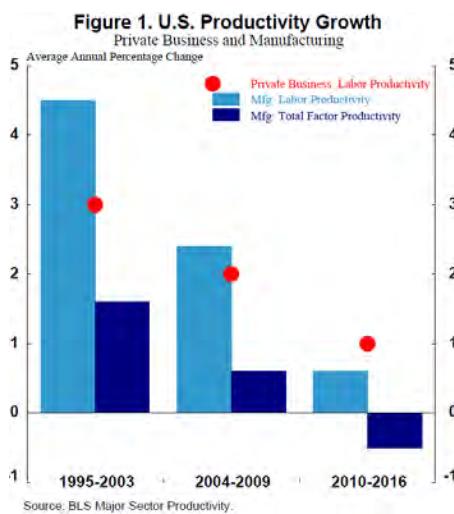
Table 1: Indicators of Productivity in Manufacturing
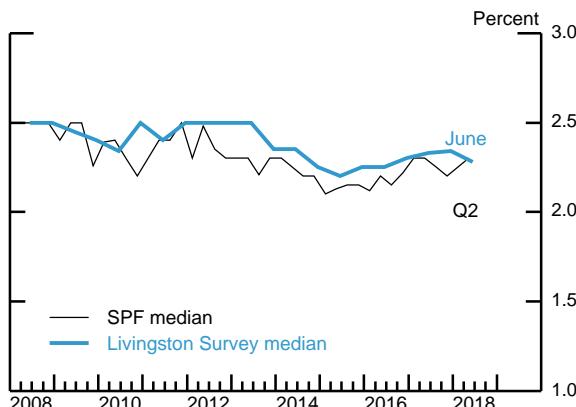
	1995-2003	2004-2009	2010-2016
Innovation			
1 Manufacturing R&D[1]	3.0%	3.6%	3.7%
2 Patents issued[2]	3.7%	-3.6%	10.3%
Adoption			
3 Computing performance[2]	61%	61%	42%
4 Energy efficiency[2]	2.1%	6.0%	-0.4%
Reallocation			
5 Dispersion of Labor Prod.[3]	0.83	0.86	0.89

Note: Dates for row 4 are 1995-2002, 2003-2010, and 2011-2014. Patents issued ends in 2014.

[1] Share of output   [2] Average annual growth rate   [3] Within industry std. deviation

Source: National Science Foundation; U.S. Patent and Trademark Office; Top500.org; Department of Energy; and Decker and others (2018).

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[4] The industries included in the index—petroleum and coal products, chemicals, paper, nonmetallic mineral products, primary metals, and wood products—accounted for 81 percent of energy use in the manufacturing sector in 2014, excluding energy used as feedstock.

[5] Ryan Decker, John Haltiwanger, Ron S. Jarmin, and Javier Miranda (2018), "Changing Business Dynamism and Productivity: Shocks vs. Responsiveness," NBER Working Paper Series 24236 (Cambridge, Mass.: National Bureau of Economic Research, January), www.nber.org/papers/w24236.
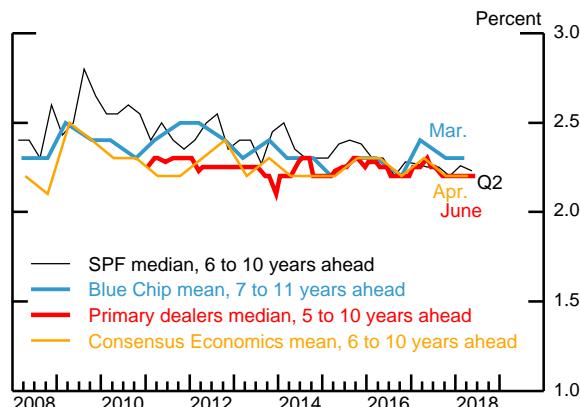
Survey Measures of Longer-Term Inflation Expectations

CPI Next 10 Years
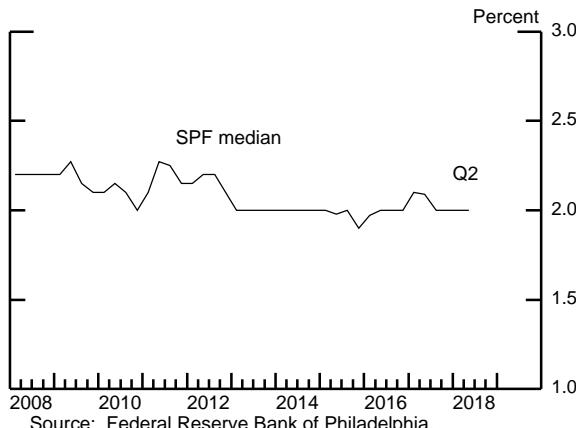
Note: SPF is Survey of Professional Forecasters.
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations

- SPF median, 6 to 10 years ahead
- Blue Chip mean, 7 to 11 years ahead
- Primary dealers median, 5 to 10 years ahead
- Consensus Economics mean, 6 to 10 years ahead
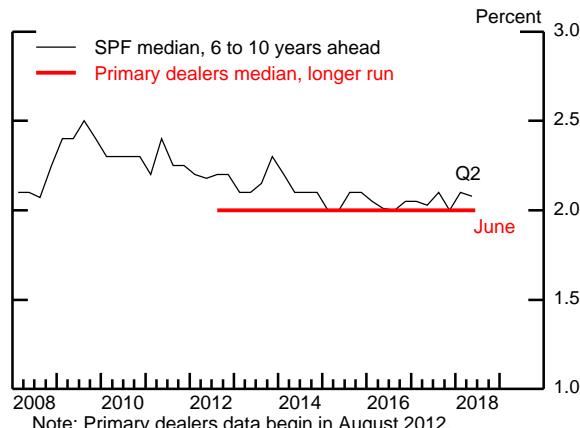
Source: Federal Reserve Bank of Philadelphia; Blue Chip
Economic Indicators; Federal Reserve Bank of New York;
Consensus Economics.

PCE Next 10 Years
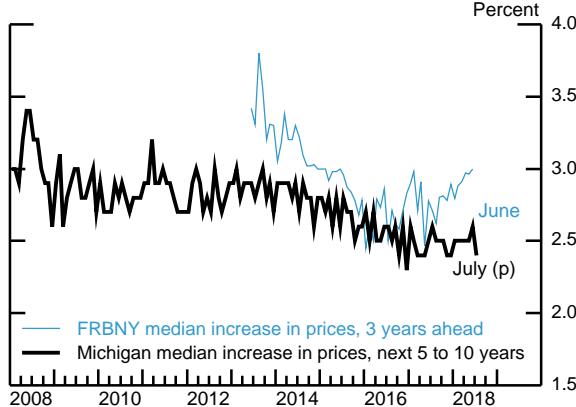
Source: Federal Reserve Bank of Philadelphia.

PCE Forward Expectations

- SPF median, 6 to 10 years ahead
- Primary dealers median, longer run

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

Surveys of Consumers
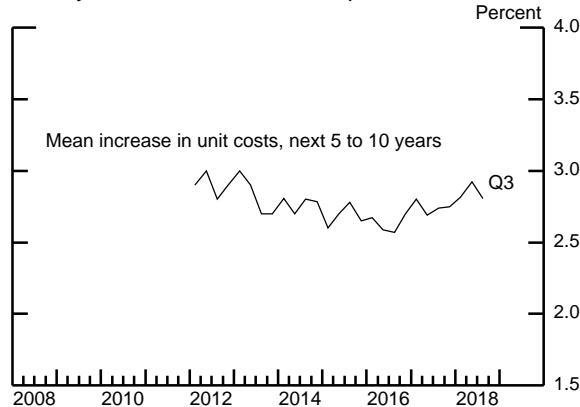
- FRBNY median increase in prices, 3 years ahead
- Michigan median increase in prices, next 5 to 10 years

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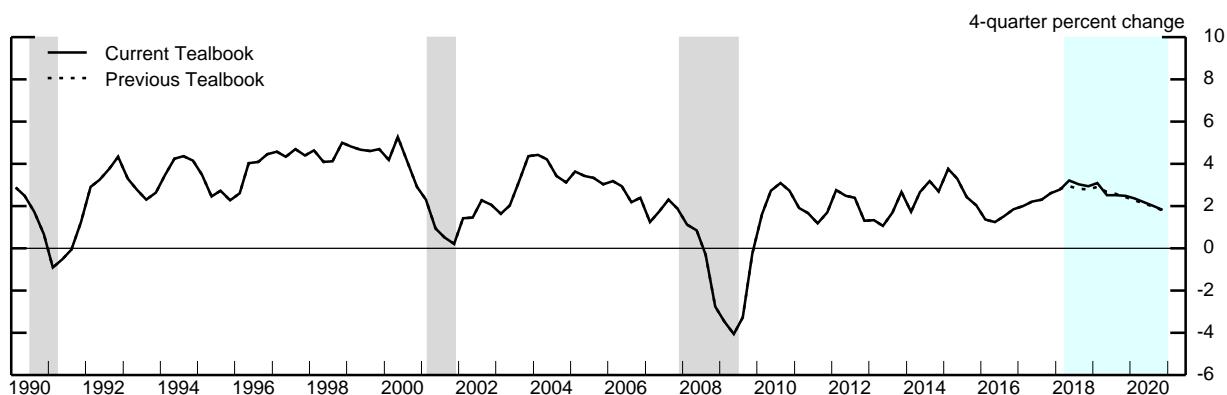
Survey of Business Inflation Expectations

Mean increase in unit costs, next 5 to 10 years

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)

Domestic Econ Devel & Outlook
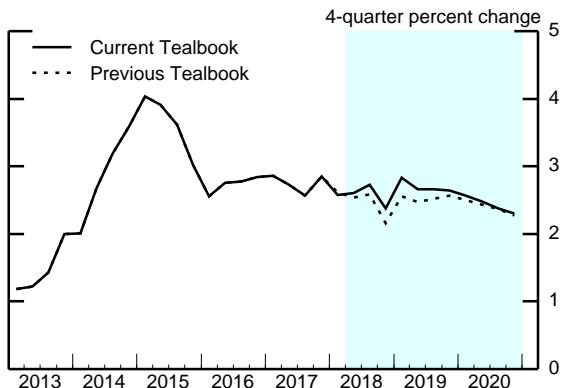
Measure	2017	2018		2018	2019	2020
		H1	H2			
Real GDP	**2.6**	**3.4**	**2.5**	**2.9**	**2.5**	**1.8**
Previous Tealbook	2.6	2.8	2.7	2.8	2.4	1.8
Final sales	2.9	3.4	2.4	2.9	2.5	1.8
Previous Tealbook	2.9	2.6	2.8	2.7	2.5	1.8
Personal consumption expenditures	2.8	2.1	2.7	2.4	2.6	2.3
Previous Tealbook	2.8	2.0	2.3	2.2	2.6	2.3
Residential investment	2.6	-1.2	-1.3	-1.2	2.3	.9
Previous Tealbook	2.6	-1.3	.3	-.5	.6	1.5
Nonresidential structures	5.0	13.5	6.6	10.0	2.4	.4
Previous Tealbook	5.0	11.9	7.1	9.5	2.4	.4
Equipment and intangibles	6.7	6.6	6.2	6.4	4.2	2.0
Previous Tealbook	6.7	6.4	6.5	6.5	4.2	1.6
Federal purchases	1.0	3.6	1.1	2.4	4.0	3.0
Previous Tealbook	1.0	1.4	3.4	2.4	4.0	3.0
State and local purchases	.5	1.4	.8	1.1	1.0	1.0
Previous Tealbook	.5	.8	.9	.9	1.0	1.0
Exports	5.0	7.4	2.0	4.7	3.6	2.6
Previous Tealbook	5.0	4.6	5.0	4.8	4.0	3.0
Imports	4.7	2.2	4.1	3.2	4.9	4.3
Previous Tealbook	4.7	2.8	3.8	3.3	4.5	4.3
	Contributions to change in real GDP (percentage points)					
Inventory change	-.3	.0	.1	.1	.0	.0
Previous Tealbook	-.3	.2	-.1	.1	.0	.0
Net exports	-.1	.6	-.4	.1	-.3	-.3
Previous Tealbook	-.1	.1	.0	.1	-.2	-.3

Real GDP

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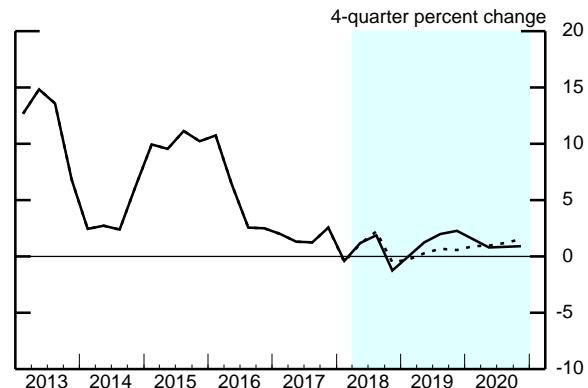
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Domestic Econ Devel & Outlook

Components of Final Demand
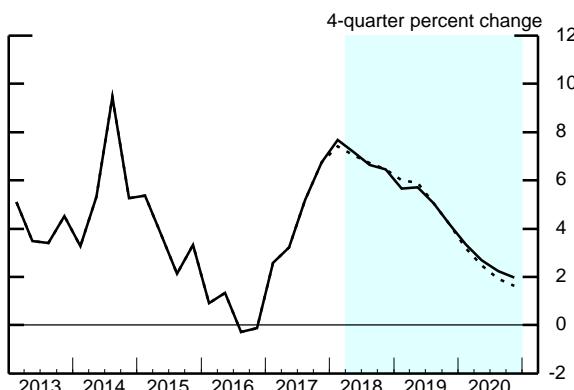
Personal Consumption Expenditures
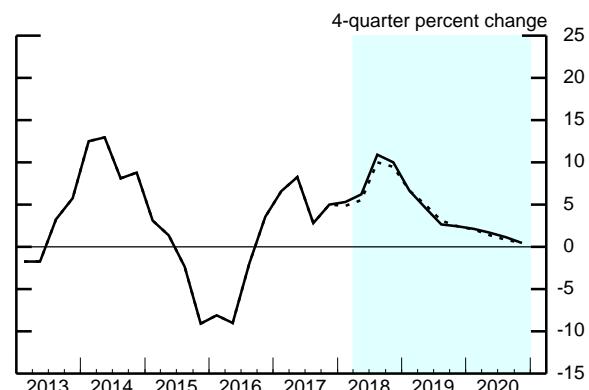
4-quarter percent change

— Current Tealbook
····· Previous Tealbook

Residential Investment

4-quarter percent change

Equipment and Intangibles

4-quarter percent change

Nonresidential Structures

4-quarter percent change
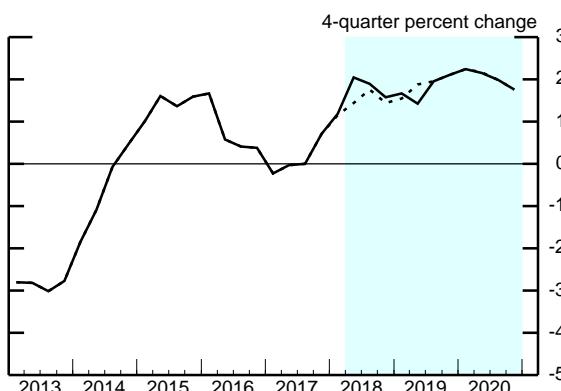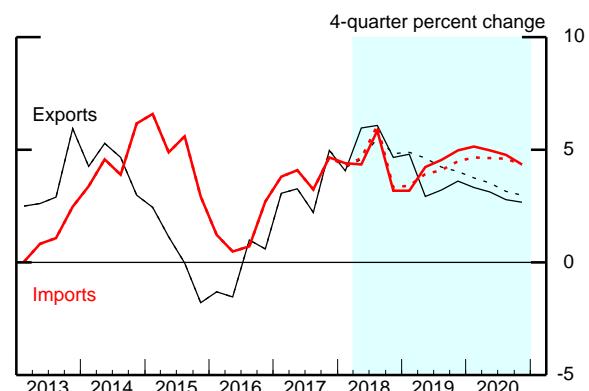
Government Consumption and Investment

4-quarter percent change

Exports and Imports

4-quarter percent change
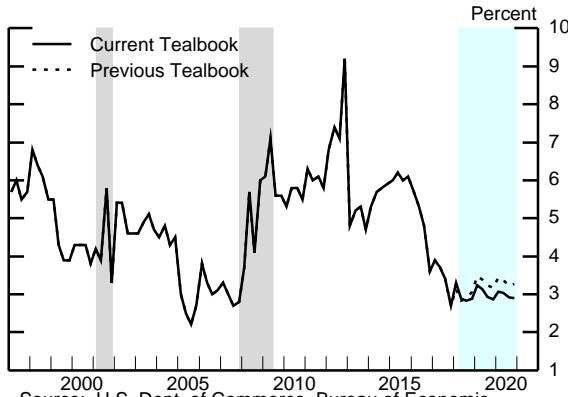
Exports

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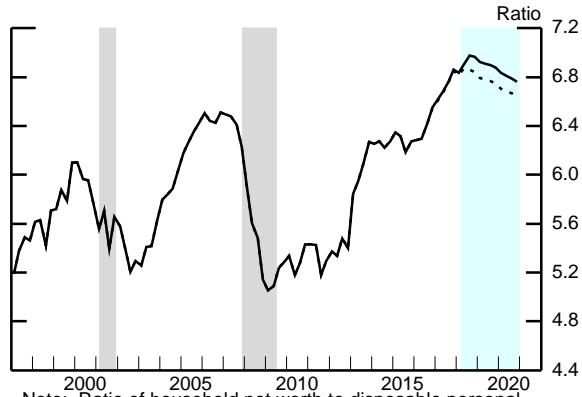
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Aspects of the Medium-Term Projection
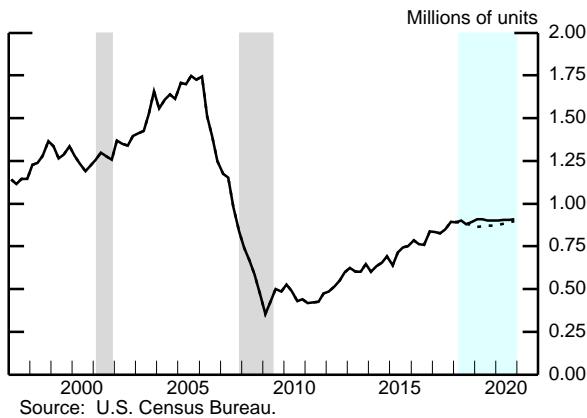
Domestic Econ Devel & Outlook

Personal Saving Rate

Percent

- —— Current Tealbook
- ····· Previous Tealbook

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

Wealth-to-Income Ratio

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

Millions of units

Source: U.S. Census Bureau.
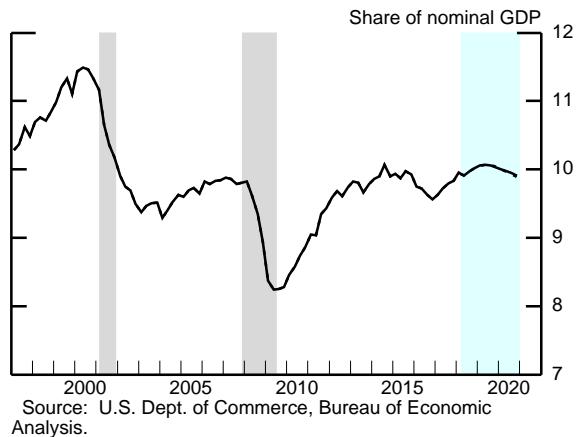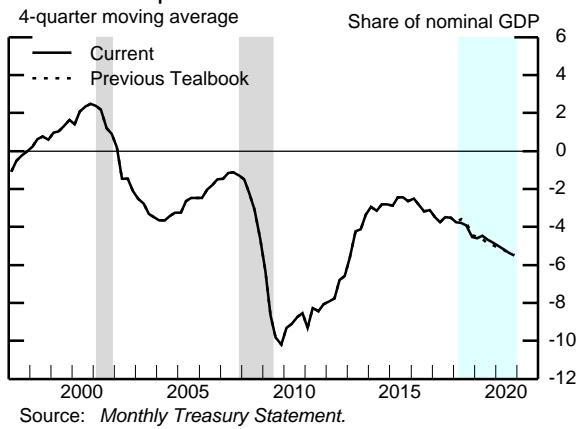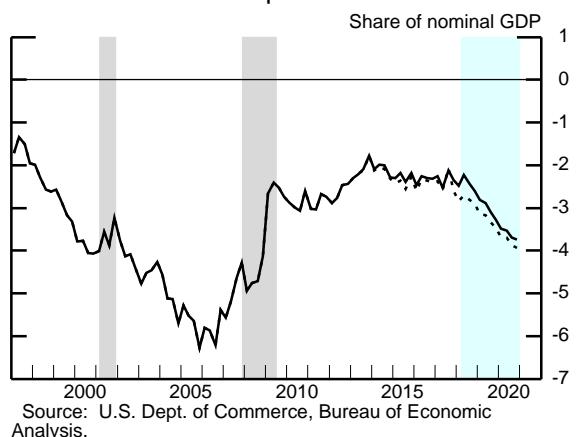
Equipment and Intangibles Spending

Share of nominal GDP

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

Federal Surplus/Deficit

4-quarter moving average   Share of nominal GDP

- —— Current
- ····· Previous Tealbook

Source: *Monthly Treasury Statement.*
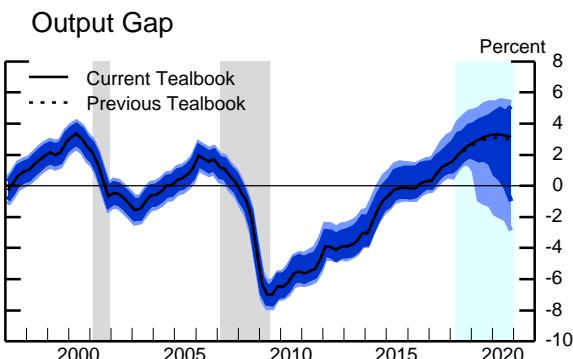
Current Account Surplus/Deficit
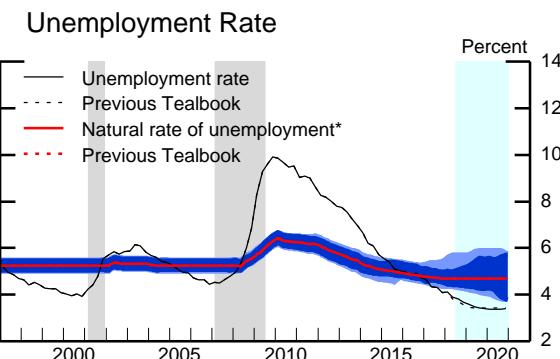
Share of nominal GDP

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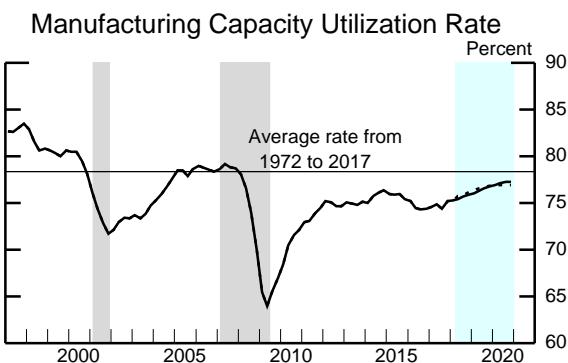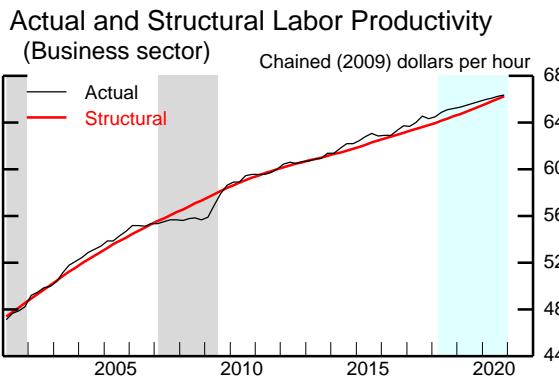
Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the natural rate.
*Staff estimate including the effect of EEB.
Source: Various macroeconomic data; staff assumptions.

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	2011-15	2016	2017	2018	2019	2020
Potential output	3.1	3.5	2.7	1.8	1.4	1.6	1.5	1.7	1.8	1.9
Previous Tealbook	3.1	3.5	2.7	1.8	1.4	1.6	1.5	1.7	1.8	1.9
Selected contributions[1]										
Structural labor productivity[2]	1.7	3.0	2.7	1.7	1.1	1.0	1.1	1.2	1.3	1.4
Previous Tealbook	1.7	3.0	2.7	1.7	1.1	1.0	1.1	1.2	1.3	1.4
Capital deepening	.7	1.5	1.0	.3	.5	.5	.5	.6	.6	.6
Multifactor productivity	.7	1.1	1.5	1.2	.3	.3	.4	.5	.5	.6
Structural hours	1.6	1.0	.8	.4	.5	.8	.2	.7	.6	.6
Previous Tealbook	1.6	1.0	.8	.4	.5	.8	.2	.7	.6	.6
Labor force participation	.4	-.1	-.2	-.5	-.6	-.3	-.3	-.3	-.2	-.2
Previous Tealbook	.4	-.1	-.2	-.5	-.6	-.3	-.3	-.3	-.2	-.2
Memo:										
Output gap[3]	-1.5	2.5	.2	-5.5	-.1	.3	1.4	2.6	3.3	3.1
Previous Tealbook	-1.5	2.5	.2	-5.5	-.1	.3	1.4	2.5	3.0	2.9

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
		H1	H2			
Nonfarm payroll employment[1]	183	215	200	207	171	133
Previous Tealbook	183	205	187	196	158	129
Private employment[1]	180	213	193	203	160	123
Previous Tealbook	180	206	180	193	148	119
Labor force participation rate[2]	62.7	62.8	62.8	62.8	62.8	62.8
Previous Tealbook	62.7	62.8	62.7	62.7	62.7	62.7
Civilian unemployment rate[2]	4.1	3.9	3.7	3.7	3.4	3.4
Previous Tealbook	4.1	3.8	3.6	3.6	3.4	3.4
Employment to population ratio[2]	60.1	60.4	60.5	60.5	60.6	60.6
Previous Tealbook	60.1	60.4	60.5	60.5	60.6	60.5

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

Inflation Projections
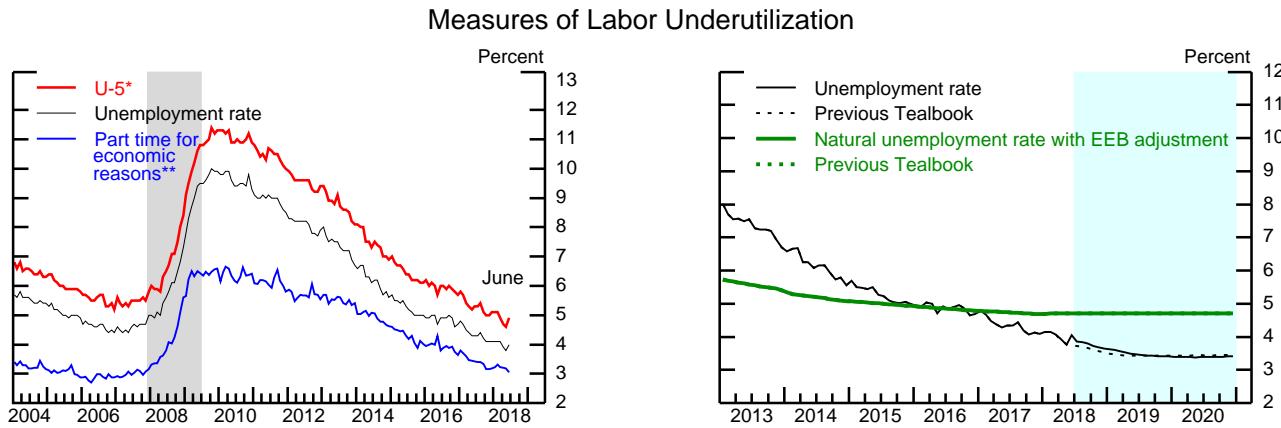
Measure	2017	2018		2018	2019	2020
		H1	H2			
Percent change at annual rate from final quarter of preceding period						
PCE chain-weighted price index	1.7	2.2	1.6	1.9	1.9	2.0
Previous Tealbook	1.7	2.3	1.8	2.1	1.9	2.0
Food and beverages	.7	.7	1.7	1.2	2.4	2.6
Previous Tealbook	.7	1.0	2.0	1.5	2.3	2.3
Energy	7.6	6.5	.9	3.7	-.4	-1.0
Previous Tealbook	7.6	7.9	4.5	6.2	-1.3	-1.0
Excluding food and energy	1.5	2.1	1.6	1.9	2.0	2.1
Previous Tealbook	1.5	2.1	1.7	1.9	2.0	2.1
Prices of core goods imports[1]	1.3	2.1	-1.3	.4	.5	.7
Previous Tealbook	1.3	2.7	.2	1.4	.6	.6

	June 2018[2]	July 2018[2]	Aug. 2018[2]	Sept. 2018[2]	Oct. 2018[2]	Nov. 2018[2]
12-month percent change						
PCE chain-weighted price index	2.3	2.3	2.2	1.9	1.9	1.9
Previous Tealbook	2.4	2.5	2.4	2.1	...	...
Excluding food and energy	1.9	1.9	1.9	1.9	1.8	1.9
Previous Tealbook	1.9	2.0	2.0	1.9	...	...

