

**Prefatory Note**

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Class II FOMC – Restricted (FR)

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# Report to the FOMC on Economic Conditions and Monetary Policy



## Book A Economic and Financial Conditions: Outlook, Risks, and Policy Strategies

June 5, 2017

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

## Comparing the Staff Projection with Other Forecasts

The staff's projection for real GDP growth is above the projections from both the Survey of Professional Forecasters (SPF) and the Blue Chip consensus forecast in 2017 and below the Blue Chip consensus in 2018. The staff's unemployment rate forecast is lower than both outside forecasts. The staff's projection for CPI inflation is below those of outside forecasters in 2017 and is the same as them in 2018. The staff's projections for both overall and core PCE price inflation are noticeably below the SPF forecasts in 2017 but are in line with the SPF forecasts in 2018.

### Comparison of Tealbook and Outside Forecasts

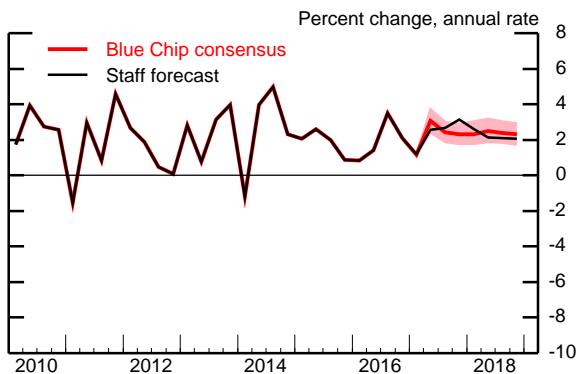
	2017	2018
<b>GDP (Q4/Q4 percent change)</b>		
June Tealbook	2.4	2.2
Blue Chip (5/10/17)	2.1	2.4
SPF median (5/12/17)	2.2	n.a.
<b>Unemployment rate (Q4 level)</b>		
June Tealbook	4.2	3.9
Blue Chip (5/10/17)	4.4	4.2
SPF median (5/12/17)	4.4	n.a.
<b>CPI inflation (Q4/Q4 percent change)</b>		
June Tealbook	1.9	2.3
Blue Chip (5/10/17)	2.2	2.3
SPF median (5/12/17)	2.3	2.3
<b>PCE price inflation (Q4/Q4 percent change)</b>		
June Tealbook	1.6	1.9
SPF median (5/12/17)	2.0	2.0
<b>Core PCE price inflation (Q4/Q4 percent change)</b>		
June Tealbook	1.6	1.9
SPF median (5/12/17)	2.0	2.0