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

Labor Market Developments and Outlook (1)

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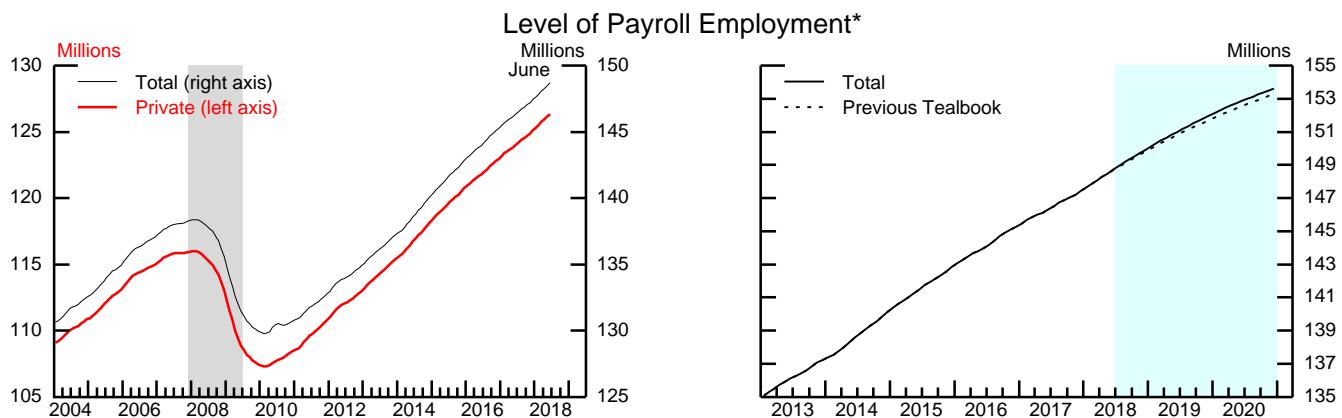
* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.
** Percent of Current Population Survey employment.
EEB Extended and emergency unemployment benefits.
Source: U.S. Department of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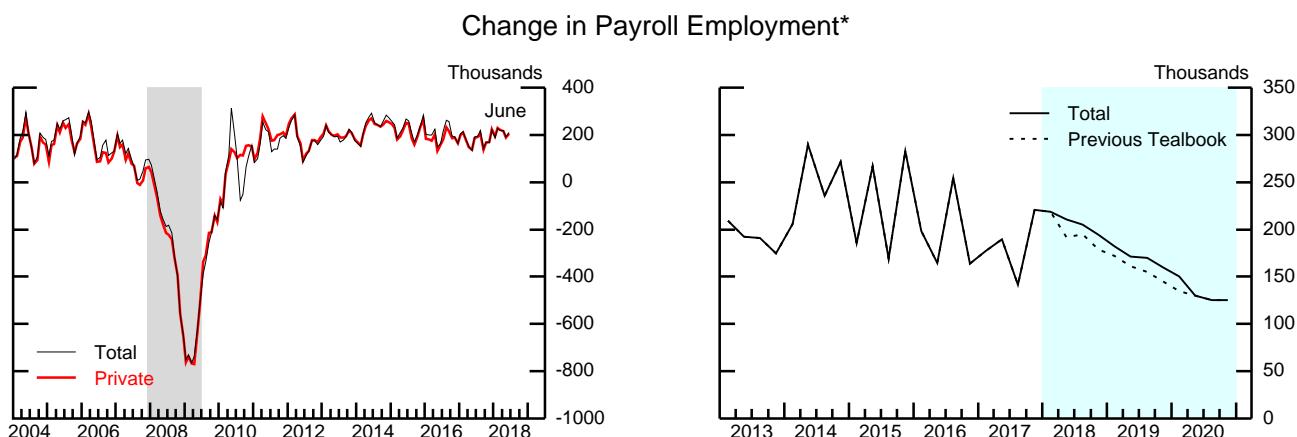
Level of Payroll Employment*

* 3-month moving averages.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Change in Payroll Employment*
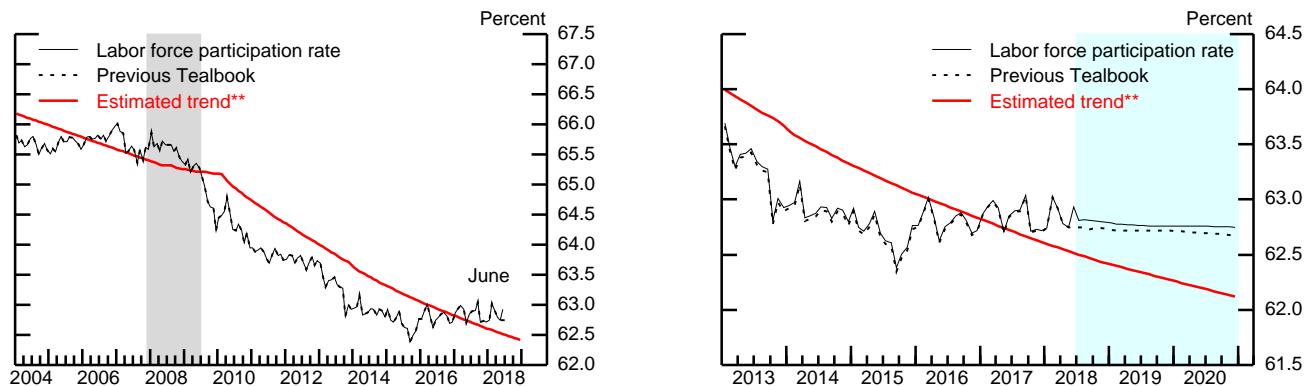
* 3-month moving averages.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

Labor Market Developments and Outlook (2)

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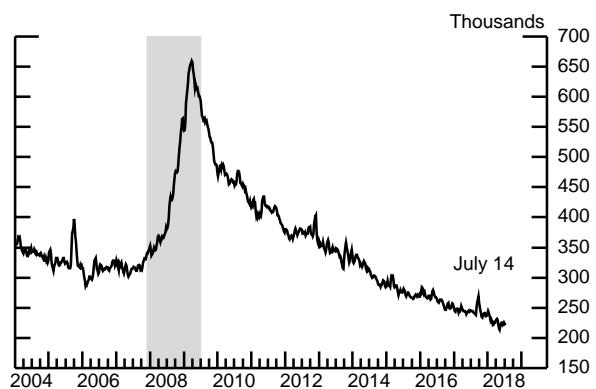
* Published data adjusted by staff to account for changes in population weights.
** Includes staff estimate of the effect of extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.
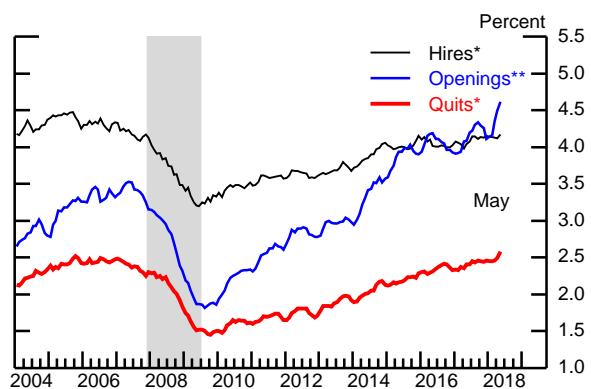
Initial Unemployment Insurance Claims*

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

Hires, Quits, and Job Openings
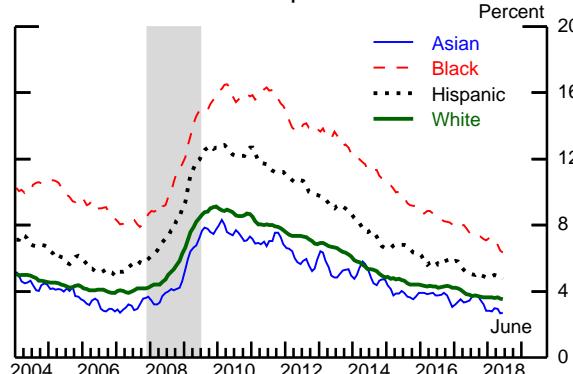
* Percent of private nonfarm payroll employment, 3-month moving average.
** Percent of private nonfarm payroll employment plus unfilled jobs, 3-month moving average.
Source: Job Openings and Labor Turnover Survey.
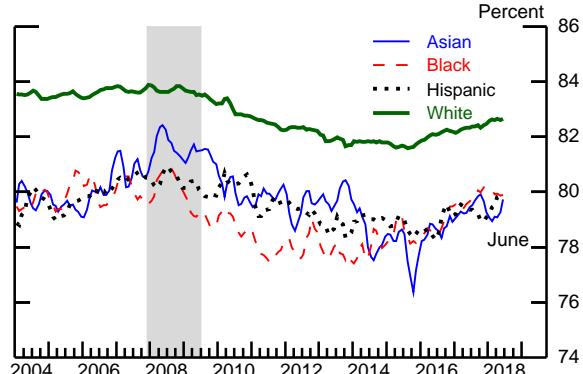
Unemployment Rate by Racial/Ethnic Group

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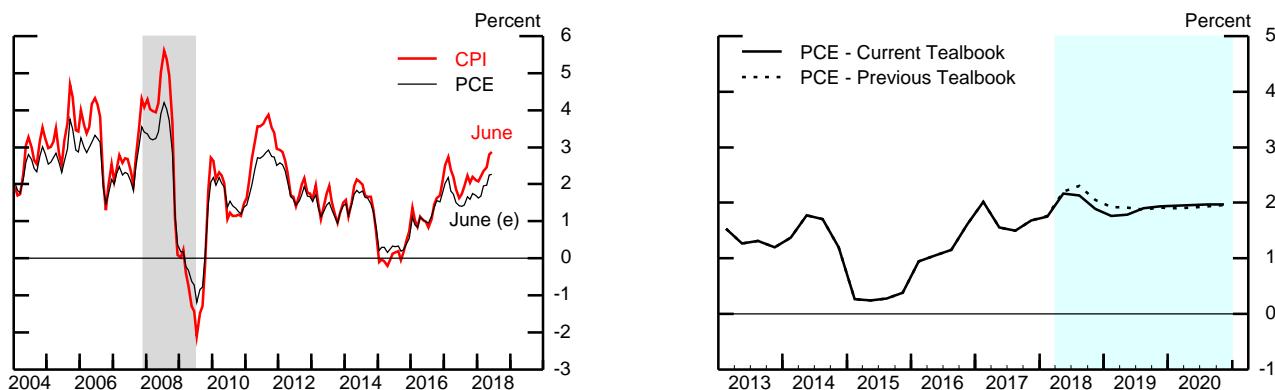
Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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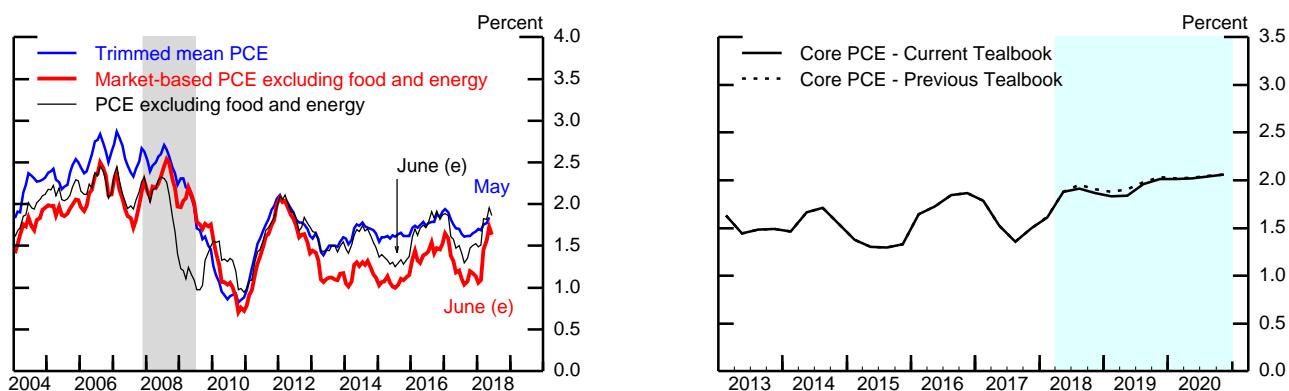
Headline Consumer Price Inflation

Note: PCE prices from April to June 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.
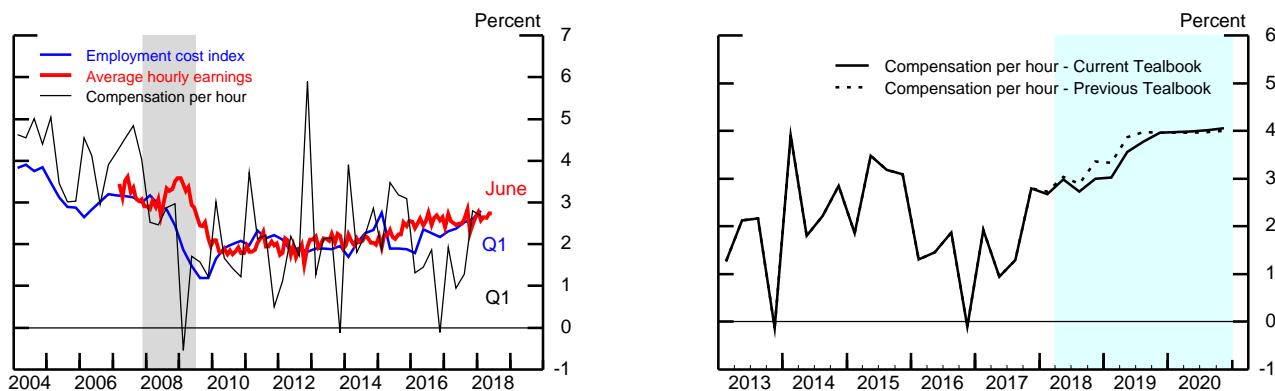
Measures of Underlying PCE Price Inflation

Note: Core PCE prices from April to June 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.
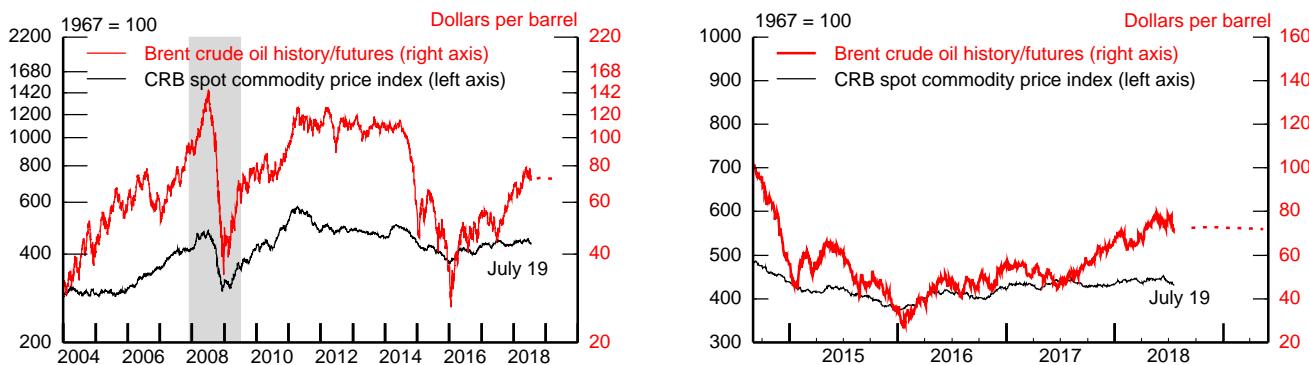
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

Authorized for Public Release
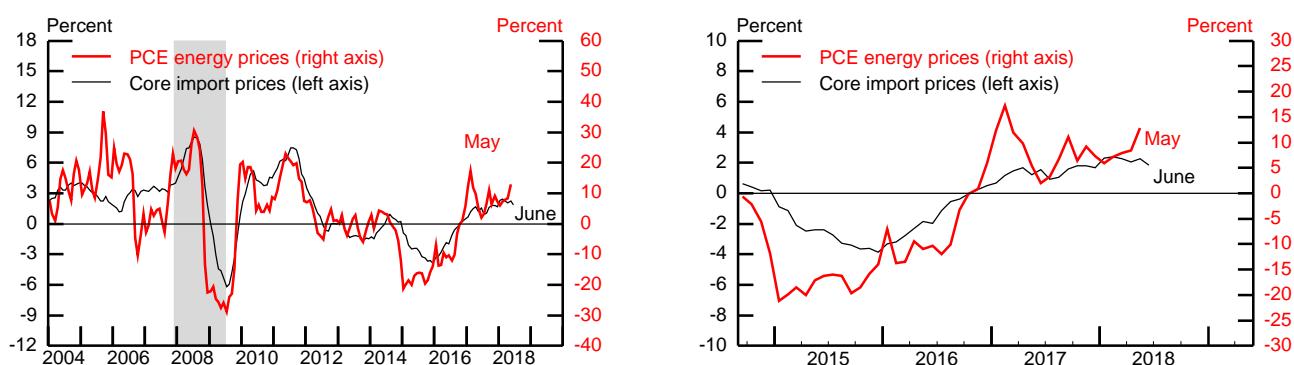
Inflation Developments and Outlook (2)
(Percent change from year-earlier period, except as noted)

Domestic Econ Devel & Outlook
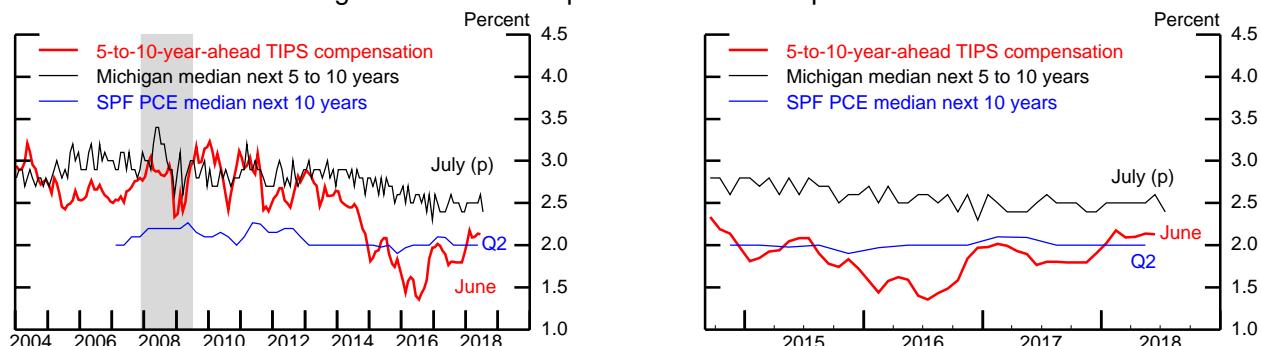
Commodity and Oil Price Levels

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

Energy and Import Price Inflation

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

Long-Term Inflation Expectations and Compensation

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

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

Authorized for Public Release
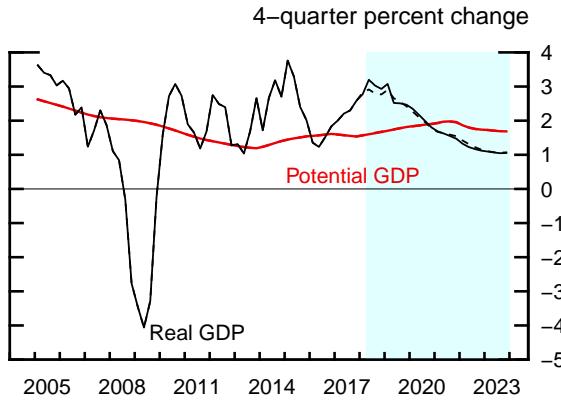
The Long–Term Outlook

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

Domestic Econ Devel & Outlook
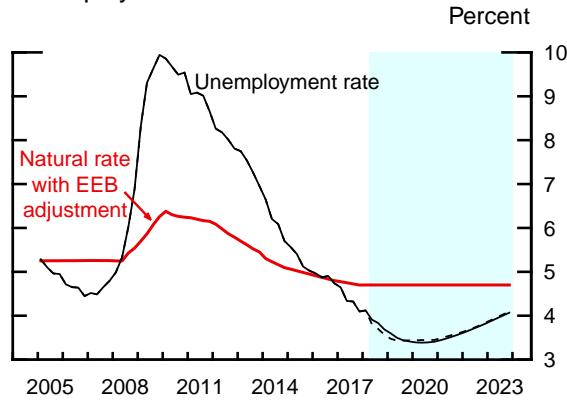
Measure	2018	2019	2020	2021	2022	2023	Longer run
Real GDP	2.9	2.5	1.8	1.5	1.1	1.1	1.7
Previous Tealbook	2.8	2.4	1.8	1.5	1.1	1.1	1.7
Civilian unemployment rate[1]	3.7	3.4	3.4	3.6	3.8	4.1	4.7
Previous Tealbook	3.6	3.4	3.4	3.6	3.8	4.1	4.7
PCE prices, total	1.9	1.9	2.0	2.0	2.1	2.1	2.0
Previous Tealbook	2.1	1.9	2.0	2.0	2.1	2.1	2.0
Core PCE prices	1.9	2.0	2.1	2.1	2.1	2.2	2.0
Previous Tealbook	1.9	2.0	2.1	2.1	2.1	2.2	2.0
Federal funds rate[1]	2.50	3.83	4.68	4.99	4.94	4.63	2.50
Previous Tealbook	2.52	3.78	4.54	4.79	4.73	4.44	2.50
10-year Treasury yield[1]	3.1	4.1	4.3	4.2	4.1	4.0	3.4
Previous Tealbook	3.6	4.1	4.3	4.2	4.1	3.9	3.4

1. Percent, average for the final quarter of the period.
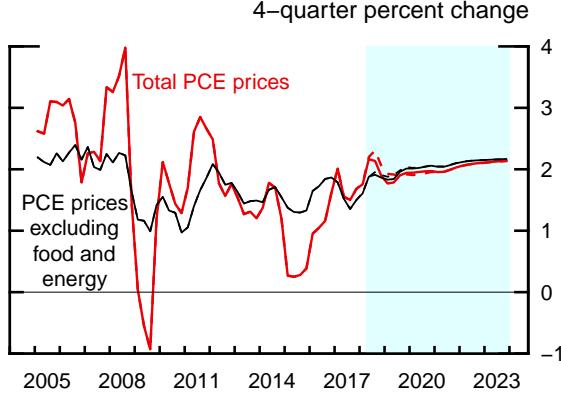
Real GDP
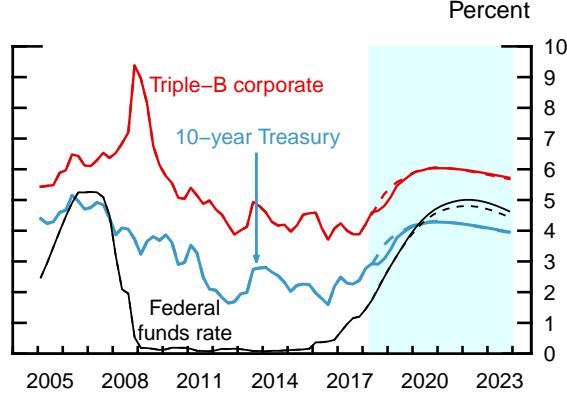
Unemployment Rate

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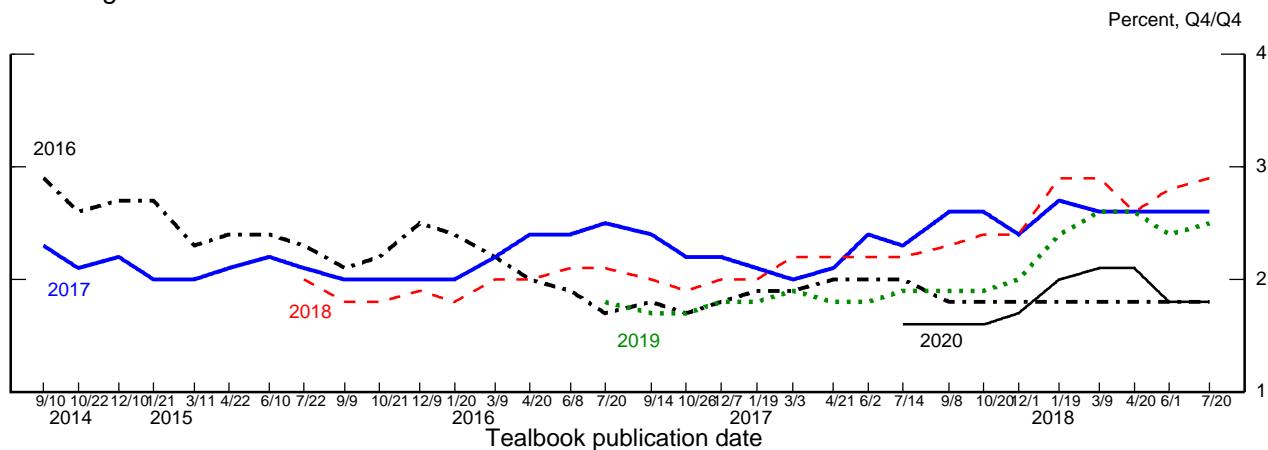
Interest Rates
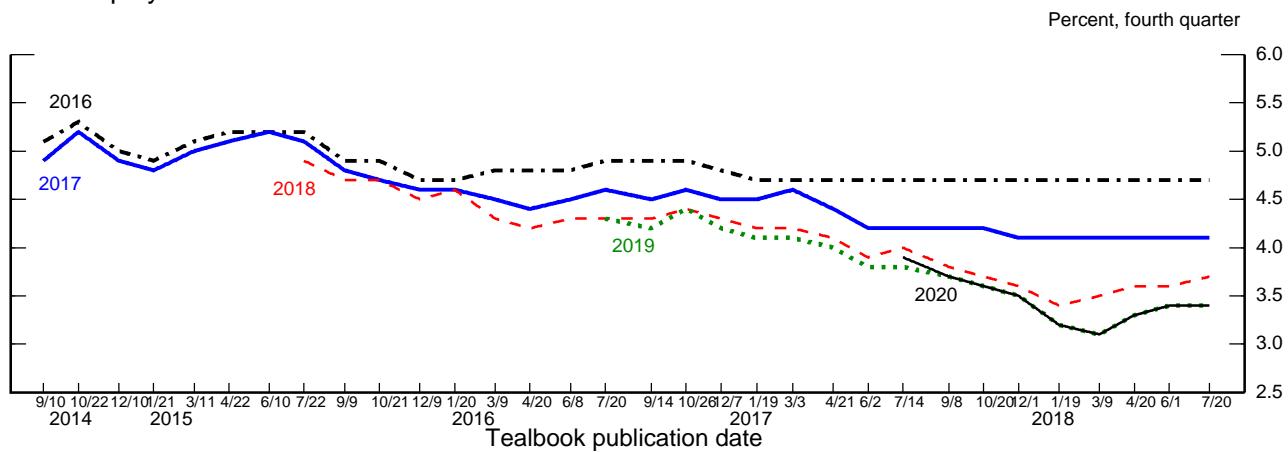
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

Authorized for Public Release

Evolution of the Staff Forecast

Change in Real GDP

Percent, Q4/Q4

2016

2017

2018

2019

2020

| 9/10 | 10/22 | 12/10 | 1/21 | 3/11 | 4/22 | 6/10 | 7/22 | 9/9 | 10/21 | 12/9 | 1/20 | 3/9 | 4/20 | 6/8 | 7/20 | 9/14 | 10/26 | 12/7 | 1/19 | 3/3 | 4/21 | 6/2 | 7/14 | 9/8 | 10/20 | 12/1 | 1/19 | 3/9 | 4/20 | 6/1 | 7/20 |

2014   2015   2016   2017   2018

Tealbook publication date

Unemployment Rate

Percent, fourth quarter

2016

2017

2018

2019

2020

| 9/10 | 10/22 | 12/10 | 1/21 | 3/11 | 4/22 | 6/10 | 7/22 | 9/9 | 10/21 | 12/9 | 1/20 | 3/9 | 4/20 | 6/8 | 7/20 | 9/14 | 10/26 | 12/7 | 1/19 | 3/3 | 4/21 | 6/2 | 7/14 | 9/8 | 10/20 | 12/1 | 1/19 | 3/9 | 4/20 | 6/1 | 7/20 |

2014   2015   2016   2017   2018

Tealbook publication date

Change in PCE Prices excluding Food and Energy

Percent, Q4/Q4

2018

2019

2020

2017

2016

| 9/10 | 10/22 | 12/10 | 1/21 | 3/11 | 4/22 | 6/10 | 7/22 | 9/9 | 10/21 | 12/9 | 1/20 | 3/9 | 4/20 | 6/8 | 7/20 | 9/14 | 10/26 | 12/7 | 1/19 | 3/3 | 4/21 | 6/2 | 7/14 | 9/8 | 10/20 | 12/1 | 1/19 | 3/9 | 4/20 | 6/1 | 7/20 |

2014   2015   2016   2017   2018

Tealbook publication date
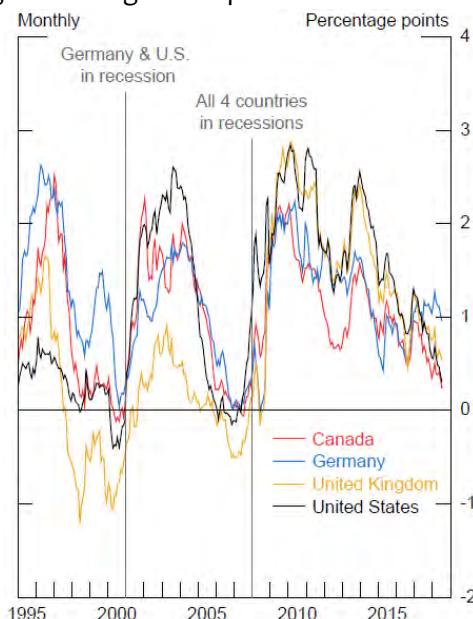
Yield Curve Inversions and Economic Recessions Abroad

As in the United States, long-term spreads have been trending down in several major advanced foreign economies (AFEs). Indeed, long-term spreads in Canada and the United Kingdom, in a range of 20 to 50 basis points, are similar to those in the United States (figure 1). The box "Don't Fear the Long-Term Spread" in the Financial Market Developments section of the June 2018 Tealbook investigated how well near- and long-term spreads predicted recessions in the United States. Are yield curve inversions as consistent a predictor of recessions in AFEs as they are in the United States? The evidence is mixed.

On the one hand, the evidence for AFEs in general is less convincing, especially in recent decades. The AFEs have had many episodes of inverted yield curves over the past six decades (table 1). But the association between inversion episodes (defined as negative spreads between 10-year and 3-month rates lasting at least six months) and economic recessions is much weaker for AFEs than for the United States.[1] While all U.S. inversion episodes except one were followed by a recession, most AFE episodes were not. Moreover, the association of inversions and recessions for AFEs, unlike for the United States, has weakened in recent decades. In the AFEs, recessions followed about one-half of the inversion episodes before 1990 but only one-fifth of episodes since.
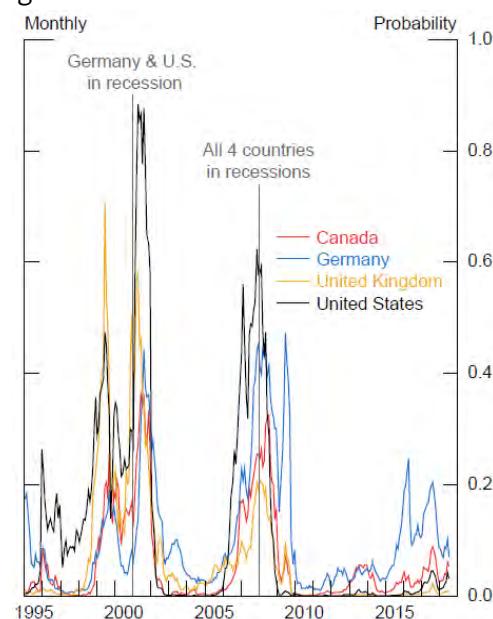
Figure 1. Long-Term Spreads

Note: The long-term spread is a spread of 10-year over 2-year yields. Final values are for July 10, 2018. Vertical lines roughly indicate recession starts.
Source: Bloomberg, ECRI, and GFD data.

Figure 2. Predicted Recession Probabilities

Note: Based on the long-term spread models estimated for 1980 to 2018. Final estimates are for July 10, 2018. Vertical lines roughly indicate recession starts.
Source: Staff calculations based on Bloomberg, ECRI, and GFD data.

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[1] In earlier decades, inflation expectations in most AFEs were poorly anchored, and attempts by foreign central banks to subdue inflation often resulted in recession. By contrast, in recent decades, inflation expectations have been much better anchored, obviating drastic monetary policy tightenings.

On the other hand, while the evidence for AFEs as a group is limited, the relationship between inversion episodes and recessions is stronger for some major AFEs. The left-hand side of table 2 reports results of regressions of the probability of transitioning into a recession over the next 12 months conditional on a 12-month lag of a long-term spread (a spread of 10-year over 2-year yields). For the AFEs in total, long-term spreads are very weak predictors of recession, especially in recent decades, but the results for Canada, Germany, and the United Kingdom show a statistical relationship slightly weaker than that for the United States. The right-hand side looks at the same analysis for a 2-year spread (a spread of 2-year over 3-month yields). (Note that because of data limitations, we cannot look at the same near-term spreads as in the June Tealbook box.) Here the results tell a similar story, with a stronger relationship for major AFEs than for AFEs in aggregate.[2]

Although the predictive power of inversions is stronger in major AFEs than for AFEs more generally, based on our 1980–2018 estimates, the probability of recession in the three AFEs implied by long-term spreads has risen but remains very low (figure 2). Moreover, with monetary policy likely to remain accommodative for longer in these economies than in the United States, the likelihood of an inversion is lower.

Table 1. Incidence of Yield Curve Inversions and Economic Recessions

| Number of: | 1960 to 2018 | | 1960 to 1989 | | 1990 to 2018 | |
	Inversion episodes	Subsequent recessions	Inversion episodes	Subsequent recessions	Inversion episodes	Subsequent recessions
Panel of 11 AFEs	70	29	48	25	22	4
United States	7	6	5	4	2	2

Note: The 11 AFEs are Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Norway, Spain, Sweden, and the United Kingdom. A subsequent recession is a recession within 12 months of the inversion episode.
Source: Staff calculations based on Bloomberg, ECRI, GFD, Haver, and OECD data.