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

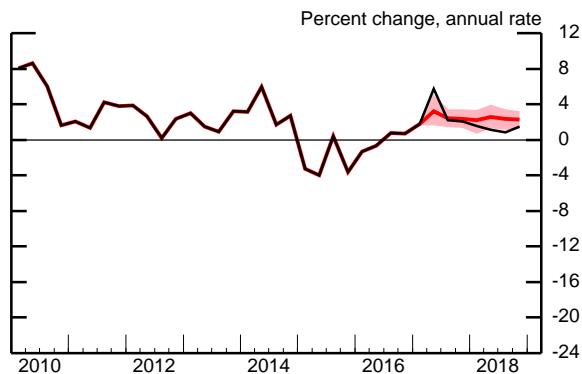
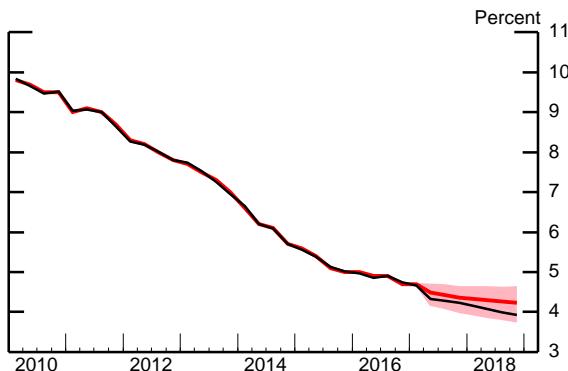
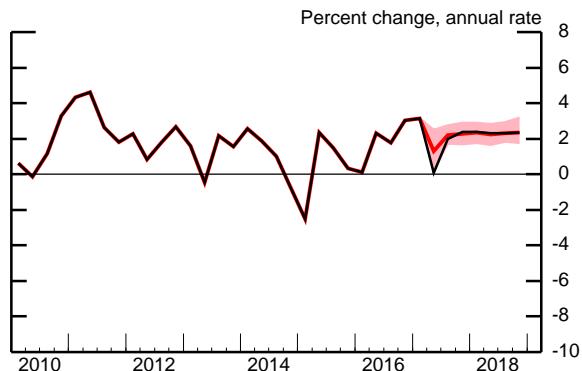
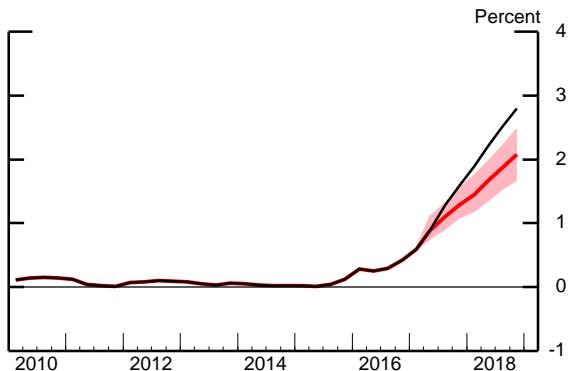
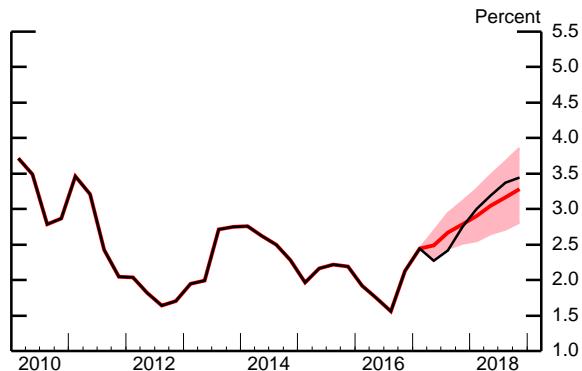
n.a. Not available.

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

## Tealbook Forecast Compared with Blue Chip (Blue Chip survey released May 10, 2017)

**Real GDP**

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

**Industrial Production****Unemployment Rate****Consumer Price Index****Treasury Bill Rate****10-Year Treasury Yield**

Note: The yield is for on-the-run Treasury securities. Over the forecast period, the staff's projected yield is assumed to be 15 basis points below the off-the-run yield.

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

## Revisions to the Staff Projection since the Previous SEP

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

Since March, we have revised up our projection for the increase in real GDP in 2017 by about  $\frac{1}{2}$  percentage point. Our forecast for real GDP growth in 2018 and 2019 is unrevised. With faster GDP growth, on net, over the projection period, the unemployment rate falls by more than in the March forecast and reaches 3.8 percent at the end of 2019, which is 1.1 percentage points below the staff's downwardly revised estimate of the longer-run natural rate.

The available data on consumer price inflation for March and April were weak, but we view these readings as importantly reflecting idiosyncratic and transitory factors. As a result, the forecast for core PCE price inflation is marked down this year but is unrevised thereafter. Total PCE inflation is expected to move up modestly over the next couple of years and to reach 2 percent in 2019, 0.1 percentage point higher than in the March forecast.

With the outlook for the GDP gap somewhat tighter, the federal funds rate path from the intercept-adjusted inertial Taylor (1999) rule that we use in our baseline forecast is above that in the March Tealbook through most of the projection period.

**Staff Economic Projections Compared with the March Tealbook**

Variable	2016	2017		2017	2018	2019	Longer run
		H1	H2				
Real GDP <sup>1</sup> March Tealbook	2.0 1.9	1.9 1.7	2.9 2.2	2.4 2.0	2.2 2.2	1.8 1.9	1.7 1.7
Unemployment rate <sup>2</sup> March Tealbook	4.7 4.7	4.3 4.7	4.2 4.6	4.2 4.6	3.9 4.2	3.8 4.1	4.9 5.0
PCE inflation <sup>1</sup> March Tealbook	1.4 1.4	1.4 2.0	1.7 1.5	1.6 1.7	1.9 1.8	2.0 1.9	2.0 2.0
Core PCE inflation <sup>1</sup> March Tealbook	1.7 1.7	1.6 2.0	1.7 1.5	1.6 1.8	1.9 1.9	2.0 2.0	n.a. n.a.
Federal funds rate <sup>2</sup> March Tealbook	.45 .45	.92 .94	1.48 1.45	1.48 1.45	2.70 2.46	3.67 3.36	3.00 3.00
Memo: Federal funds rate, end of period March Tealbook	.63 .63	.94 1.02	1.51 1.53	1.51 1.53	2.73 2.54	3.68 3.42	3.00 3.00
GDP gap <sup>2,3</sup> March Tealbook	.5 .4	.7 .5	1.3 .9	1.3 .9	1.9 1.5	2.0 1.7	n.a. n.a.