Table 2. Probability Models of Entering a Recession

| | Long-term spread | | | | Near-term spread | | | |
| | 1980 to 2018 | | 1995 to 2018 | | 1980 to 2018 | | 1995 to 2018 | |
	Coeff.	R-sq.	Coeff.	R-sq.	Coeff.	R-sq.	Coeff.	R-sq.
Panel of 11 AFEs	-0.7*	0.12	-0.5	0.12	-0.1	0.1	0.3	0.1
Canada	-2.6*	0.34	-5.0*	0.40	-1.6*	0.2	-5.0*	0.2
Germany	-1.8*	0.23	-2.2*	0.21	0.3	0.0	1.2*	0.0
United Kingdom	-2.4*	0.33	-1.7*	0.22	-0.8*	0.1	-0.7*	0.0
United States	-3.1*	0.51	-6.4*	0.59	-1.7*	0.2	-1.6*	0.1

Note: The probability models are based on an extreme value distribution. * denotes statistical significance at 5 percent or lower.
Source: Staff calculations based on Bloomberg, ECRI, GFD, Haver, and OECD data.

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[2] Because we use the 2-year spread instead of the June Tealbook box's near-term spread (the difference between the 5-quarter-ahead and 1-quarter-ahead forward interest rates), our results for the United States suggest that the shorter-term spread has a weaker predictive power than the long-term spreads.
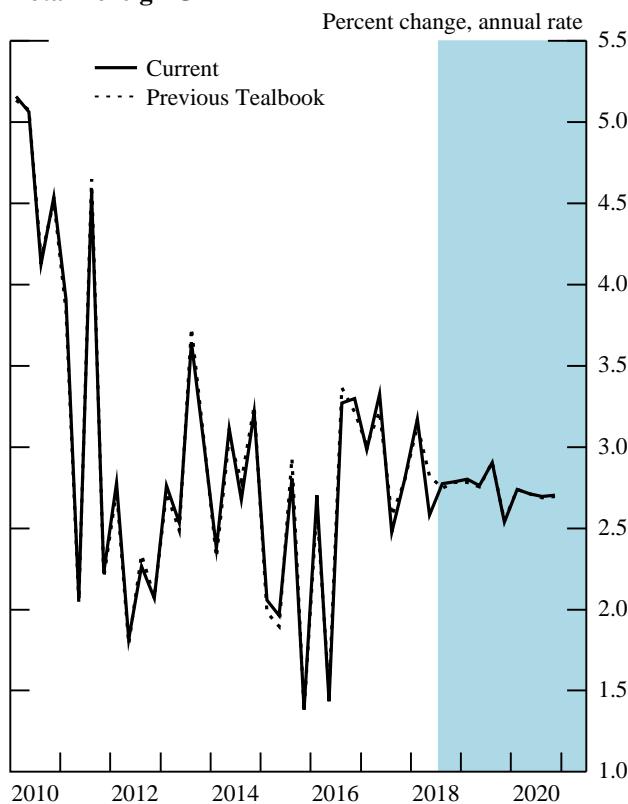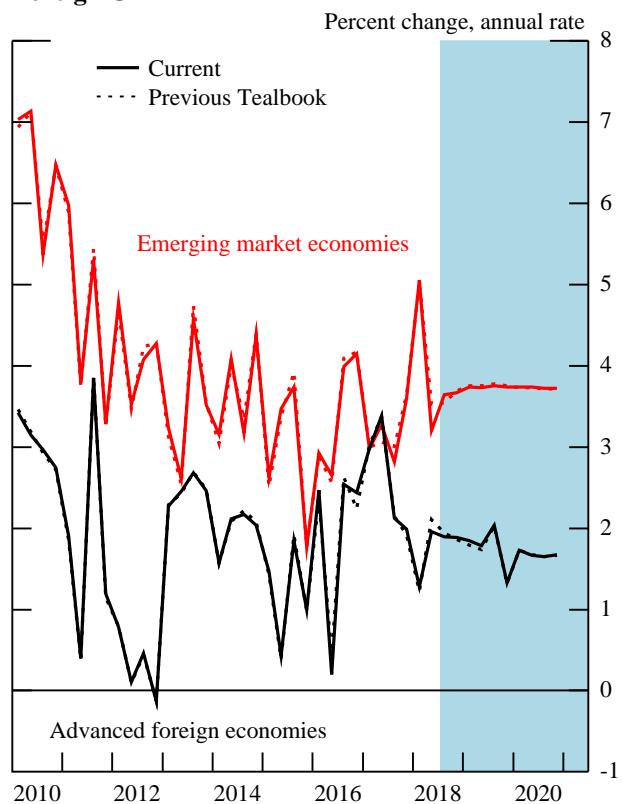
The Foreign GDP Outlook

Real GDP* Percent change, annual rate

	2017			2018			2019	2020
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	3.2	2.5	2.8	3.2	2.6	2.8	2.8	2.7
Previous Tealbook	3.1	2.6	2.8	3.1	2.8	2.8	2.7	2.7
2. Advanced Foreign Economies	3.2	2.1	2.0	1.3	2.0	1.9	1.7	1.7
Previous Tealbook	3.2	2.1	1.9	1.2	2.1	1.9	1.7	1.7
3. Canada	4.3	1.7	1.7	1.3	2.4	2.3	2.1	1.8
4. Euro Area	2.7	2.9	2.8	1.5	1.6	1.6	1.6	1.6
5. Japan	2.4	2.0	1.0	-.6	1.4	.9	.2	.9
6. United Kingdom	1.2	1.4	1.4	.9	1.5	1.6	1.7	1.7
7. Emerging Market Economies	3.1	2.8	3.6	5.1	3.2	3.7	3.7	3.7
Previous Tealbook	3.0	3.0	3.6	5.0	3.5	3.6	3.8	3.7
8. China	7.0	6.6	6.5	7.2	6.6	6.3	6.2	5.9
9. Emerging Asia ex. China	4.2	4.9	3.3	5.6	3.7	3.9	3.8	3.7
10. Mexico	1.4	-.2	3.6	4.6	2.4	2.8	2.9	3.0
11. Brazil	3.4	1.1	.9	1.8	-1.5	3.5	2.8	2.8

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

Total Foreign GDP

Foreign GDP

The Foreign Inflation Outlook

Consumer Prices*   Percent change, annual rate
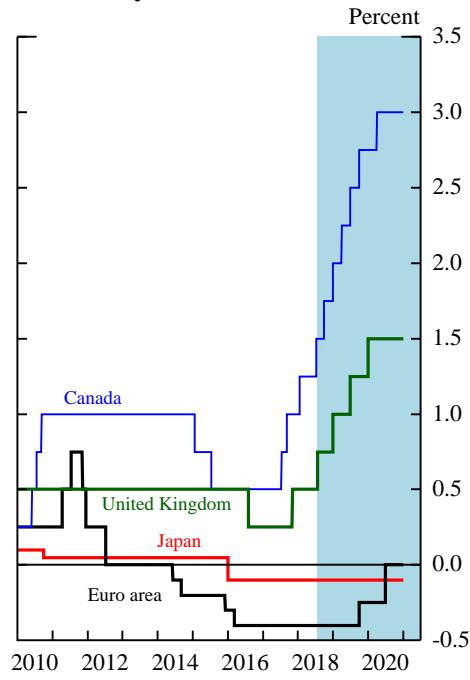
		2017			2018		2019	2020
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	2.5	2.3	3.0	2.6	1.6	2.6	2.5	2.4
Previous Tealbook	2.5	2.3	3.0	2.6	2.1	2.8	2.6	2.4
2. Advanced Foreign Economies	1.3	1.2	2.1	2.6	1.0	1.7	1.8	1.7
Previous Tealbook	1.3	1.2	2.1	2.6	1.7	1.9	1.9	1.6
3. Canada	1.4	1.4	3.0	3.6	1.0	2.4	2.1	2.0
4. Euro Area	1.5	1.0	1.6	2.1	2.2	1.4	1.4	1.6
5. Japan	-.1	.7	1.9	2.5	-2.3	1.3	2.3	1.0
6. United Kingdom	3.4	2.4	2.9	2.5	1.8	2.1	2.3	2.1
7. Emerging Market Economies	3.3	3.1	3.7	2.6	2.1	3.2	3.0	3.0
Previous Tealbook	3.3	3.1	3.7	2.6	2.4	3.3	3.1	3.0
8. China	1.0	2.2	2.9	1.5	.7	2.6	2.5	2.5
9. Emerging Asia ex. China	2.0	2.0	3.2	2.2	1.4	2.7	3.1	3.0
10. Mexico	8.0	5.4	5.0	4.1	3.8	3.9	3.4	3.2
11. Brazil	2.7	2.3	3.6	3.1	4.3	4.8	4.3	4.3

* CPI aggregates weighted by shares of U.S. non-oil imports.
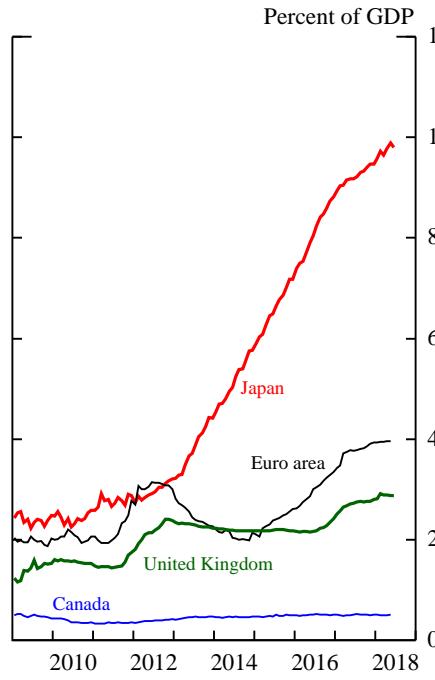
Int'l Econ Devel & Outlook

Foreign Monetary Policy
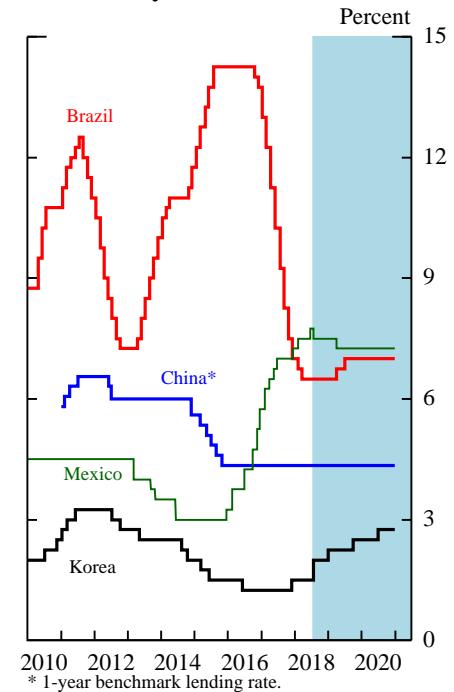
AFE Policy Rates

AFE Central Bank Balance Sheets

EME Policy Rates

* 1-year benchmark lending rate.
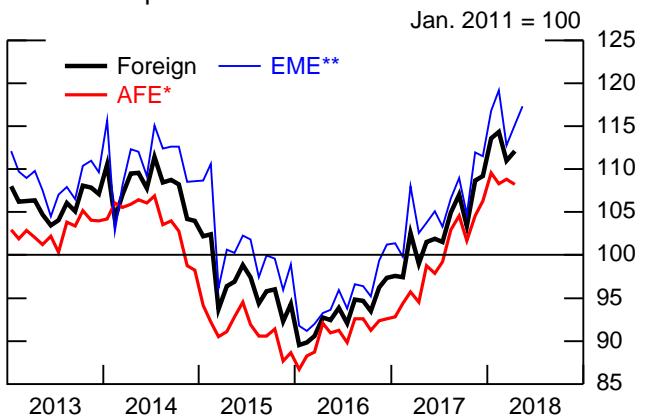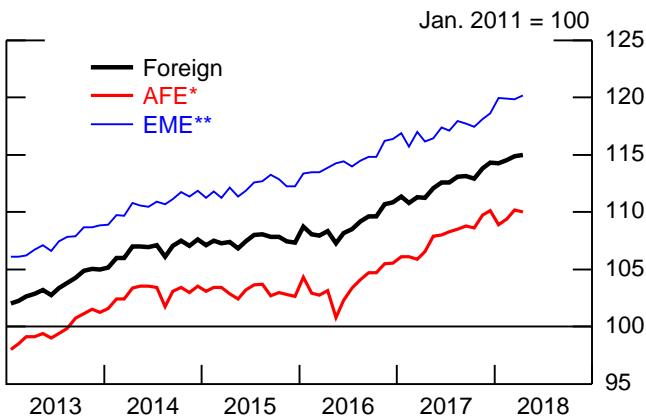
Recent Foreign Indicators

Int'l Econ Devel & Outlook

Nominal Exports

Jan. 2011 = 100

Foreign — EME**
AFE*
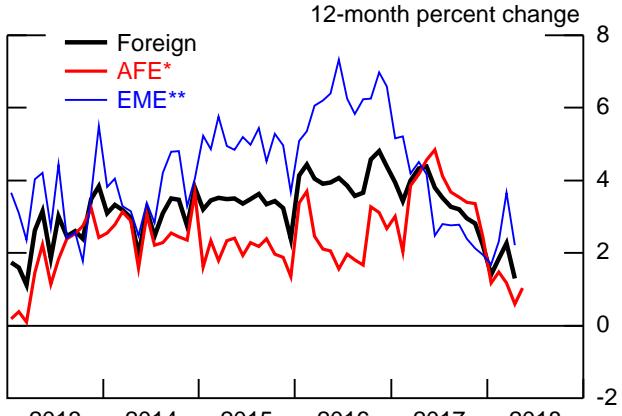
2013 2014 2015 2016 2017 2018
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, Hong Kong, India,
Indonesia, Israel, Korea, Malaysia, Mexico, Singapore, Taiwan, Thailand.

Industrial Production

Jan. 2011 = 100

Foreign
AFE*
EME**
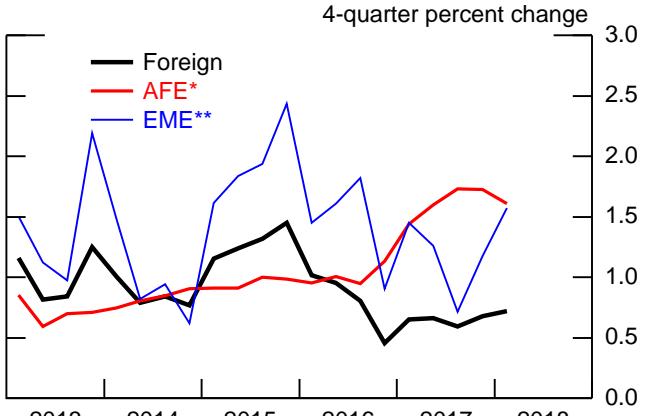
2013 2014 2015 2016 2017 2018
* Includes Canada, euro area, Japan, Sweden, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, India, Indonesia,
Israel, Korea, Malaysia, Mexico, Philippines, Russia, Singapore,
Taiwan, Thailand.

Retail Sales

12-month percent change

Foreign
AFE*
EME**
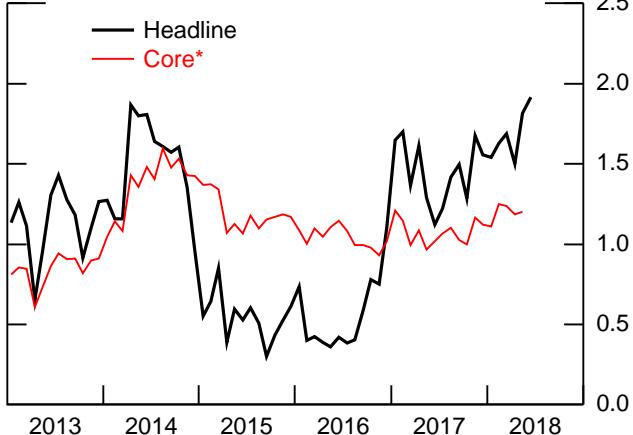
2013 2014 2015 2016 2017 2018
* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, Chile, China, Korea, Mexico, Singapore, Taiwan.

Employment

4-quarter percent change

Foreign
AFE*
EME**
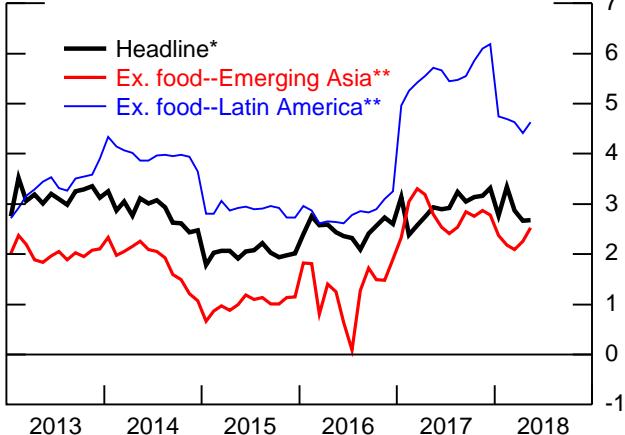
2013 2014 2015 2016 2017 2018
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Chile, Colombia, Hong Kong, Israel, Korea, Mexico,
Philippines, Russia, Singapore, Taiwan, Thailand, Turkey.

Consumer Prices: Advanced Foreign Economies

12-month percent change

Headline
Core*

2013 2014 2015 2016 2017 2018
Note: Includes Canada, euro area, Japan, U.K.
* Excludes all food and energy; staff calculation.
Source: Haver Analytics.
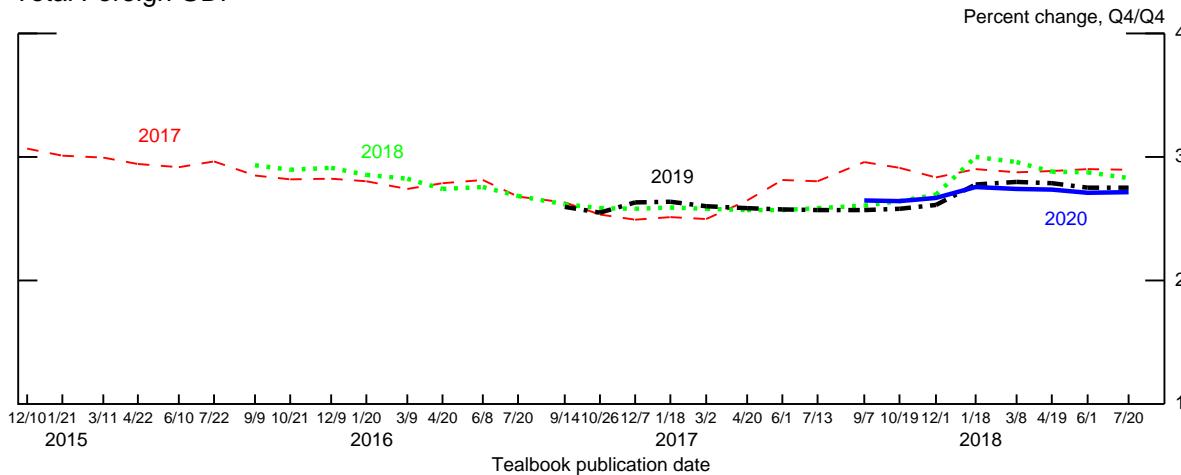
Consumer Prices: Emerging Market Economies

12-month percent change

Headline*
Ex. food--Emerging Asia**
Ex. food--Latin America**
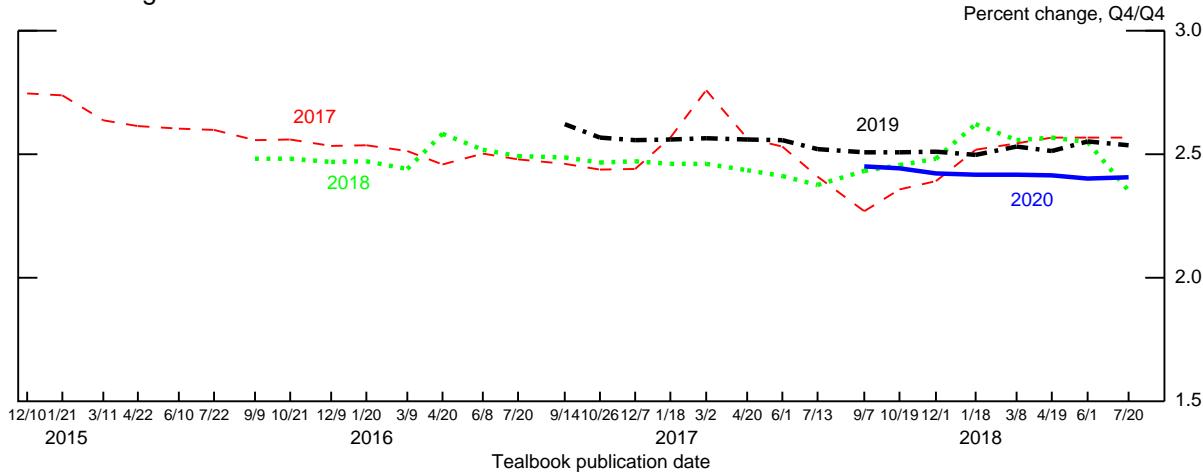
2013 2014 2015 2016 2017 2018
* Includes Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia,
Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand.
** Excludes all food; staff calculation. Latin America excludes Argentina
and Venezuela.

Evolution of Staff's International Forecast

Total Foreign GDP

Percent change, Q4/Q4

2017

2018

2019

2020

12/1 01/21 3/11 4/22 6/10 7/22 9/9 10/21 12/9 1/20 3/9 4/20 6/8 7/20 9/14 10/26 12/7 1/18 3/2 4/20 6/1 7/13 9/7 10/19 12/1 1/18 3/8 4/19 6/1 7/20

2015   2016   2017   2018

Tealbook publication date

Total Foreign CPI

Percent change, Q4/Q4

2017

2018

2019

2020

12/1 01/21 3/11 4/22 6/10 7/22 9/9 10/21 12/9 1/20 3/9 4/20 6/8 7/20 9/14 10/26 12/7 1/18 3/2 4/20 6/1 7/13 9/7 10/19 12/1 1/18 3/8 4/19 6/1 7/20

2015   2016   2017   2018

Tealbook publication date

U.S. Current Account Balance

Percent of GDP

2017

2018

2019

2020

12/1 01/21 3/11 4/22 6/10 7/22 9/9 10/21 12/9 1/20 3/9 4/20 6/8 7/20 9/14 10/26 12/7 1/18 3/2 4/20 6/1 7/13 9/7 10/19 12/1 1/18 3/8 4/19 6/1 7/20

2015   2016   2017   2018

Tealbook publication date

Int'l Econ Devel & Outlook

Policy Expectations and Treasury Yields
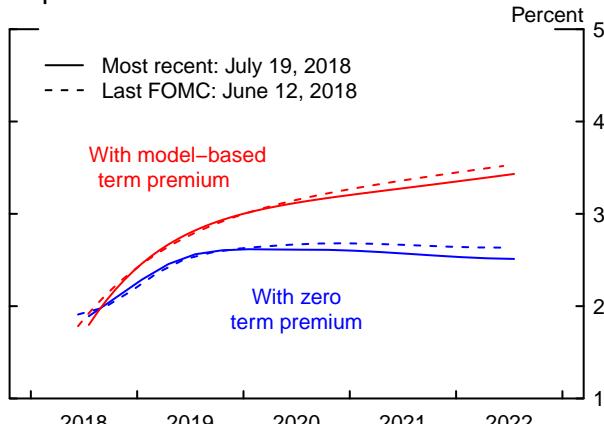
Market–Implied Probability Distribution of the Timing of the Next Rate Increase

Percent

- ■ Most recent: July 19, 2018
- - - Last FOMC: June 12, 2018

Aug. 1   Sept. 26   >= Nov. 8

Note: Probabilities implied by a binomial tree fitted to settlement prices on federal funds futures contracts, assuming the next policy action 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 on the previous non–month–end business day.
Source: CME Group; Federal Reserve Board staff estimates.

Implied Federal Funds Rate

Percent

- —— Most recent: July 19, 2018
- - - Last FOMC: June 12, 2018

With model–based term premium

With zero term premium

2018 2019 2020 2021 2022
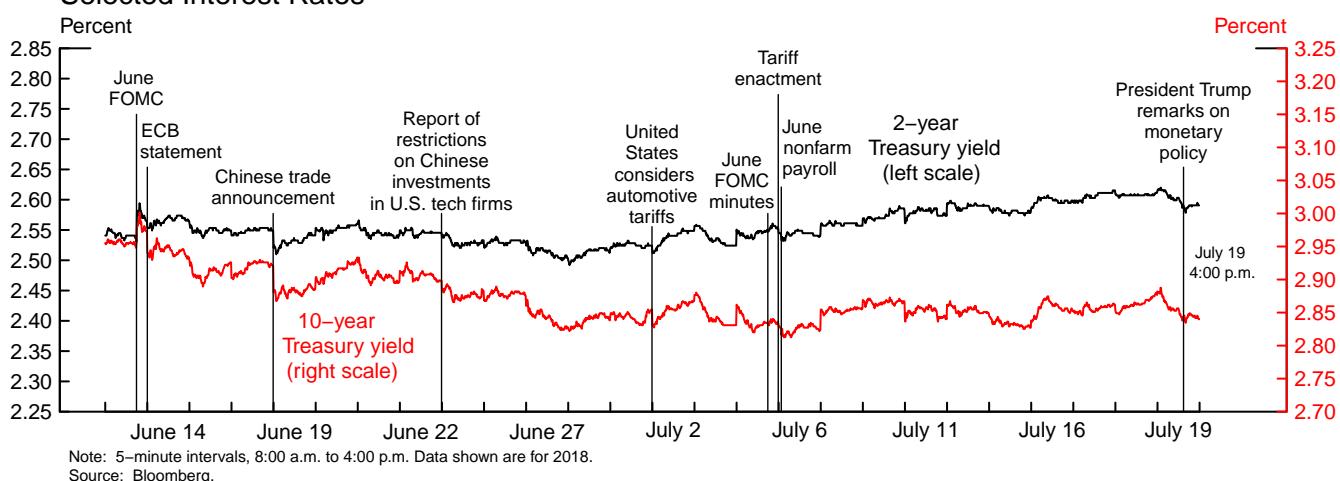
Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points. Model–based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premium.
Source: Bloomberg; Federal Reserve Board staff estimates.
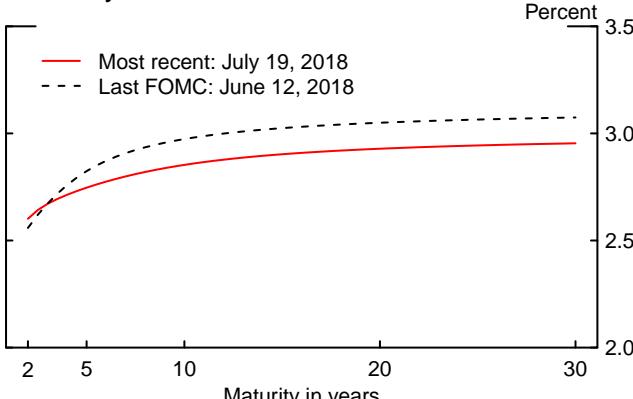
Selected Interest Rates

Percent

Percent

June FOMC
ECB statement
Chinese trade announcement
Report of restrictions on Chinese investments in U.S. tech firms
United States considers automotive tariffs
June FOMC minutes
June nonfarm payroll
Tariff enactment
2–year Treasury yield (left scale)
President Trump remarks on monetary policy
July 19 4:00 p.m.

10–year Treasury yield (right scale)

June 14   June 19   June 22   June 27   July 2   July 6   July 11   July 16   July 19

Note: 5–minute intervals, 8:00 a.m. to 4:00 p.m. Data shown are for 2018.
Source: Bloomberg.

Treasury Yield Curve

Percent

- —— Most recent: July 19, 2018
- - - Last FOMC: June 12, 2018

2   5   10   20   30
Maturity in years
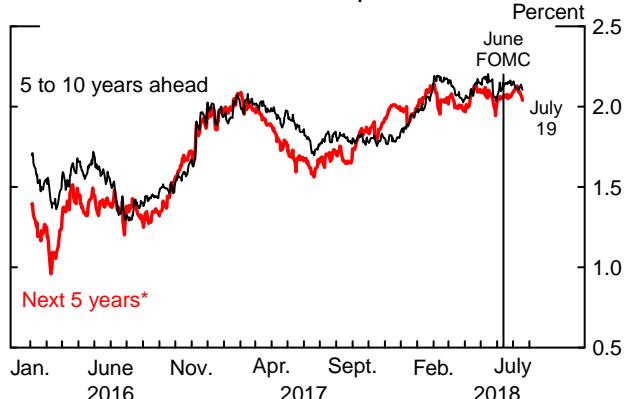
Note: Smoothed yield curve estimated from off-the-run Treasury coupon securities. Yields shown are those on notional par Treasury securities with semiannual coupons.
Source: Federal Reserve Bank of New York; Federal Reserve Board staff estimates.

TIPS–Based Inflation Compensation

Percent

5 to 10 years ahead

June FOMC

July 19

Next 5 years*

Jan.   June   Nov.   Apr.   Sept.   Feb.   July
2016   2017   2018
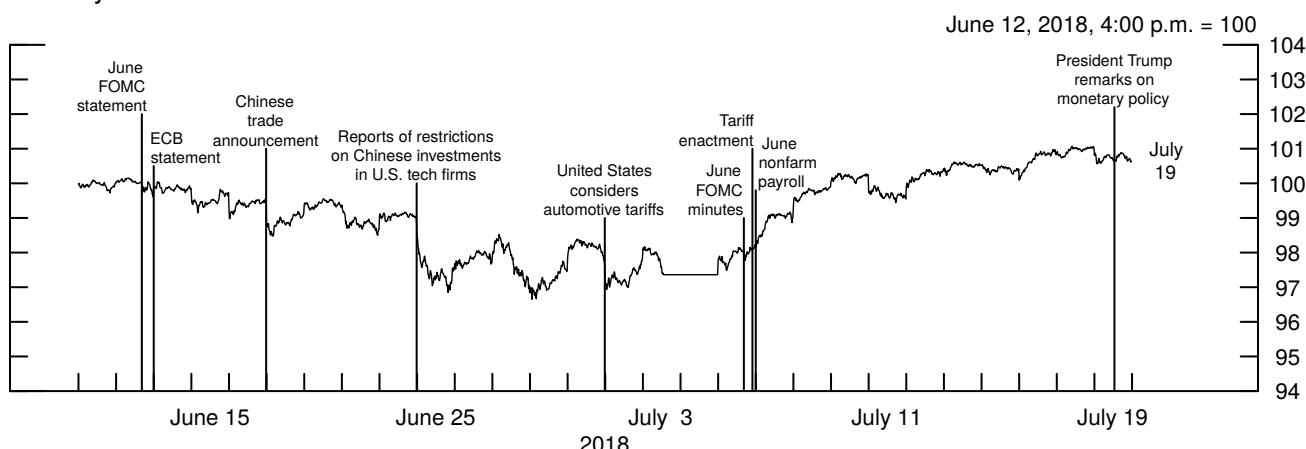
Note: Estimates based on smoothed nominal and inflation-indexed Treasury yield curves.
 * Adjusted for lagged indexation of Treasury Inflation-Protected Securities (carry effect).
Source: Federal Reserve Bank of New York; Federal Reserve Board staff estimates.
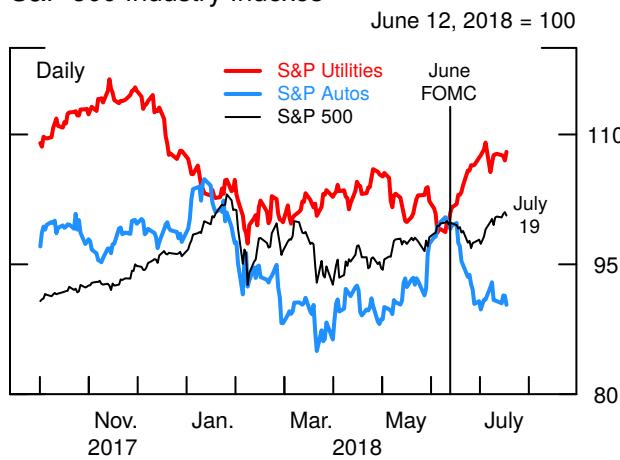
Financial Markets

Corporate Asset Market Developments

Intraday S&P 500 Index

June 12, 2018, 4:00 p.m. = 100

June FOMC statement
ECB statement
Chinese trade announcement
Reports of restrictions on Chinese investments in U.S. tech firms
United States considers automotive tariffs
June FOMC minutes
Tariff enactment
June nonfarm payroll
President Trump remarks on monetary policy
July 19

2018

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

June 12, 2018 = 100

Daily
S&P Utilities
S&P Autos
S&P 500
June FOMC
July 19

Source: Bloomberg.