1. Percent change from final quarter of preceding period to final quarter of period indicated.

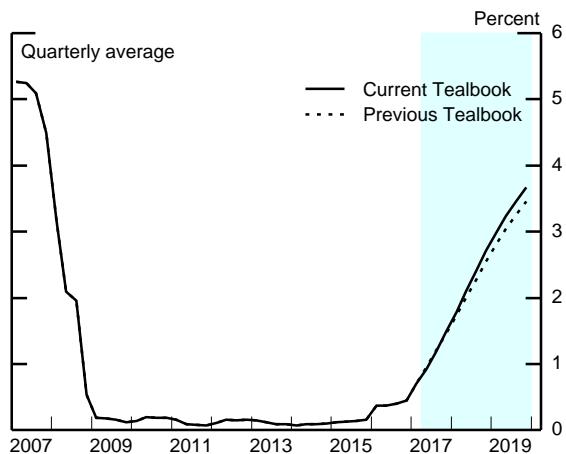
2. Percent, final quarter of period indicated.

3. Percent difference between actual and potential. A negative number indicates that the economy is operating below potential.

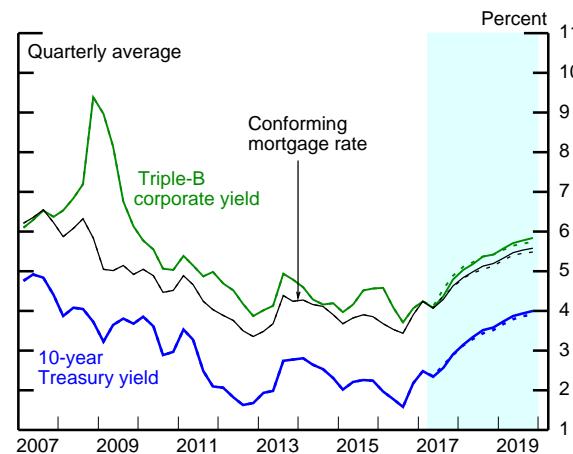
n.a. Not available.