Implied Volatility on S&P 500 (VIX)

Log scale, percent

Daily
VIX
Realized volatility
June FOMC
July 19

Source: Chicago Board Options Exchange; Bloomberg.

10-Year Corporate Bond Yields

Percent

Daily
High-yield
Triple-B
June FOMC
July 19

Source: Staff estimates of smoothed yield curves based on Merrill Lynch bond data.
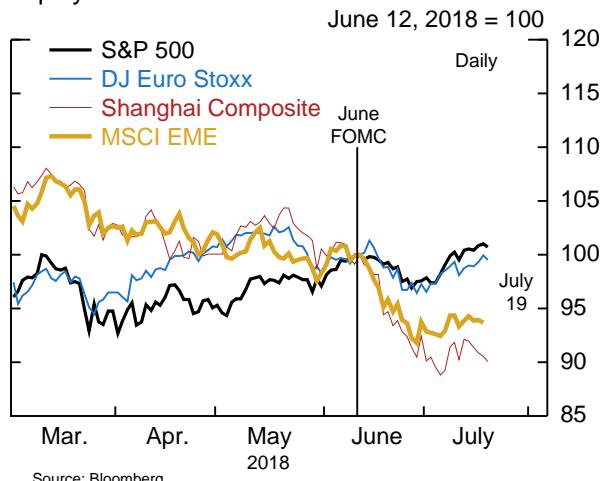
10-Year Corporate Bond Spreads

Basis points   Basis points

Daily
High-yield (right scale)
Triple-B (left scale)
June FOMC
July 19

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
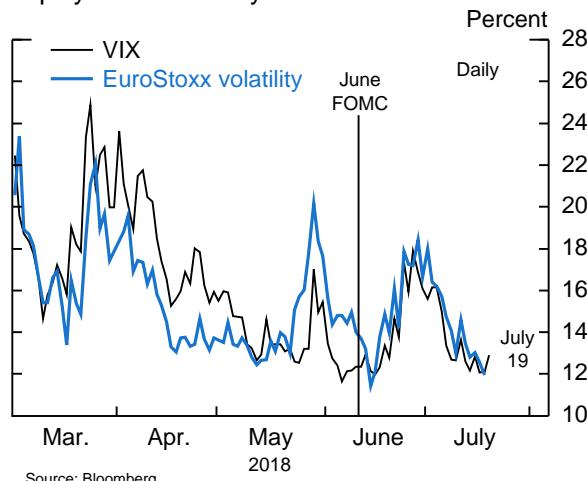
Foreign Developments

Equity Indexes

June 12, 2018 = 100

Daily

- S&P 500
- DJ Euro Stoxx
- Shanghai Composite
- MSCI EME

June FOMC

July 19

Source: Bloomberg.
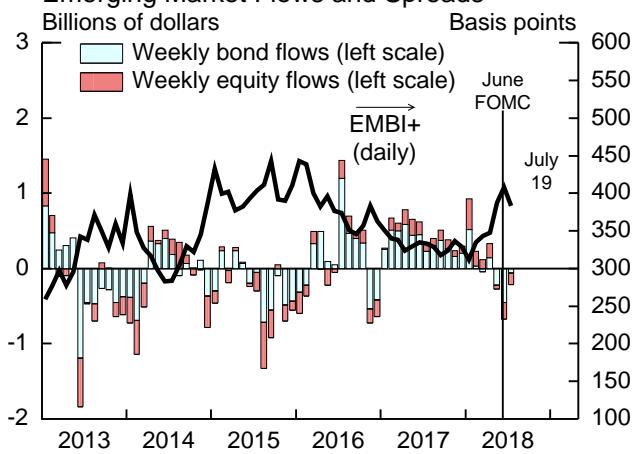
Equity Price Volatility

Percent

Daily

- VIX
- EuroStoxx volatility

June FOMC

July 19

Source: Bloomberg.
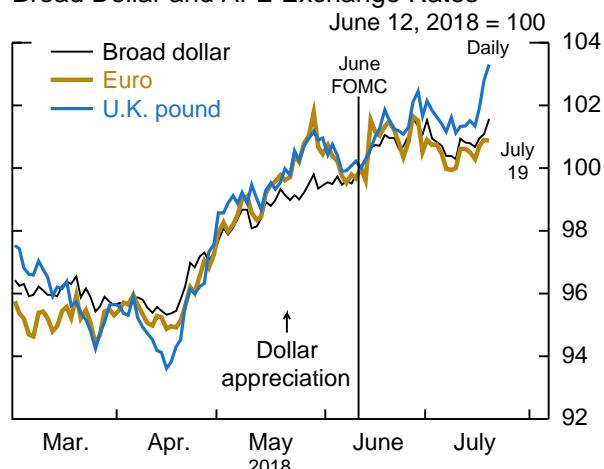
Emerging Market Flows and Spreads

Billions of dollars

Basis points

- Weekly bond flows (left scale)
- Weekly equity flows (left scale)

June FOMC

EMBI+ (daily)

July 19
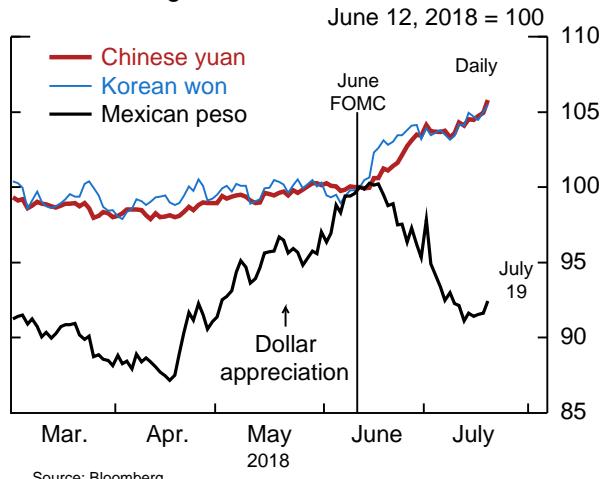
Note: Emerging market bond spreads over zero-coupon Treasury securities. Flows data exclude intra-China flows. Monthly figures are averaged.
Source: EPFR; J.P. Morgan.
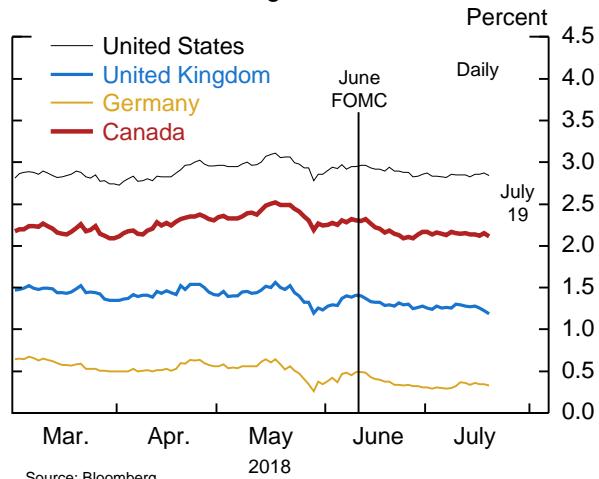
Broad Dollar and AFE Exchange Rates

June 12, 2018 = 100

Daily

- Broad dollar
- Euro
- U.K. pound

June FOMC

July 19

Dollar appreciation

Source: Bloomberg; Federal Reserve Bank of New York; Federal Reserve Board, Statistical Release H.10, "Foreign Exchange Rates."

EME Exchange Rates

June 12, 2018 = 100

Daily

- Chinese yuan
- Korean won
- Mexican peso

June FOMC

July 19

Dollar appreciation

Source: Bloomberg.
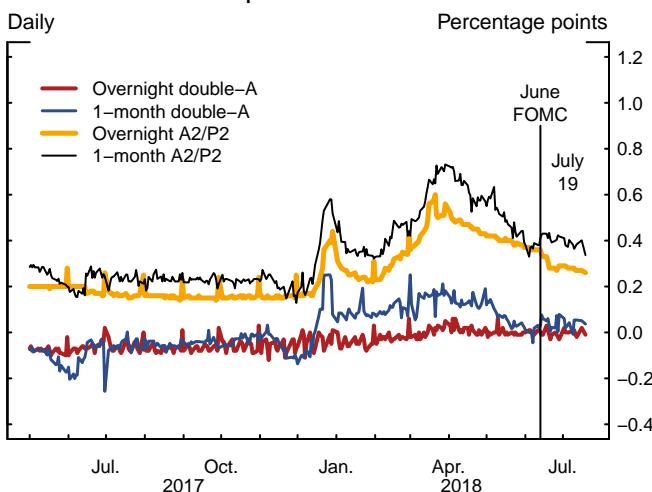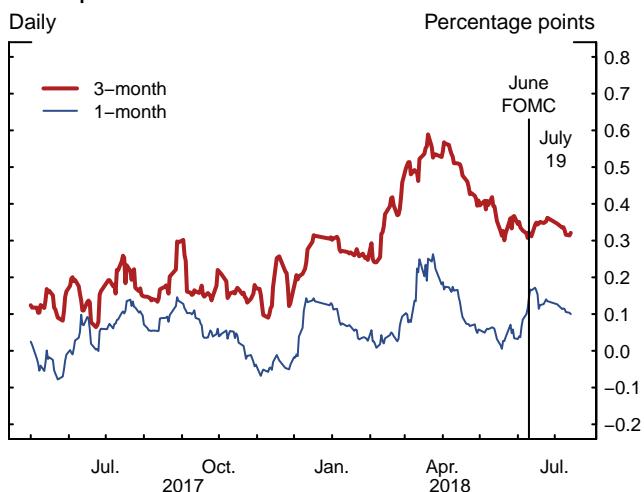
10-Year AFE Sovereign Yields

Percent

Daily

- United States
- United Kingdom
- Germany
- Canada

June FOMC

July 19

Source: Bloomberg.

Short–Term Funding Markets and Federal Reserve Operations

Nonfinancial CP Spreads

Daily

Percentage points

Overnight double–A
1–month double–A
Overnight A2/P2
1–month A2/P2

June FOMC

July 19
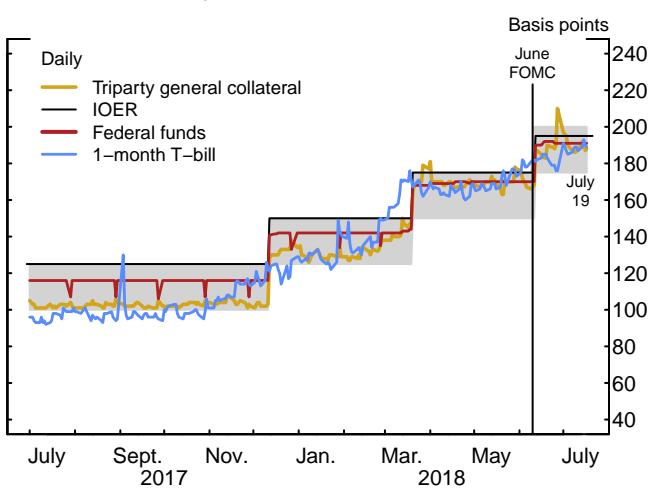
Note: Overnight commercial paper (CP) spreads are to the federal funds rate, and 1–month CP spreads are to overnight index swap rates.
Source: Depository Trust & Clearing Corporation.

CD Spreads to OIS

Daily

Percentage points

3–month
1–month

June FOMC

July 19
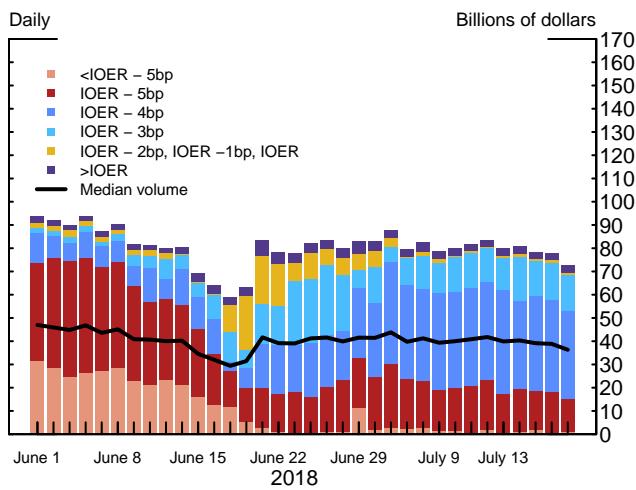
Note: Certificate of deposit (CD) rates are a 5–day moving average. OIS is overnight index swap.
Source: Depository Trust & Clearing Corporation.

Selected Money Market Rates

Basis points

June FOMC

Daily

Triparty general collateral
IOER
Federal funds
1–month T–bill

July 19
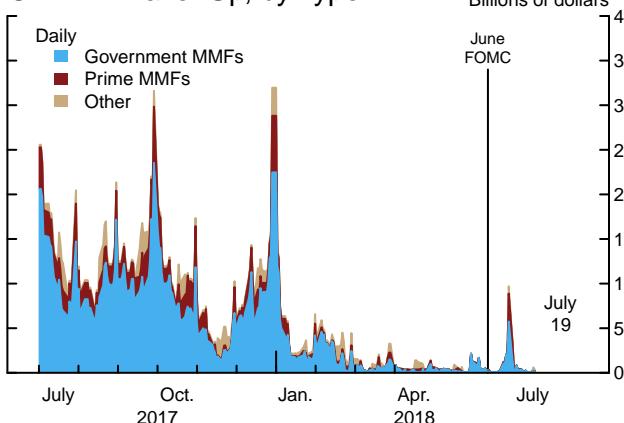
Note: Federal funds rate is a weighted median, and shaded area is the target range for the federal funds rate. IOER is interest on excess reserves.
Source: Federal Reserve Board, Form FR 2420, Report of Selected Money Market Rates.

Fed Funds Rate Distribution

Daily

Billions of dollars

<IOER – 5bp
IOER – 5bp
IOER – 4bp
IOER – 3bp
IOER – 2bp, IOER –1bp, IOER
>IOER
Median volume
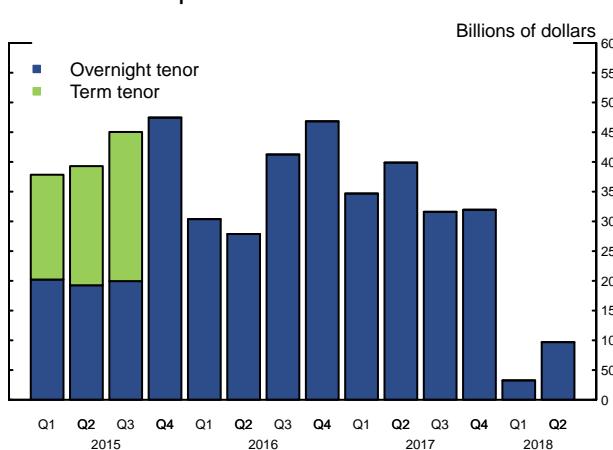
Note: IOER is interest on excess reserves.
Source: Federal Reserve Board, Form FR 2420, Report of Selected Money Market Rates.

ON RRP Take–Up, by Type

Daily

Billions of dollars

Government MMFs
Prime MMFs
Other

June FOMC

July 19

Note: ON RRP is overnight reverse repurchase agreement; MMF is money market fund.
Source: Federal Reserve Bank of New York.
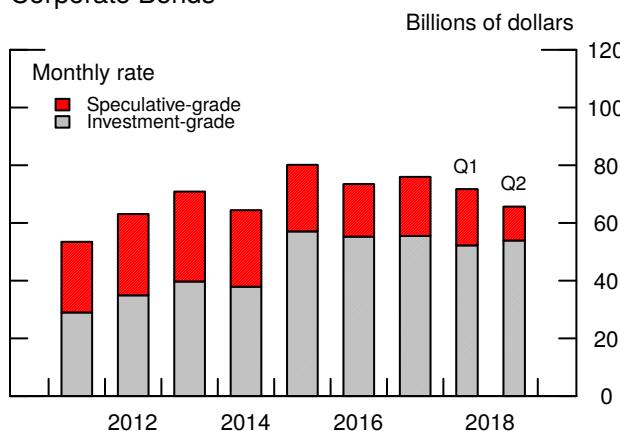
RRP Take–Up on Quarter–Ends

Billions of dollars

Overnight tenor
Term tenor

Note: RRP is reverse repurchase agreement.
Source: Federal Reserve Bank of New York.
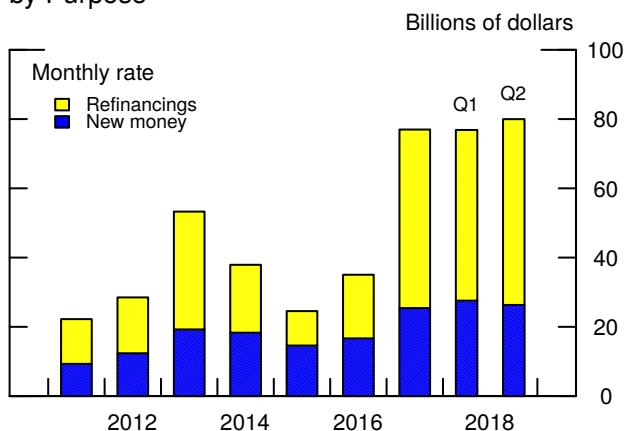
Business Finance

Gross Issuance of Nonfinancial Corporate Bonds

Billions of dollars

Monthly rate

■ Speculative-grade
■ Investment-grade

Q1 Q2

2012   2014   2016   2018
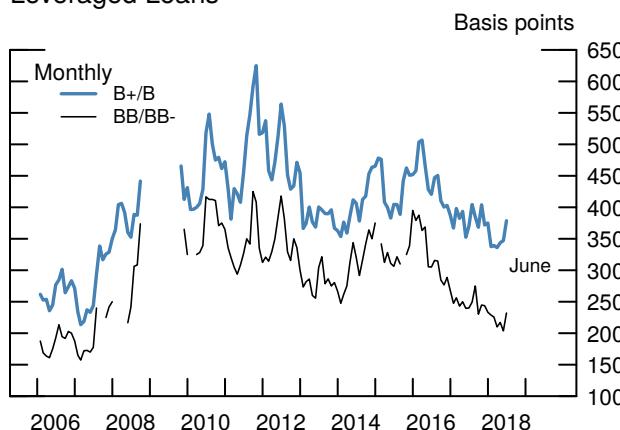
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.
Source: Mergent Fixed Income Securities Database.

Institutional Leveraged Loan Issuance, by Purpose

Billions of dollars

Monthly rate

■ Refinancings
■ New money

Q1 Q2

2012   2014   2016   2018
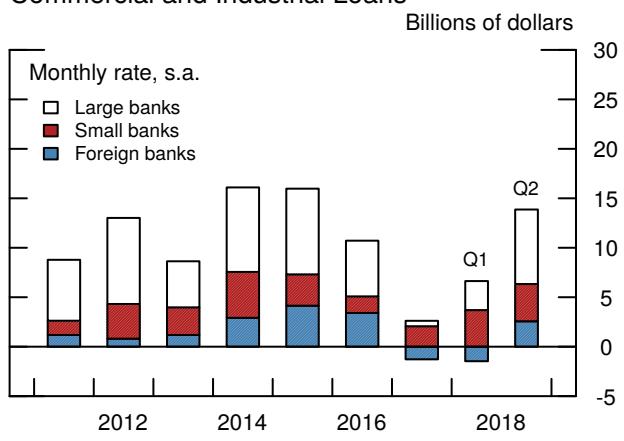
Source: Thomson Reuters LPC LoanConnector.

Average Spread of New-Issue Institutional Leveraged Loans

Basis points

Monthly

B+/B
BB/BB-

June

2006 2008 2010 2012 2014 2016 2018
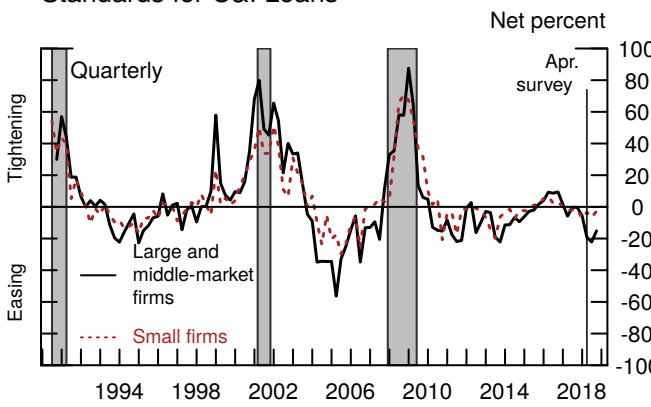
Note: Breaks in the series represent periods with no issuance. Spreads are calculated against 3-month LIBOR. The spreads do not include up-front fees.
Source: S&P LCD.

Commercial and Industrial Loans

Billions of dollars

Monthly rate, s.a.

☐ Large banks
■ Small banks
■ Foreign banks

Q1 Q2

2012   2014   2016   2018

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.

Standards for C&I Loans

Net percent

Quarterly

Apr. survey

Tightening

Easing

Large and middle-market firms

Small firms

1994 1998 2002 2006 2010 2014 2018
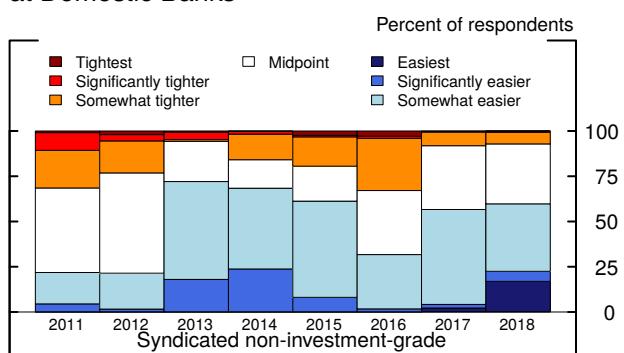
Note: C&I is commercial and industrial. The most recent data are from the July 2018 SLOOS. Banks' responses are weighted by the outstanding amount of C&I loans on their balance sheets at the end of the previous quarter. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS).

Level of Standards on C&I Loans at Domestic Banks

Percent of respondents

■ Tightest   ☐ Midpoint   ■ Easiest
■ Significantly tighter   ■ Significantly easier
■ Somewhat tighter   ■ Somewhat easier

2011 2012 2013 2014 2015 2016 2017 2018

Syndicated non-investment-grade

Note: C&I is commercial and industrial. Banks were asked to describe their current level of standards in relation to the midpoint of the range of standards at their bank between 2005 and the present. Responses are weighted by survey respondents' holdings of relevant loan types as reported on the Q1 Call Reports from 2011 to 2018 where relevant.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Financing Conditions

unlikely to have faced notable constraints or costs to accessing capital markets to fund investment before the TCJA. Any boost to investment due to tax reform may also take time to materialize.

How have the top 15 funded their increase in share buybacks? Given that most of the offshore funds are invested in U.S. fixed-income securities, one might expect some of these to have been sold to pay for the buybacks. The evidence supports this conclusion: Figure 3 plots the net purchase of securities (scaled by assets), and indeed the top 15 were net sellers in 2018:Q1, with their total securities holdings falling by about 3 percent of their total assets (or $66 billion).[6]

The sale of securities following repatriation may also have been used to pay down debt; however, the aggregate debt of the top 15 declined only about $15 billion, or 2 percent of their total debt outstanding, suggesting limited paydowns so far. Consequently, figure 4 shows that the debt-to-assets ratio of the top 15 was little changed in 2018:Q1 (remaining at 32 percent).[7]

Figure 1: Aggregate Ratio of Share Buybacks to Assets
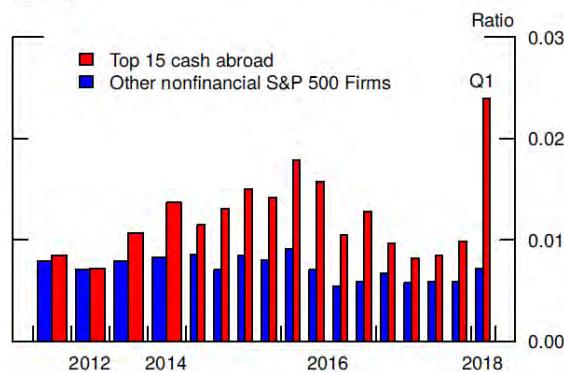
Figure 2: Aggregate Ratio of Cap-Ex Plus R&D to Assets

Note: R&D is research and development
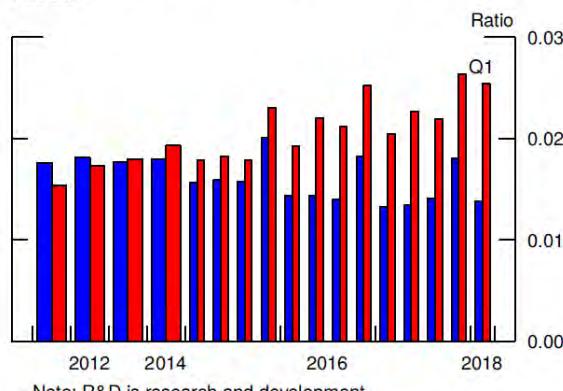
Figure 3: Aggregate Ratio of Net Purchase of Securities to Assets
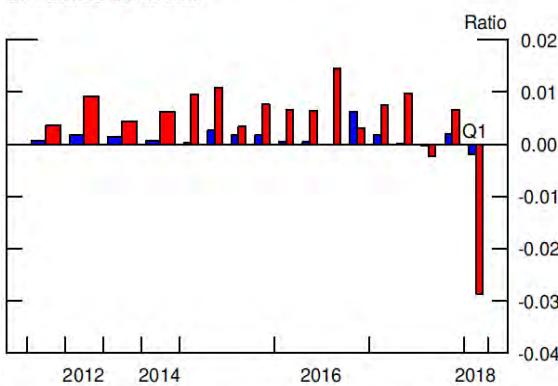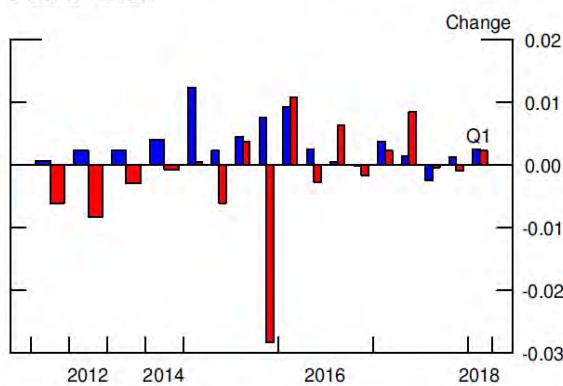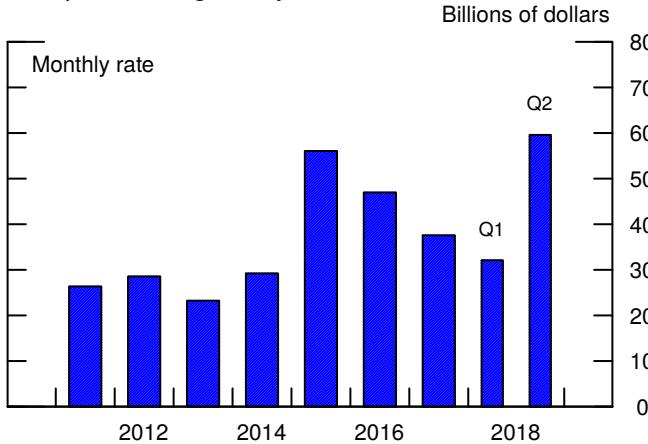
Figure 4: Quarterly Change in Aggregate Ratio of Debt to Assets
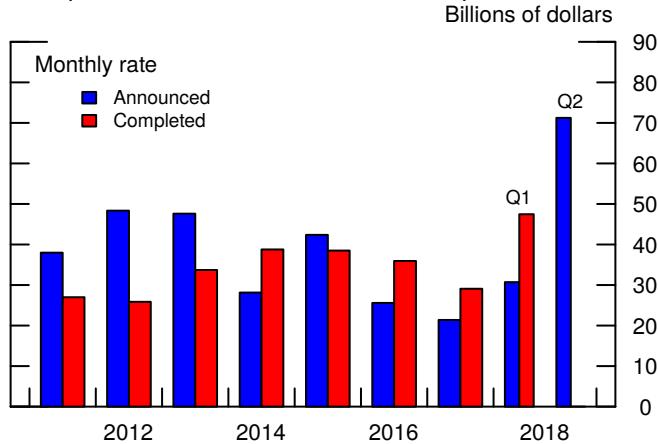
Note: For years before 2015, annual averages of quarterly values are shown.
Source: Compustat; Bloomberg.

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[6] Net purchase of securities is defined as the purchase of securities minus the proceeds from the sale and maturity of securities.

[7] The large drop in the debt-to-assets ratio in 2015:Q4 reflects GE's exit from GE Capital.

Financing Conditions

Business Finance (continued)

Completed Mergers, by Deal Value

Billions of dollars

Monthly rate

Q2

Q1

2012   2014   2016   2018
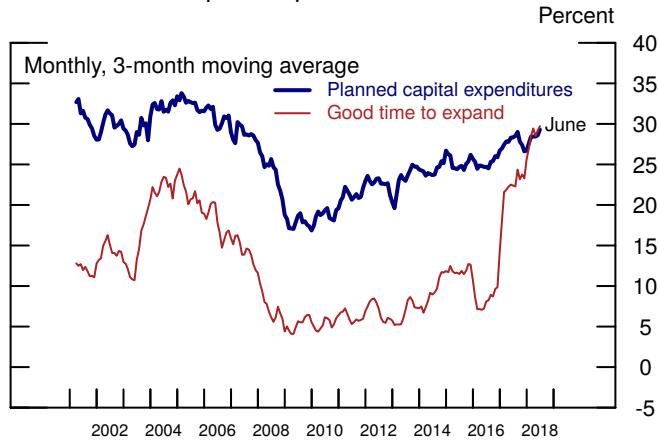
Source: Securities Data Company.

Completed and Announced Share Repurchases

Billions of dollars

Monthly rate

- ■ Announced
- ■ Completed

Q2

Q1

2012   2014   2016   2018
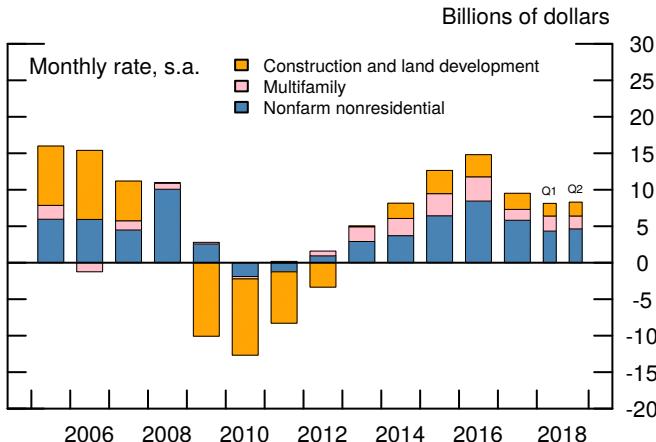
Source: Compustat; Securities Data Company.

NFIB Optimism Index

1986 = 100

Monthly, 3-month moving average

June

2004   2006   2008   2010   2012   2014   2016   2018

Note: Data are seasonally adjusted.
Source: National Federation of Independent Business (NFIB),
Small Business Economic Trends data.
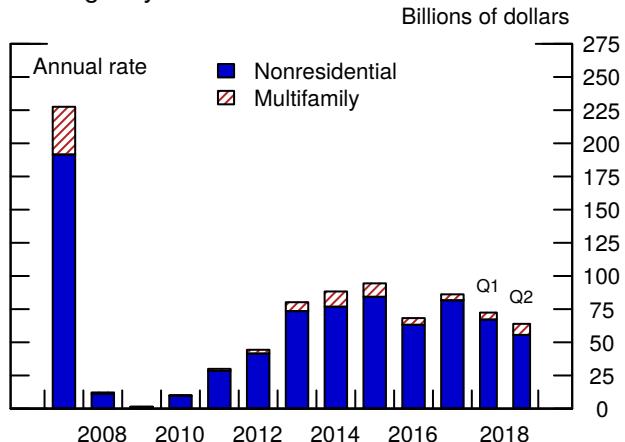
Other NFIB Indexes: Good Time to Expand and Planned Capital Expenditures

Percent

Monthly, 3-month moving average

— Planned capital expenditures
— Good time to expand

June

2002   2004   2006   2008   2010   2012   2014   2016   2018

Note: Data are seasonally adjusted.
Source: National Federation of Independent Business (NFIB),
Small Business Economic Trends data.

Commercial Real Estate Loans

Billions of dollars

Monthly rate, s.a.
- ■ Construction and land development
- ■ Multifamily
- ■ Nonfarm nonresidential

Q1   Q2

2006   2008   2010   2012   2014   2016   2018
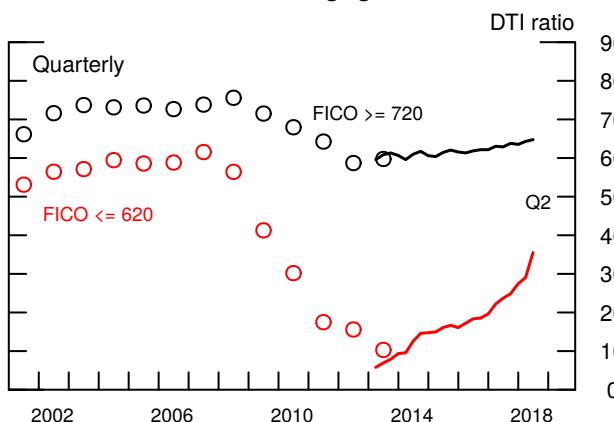
Note: Yearly rates are Q4 to Q4; quarterly annual rates use corresponding
average levels.
Source: Staff calculations, Federal Reserve Board, Form FR 2644, Weekly
Report of Selected Assets and Liabilities of Domestically Chartered
Commercial Banks and U.S. Branches and Agencies of Foreign Banks.
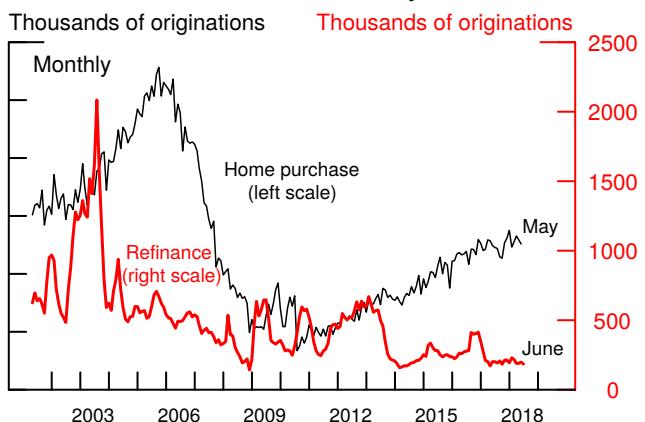
Non-agency CMBS Issuance

Billions of dollars

Annual rate
- ■ Nonresidential
- ▨ Multifamily

Q1   Q2

2008   2010   2012   2014   2016   2018

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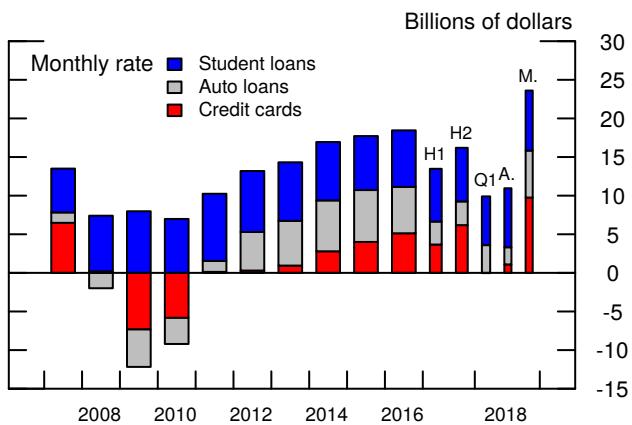
Financing Conditions

Maximum Allowed Debt-Service-to-Income Ratio for Residential Morgages
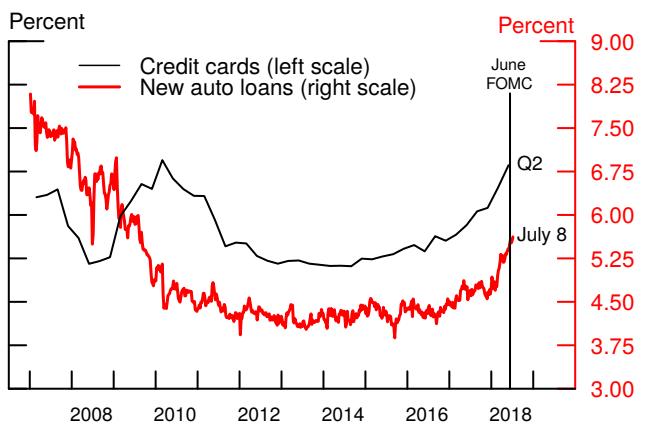
Note: DTI is debt service to income.
Source: For frontiers shown with circles, McDash and CoreLogic; for frontiers shown with solid lines, Optimal Blue.

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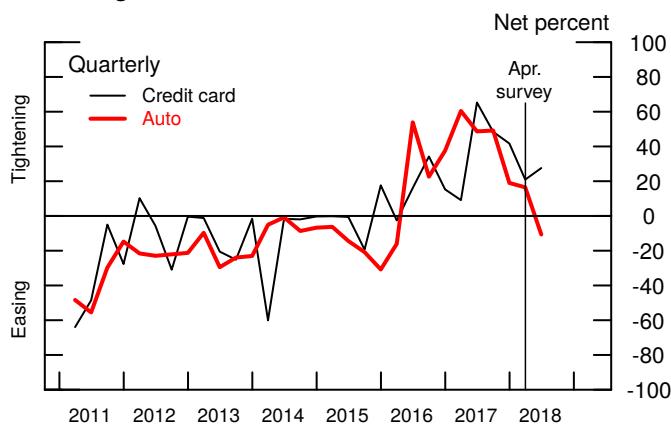
Note: The data are seasonally adjusted by Federal Reserve Board staff.
Source: For values before 2017, data reported under the Home Mortgage Disclosure Act of 1975; for values in and after 2017, staff estimates.

Consumer Credit Flows
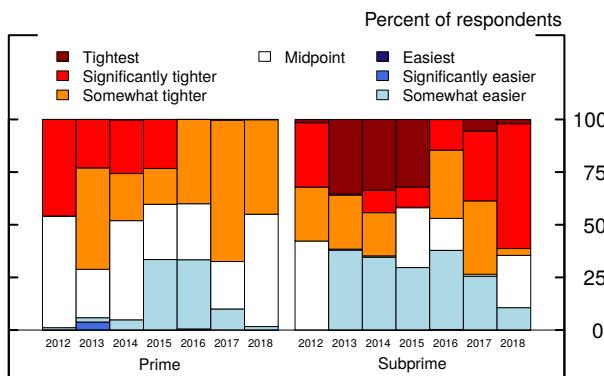
Note: The data are seasonally adjusted by Federal Reserve Board staff.
Source: Federal Reserve Board.

Consumer Interest Rates

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

Changes in Standards for Consumer Loans
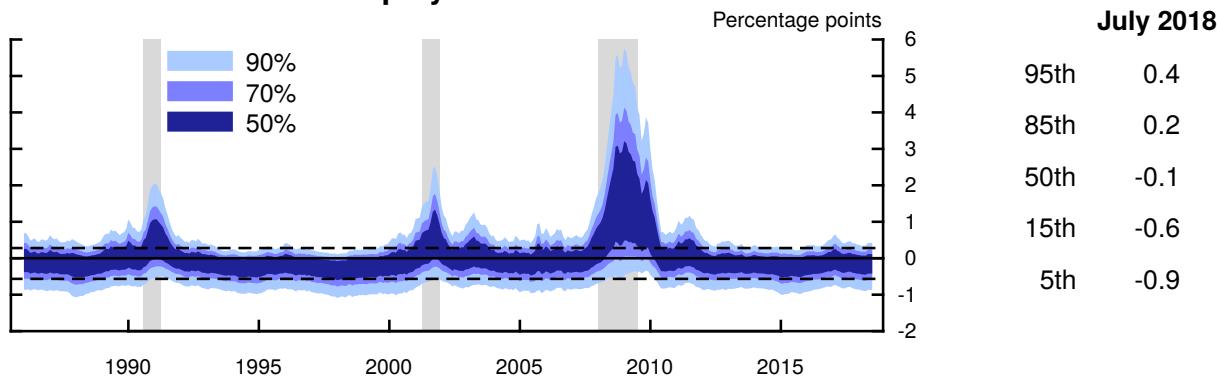
Note: The most recent data are from the July 2018 SLOOS. Banks' responses are weighted by the outstanding amount of the relevant loan category on their balance sheets at the end of the previous quarter.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS).

Level of Standards on Consumer Credit Card Loans at Domestic Banks
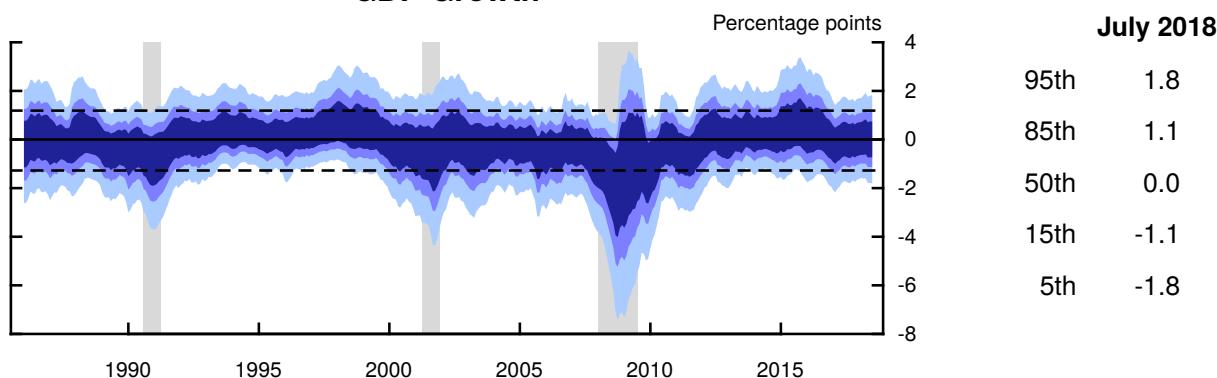
Note: Banks were asked to describe their current level of standards in relation to their midpoint range of standards between 2005 and the present. Responses are weighted by survey respondents' holdings of relevant loan types as reported on the Q1 Call Reports from 2012 to 2018 where relevant.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Financing Conditions

Risks & Uncertainty

Time-Varying Macroeconomic Risk

Unemployment Rate

Percentage points

	90%
	70%
	50%

July 2018

95th	0.4
85th	0.2
50th	-0.1
15th	-0.6
5th	-0.9

GDP Growth

Percentage points

July 2018

95th	1.8
85th	1.1
50th	0.0
15th	-1.1
5th	-1.8

CPI Inflation

Percentage points

July 2018

95th	1.9
85th	1.2
50th	0.1
15th	-0.8
5th	-1.4
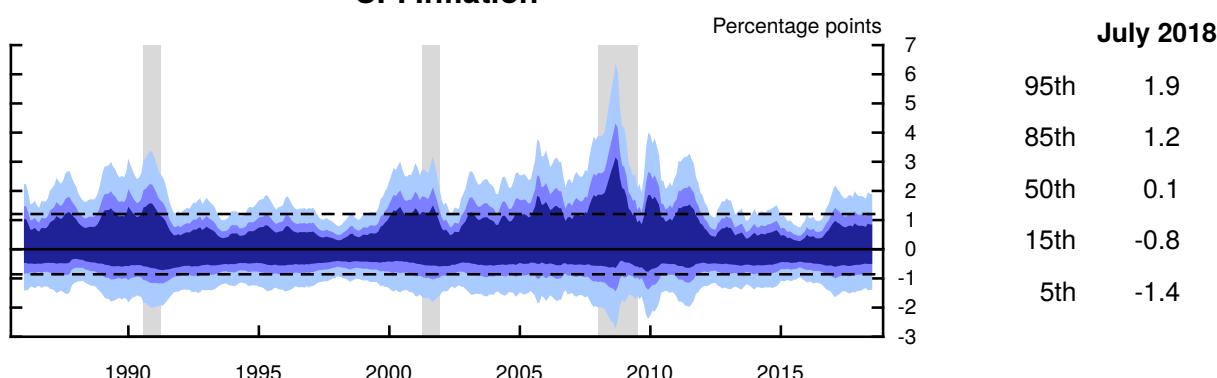
Note: The exhibit shows estimates of quantiles of the distribution of errors for four-quarter-ahead staff forecasts. The estimates are conditioned on indicators of real activity, inflation, financial market strain, and the volatility of high-frequency macroeconomic indicators. The tables show selected 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.
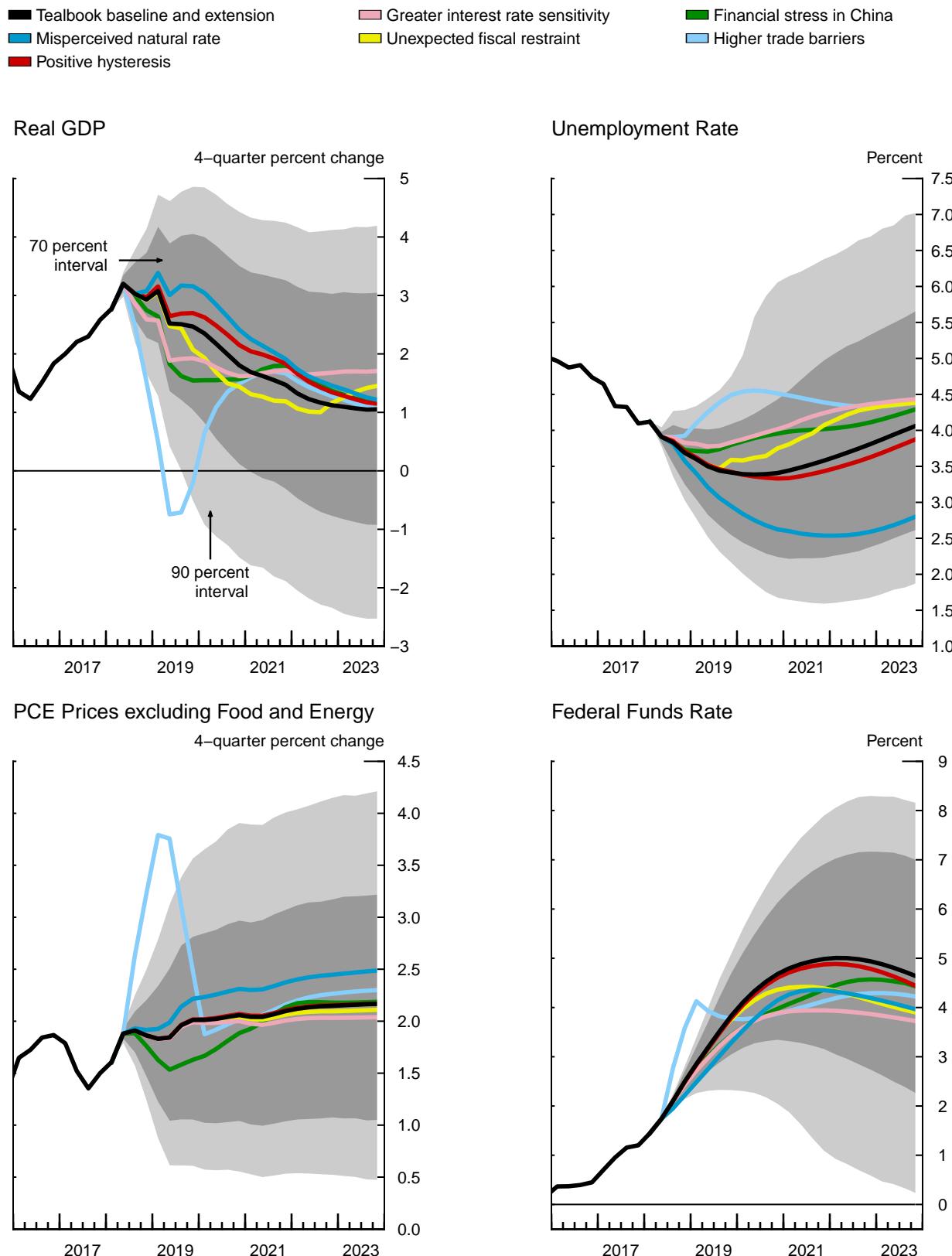
Alternative Scenarios

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

Measure and scenario	2018 H1	2018 H2	2019	2020	2021	2022-23
Real GDP						
Tealbook baseline and extension	3.4	2.5	2.5	1.8	1.5	1.1
Misperceived natural rate	3.4	2.8	3.2	2.4	1.9	1.3
Positive hysteresis	3.4	2.6	2.7	2.2	1.8	1.2
Greater interest rate sensitivity	3.4	1.8	1.9	1.6	1.7	1.7
Unexpected fiscal restraint	3.4	2.5	2.1	1.4	1.2	1.3
Financial stress in China	3.4	2.1	1.5	1.6	1.8	1.3
Higher trade barriers	3.4	-.3	-.2	1.5	1.7	1.2
Unemployment rate[1]						
Tealbook baseline and extension	3.9	3.7	3.4	3.4	3.6	4.1
Misperceived natural rate	3.9	3.6	2.9	2.6	2.5	2.8
Positive hysteresis	3.9	3.7	3.4	3.3	3.4	3.9
Greater interest rate sensitivity	3.9	3.8	3.8	4.0	4.2	4.4
Unexpected fiscal restraint	3.9	3.7	3.6	3.8	4.1	4.4
Financial stress in China	3.9	3.7	3.8	4.0	4.0	4.3
Higher trade barriers	3.9	3.9	4.5	4.5	4.4	4.4
Total PCE prices						
Tealbook baseline and extension	2.2	1.6	1.9	2.0	2.0	2.1
Misperceived natural rate	2.2	1.7	2.1	2.2	2.3	2.4
Positive hysteresis	2.2	1.6	1.9	2.0	2.0	2.1
Greater interest rate sensitivity	2.2	1.6	1.9	1.9	1.9	2.0
Unexpected fiscal restraint	2.2	1.6	1.9	2.0	2.0	2.1
Financial stress in China	2.2	1.2	1.4	1.8	2.2	2.2
Higher trade barriers	2.2	4.3	2.4	1.9	2.1	2.2
Core PCE prices						
Tealbook baseline and extension	2.1	1.6	2.0	2.1	2.1	2.2
Misperceived natural rate	2.1	1.7	2.2	2.3	2.4	2.5
Positive hysteresis	2.1	1.6	2.0	2.1	2.1	2.2
Greater interest rate sensitivity	2.1	1.6	2.0	2.0	2.0	2.0
Unexpected fiscal restraint	2.1	1.6	2.0	2.0	2.1	2.1
Financial stress in China	2.1	1.4	1.6	1.9	2.1	2.2
Higher trade barriers	2.1	4.3	2.5	2.0	2.2	2.3
Federal funds rate[1]						
Tealbook baseline and extension	1.7	2.5	3.8	4.7	5.0	4.6
Misperceived natural rate	1.7	2.2	3.3	4.1	4.4	4.0
Positive hysteresis	1.7	2.5	3.8	4.6	4.9	4.4
Greater interest rate sensitivity	1.7	2.4	3.4	3.9	3.9	3.7
Unexpected fiscal restraint	1.7	2.5	3.8	4.4	4.4	3.9
Financial stress in China	1.7	2.5	3.4	4.0	4.4	4.4
Higher trade barriers	1.7	3.6	3.8	3.9	4.1	4.2

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

Forecast Confidence Intervals and Alternative Scenarios

Confidence Intervals Based on FRB/US Stochastic Simulations

- ■ Tealbook baseline and extension
- ■ Misperceived natural rate
- ■ Positive hysteresis
- ■ Greater interest rate sensitivity
- ■ Unexpected fiscal restraint
- ■ Financial stress in China
- ■ Higher trade barriers

Risks & Uncertainty

Real GDP
4–quarter percent change

70 percent interval

90 percent interval

Unemployment Rate
Percent

PCE Prices excluding Food and Energy
4–quarter percent change

Federal Funds Rate
Percent

Selected Tealbook Projections and 70 Percent Confidence Intervals Derived from Historical Tealbook Forecast Errors and FRB/US Simulations
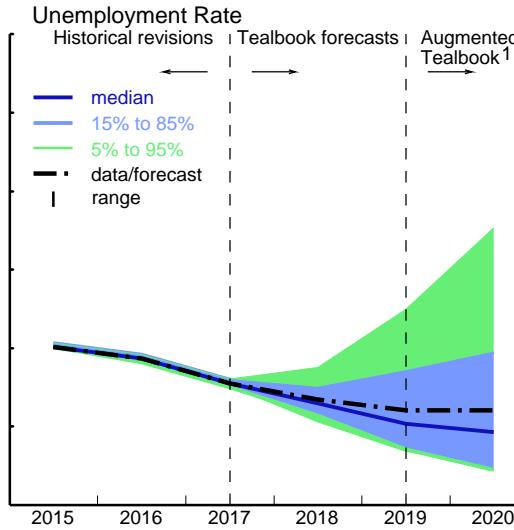
Measure	2018	2019	2020	2021	2022	2023
Real GDP						
(percent change, Q4 to Q4)						
Projection	2.9	2.5	1.8	1.5	1.1	1.1
Confidence interval						
Tealbook forecast errors	1.9–4.4	.7–4.0	-.4–3.5	. . .	. . .	. . .
FRB/US stochastic simulations	2.3–3.7	1.0–4.1	.1–3.5	-.3–3.3	-.8–3.0	-.9–3.0
Civilian unemployment rate						
(percent, Q4)						
Projection	3.7	3.4	3.4	3.6	3.8	4.1
Confidence interval						
Tealbook forecast errors	3.3–4.0	2.4–4.4	1.9–4.9	. . .	. . .	. . .
FRB/US stochastic simulations	3.2–4.0	2.5–4.1	2.2–4.4	2.2–5.0	2.4–5.3	2.6–5.7
PCE prices, total						
(percent change, Q4 to Q4)						
Projection	1.9	1.9	2.0	2.0	2.1	2.1
Confidence interval						
Tealbook forecast errors	1.3–2.3	.9–3.5	.7–3.5	. . .	. . .	. . .
FRB/US stochastic simulations	1.4–2.3	.9–2.8	.9–3.0	.9–3.1	.9–3.2	.9–3.3
PCE prices excluding						
food and energy						
(percent change, Q4 to Q4)						
Projection	1.9	2.0	2.1	2.1	2.1	2.2
Confidence interval						
Tealbook forecast errors	1.6–2.1	1.5–2.7	. . .	. . .	. . .	. . .
FRB/US stochastic simulations	1.5–2.2	1.1–2.8	1.0–3.0	1.0–3.1	1.1–3.2	1.1–3.2
Federal funds rate						
(percent, Q4)						
Projection	2.5	3.8	4.7	5.0	4.9	4.6
Confidence interval						
FRB/US stochastic simulations	2.3–2.7	3.0–4.7	3.3–6.1	3.2–6.9	2.7–7.2	2.2–7.0

Note: Shocks underlying FRB/US stochastic simulations are randomly drawn from the 1969–2018 set of model equation residuals. Intervals derived from Tealbook forecast errors are based on projections made from 1980 to 2018 for real GDP and unemployment and from 1998 to 2018 for PCE prices. The intervals for real GDP, unemployment, and total PCE prices are extended into 2020 using information from the Blue Chip survey and forecasts from the CBO and CEA.
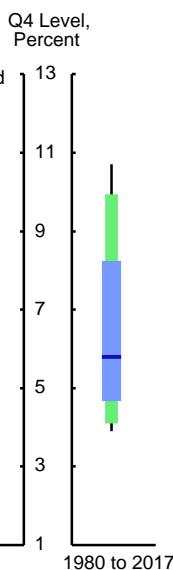
. . . Not applicable.

Prediction Intervals Derived from Historical Tealbook Forecast Errors
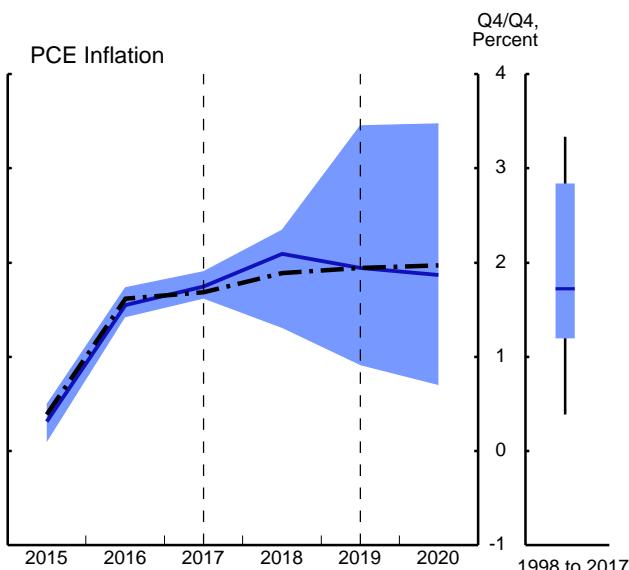
Forecast Error Percentiles

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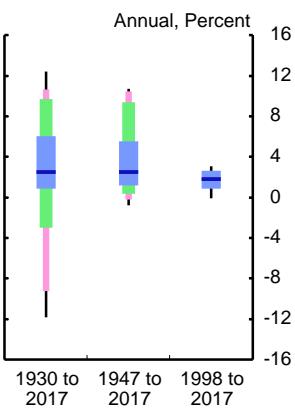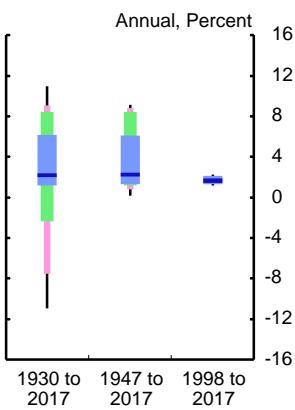
Note: See the technical note in the appendix for more information on this exhibit.

1. Augmented Tealbook prediction intervals use 1- and 2-year-ahead forecast errors from Blue Chip, CBO, and CEA to extend the Tealbook prediction intervals through 2020.