## Key Background Factors underlying the Baseline Staff Projection

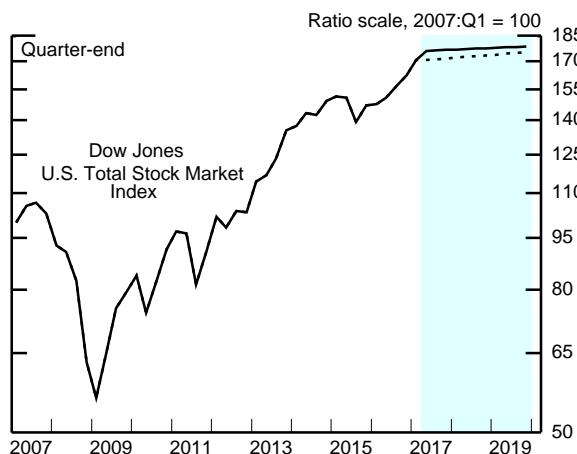
Federal Funds Rate



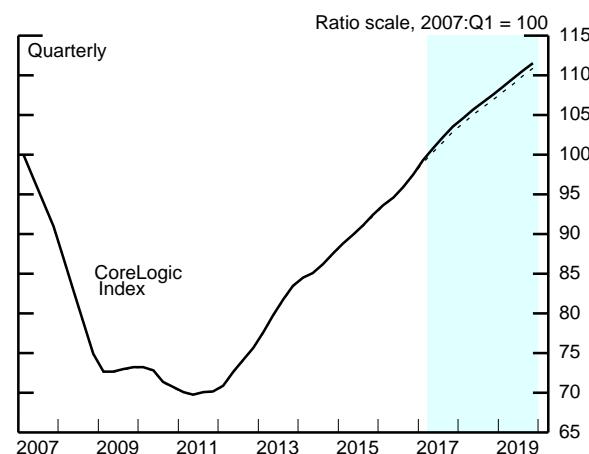
Long-Term Interest Rates



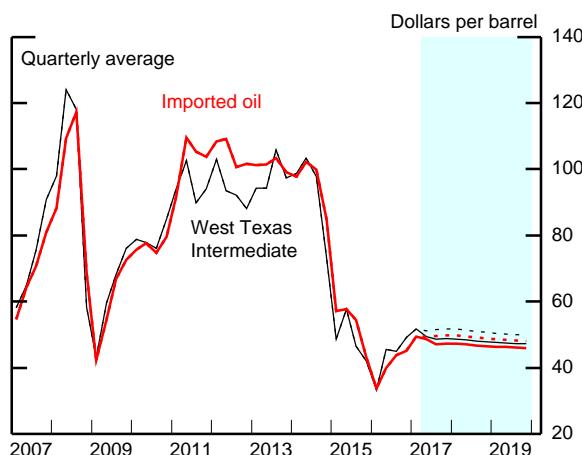
Equity Prices



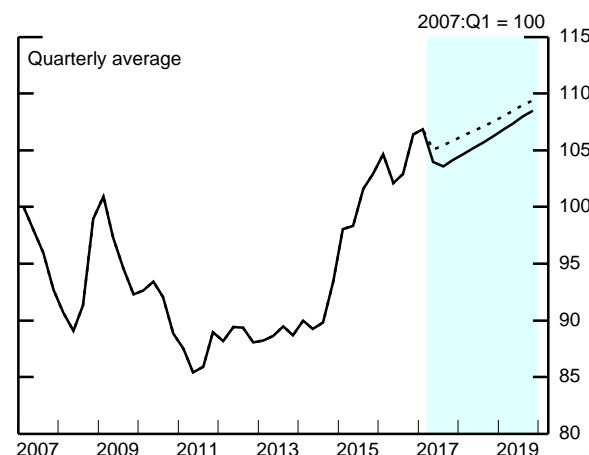
House Prices



Crude Oil Prices



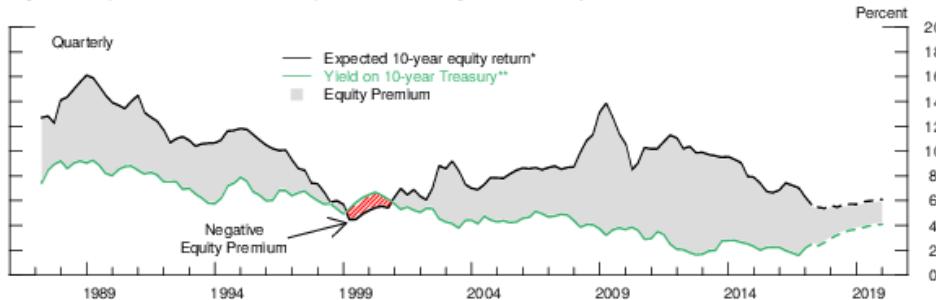
Broad Real Dollar



literature on forecasting stock returns does offer evidence that there is some predictive content of stock valuation measures for subsequent returns, though such tests have less predictive power out of sample.<sup>1</sup> Most predictive regressions, however, would suggest low positive, rather than negative, expected returns. An alternative approach involves estimating the probability of a stock market crash or substandard returns. Here, again, recent research and preliminary staff analysis tend to suggest that current stock market valuations would, at best, predicate a fairly modest increase in the odds of substandard future returns, with wide confidence bands.<sup>2</sup>

Finally, although valuation ratios and equity premium measures do not enable us to predict the timing and extent of stock market corrections with much confidence, these variables are useful in assessing the financial system's vulnerability to negative shocks. Thus, for now at least, we think it is preferable to signal our concerns regarding valuation pressures through the use of alternative scenarios rather than adjustments to the baseline forecast.

Figure 1: Expected Return on U.S. Equities versus Long-Term Treasury Yield



\*Staff estimate using a dividend discount model incorporating staff forecast of corporate profits.