Assessment of Key Macroeconomic Risks

Probability of Inflation Events

(4 quarters ahead)

Probability that the 4-quarter change in total PCE prices will be . . .	Staff	FRB/US	EDO	BVAR
Greater than 3 percent				
Current Tealbook	.06	.08	.02	.09
Previous Tealbook	.07	.07	.02	.11
Less than 1 percent				
Current Tealbook	.16	.11	.12	.12
Previous Tealbook	.11	.11	.12	.11

Probability of Unemployment Events

(4 quarters ahead)

Probability that the unemployment rate will . . .	Staff	FRB/US	EDO	BVAR
Increase by 1 percentage point				
Current Tealbook	.01	.08	.15	.03
Previous Tealbook	.01	.02	.14	.02
Decrease by 1 percentage point				
Current Tealbook	.18	.01	.04	.10
Previous Tealbook	.13	.03	.04	.12

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	.02
Previous Tealbook	.01	.01	.04	.04	.00

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. Note that the current values for the FRB/US model have been calculated using a revised version of the model; entries marked "Previous Tealbook" are the published values from the July Tealbook. 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

Monetary Policy Strategies

Near−Term Prescriptions of Selected Simple Policy Rules[1,2]
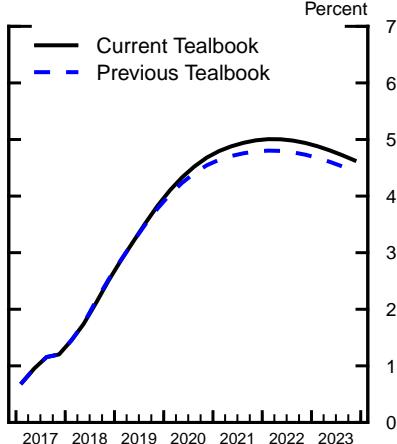
(Percent)
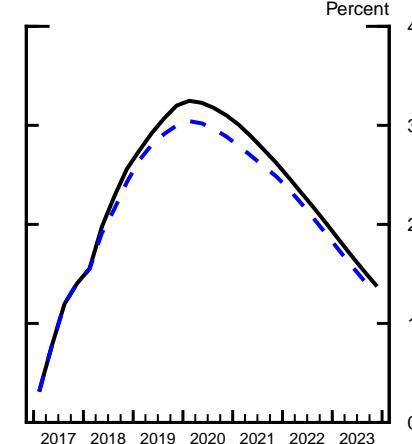
	2018:Q3	2018:Q4
Taylor (1999) rule	**4.62**	**4.83**
Previous Tealbook (adjusted)	*4.59*	*4.79*
Taylor (1993) rule	**3.48**	**3.55**
Previous Tealbook (adjusted)	*3.51*	*3.57*
First−difference rule	**2.12**	**2.49**
Previous Tealbook projection (adjusted)	*2.13*	*2.49*
Flexible price−level targeting rule	**1.59**	**1.47**
Previous Tealbook projection (adjusted)	*1.63*	*1.54*
Addendum:		
Tealbook baseline	**2.11**	**2.50**

Key Elements of the Staff Projection

Federal Funds Rate
— Current Tealbook
-- Previous Tealbook
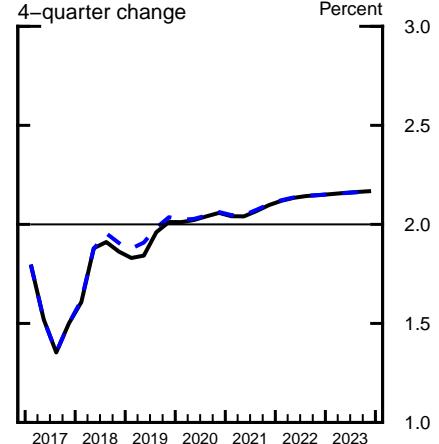
GDP Gap

PCE Prices ex. Food and Energy
4−quarter change

A Medium−Term Notion of the Equilibrium Real Federal Funds Rate[2,3]

(Percent)

	Current Value	*Current−Quarter Estimate Based on Previous Tealbook (adjusted)*	*Previous Tealbook (adjusted)*
Tealbook baseline			
FRB/US *r**	3.44	*3.26*	*3.07*
Average projected real federal funds rate	1.82	*1.74*	*1.50*
SEP−consistent baseline			
FRB/US *r**	1.80		
Average projected real federal funds rate	.88		
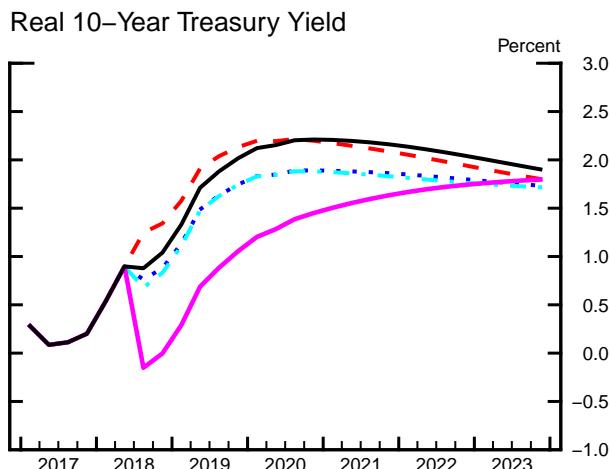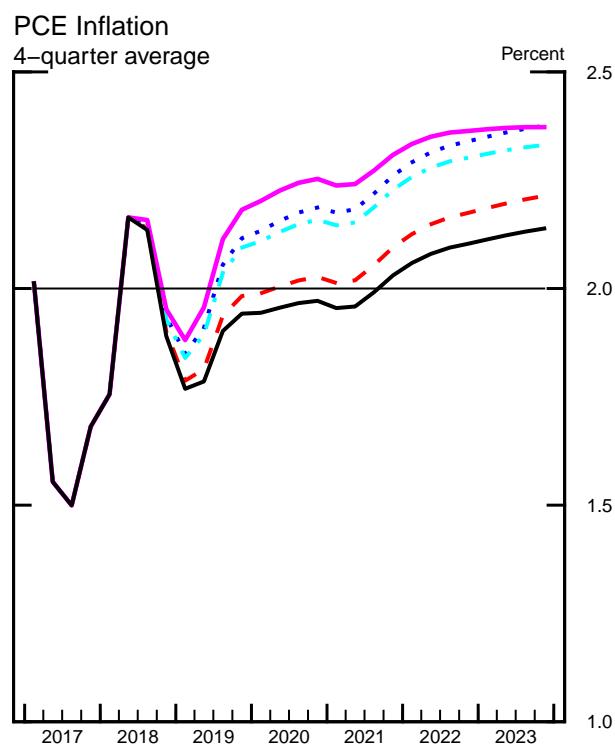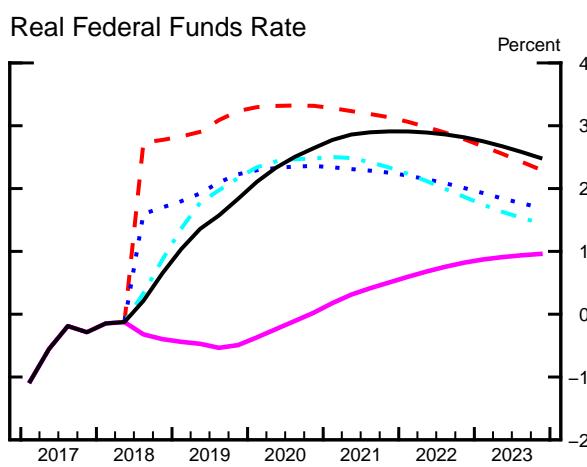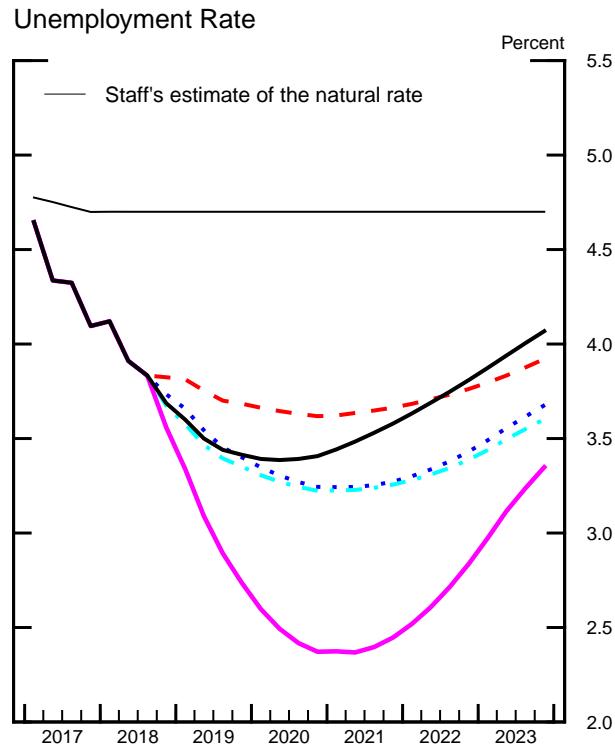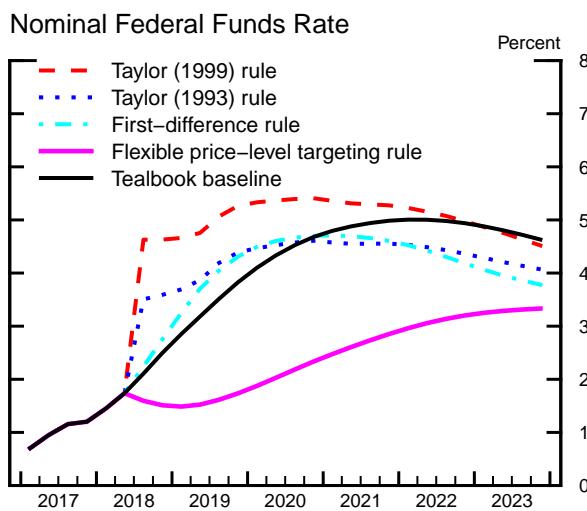
1. For rules that have a lagged policy rate as a right−hand−side variable, the lines denoted "Previous Tealbook projection" report prescriptions based on the previous Tealbook's staff outlook for inflation and the output gap, but conditional on the current−Tealbook value of the lagged policy rate.

2. Starting with this Tealbook, the equations for the Tealbook baseline policy rule and for all simple rules considered herein express policy rates on the same 360−day uncompounded basis as the published federal funds rate throughout the calculations. For comparability, all previous Tealbook prescriptions reported herein are adjusted to reflect the new methodology.

3. 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

Percent

- – – Taylor (1999) rule
- ···· Taylor (1993) rule
- –·– First–difference rule
- —— Flexible price–level targeting rule
- —— Tealbook baseline

Unemployment Rate

Percent

—— Staff's estimate of the natural rate

Real Federal Funds Rate

Percent

PCE Inflation
4–quarter average

Percent

Real 10–Year Treasury Yield

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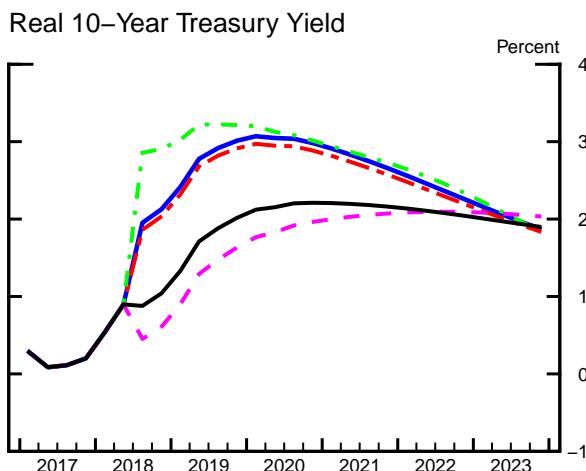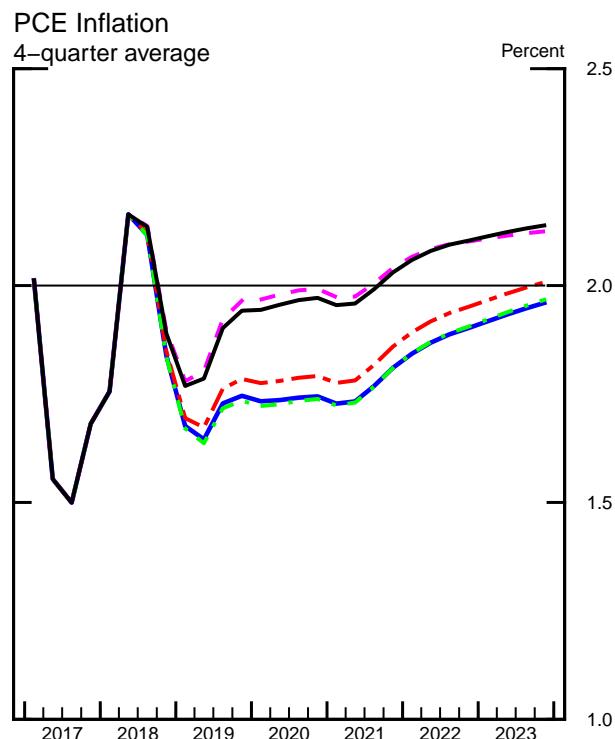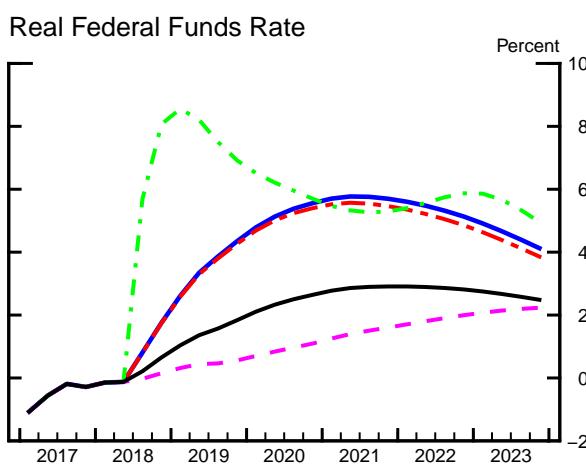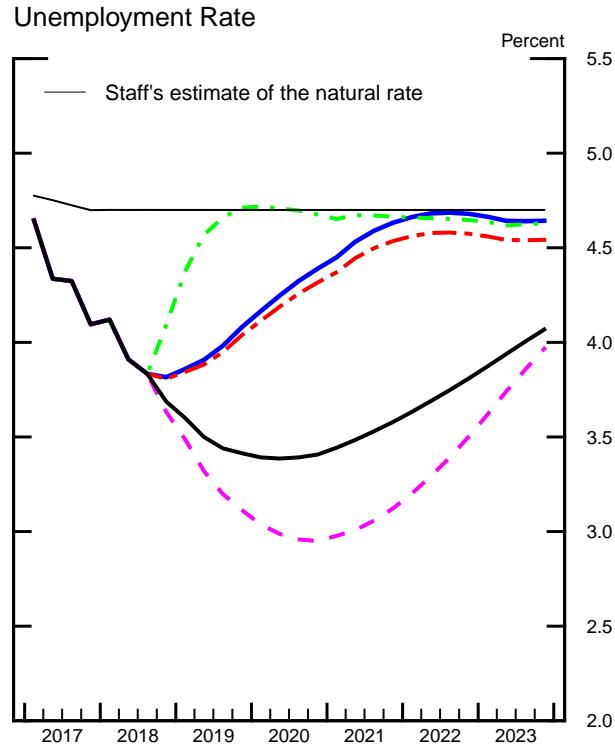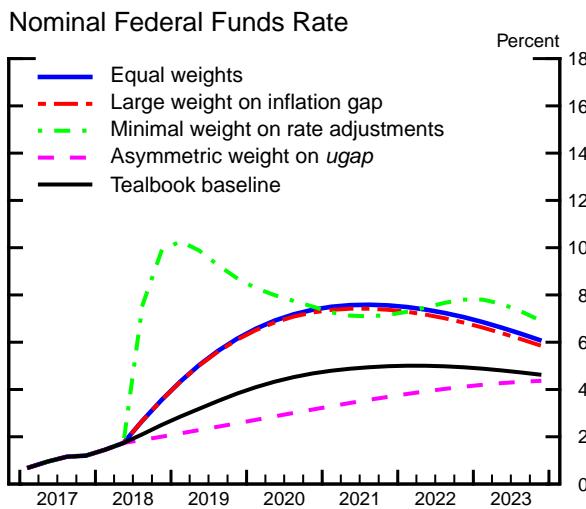
Note: The policy rule simulations in this exhibit are based on rules that respond to core inflation rather than to headline inflation. This choice of rule specification was made in light of a tendency for current and near–term core inflation rates to outperform headline inflation rates as predictors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

Monetary Policy Strategies

Optimal Control Simulations under Commitment

Monetary Policy Strategies

Nominal Federal Funds Rate

Percent

- Equal weights
- Large weight on inflation gap
- Minimal weight on rate adjustments
- Asymmetric weight on *ugap*
- Tealbook baseline

Unemployment Rate

Percent

Staff's estimate of the natural rate

Real Federal Funds Rate

Percent

PCE Inflation
4–quarter average

Percent

Real 10–Year Treasury Yield

Percent

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.

Outcomes of Simple Policy Rule Simulations

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

Outcome and strategy	2018	2019	2020	2021	2022	2023
Nominal federal funds rate[1]						
Taylor (1999)	4.6	5.3	5.4	5.3	5.0	4.5
Taylor (1993)	3.6	4.4	4.6	4.6	4.4	4.1
First-difference	2.8	4.3	4.7	4.6	4.2	3.8
Flexible price-level targeting	1.5	1.7	2.3	2.9	3.2	3.3
Extended Tealbook baseline	2.5	3.8	4.7	5.0	4.9	4.6
Real GDP						
Taylor (1999)	2.7	2.2	1.9	1.7	1.4	1.2
Taylor (1993)	2.9	2.6	2.1	1.7	1.2	1.1
First-difference	3.0	2.6	2.1	1.7	1.3	1.1
Flexible price-level targeting	3.2	3.7	2.5	1.6	.8	.7
Extended Tealbook baseline	2.9	2.5	1.8	1.5	1.1	1.1
Unemployment rate[1]						
Taylor (1999)	3.8	3.7	3.6	3.7	3.8	3.9
Taylor (1993)	3.7	3.4	3.2	3.3	3.4	3.7
First-difference	3.7	3.4	3.2	3.3	3.4	3.6
Flexible price-level targeting	3.6	2.7	2.4	2.4	2.8	3.3
Extended Tealbook baseline	3.7	3.4	3.4	3.6	3.8	4.1
Total PCE prices						
Taylor (1999)	1.9	2.0	2.0	2.1	2.2	2.2
Taylor (1993)	1.9	2.1	2.2	2.3	2.3	2.4
First-difference	1.9	2.1	2.2	2.2	2.3	2.3
Flexible price-level targeting	2.0	2.2	2.3	2.3	2.4	2.4
Extended Tealbook baseline	1.9	1.9	2.0	2.0	2.1	2.1
Core PCE prices						
Taylor (1999)	1.9	2.1	2.1	2.2	2.2	2.2
Taylor (1993)	1.9	2.2	2.3	2.3	2.4	2.4
First-difference	1.9	2.2	2.2	2.3	2.3	2.4
Flexible price-level targeting	1.9	2.3	2.3	2.4	2.4	2.4
Extended Tealbook baseline	1.9	2.0	2.1	2.1	2.1	2.2

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

Monetary Policy Strategies

Outcomes of Simple Policy Rule Simulations, Quarterly
(4-quarter percent change, except as noted)

Outcome and strategy	2018				2019			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Nominal federal funds rate[1]								
Taylor (1999)	1.4	1.7	4.6	4.6	4.7	4.8	5.1	5.3
Taylor (1993)	1.4	1.7	3.5	3.6	3.7	3.9	4.2	4.4
First-difference	1.4	1.7	2.2	2.8	3.2	3.7	4.0	4.3
Flexible price-level targeting	1.4	1.7	1.6	1.5	1.5	1.5	1.6	1.7
Extended Tealbook baseline	1.4	1.7	2.1	2.5	2.9	3.2	3.5	3.8
Real GDP								
Taylor (1999)	2.8	3.2	3.0	2.7	2.7	2.0	2.0	2.2
Taylor (1993)	2.8	3.2	3.0	2.9	3.0	2.5	2.5	2.6
First-difference	2.8	3.2	3.0	3.0	3.2	2.6	2.7	2.6
Flexible price-level targeting	2.8	3.2	3.0	3.2	3.7	3.5	3.7	3.7
Extended Tealbook baseline	2.8	3.2	3.0	2.9	3.1	2.5	2.5	2.5
Unemployment rate[1]								
Taylor (1999)	4.1	3.9	3.8	3.8	3.8	3.8	3.7	3.7
Taylor (1993)	4.1	3.9	3.8	3.7	3.7	3.5	3.5	3.4
First-difference	4.1	3.9	3.8	3.7	3.6	3.5	3.4	3.4
Flexible price-level targeting	4.1	3.9	3.8	3.6	3.3	3.1	2.9	2.7
Extended Tealbook baseline	4.1	3.9	3.8	3.7	3.6	3.5	3.4	3.4
Total PCE prices								
Taylor (1999)	1.8	2.2	2.1	1.9	1.8	1.8	1.9	2.0
Taylor (1993)	1.8	2.2	2.2	1.9	1.8	1.9	2.1	2.1
First-difference	1.8	2.2	2.1	1.9	1.8	1.9	2.0	2.1
Flexible price-level targeting	1.8	2.2	2.2	2.0	1.9	2.0	2.1	2.2
Extended Tealbook baseline	1.8	2.2	2.1	1.9	1.8	1.8	1.9	1.9
Core PCE prices								
Taylor (1999)	1.6	1.9	1.9	1.9	1.8	1.9	2.0	2.1
Taylor (1993)	1.6	1.9	1.9	1.9	1.9	2.0	2.1	2.2
First-difference	1.6	1.9	1.9	1.9	1.9	2.0	2.1	2.2
Flexible price-level targeting	1.6	1.9	1.9	1.9	1.9	2.0	2.2	2.3
Extended Tealbook baseline	1.6	1.9	1.9	1.9	1.8	1.8	2.0	2.0

1. Percent, average for the quarter.

Monetary Policy Strategies

Outcomes of Optimal Control Simulations under Commitment

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

Outcome and strategy	2018	2019	2020	2021	2022	2023
Nominal federal funds rate[1]						
Equal weights	3.6	6.1	7.4	7.6	7.1	6.1
Large weight on inflation gap	3.5	6.1	7.3	7.4	6.8	5.9
Minimal weight on rate adjustments	9.9	8.7	7.5	7.2	7.8	6.9
Asymmetric weight on *ugap*	2.0	2.6	3.2	3.7	4.1	4.4
Extended Tealbook baseline	2.5	3.8	4.7	5.0	4.9	4.6
Real GDP						
Equal weights	2.6	1.3	1.1	1.4	1.5	1.5
Large weight on inflation gap	2.7	1.4	1.2	1.5	1.5	1.5
Minimal weight on rate adjustments	2.2	.5	1.7	1.9	1.6	1.5
Asymmetric weight on *ugap*	3.1	3.0	2.1	1.4	.8	.7
Extended Tealbook baseline	2.9	2.5	1.8	1.5	1.1	1.1
Unemployment rate[1]						
Equal weights	3.8	4.1	4.4	4.6	4.7	4.6
Large weight on inflation gap	3.8	4.0	4.3	4.5	4.6	4.5
Minimal weight on rate adjustments	4.1	4.7	4.7	4.7	4.6	4.6
Asymmetric weight on *ugap*	3.6	3.1	3.0	3.1	3.5	4.0
Extended Tealbook baseline	3.7	3.4	3.4	3.6	3.8	4.1
Total PCE prices						
Equal weights	1.8	1.7	1.7	1.8	1.9	2.0
Large weight on inflation gap	1.8	1.8	1.8	1.9	2.0	2.0
Minimal weight on rate adjustments	1.8	1.7	1.7	1.8	1.9	2.0
Asymmetric weight on *ugap*	1.9	2.0	2.0	2.0	2.1	2.1
Extended Tealbook baseline	1.9	1.9	2.0	2.0	2.1	2.1
Core PCE prices						
Equal weights	1.8	1.8	1.8	1.9	1.9	2.0
Large weight on inflation gap	1.8	1.9	1.9	1.9	2.0	2.0
Minimal weight on rate adjustments	1.8	1.8	1.8	1.9	2.0	2.0
Asymmetric weight on *ugap*	1.9	2.0	2.1	2.1	2.1	2.2
Extended Tealbook baseline	1.9	2.0	2.1	2.1	2.1	2.2

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

Monetary Policy Strategies

Outcomes of Optimal Control Simulations under Commitment, Quarterly
(4-quarter percent change, except as noted)

Outcome and strategy	2018				2019			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Nominal federal funds rate[1]								
Equal weights	1.4	1.7	2.7	3.6	4.3	5.0	5.6	6.1
Large weight on inflation gap	1.4	1.7	2.7	3.5	4.3	5.0	5.6	6.1
Minimal weight on rate adjustments	1.4	1.7	7.6	9.9	10.3	9.9	9.3	8.7
Asymmetric weight on *ugap*	1.4	1.7	1.9	2.0	2.1	2.3	2.4	2.6
Extended Tealbook baseline	1.4	1.7	2.1	2.5	2.9	3.2	3.5	3.8
Real GDP								
Equal weights	2.8	3.2	3.0	2.6	2.5	1.6	1.3	1.3
Large weight on inflation gap	2.8	3.2	3.0	2.7	2.5	1.7	1.4	1.4
Minimal weight on rate adjustments	2.8	3.2	3.0	2.2	1.7	.4	.0	.5
Asymmetric weight on *ugap*	2.8	3.2	3.0	3.1	3.3	2.9	3.0	3.0
Extended Tealbook baseline	2.8	3.2	3.0	2.9	3.1	2.5	2.5	2.5
Unemployment rate[1]								
Equal weights	4.1	3.9	3.8	3.8	3.9	3.9	4.0	4.1
Large weight on inflation gap	4.1	3.9	3.8	3.8	3.8	3.9	3.9	4.0
Minimal weight on rate adjustments	4.1	3.9	3.8	4.1	4.4	4.6	4.7	4.7
Asymmetric weight on *ugap*	4.1	3.9	3.8	3.6	3.5	3.3	3.2	3.1
Extended Tealbook baseline	4.1	3.9	3.8	3.7	3.6	3.5	3.4	3.4
Total PCE prices								
Equal weights	1.8	2.2	2.1	1.8	1.7	1.6	1.7	1.7
Large weight on inflation gap	1.8	2.2	2.1	1.8	1.7	1.7	1.8	1.8
Minimal weight on rate adjustments	1.8	2.2	2.1	1.8	1.7	1.6	1.7	1.7
Asymmetric weight on *ugap*	1.8	2.2	2.1	1.9	1.8	1.8	1.9	2.0
Extended Tealbook baseline	1.8	2.2	2.1	1.9	1.8	1.8	1.9	1.9
Core PCE prices								
Equal weights	1.6	1.9	1.9	1.8	1.7	1.7	1.8	1.8
Large weight on inflation gap	1.6	1.9	1.9	1.8	1.8	1.7	1.8	1.9
Minimal weight on rate adjustments	1.6	1.9	1.9	1.8	1.7	1.7	1.8	1.8
Asymmetric weight on *ugap*	1.6	1.9	1.9	1.9	1.8	1.9	2.0	2.0
Extended Tealbook baseline	1.6	1.9	1.9	1.9	1.8	1.8	2.0	2.0

1. Percent, average for the quarter.

Monetary Policy Strategies

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

Interval	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate[1]	
	06/01/18	07/19/18	06/01/18	07/19/18	06/01/18	07/19/18	06/01/18	07/19/18	06/01/18	07/19/18
Quarterly										
2017:Q1	3.3	3.3	1.2	1.2	2.2	2.2	1.8	1.8	4.6	4.6
Q2	4.1	4.1	3.1	3.1	.3	.3	.9	.9	4.3	4.3
Q3	5.3	5.3	3.2	3.2	1.5	1.5	1.3	1.3	4.3	4.3
Q4	5.3	5.3	2.9	2.9	2.7	2.7	1.9	1.9	4.1	4.1
2018:Q1	4.2	4.2	2.2	2.0	2.6	2.5	2.3	2.3	4.1	4.1
Q2	5.8	7.4	3.4	4.8	2.0	1.9	2.0	2.0	3.8	3.9
Q3	4.8	4.2	2.7	2.5	2.0	1.4	1.6	1.5	3.7	3.8
Q4	4.7	4.5	2.8	2.5	1.7	1.7	1.7	1.7	3.6	3.7
2019:Q1	4.7	4.7	2.7	2.6	2.0	2.0	2.2	2.1	3.5	3.6
Q2	4.9	4.9	2.5	2.5	1.9	2.0	2.1	2.0	3.4	3.5
Q3	4.3	4.5	2.3	2.4	1.8	1.9	1.9	1.9	3.4	3.4
Q4	4.1	4.3	2.3	2.3	1.8	1.9	2.0	1.9	3.4	3.4
Two-quarter[2]										
2017:Q2	3.7	3.7	2.1	2.1	1.2	1.2	1.4	1.4	-.4	-.4
Q4	5.3	5.3	3.0	3.0	2.1	2.1	1.6	1.6	-.2	-.2
2018:Q2	5.0	5.8	2.8	3.4	2.3	2.2	2.1	2.1	-.3	-.2
Q4	4.7	4.3	2.7	2.5	1.8	1.6	1.7	1.6	-.2	-.2
2019:Q2	4.8	4.8	2.6	2.6	2.0	2.0	2.1	2.1	-.2	-.2
Q4	4.2	4.4	2.3	2.4	1.8	1.9	1.9	1.9	.0	-.1
Four-quarter[3]										
2016:Q4	3.4	3.4	1.8	1.8	1.6	1.6	1.9	1.9	-.3	-.3
2017:Q4	4.5	4.5	2.6	2.6	1.7	1.7	1.5	1.5	-.6	-.6
2018:Q4	4.9	5.1	2.8	2.9	2.1	1.9	1.9	1.9	-.5	-.4
2019:Q4	4.5	4.6	2.4	2.5	1.9	1.9	2.0	2.0	-.2	-.3
2020:Q4	3.9	3.9	1.8	1.8	2.0	2.0	2.1	2.1	.0	.0
Annual										
2016	2.8	2.8	1.5	1.5	1.2	1.2	1.8	1.8	4.9	4.9
2017	4.1	4.1	2.3	2.3	1.7	1.7	1.5	1.5	4.4	4.4
2018	4.9	5.2	2.8	3.0	2.1	2.0	1.8	1.8	3.8	3.9
2019	4.7	4.7	2.6	2.6	1.9	1.8	2.0	1.9	3.4	3.5
2020	4.1	4.2	2.0	2.1	1.9	2.0	2.0	2.0	3.4	3.4

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.

Greensheets

Greensheets

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

Item	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2017[1]	2018[1]	2019[1]	2020[1]
Real GDP	3.1	3.2	2.9	2.0	4.8	2.5	2.5	2.6	2.5	2.4	2.3	2.6	2.9	2.5	1.8
Previous Tealbook	3.1	3.2	2.9	2.2	3.4	2.7	2.8	2.7	2.5	2.3	2.3	2.6	2.8	2.4	1.8
Final sales	3.0	2.4	3.4	2.0	4.8	2.2	2.5	2.9	2.5	2.2	2.2	2.9	2.9	2.5	1.8
Previous Tealbook	3.0	2.4	3.4	2.1	3.1	2.9	2.8	2.8	2.5	2.3	2.2	2.9	2.7	2.5	1.8
Priv. dom. final purch.	3.3	2.2	4.8	2.1	3.5	3.1	2.9	3.1	2.9	2.7	2.5	3.3	2.9	2.8	2.1
Previous Tealbook	3.3	2.2	4.8	2.1	3.2	3.0	2.8	2.8	2.8	2.6	2.4	3.3	2.8	2.7	2.1
Personal cons. expend.	3.3	2.2	4.0	.9	3.4	2.7	2.6	2.7	2.7	2.7	2.6	2.8	2.4	2.6	2.3
Previous Tealbook	3.3	2.2	4.0	1.0	2.9	2.4	2.3	2.6	2.6	2.5	2.5	2.8	2.2	2.6	2.3
Durables	7.6	8.6	13.7	-2.1	7.7	5.6	4.1	2.2	2.2	2.2	2.0	7.3	3.8	2.1	1.7
Nondurables	4.2	2.3	4.8	.5	4.4	2.5	3.1	2.8	2.8	2.8	2.7	3.1	2.6	2.7	2.4
Services	2.3	1.1	2.3	1.5	2.4	2.2	2.3	2.7	2.7	2.7	2.6	2.1	2.1	2.7	2.4
Residential investment	-7.3	-4.7	12.8	-1.1	-1.4	-2.1	-.4	3.9	3.7	.8	.8	2.6	-1.2	2.3	.9
Previous Tealbook	-7.3	-4.7	12.8	-1.7	-.9	-.7	1.2	-.8	1.4	.9	.8	2.6	-.5	.6	1.5
Nonres. priv. fixed invest.	6.7	4.7	6.8	10.4	6.0	7.3	5.4	4.9	4.2	3.4	2.5	6.3	7.2	3.8	1.6
Previous Tealbook	6.7	4.7	6.8	9.2	6.1	7.8	5.6	5.1	4.3	3.4	2.3	6.3	7.1	3.7	1.3
Equipment & intangibles	6.6	8.4	7.0	8.8	4.6	6.4	6.1	5.6	4.7	3.7	2.6	6.7	6.4	4.2	2.0
Previous Tealbook	6.6	8.4	7.0	7.7	5.1	7.1	5.9	5.8	4.7	3.7	2.5	6.7	6.5	4.2	1.6
Nonres. structures	7.0	-7.0	6.3	16.2	10.8	10.4	2.8	2.8	2.5	2.3	2.2	5.0	10.0	2.4	.4
Previous Tealbook	7.0	-7.0	6.3	14.2	9.6	10.0	4.3	2.8	3.1	2.2	1.6	5.0	9.5	2.4	.4
Net exports[2]	-614	-598	-654	-657	-605	-627	-641	-641	-661	-687	-705	-622	-633	-673	-750
Previous Tealbook[2]	-614	-598	-654	-651	-643	-646	-642	-640	-652	-669	-682	-622	-646	-661	-720
Exports	3.5	2.1	7.0	3.6	11.4	2.5	1.4	4.1	3.6	3.7	3.0	5.0	4.7	3.6	2.6
Imports	1.5	-.7	14.1	3.2	1.3	5.2	3.1	3.2	5.6	6.4	4.7	4.7	3.2	4.9	4.3
Gov't. cons. & invest.	-.2	.7	3.0	1.3	3.2	.1	1.7	1.6	2.3	2.2	2.4	.7	1.6	2.1	1.8
Previous Tealbook	-.2	.7	3.0	1.1	1.0	1.9	1.7	1.6	2.3	2.2	2.4	.7	1.4	2.1	1.8
Federal	1.9	1.3	3.2	1.7	5.6	-1.0	3.3	2.6	4.4	4.3	4.6	1.0	2.4	4.0	3.0
Defense	4.7	2.4	5.5	1.8	9.7	-3.3	4.1	3.0	5.5	5.0	5.3	2.3	3.0	4.7	3.2
Nondefense	-1.9	-.2	-.1	1.6	-.3	2.5	2.1	2.0	2.8	3.3	3.6	-.9	1.5	2.9	2.7
State & local	-1.5	.2	2.9	1.0	1.8	.8	.8	1.0	1.0	1.0	1.0	.5	1.1	1.0	1.0
Change in priv. inventories[2]	5	39	16	14	13	24	24	8	9	20	27	15	19	16	33
Previous Tealbook[2]	5	39	16	20	33	25	25	23	19	19	20	15	26	20	20

1. Change from fourth quarter of previous year to fourth quarter of year indicated.
2. Billions of chained (2009) dollars.

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	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Real GDP	1.7	1.3	2.7	2.7	2.0	1.8	2.6	2.9	2.5	1.8
Previous Tealbook	1.7	1.3	2.7	2.7	2.0	1.8	2.6	2.8	2.4	1.8
Final sales	1.5	1.7	2.0	2.9	2.0	1.9	2.9	2.9	2.5	1.8
Previous Tealbook	1.5	1.7	2.0	2.9	2.0	1.9	2.9	2.7	2.5	1.8
Priv. dom. final purch.	2.6	2.3	2.6	4.1	2.9	2.5	3.3	2.9	2.8	2.1
Previous Tealbook	2.6	2.3	2.6	4.1	2.9	2.5	3.3	2.8	2.7	2.1
Personal cons. expend.	1.5	1.3	2.0	3.6	3.0	2.8	2.8	2.4	2.6	2.3
Previous Tealbook	1.5	1.3	2.0	3.6	3.0	2.8	2.8	2.2	2.6	2.3
Durables	4.8	7.2	5.2	8.7	6.4	7.0	7.3	3.8	2.1	1.7
Nondurables	.4	.8	2.6	2.8	2.8	2.5	3.1	2.6	2.7	2.4
Services	1.4	.6	1.3	3.0	2.6	2.3	2.1	2.1	2.7	2.4
Residential investment	6.0	15.7	6.8	6.3	10.3	2.5	2.6	-1.2	2.3	.9
Previous Tealbook	6.0	15.7	6.8	6.3	10.3	2.5	2.6	-.5	.6	1.5
Nonres. priv. fixed invest.	9.0	5.2	4.8	6.1	.3	.7	6.3	7.2	3.8	1.6
Previous Tealbook	9.0	5.2	4.8	6.1	.3	.7	6.3	7.1	3.7	1.3
Equipment & intangibles	9.2	5.5	4.5	5.3	3.3	-.1	6.7	6.4	4.2	2.0
Previous Tealbook	9.2	5.5	4.5	5.3	3.3	-.1	6.7	6.5	4.2	1.6
Nonres. structures	8.0	4.1	5.8	8.8	-9.1	3.5	5.0	10.0	2.4	.4
Previous Tealbook	8.0	4.1	5.8	8.8	-9.1	3.5	5.0	9.5	2.4	.4
Net exports[1]	-459	-447	-405	-428	-545	-586	-622	-633	-673	-750
Previous Tealbook[1]	-459	-447	-405	-428	-545	-586	-622	-646	-661	-720
Exports	4.2	2.2	5.9	3.0	-1.8	.6	5.0	4.7	3.6	2.6
Imports	3.5	.3	2.5	6.2	2.9	2.7	4.7	3.2	4.9	4.3
Gov't. cons. & invest.	-3.0	-2.2	-2.8	.5	1.6	.4	.7	1.6	2.1	1.8
Previous Tealbook	-3.0	-2.2	-2.8	.5	1.6	.4	.7	1.4	2.1	1.8
Federal	-4.0	-2.1	-6.7	-1.2	1.2	-.3	1.0	2.4	4.0	3.0
Defense	-4.1	-3.9	-7.1	-4.0	.0	-1.4	2.3	3.0	4.7	3.2
Nondefense	-3.9	1.0	-6.0	3.5	2.9	1.2	-.9	1.5	2.9	2.7
State & local	-2.3	-2.3	-.1	1.5	1.9	.8	.5	1.1	1.0	1.0
Change in priv. inventories[1]	38	55	79	68	101	33	15	19	16	33
Previous Tealbook[1]	38	55	79	68	101	33	15	26	20	20

1. Billions of chained (2009) dollars.

Greensheets

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

Item	2017 Q2	Q3	Q4	2018 Q1	Q2	Q3	Q4	2019 Q1	Q2	Q3	Q4	2017[1]	2018[1]	2019[1]	2020[1]
Real GDP	3.1	3.2	2.9	2.0	4.8	2.5	2.5	2.6	2.5	2.4	2.3	2.6	2.9	2.5	1.8
Previous Tealbook	3.1	3.2	2.9	2.2	3.4	2.7	2.8	2.7	2.5	2.3	2.3	2.6	2.8	2.4	1.8
Final sales	2.9	2.4	3.4	2.0	4.8	2.2	2.5	2.9	2.5	2.2	2.2	2.9	2.9	2.5	1.8
Previous Tealbook	2.9	2.4	3.4	2.1	3.1	2.9	2.8	2.8	2.5	2.3	2.2	2.9	2.7	2.4	1.8
Priv. dom. final purch.	2.8	1.9	4.1	1.8	3.1	2.7	2.5	2.6	2.5	2.3	2.1	2.8	2.5	2.4	1.8
Previous Tealbook	2.8	1.9	4.1	1.8	2.8	2.6	2.4	2.4	2.4	2.2	2.1	2.8	2.4	2.3	1.8
Personal cons. expend.	2.2	1.5	2.8	.6	2.4	1.8	1.8	1.8	1.8	1.8	1.8	2.0	1.6	1.8	1.6
Previous Tealbook	2.2	1.5	2.8	.7	2.0	1.6	1.6	1.8	1.8	1.7	1.7	2.0	1.5	1.8	1.6
Durables	.6	.6	1.0	-.2	.6	.4	.3	.2	.2	.2	.1	.5	.3	.2	.1
Nondurables	.6	.3	.7	.1	.6	.4	.4	.4	.4	.4	.4	.5	.4	.4	.3
Services	1.1	.5	1.1	.7	1.1	1.0	1.1	1.3	1.3	1.3	1.2	1.0	1.0	1.3	1.1
Residential investment	-.3	-.2	.5	.0	-.1	-.1	.0	.1	.1	.0	.0	.1	.0	.1	.0
Previous Tealbook	-.3	-.2	.5	-.1	.0	.0	.0	.0	.1	.0	.0	.1	.0	.0	.1
Nonres. priv. fixed invest.	.8	.6	.8	1.3	.8	.9	.7	.6	.5	.4	.3	.8	.9	.5	.2
Previous Tealbook	.8	.6	.8	1.1	.8	1.0	.7	.7	.6	.4	.3	.8	.9	.5	.2
Equipment & intangibles	.6	.8	.7	.8	.5	.6	.6	.6	.5	.4	.3	.6	.6	.4	.2
Previous Tealbook	.6	.8	.7	.7	.5	.7	.6	.6	.5	.4	.2	.6	.6	.4	.2
Nonres. structures	.2	-.2	.2	.4	.3	.3	.1	.1	.1	.1	.1	.1	.3	.1	.0
Previous Tealbook	.2	-.2	.2	.4	.3	.3	.1	.1	.1	.1	.1	.1	.3	.1	.0
Net exports	.2	.4	-1.2	.0	1.2	-.5	-.3	.0	-.4	-.5	-.3	-.1	.1	-.3	-.3
Previous Tealbook	.2	.4	-1.2	.1	.2	-.1	.1	.1	-.2	-.3	-.2	-.1	.1	-.2	-.3
Exports	.4	.3	.8	.4	1.4	.3	.2	.5	.4	.5	.4	.6	.6	.4	.3
Imports	-.2	.1	-2.0	-.5	-.2	-.8	-.5	-.5	-.8	-.9	-.7	-.7	-.5	-.7	-.7
Gov't. cons. & invest.	.0	.1	.5	.2	.6	.0	.3	.3	.4	.4	.4	.1	.3	.4	.3
Previous Tealbook	.0	.1	.5	.2	.2	.3	.3	.3	.4	.4	.4	.1	.2	.4	.3
Federal	.1	.1	.2	.1	.4	-.1	.2	.2	.3	.3	.3	.1	.2	.3	.2
Defense	.2	.1	.2	.1	.4	-.1	.2	.1	.2	.2	.2	.1	.1	.2	.1
Nondefense	-.1	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.0	.0	.1	.1
State & local	-.2	.0	.3	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
Change in priv. inventories	.1	.8	-.5	.0	.0	.2	.0	-.3	.0	.2	.2	-.3	.1	.0	.0
Previous Tealbook	.1	.8	-.5	.1	.3	-.2	.0	-.1	-.1	.0	.0	-.3	.1	.0	.0

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

Class II FOMC – Restricted (FR)   July 20, 2018 (Corrected)

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

Item	2017			2018				2019				2017[1]	2018[1]	2019[1]	2020[1]
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
GDP chain-wt. price index	1.0	2.1	2.3	2.2	2.5	1.7	1.9	2.0	2.3	2.1	1.9	1.9	2.1	2.1	2.1
Previous Tealbook	1.0	2.1	2.3	1.9	2.3	2.1	1.8	1.9	2.4	2.0	1.8	1.9	2.0	2.0	2.1
PCE chain-wt. price index	.3	1.5	2.7	2.5	1.9	1.4	1.7	2.0	2.0	1.9	1.9	1.7	1.9	1.9	2.0
Previous Tealbook	.3	1.5	2.7	2.6	2.0	2.0	1.7	2.0	1.9	1.8	1.8	1.7	2.1	1.9	2.0
Energy	-16.0	8.4	27.7	12.8	.4	.4	1.4	.2	-.5	-.6	-.9	7.6	3.7	-.4	-1.0
Previous Tealbook	-16.0	8.4	27.7	12.9	3.1	9.0	.2	-1.1	-1.3	-1.3	-1.3	7.6	6.2	-1.3	-1.0
Food	2.0	.2	.2	.2	1.2	1.4	2.0	2.0	2.2	2.6	3.0	.7	1.2	2.4	2.6
Previous Tealbook	2.0	.2	.2	.2	1.7	1.8	2.3	2.3	2.3	2.3	2.3	.7	1.5	2.3	2.3
Ex. food & energy	.9	1.3	1.9	2.3	2.0	1.5	1.7	2.1	2.0	1.9	1.9	1.5	1.9	2.0	2.1
Previous Tealbook	.9	1.3	1.9	2.3	2.0	1.6	1.7	2.2	2.1	1.9	2.0	1.5	1.9	2.0	2.1
Ex. food & energy, market based	.3	1.0	1.5	2.0	2.0	1.3	1.6	1.9	1.9	1.8	1.8	1.2	1.8	1.8	1.9
Previous Tealbook	.3	1.0	1.5	2.3	2.2	1.6	1.5	2.0	1.9	1.8	1.8	1.2	1.9	1.9	1.9
CPI	.1	2.1	3.3	3.5	1.7	1.9	2.2	2.3	2.2	2.2	2.2	2.1	2.3	2.2	2.3
Previous Tealbook	.1	2.1	3.3	3.5	2.0	2.7	2.1	2.3	2.2	2.1	2.1	2.1	2.6	2.2	2.3
Ex. food & energy	.8	1.8	2.2	3.0	1.8	2.1	2.2	2.5	2.5	2.4	2.4	1.7	2.3	2.4	2.5
Previous Tealbook	.8	1.8	2.2	3.0	1.9	2.2	2.2	2.5	2.5	2.4	2.4	1.7	2.3	2.5	2.5
ECI, hourly compensation[2]	2.2	3.1	1.9	4.0	2.4	2.3	2.3	2.8	2.8	2.8	2.8	2.6	2.7	2.8	2.9
Previous Tealbook[2]	2.2	3.1	1.9	4.0	2.4	2.4	2.5	2.8	2.8	2.8	2.8	2.6	2.8	2.8	2.9
Business sector															
Output per hour	1.6	3.2	-.4	.5	4.4	.9	.1	.9	.9	.9	.9	.9	1.4	.9	.9
Previous Tealbook	1.6	3.2	-.4	.8	2.4	1.0	1.0	1.2	1.0	.8	.8	.9	1.3	.9	.9
Compensation per hour	.6	4.2	2.1	3.9	1.8	3.1	3.2	4.0	4.0	4.0	4.0	2.8	3.0	4.0	4.1
Previous Tealbook	.6	4.2	2.1	4.1	1.8	3.6	4.0	4.0	4.0	4.0	4.0	2.8	3.4	4.0	4.0
Unit labor costs	-1.0	.9	2.6	3.4	-2.4	2.2	3.1	3.1	3.0	3.0	3.0	1.9	1.5	3.0	3.1
Previous Tealbook	-1.0	.9	2.6	3.3	-.6	2.6	2.9	2.8	3.0	3.1	3.1	1.8	2.0	3.0	3.0
Core goods imports chain-wt. price index[3]	2.5	1.1	1.5	2.7	1.4	-1.9	-.7	.4	.5	.6	.6	1.3	.4	.5	.7
Previous Tealbook[3]	2.5	1.1	1.5	2.8	2.6	-.2	.6	.8	.6	.6	.5	1.3	1.4	.6	.6

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.

Greensheets

Authorized for Public Release

Greensheets
Changes in Prices and Costs
(Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise noted)

Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
GDP chain-wt. price index	1.9	1.9	1.6	1.6	1.0	1.5	1.9	2.1	2.1	2.1
Previous Tealbook	1.9	1.9	1.6	1.6	1.0	1.5	1.9	2.0	2.0	2.1
PCE chain-wt. price index	2.7	1.8	1.2	1.2	.4	1.6	1.7	1.9	1.9	2.0
Previous Tealbook	2.7	1.8	1.2	1.2	.4	1.6	1.7	2.1	1.9	2.0
Energy	12.0	2.3	-2.5	-6.5	-16.2	2.2	7.6	3.7	-.4	-1.0
Previous Tealbook	12.0	2.3	-2.5	-6.5	-16.2	2.2	7.6	6.2	-1.3	-1.0
Food	5.1	1.2	.7	2.6	.3	-1.7	.7	1.2	2.4	2.6
Previous Tealbook	5.1	1.2	.7	2.6	.3	-1.7	.7	1.5	2.3	2.3
Ex. food & energy	1.9	1.8	1.5	1.5	1.3	1.9	1.5	1.9	2.0	2.1
Previous Tealbook	1.9	1.8	1.5	1.5	1.3	1.9	1.5	1.9	2.0	2.1
Ex. food & energy, market based	1.9	1.5	1.1	1.2	1.1	1.5	1.2	1.8	1.8	1.9
Previous Tealbook	1.9	1.5	1.1	1.2	1.1	1.5	1.2	1.9	1.9	1.9
CPI	3.3	1.9	1.2	1.2	.4	1.8	2.1	2.3	2.2	2.3
Previous Tealbook	3.3	1.9	1.2	1.2	.4	1.8	2.1	2.6	2.2	2.3
Ex. food & energy	2.2	1.9	1.7	1.7	2.0	2.2	1.7	2.3	2.4	2.5
Previous Tealbook	2.2	1.9	1.7	1.7	2.0	2.2	1.7	2.3	2.5	2.5
ECI, hourly compensation[1]	2.2	1.8	2.0	2.3	1.9	2.2	2.6	2.7	2.8	2.9
Previous Tealbook[1]	2.2	1.8	2.0	2.3	1.9	2.2	2.6	2.8	2.8	2.9
Business sector										
Output per hour	-.1	-.1	1.9	.1	.7	1.1	.9	1.4	.9	.9
Previous Tealbook	-.1	-.1	1.9	.1	.7	1.1	.9	1.3	.9	.9
Compensation per hour	.5	5.9	-.1	2.9	3.1	-.1	2.8	3.0	4.0	4.1
Previous Tealbook	.5	5.9	-.1	2.9	3.1	-.1	2.8	3.4	4.0	4.0
Unit labor costs	.6	6.0	-2.0	2.8	2.4	-1.2	1.9	1.5	3.0	3.1
Previous Tealbook	.6	6.0	-2.0	2.8	2.4	-1.2	1.8	2.0	3.0	3.0
Core goods imports chain-wt. price index[2]	4.3	.1	-1.5	.3	-3.7	-.2	1.3	.4	.5	.7
Previous Tealbook[2]	4.3	.1	-1.5	.3	-3.7	-.2	1.3	1.4	.6	.6

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

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Other Macroeconomic Indicators

Item	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2017[1]	2018[1]	2019[1]	2020[1]
Employment and production															
Nonfarm payroll employment[2]	190	142	221	218	211	205	194	182	171	170	160	182	207	171	133
Unemployment rate[3]	4.3	4.3	4.1	4.1	3.9	3.8	3.7	3.6	3.5	3.4	3.4	4.1	3.7	3.4	3.4
Previous Tealbook[3]	4.3	4.3	4.1	4.1	3.8	3.7	3.6	3.5	3.4	3.4	3.4	4.1	3.6	3.4	3.4
Natural rate of unemployment[3]	4.8	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
Previous Tealbook[3]	4.8	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]	60.1	60.2	60.1	60.3	60.4	60.4	60.5	60.5	60.6	60.6	60.6	60.1	60.5	60.6	60.6
Employment-to-Population Trend[3]	59.8	59.7	59.7	59.6	59.6	59.5	59.5	59.5	59.4	59.4	59.4	59.7	59.5	59.4	59.2
Output gap[4]	.8	1.2	1.4	1.6	2.0	2.3	2.6	2.8	3.0	3.1	3.3	1.4	2.6	3.3	3.1
Previous Tealbook[4]	.8	1.2	1.4	1.6	1.9	2.2	2.5	2.7	2.8	3.0	3.0	1.4	2.5	3.0	2.9
Industrial production[5]	5.0	-1.5	7.7	2.4	6.0	2.8	2.0	2.3	2.4	2.0	1.9	3.0	3.3	2.2	1.4
Previous Tealbook[5]	5.0	-1.5	7.7	2.3	6.3	2.0	4.0	3.4	2.3	1.2	1.0	3.0	3.7	2.0	1.1
Manufacturing industr. prod.[5]	2.4	-2.1	5.3	1.7	1.9	3.1	2.3	1.8	2.5	2.6	2.1	1.9	2.3	2.2	1.4
Previous Tealbook[5]	2.4	-2.1	5.2	1.4	4.0	2.1	3.1	2.4	2.1	1.9	1.4	1.8	2.6	1.9	1.0
Capacity utilization rate - mfg.[3]	74.9	74.4	75.2	75.3	75.4	75.7	75.9	76.0	76.3	76.6	76.8	75.2	75.9	76.8	77.3
Previous Tealbook[3]	74.9	74.4	75.2	75.2	75.7	75.9	76.2	76.4	76.6	76.7	76.8	75.2	76.2	76.8	76.9
Housing starts[6]	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3	1.3
Light motor vehicle sales[6]	16.8	17.1	17.7	17.1	17.1	17.1	17.2	17.2	17.1	17.0	17.0	17.1	17.1	17.1	16.8
Income and saving															
Nominal GDP[5]	4.1	5.3	5.3	4.2	7.4	4.2	4.5	4.7	4.9	4.5	4.3	4.5	5.1	4.6	3.9
Real disposable pers. income[5]	2.7	.7	1.2	3.6	1.8	2.5	2.9	4.1	2.2	1.8	2.2	1.9	2.7	2.6	2.3
Previous Tealbook[5]	2.7	.7	1.2	3.3	1.7	2.6	3.1	4.3	2.2	1.8	2.2	1.9	2.7	2.6	2.4
Personal saving rate[3]	3.7	3.4	2.7	3.3	2.9	2.8	2.9	3.2	3.1	2.9	2.9	2.7	2.9	2.9	2.9
Previous Tealbook[3]	3.7	3.4	2.7	3.1	2.8	2.9	3.1	3.5	3.4	3.2	3.2	2.7	3.1	3.2	3.3
Corporate profits[7]	2.8	18.1	-.2	7.3	5.0	-.8	.0	1.7	5.6	4.2	3.4	2.7	2.8	3.7	2.4
Profit share of GNP[3]	10.9	11.2	11.1	11.2	11.1	11.0	10.9	10.8	10.9	10.9	10.9	11.1	10.9	10.9	10.7
Gross national saving rate[3]	17.2	17.7	16.8	17.3	16.9	16.8	16.7	16.6	16.6	16.5	16.4	16.8	16.7	16.4	15.9
Net national saving rate[3]	2.0	2.6	1.6	2.2	1.9	1.7	1.6	1.3	1.3	1.2	1.0	1.6	1.6	1.0	.4

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.

Greensheets

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Other Macroeconomic Indicators

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

Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Employment and production										
Nonfarm payroll employment[1]	174	179	192	250	226	195	182	207	171	133
Unemployment rate[2]	8.7	7.8	7.0	5.7	5.0	4.7	4.1	3.7	3.4	3.4
Previous Tealbook[2]	8.7	7.8	7.0	5.7	5.0	4.7	4.1	3.6	3.4	3.4
Natural rate of unemployment[2]	5.9	5.6	5.4	5.1	4.9	4.8	4.7	4.7	4.7	4.7
Previous Tealbook[2]	5.9	5.6	5.4	5.1	4.9	4.8	4.7	4.7	4.7	4.7
Employment-to-Population Ratio[2]	58.5	58.7	58.5	59.3	59.4	59.8	60.1	60.5	60.6	60.6
Employment-to-Population Trend[2]	60.7	60.3	60.2	60.1	59.9	59.8	59.7	59.5	59.4	59.2
Output gap[3]	-4.7	-3.9	-3.0	-.9	-.1	.3	1.4	2.6	3.3	3.1
Previous Tealbook[3]	-4.7	-3.9	-3.0	-.9	-.1	.3	1.4	2.5	3.0	2.9
Industrial production	3.2	2.2	2.3	3.4	-3.3	-.5	3.0	3.3	2.2	1.4
Previous Tealbook	3.2	2.2	2.3	3.4	-3.3	-.5	3.0	3.7	2.0	1.1
Manufacturing industr. prod.	2.8	1.4	1.1	1.4	-1.6	-.1	1.9	2.3	2.2	1.4
Previous Tealbook	2.8	1.4	1.1	1.4	-1.6	-.1	1.8	2.6	1.9	1.0
Capacity utilization rate - mfg.[2]	74.5	74.7	75.1	76.3	75.4	74.4	75.2	75.9	76.8	77.3
Previous Tealbook[2]	74.5	74.7	75.1	76.3	75.4	74.4	75.2	76.2	76.8	76.9
Housing starts[4]	.6	.8	.9	1.0	1.1	1.2	1.2	1.3	1.3	1.3
Light motor vehicle sales[4]	12.7	14.4	15.5	16.5	17.4	17.5	17.1	17.1	17.1	16.8
Income and saving										
Nominal GDP	3.6	3.2	4.3	4.3	3.1	3.4	4.5	5.1	4.6	3.9
Real disposable pers. income	1.7	5.1	-2.8	4.9	3.2	.2	1.9	2.7	2.6	2.3
Previous Tealbook	1.7	5.1	-2.8	4.9	3.2	.2	1.9	2.7	2.6	2.4
Personal saving rate[2]	5.8	9.2	4.7	5.9	6.1	3.6	2.7	2.9	2.9	2.9
Previous Tealbook[2]	5.8	9.2	4.7	5.9	6.1	3.6	2.7	3.1	3.2	3.3
Corporate profits[5]	6.8	.6	4.7	7.4	-11.1	8.7	2.7	2.8	3.7	2.4
Profit share of GNP[2]	12.3	12.0	12.0	12.4	10.7	11.3	11.1	10.9	10.9	10.7
Gross national saving rate[2]	16.1	18.0	18.2	19.5	19.0	17.2	16.8	16.7	16.4	15.9
Net national saving rate[2]	.8	2.9	3.1	4.7	4.1	2.1	1.6	1.6	1.0	.4

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.

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Staff Projections of Government-Sector Accounts and Related Items

Item	2015	2016	2017	2018	2019	2020	2018			
							Q1	Q2	Q3	Q4
Unified federal budget[1]										
Billions of dollars										
Receipts	3,250	3,268	3,316	3,329	3,426	3,576	727	1,044	788	755
Outlays	3,688	3,853	3,982	4,119	4,413	4,760	1,102	1,051	971	1,114
Surplus/deficit	-438	-585	-665	-790	-987	-1,184	-375	-7	-183	-359
Percent of GDP										
Surplus/deficit	-2.4	-3.2	-3.5	-3.9	-4.7	-5.4	-7.6	-.1	-3.6	-7.0
Previous Tealbook	-2.4	-3.2	-3.5	-3.8	-4.9	-5.4	-7.6	.7	-3.7	-7.3
Primary surplus/deficit	-1.2	-1.9	-2.1	-2.3	-2.8	-3.1	-6.0	1.8	-2.6	-4.9
Net interest	1.2	1.3	1.4	1.6	1.9	2.3	1.7	2.0	1.1	2.1
Cyclically adjusted surplus/deficit	-2.0	-3.1	-3.8	-4.8	-6.1	-7.0	-8.3	-1.1	-4.7	-8.3
Federal debt held by public	72.9	76.7	76.5	77.9	78.5	81.1	78.6	77.7	77.9	78.1
Government in the NIPA[2]										
Real percent change, annual rate										
Purchases	1.6	.4	.7	1.6	2.1	1.8	1.3	3.2	.1	1.7
Consumption	1.9	.6	.4	.9	1.5	1.3	1.0	1.6	.1	1.2
Investment	.4	-.5	2.4	3.9	4.5	3.7	1.6	10.3	.1	3.9
State and local construction	.0	-2.3	-1.9	2.4	1.0	1.0	-.6	9.6	.5	.5
Real disposable personal income	3.2	.2	1.9	2.7	2.6	2.3	3.6	1.8	2.5	2.9
Contribution from transfers[3]	.7	.3	.2	.5	.8	.7	.5	.3	.5	.7
Contribution from taxes[3]	-1.4	.2	-1.1	-.2	-.7	-.6	.6	-.2	-.6	-.7
Government employment										
Average net change in monthly payrolls, thousands										
Federal	3	3	-1	0	2	1	-1	-1	1	2
State and local	10	14	3	4	9	9	-1	6	4	7
Fiscal indicators[2]										
Percentage point contribution to change in real GDP, annual rate										
Fiscal effect (FE)[4]	.4	.5	.0	.2	.7	.7	-.3	.6	.1	.6
Discretionary policy actions (FI)	.4	.1	.2	.5	.7	.5	.5	.8	.3	.6
Previous Tealbook	.4	.1	.2	.5	.7	.5	.5	.5	.6	.6
Federal purchases	.1	.0	.1	.1	.3	.2	.1	.4	-.1	.2
State and local purchases	.2	.1	.1	.1	.1	.1	.1	.2	.1	.1
Taxes and transfers	.1	.1	.0	.3	.3	.2	.3	.3	.3	.3
Cyclical	-.3	-.1	-.2	-.2	-.2	.0	-.1	-.2	-.3	-.2
Other	.3	.4	-.1	-.1	.3	.2	-.6	.0	.1	.2

1. Annual values stated on a fiscal year basis. Quarterly values not seasonally adjusted.
2. Annual values refer to the change from fourth quarter of previous year to fourth quarter of year indicated.
3. Percentage point contribution to change in real disposable personal income, annual basis.
4. The FE measure captures the total contribution of the government sector to the growth of real GDP (excluding multiplier effects). It equals the sum of the direct contributions to real GDP 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).

Greensheets

Greensheets

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

Measure and country	2017				2018				2019 (Projected)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP[1]												
Total foreign	3.0	3.3	2.5	2.8	3.2	2.6	2.8	2.8	2.8	2.8	2.9	2.5
Previous Tealbook	3.0	3.2	2.6	2.8	3.1	2.8	2.7	2.8	2.8	2.8	2.9	2.5
Advanced foreign economies	3.0	3.4	2.1	2.0	1.3	2.0	1.9	1.9	1.9	1.8	2.0	1.3
Canada	4.0	4.6	1.7	1.7	1.3	2.4	2.3	2.3	2.3	2.1	2.1	2.1
Japan	2.7	2.1	2.0	1.0	-.6	1.4	1.0	.9	.8	.8	3.1	-3.8
United Kingdom	1.6	.9	1.4	1.4	.9	1.5	1.6	1.6	1.7	1.7	1.7	1.7
Euro area	2.4	2.9	2.9	2.8	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Germany	3.6	2.6	3.0	2.5	1.2	1.5	1.6	1.6	1.6	1.6	1.5	1.5
Emerging market economies	3.0	3.3	2.8	3.6	5.1	3.2	3.6	3.7	3.7	3.7	3.8	3.7
Asia	5.4	5.2	5.5	4.6	6.2	4.8	4.8	4.9	4.8	4.7	4.7	4.7
Korea	4.0	2.6	5.7	-.8	4.1	3.3	3.3	3.4	3.2	3.2	3.1	3.1
China	6.9	7.1	6.6	6.5	7.2	6.6	6.3	6.3	6.3	6.2	6.2	6.1
Latin America	1.3	1.5	.3	3.0	3.9	1.6	2.6	2.6	2.8	2.8	2.9	2.9
Mexico	1.5	1.4	-.2	3.6	4.6	2.4	2.8	2.8	2.9	2.9	3.0	3.0
Brazil	4.4	2.4	1.1	.9	1.8	-1.5	4.5	2.5	2.8	2.8	2.8	2.8
Consumer prices[2]												
Total foreign	3.0	2.0	2.3	3.0	2.6	1.6	2.7	2.5	2.5	2.4	2.4	2.8
Previous Tealbook	3.0	2.0	2.3	3.0	2.6	2.1	2.9	2.6	2.5	2.5	2.4	2.8
Advanced foreign economies	2.2	.5	1.2	2.1	2.6	1.0	1.8	1.6	1.6	1.6	1.6	2.5
Canada	2.6	.2	1.4	3.0	3.6	1.0	2.7	2.2	2.2	2.1	2.0	2.0
Japan	-.3	.1	.7	1.9	2.5	-2.3	1.5	1.0	1.0	.9	1.0	6.3
United Kingdom	3.7	3.0	2.4	2.9	2.5	1.8	1.9	2.3	2.4	2.4	2.3	2.3
Euro area	2.7	.4	1.0	1.6	2.1	2.2	1.4	1.4	1.3	1.4	1.5	1.5
Germany	2.3	.2	1.7	2.2	1.2	2.4	1.8	1.8	2.0	2.1	2.3	2.4
Emerging market economies	3.5	3.1	3.1	3.7	2.6	2.1	3.4	3.1	3.1	3.1	3.0	3.0
Asia	1.2	1.6	2.1	3.0	1.8	1.0	2.5	2.7	2.7	2.7	2.7	2.7
Korea	2.6	.7	2.2	.5	1.6	1.8	2.9	3.4	3.0	3.1	3.1	3.1
China	.0	2.1	2.2	2.9	1.5	.7	2.7	2.5	2.5	2.5	2.5	2.5
Latin America	9.2	6.8	5.5	5.4	4.7	4.5	5.2	4.0	4.0	3.9	3.7	3.7
Mexico	9.3	6.7	5.4	5.0	4.1	3.8	4.5	3.3	3.6	3.5	3.3	3.3
Brazil	3.2	2.3	2.3	3.6	3.1	4.3	5.6	3.9	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	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
								----Projected----		
Real GDP[1]										
Total foreign	3.2	2.2	3.0	2.8	2.1	2.7	2.9	2.8	2.8	2.7
Previous Tealbook	3.2	2.2	3.0	2.9	2.0	2.7	2.9	2.9	2.7	2.7
Advanced foreign economies	1.8	.3	2.5	2.0	1.2	1.9	2.6	1.8	1.7	1.7
Canada	3.1	.7	3.6	2.5	.3	2.0	3.0	2.1	2.1	1.8
Japan	.2	.3	2.8	-.3	1.2	1.5	2.0	.7	.2	.9
United Kingdom	1.3	1.6	2.6	3.1	2.2	1.7	1.3	1.4	1.7	1.7
Euro area	.6	-1.1	.8	1.5	1.9	2.0	2.8	1.6	1.6	1.6
Germany	2.4	.2	1.6	1.9	1.3	1.9	2.9	1.5	1.5	1.4
Emerging market economies	4.6	4.2	3.5	3.7	2.9	3.4	3.2	3.9	3.7	3.7
Asia	5.1	5.8	5.4	5.0	4.5	4.9	5.2	5.2	4.7	4.6
Korea	2.9	2.1	3.5	2.8	3.2	2.6	2.8	3.5	3.1	3.0
China	8.7	8.0	7.6	7.1	6.8	6.8	6.8	6.6	6.2	5.9
Latin America	4.0	3.0	1.7	2.7	1.5	2.1	1.5	2.7	2.9	3.0
Mexico	3.9	3.0	1.2	3.4	2.8	3.3	1.6	3.1	2.9	3.0
Brazil	2.6	2.6	2.6	-.1	-5.5	-2.4	2.2	1.8	2.8	2.8
Consumer prices[2]										
Total foreign	3.4	2.3	2.4	2.0	1.4	1.9	2.6	2.4	2.5	2.4
Previous Tealbook	3.4	2.3	2.4	2.0	1.4	1.9	2.6	2.5	2.6	2.4
Advanced foreign economies	2.2	1.3	1.0	1.2	.4	.9	1.5	1.8	1.8	1.7
Canada	2.7	1.0	1.0	2.0	1.3	1.4	1.8	2.4	2.1	2.0
Japan	-.3	-.2	1.4	2.6	.1	.3	.6	.7	2.3	1.0
United Kingdom	4.6	2.6	2.1	.9	.1	1.2	3.0	2.1	2.3	2.1
Euro area	2.9	2.3	.8	.1	.2	.7	1.4	1.7	1.4	1.6
Germany	2.6	1.9	1.4	.4	.2	1.0	1.6	1.8	2.2	2.3
Emerging market economies	4.3	3.1	3.4	2.7	2.1	2.7	3.4	2.8	3.0	3.0
Asia	4.4	2.6	3.1	1.8	1.5	2.0	2.0	2.0	2.7	2.7
Korea	3.9	1.7	1.1	1.0	.9	1.5	1.5	2.4	3.1	3.0
China	4.6	2.1	2.9	1.5	1.5	2.1	1.8	1.9	2.5	2.5
Latin America	4.1	4.4	4.2	4.9	3.4	4.3	6.7	4.6	3.8	3.5
Mexico	3.5	4.1	3.6	4.2	2.3	3.3	6.6	3.9	3.4	3.2
Brazil	6.7	5.6	5.8	6.5	10.4	7.1	2.8	4.2	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.

Greensheets

Greensheets

U.S. Current Account
Quarterly Data

Billions of dollars, s.a.a.r.

	2017				2018				2019 (Projected)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
U.S. current account balance	**-430.8**	**-487.3**	**-413.8**	**-464.6**	**-496.4**	**-452.0**	**-500.6**	**-541.0**	**-588.8**	**-613.4**	**-665.4**	**-711.0**
Previous Tealbook	*-451.5*	*-495.0*	*-405.9*	*-512.6*	*-565.6*	*-547.6*	*-575.4*	*-599.6*	*-656.6*	*-673.6*	*-714.8*	*-749.7*
Current account as percent of GDP	-2.3	-2.5	-2.1	-2.4	-2.5	-2.2	-2.4	-2.6	-2.8	-2.9	-3.1	-3.3
Previous Tealbook	*-2.4*	*-2.6*	*-2.1*	*-2.6*	*-2.8*	*-2.7*	*-2.8*	*-2.9*	*-3.1*	*-3.2*	*-3.3*	*-3.5*
Net goods & services	-539.8	-546.8	-531.2	-591.3	-622.5	-549.5	-575.1	-589.2	-598.0	-601.0	-621.8	-642.5
Investment income, net	223.4	207.4	246.5	263.1	261.6	231.9	215.0	184.7	154.6	122.0	96.9	68.1
Direct, net	295.3	272.7	305.8	319.8	316.3	301.0	301.8	292.3	282.5	273.7	273.6	269.6
Portfolio, net	-71.9	-65.3	-59.3	-56.7	-54.8	-69.2	-86.8	-107.6	-127.9	-151.6	-176.7	-201.6
Other income and transfers, net	-114.4	-148.0	-129.1	-136.4	-135.5	-134.4	-140.5	-136.5	-145.4	-134.4	-140.5	-136.5

Annual Data

Billions of dollars

	2011	2012	2013	2014	2015	2016	2017	2018 (Projected)	2019 (Projected)	2020 (Projected)
U.S. current account balance	**-444.6**	**-426.2**	**-349.5**	**-365.1**	**-409.7**	**-434.3**	**-449.1**	**-497.5**	**-644.6**	**-803.5**
Previous Tealbook	*-444.6*	*-426.2*	*-349.5*	*-373.0*	*-434.6*	*-451.7*	*-466.2*	*-572.0*	*-698.7*	*-842.2*
Current account as percent of GDP	-2.9	-2.6	-2.1	-2.1	-2.3	-2.3	-2.3	-2.4	-3.0	-3.6
Previous Tealbook	*-2.9*	*-2.6*	*-2.1*	*-2.1*	*-2.4*	*-2.4*	*-2.4*	*-2.8*	*-3.3*	*-3.8*
Net goods & services	-548.6	-536.8	-461.9	-489.5	-500.4	-503.5	-552.3	-584.1	-615.8	-684.9
Investment income, net	219.2	216.1	215.4	229.0	214.7	205.7	235.1	223.3	110.4	20.6
Direct, net	288.7	285.5	283.3	284.2	284.6	272.6	298.4	302.9	274.8	281.2
Portfolio, net	-69.5	-69.4	-67.9	-55.3	-70.0	-66.9	-63.3	-79.6	-164.4	-260.7
Other income and transfers, net	-115.1	-105.5	-103.1	-104.6	-123.9	-136.6	-132.0	-136.7	-139.2	-139.2

Abbreviations

AFE	advanced foreign economy
BBA	Bipartisan Budget Act of 2018
BCA	Budget Control Act of 2011
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BOC	Bank of Canada
BOE	Bank of England
BOJ	Bank of Japan
CBO	Congressional Budget Office
C&I	commercial and industrial
CMBS	commercial mortgage-backed securities
CPI	consumer price index
CRE	commercial real estate
DSGE	dynamic stochastic general equilibrium
ECB	European Central Bank
ECI	employment cost index
EME	emerging market economy
EU	European Union
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
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
MNE	multinational enterprise
NFIB	National Federation of Independent Business
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
OPEC	Organization of the Petroleum Exporting Countries
PBOC	People's Bank of China
PCE	personal consumption expenditures
PDFP	private domestic final purchases
PMI	purchasing managers index
QS	quantitative surveillance
R&D	research and development
repo	repurchase agreement
SEC	Securities and Exchange Commission
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
TCJA	Tax Cuts and Jobs Act
TFP	total factor productivity
TIPS	Treasury Inflation-Protected Securities
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.

Report to the FOMC
on Economic Conditions
and Monetary Policy

Book B
Monetary Policy Alternatives

July 26, 2018

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

The Removal of the "Remains Accommodative" Language in 2005

A key question the Committee is likely to face before too long is when it should stop characterizing the stance of monetary policy as remaining accommodative. The previous time the Committee faced this decision was in late 2005. Based on the FOMC meeting transcripts, this box reviews the Committee's discussions over that period that led to the removal of the "remains accommodative" language from the statement at the December 2005 meeting.

Between June 2004 and November 2005, the Committee raised the federal funds rate target from 1 percent to 4 percent, and each rate increase was accompanied by an FOMC statement that referred to monetary policy as accommodative. During most of this period, postmeeting statements noted that "The Committee believes that, even after this action, the stance of monetary policy remains accommodative." [1]

Early in the tightening cycle, there was broad consensus among Committee participants that monetary policy was accommodative. This view reflected in part the fact that, at the time, the real federal funds rate was below most estimates of the neutral real federal funds rate, such as some of those shown in figure 1. As the Committee steadily raised the policy rate in 2005, FOMC participants had more frequent discussions about the appropriateness of continuing to characterize the stance of monetary policy as accommodative. These discussions often cited estimates of the neutral rate of interest and its potential drivers— such as labor productivity growth, investment, and international economic and financial factors. Inflation developments during 2005 also generated discussions of how estimates of expected inflation might alter the Committee's understanding of the current real federal funds rate and therefore the perceived real rate gap.

Figure 1: Real Federal Funds Rate and r*
Estimates

Note: The range of r* estimates is derived from five models using current data.
Source: FRBNY; BEA; various papers on r* referenced in the March 2018 Monetary Policy Strategies section of Tealbook A.
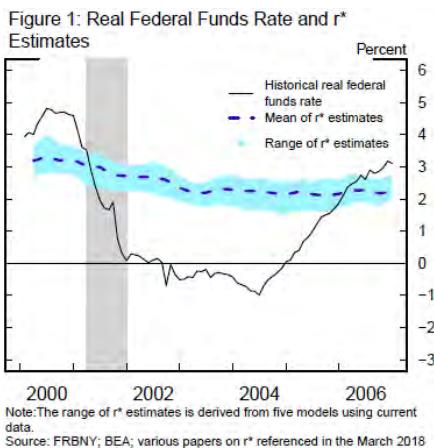
Table 1: Economic Conditions at November 2005 FOMC Meeting

	Q1	Q2	Q3	Q4
Core PCE Inflation (YoY)	2.16	1.97	1.94	1.91
Output Gap	−0.71	−0.65	−0.61	−0.50
Unemployment Gap	0.25	0.11	0.02	0.05
Rate Gap (2018 est)*	−1.25	−0.66	−0.09	−0.19

*The rate gap shown here is the difference between the real interest rate and the bottom of the range of estimates of its neutral level in each quarter of 2005, using current data.

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[1] This sentence was dropped at the September 2005 meeting, but the September and November FOMC statements continued to refer to "monetary policy accommodation." The tightening cycle ended in June 2006, with the federal funds rate target reaching 5¼ percent, after 17 consecutive 25 basis point increases.

Figure 2: Dealers Who Expected a Change to the
'Accommodative' Language in the FOMC Statement,
2005
                                                                    Number of Dealers

Feb   Mar   May   Jun   Aug   Sep   Nov   Dec
Source: FRBNY survey, 22 dealers participated.
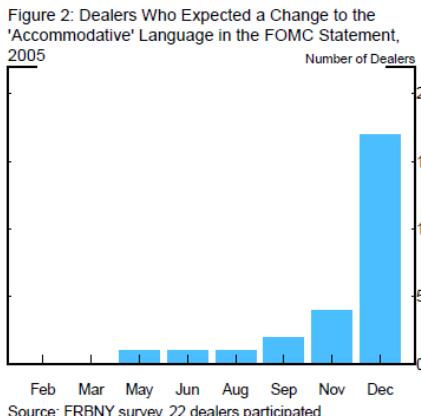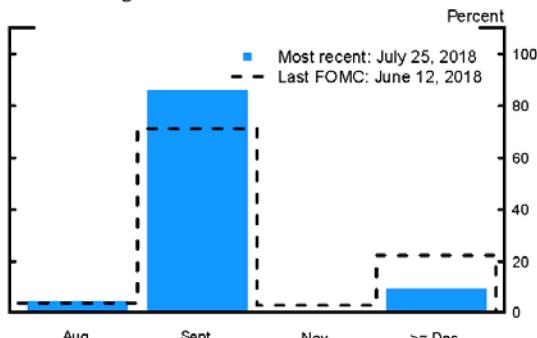
Table 2: Post–December 2005 FOMC
Event Study

On the Run Treasury Yields	
1. 2–Year	−3.4 bps
2. 5–Year	−3.9 bps
3. 10–Year	−2.8 bps
Equity Indexes	
4. S&P 500	0.5 %
Fed Funds Futures	
5. Jan−2006	0.0 bps
6. Mar−2006	−0.5 bps
Eurodollar Futures	
7. Jun−2006	−4.5 bps
8. Dec−2006	−4.5 bps

Note: Values reflect the 2–hour change around the
statement release.

As shown in table 2, changes in asset prices upon the release of the December FOMC
statement were mild. The December statement removed the accommodative language but
also included the phrase "some further measured policy firming is likely to be needed."
These changes appear to have caused only a slight reevaluation by market participants of
the remaining duration of the tightening cycle.
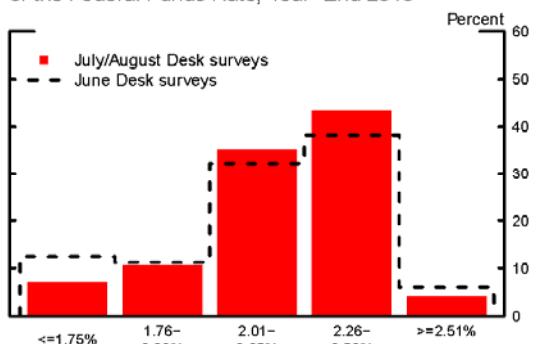
Figure 1: Market-Implied Probability Distribution of the Timing of Next Rate Increase

Note: Probabilities implied by a binomial tree fitted to settlement prices on federal funds futures contracts, without adjusting for risk premiums, and assuming the next policy action is either no change or a 25 basis point increase in the target range, and no intermeeting moves. Probabilities reflect the effect of the adjustment in IOER discussed in June FOMC communications.
Source: CME Group; Federal Reserve Board staff estimates.

Figure 2: Market-Implied Probability Distribution of the Federal Funds Rate, Year-End 2018

Note: Estimated from federal funds futures options for the average federal funds rate in January 2019, without adjusting for risk premiums.
Source: CME Group; Federal Reserve Board staff estimates.

Figure 3: 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.
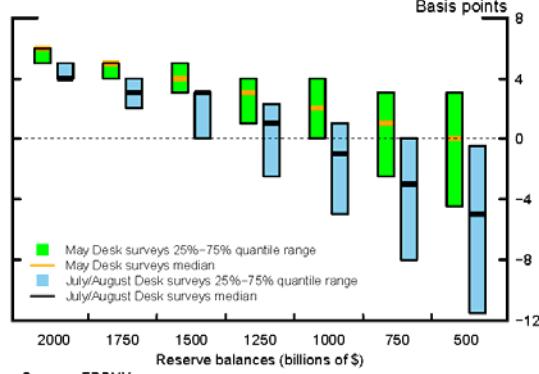
Figure 4: Federal Funds Rate Step Path

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 5: Federal Funds Rate Projections

* Estimated using overnight index swap quotes with a spline approach and without adjusting for term premiums.
** Estimated using a term structure model maintained by Board staff and adjusted for risk premiums. The longer-run model-implied forecast is for the expected federal funds rate 5 to 10 years ahead.
*** 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 6: Estimate of the IOER-EFFR Spread Conditional on Reserve Balance Levels

Source: FRBNY.

# Redemptions and Reinvestments of SOMA Principal Payments
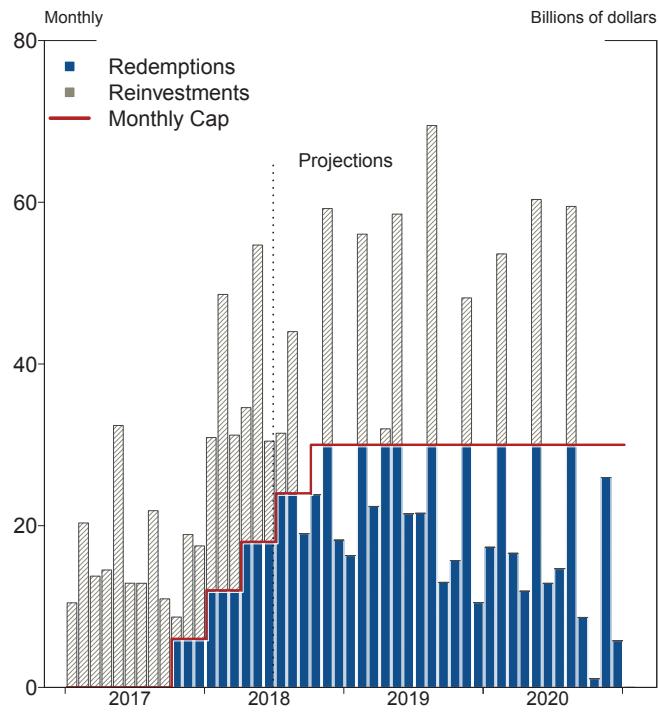
Projections for Treasury Securities
(Billions of dollars)

	Redemptions		Reinvestments	
	Period	Since Oct. 2017	Period	Since Oct. 2017
2018: Q2	54.0	108.0	65.8	167.6
2018: Q3	67.0	175.0	27.4	195.0
2018: Q4	72.0	247.1	29.2	224.2
2018	229.1	247.1	197.1	224.2
2019	270.8	517.9	114.2	338.4
2020	204.8	722.7	83.4	421.9
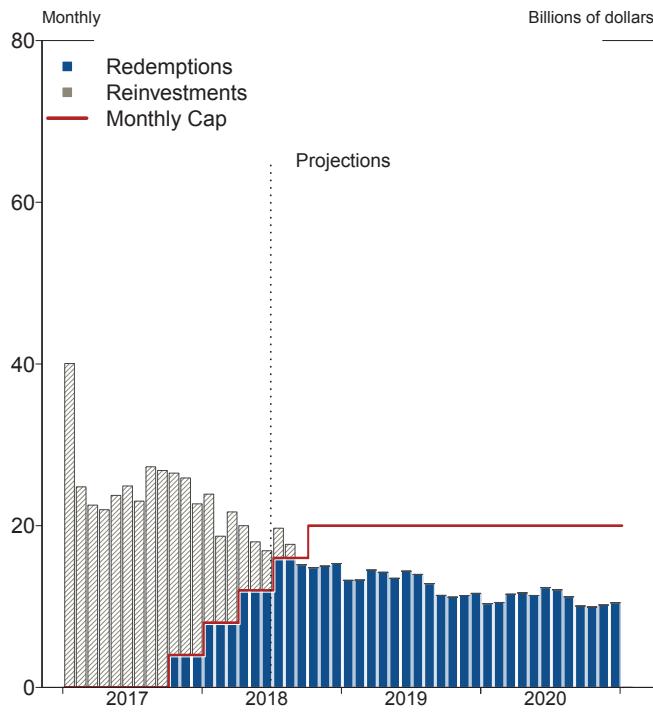
Projections for Agency Securities
(Billions of dollars)

	Redemptions		Reinvestments	
	Period	Since Oct. 2017	Period	Since Oct. 2017
2018: Q2	36.0	72.0	18.9	119.9
2018: Q3	47.2	119.2	5.4	125.3
2018: Q4	45.1	164.3	0.0	125.3
2018	152.3	164.3	64.6	125.3
2019	155.4	319.7	0.0	125.3
2020	131.7	451.4	0.0	125.3

Balance Sheet & Income

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.

# Total Assets and Selected Balance Sheet Items

—— July Tealbook baseline   – – June Tealbook baseline

Total Assets

Billions of dollars

Monthly

Reserve Balances

Billions of dollars

Monthly

SOMA Treasury Holdings

Billions of dollars

Monthly

SOMA Agency MBS Holdings

Billions of dollars

Monthly

Assets as a Share of GDP

Percent

- Treasury Securities
- Agency Securities
- Other Assets
- Loans

Projections

Liabilities as a Share of GDP

Percent

- Federal Reserve notes in circulation
- Treasury General Account
- Other Liabilities
- Total Reserves

Projections

Balance Sheet & Income

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

	Jun 30, 2018	2018	2020	2022	2024	2026	2030
Total assets	4,308	4,034	3,250	3,214	3,376	3,555	3,965
Selected assets							
Loans and other credit extensions*	3	0	0	0	0	0	0
Securities held outright	4,102	3,851	3,095	3,077	3,253	3,444	3,872
U.S. Treasury securities	2,378	2,210	1,741	1,948	2,284	2,605	3,257
Agency debt securities	2	2	2	2	2	2	2
Agency mortgage-backed securities	1,721	1,639	1,352	1,126	966	836	612
Unamortized premiums	150	141	111	91	76	63	43
Unamortized discounts	-14	-13	-10	-8	-7	-6	-4
Total other assets	67	55	55	55	55	55	55
Total liabilities	4,269	3,996	3,211	3,171	3,329	3,504	3,903
Selected liabilities							
Federal Reserve notes in circulation	1,619	1,668	1,880	2,022	2,158	2,308	2,652
Reverse repurchase agreements	342	255	248	245	245	245	245
Deposits with Federal Reserve Banks	2,301	2,068	1,078	899	921	945	1,001
Reserve balances held by depository institutions	1,887	1,715	701	500	500	500	500
U.S. Treasury, General Account	333	277	301	324	346	370	425
Other deposits	82	75	75	75	75	75	75
Earnings remittances due to the U.S. Treasury	2	0	0	0	0	0	0
Total Federal Reserve Bank capital**	39	38	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.
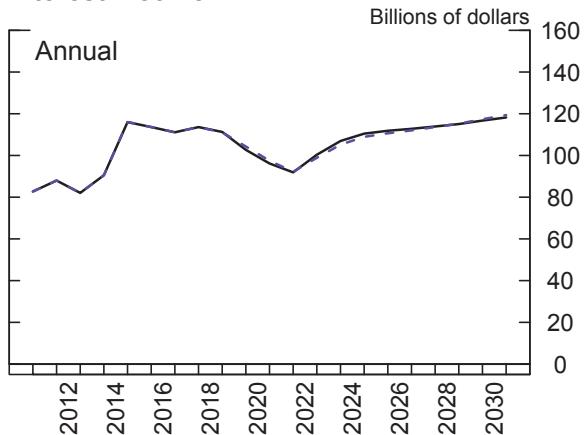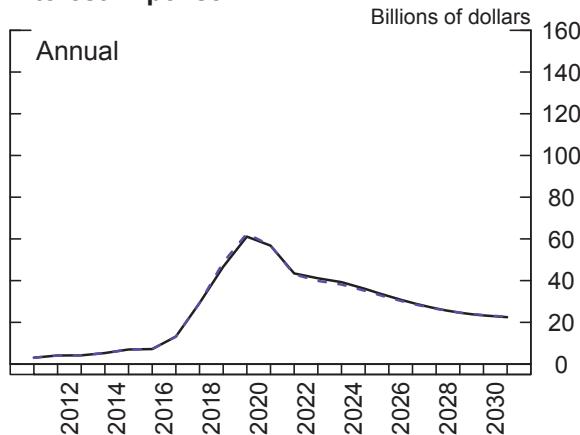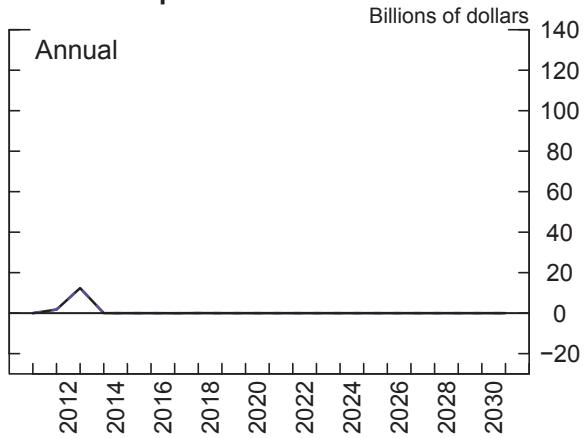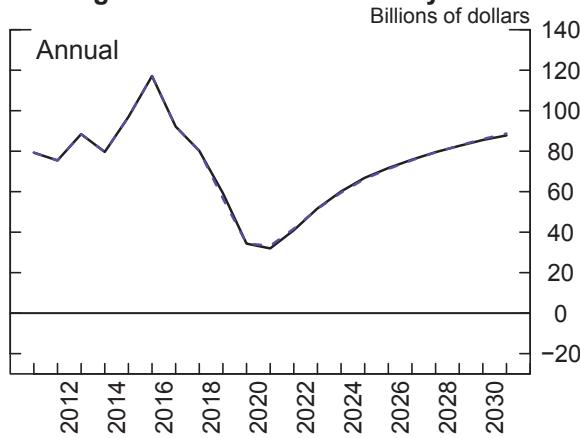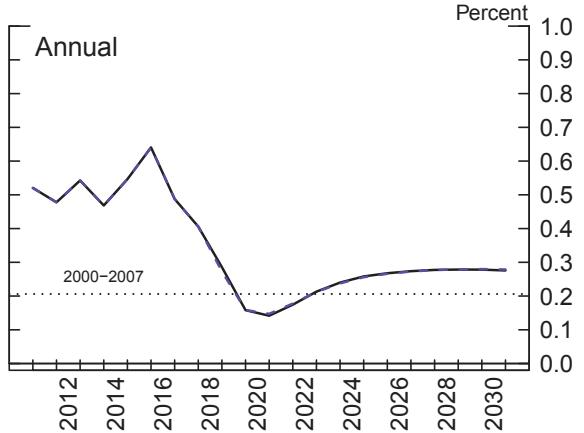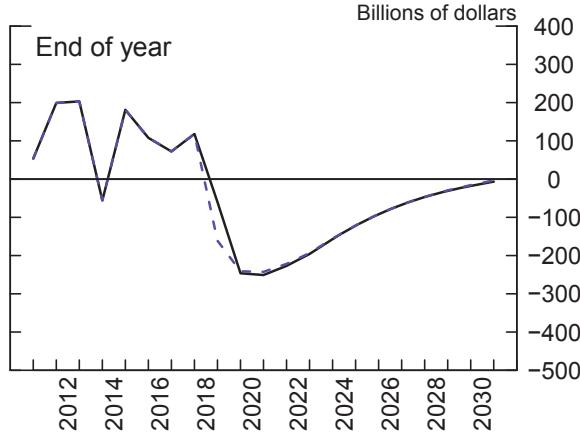
Income Projections

— July Tealbook baseline   – – June Tealbook baseline

Balance Sheet & Income

Interest Income

Annual   Billions of dollars

Interest Expense

Annual   Billions of dollars
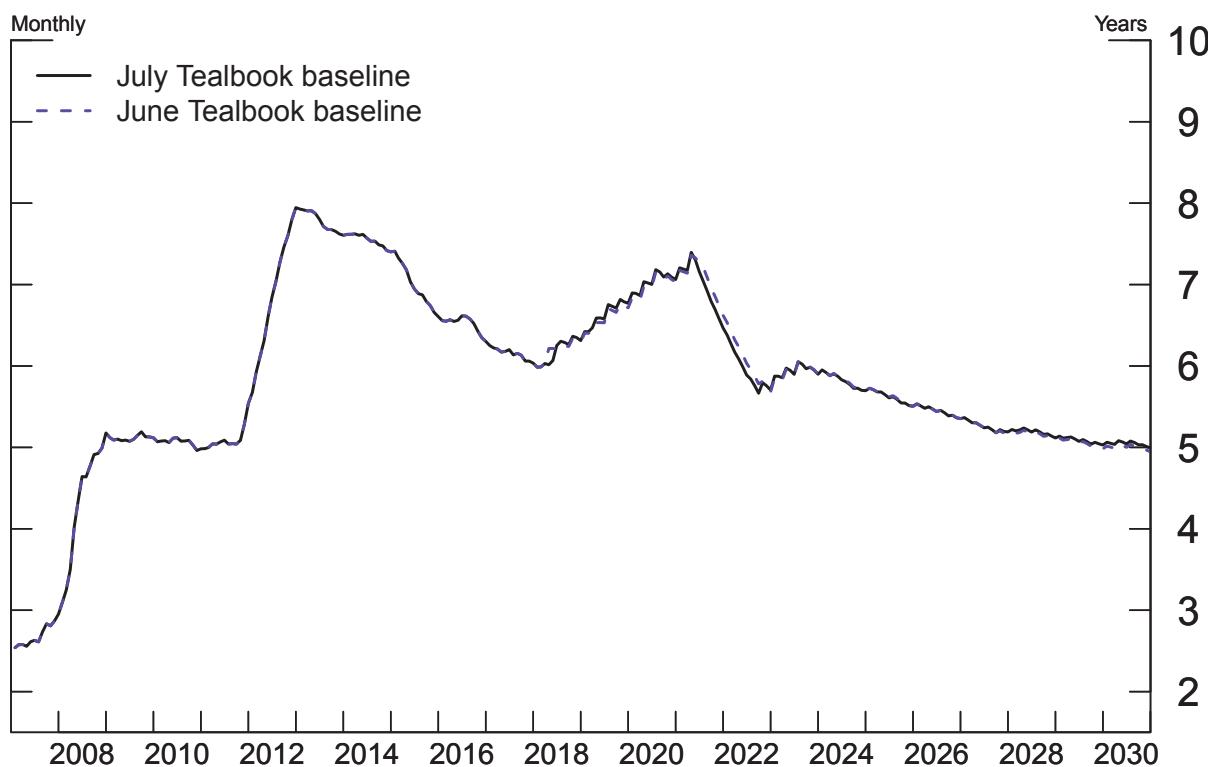
Realized Capital Gains

Annual   Billions of dollars

Earnings Remittances to Treasury

Annual   Billions of dollars

Remittances as a Percent of GDP

Annual   Percent

2000−2007

Memo: Unrealized Gains/Losses

End of year   Billions of dollars

Projections for the 10-Year Treasury Term Premium Effect *
(Basis Points)
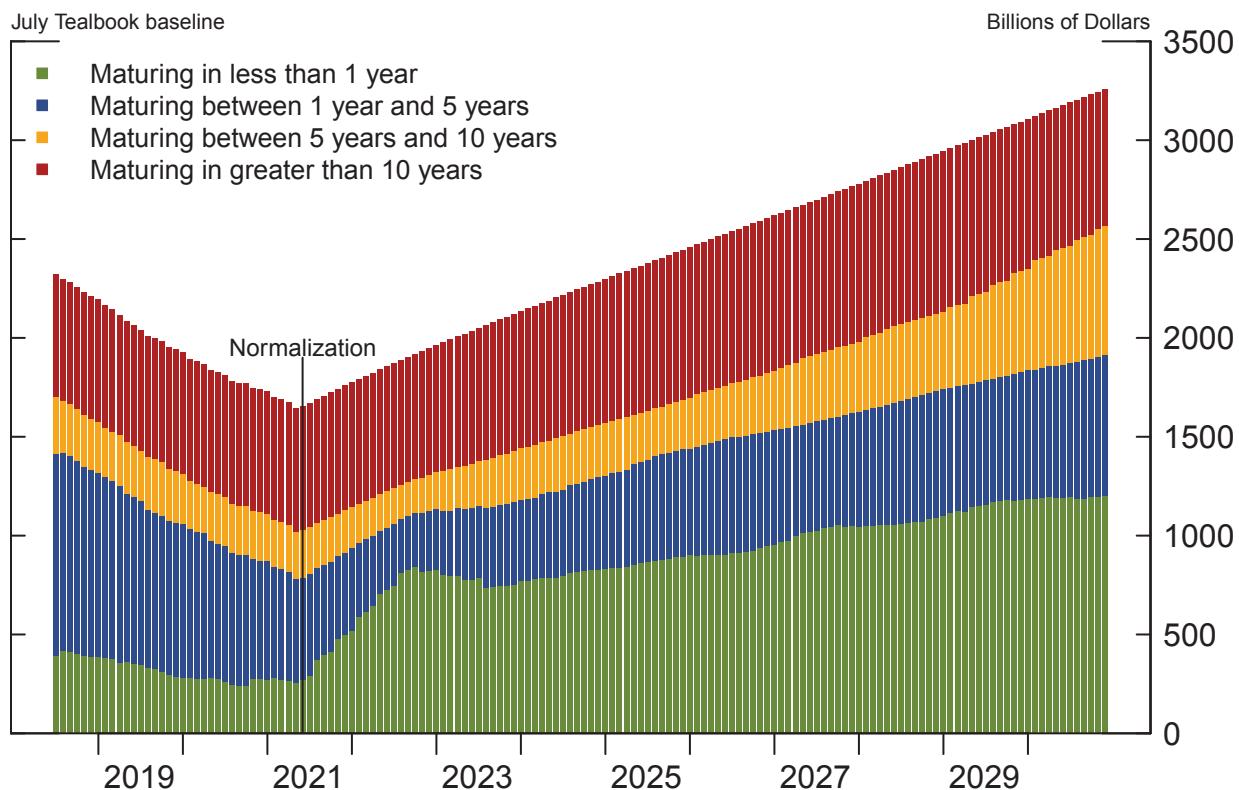
Date	July Tealbook	June Tealbook
Quarterly Averages		
2018:Q3	-78	-79
Q4	-76	-76
2019:Q4	-66	-66
2020:Q4	-58	-58
2021:Q4	-53	-53
2022:Q4	-49	-49
2023:Q4	-46	-46
2024:Q4	-43	-43
2025:Q4	-40	-40
2026:Q4	-38	-37
2027:Q4	-36	-35
2028:Q4	-34	-33
2029:Q4	-32	-31
2030:Q4	-31	-29

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

Balance Sheet & Income

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