\*\*Off-the-run 10-year Treasury yield.

Note: Dotted lines represent staff forecast. The shaded area represents the equity premium, shown in red when negative.

Source: Staff projection as of May 31, 2017.

<sup>1</sup> See Ivo Welch and Amit Goyal (2008), "A Comprehensive Look at the Empirical Performance of Equity Premium Prediction," *Review of Financial Studies*, vol. 21 (July), pp. 1455–1508; and Jessica A. Wachter and Missaka Warusawitharana (2015), "What Is the Chance That the Equity Premium Varies over Time? Evidence from Regressions on the Dividend-Price Ratio," *Journal of Econometrics*, vol. 186 (May), pp. 74–93.

<sup>2</sup> See William N. Goetzmann (2015), "Bubble Investing: Learning from History," NBER Working Paper Series 21693 (Cambridge, Mass.: National Bureau of Economic Research, October), <http://www.nber.org/papers/w21693>. Another recent study (Greenwood, Shleifer, and You, 2017) finds that sharp stock price increases help predict heightened probability of a crash in a particular industry but agrees that it is difficult to forecast negative average returns (Robin Greenwood, Andrei Shleifer, and Yang You (2017), "Bubbles for Fama," NBER Working Paper Series 23191 (Cambridge, Mass.: National Bureau of Economic Research, February), <http://www.nber.org/papers/w23191>).

**Federal Reserve System Nowcasts of 2017:Q2 Real GDP Growth**  
(Percent change at annual rate from previous quarter)

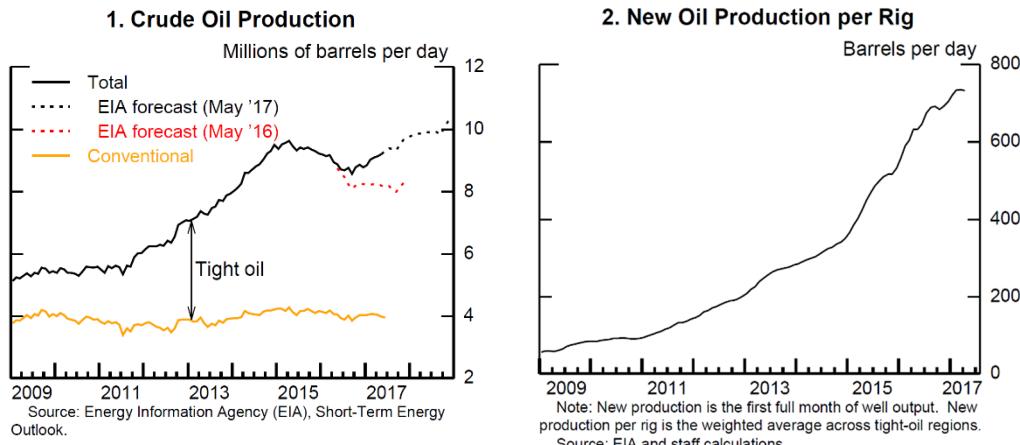
Federal Reserve entity	Type of model	Nowcast as of May 31, 2017
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	3.7
New York	• Factor-augmented autoregressive model combination • Factor-augmented autoregressive model combination, financial factors only • Dynamic factor model	2.4 2.3 2.3
Cleveland	• Bayesian regressions with stochastic volatility • Tracking model	2.7 2.6
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	3.8
Chicago	• Dynamic factor models • Bayesian VARs	2.6 3.6
St. Louis	• Dynamic factor models • News index model • Let-the-data-decide regressions	2.7 2.6 2.8
Kansas City	• Accounting-based tracking estimate	2.9
Board of Governors	• Board staff's forecast (judgmental tracking model) • Monthly dynamic factor models (DFM-45) • Mixed-frequency dynamic factor model (DFM-BM)	3.1 2.9 3.8
Memo: Median of Federal Reserve System nowcasts		2.8

## Why Is U.S. Oil Output So Strong?

Total U.S. crude oil production nearly doubled from around 5 million barrels per day (b/d) in the mid-2000s to just under 9½ million b/d in 2015 (figure 1, black line). This increase was almost exclusively due to production from unconventional “tight oil” geographies, where methods such as horizontal drilling and hydraulic fracturing have been exploited to extract oil and gas trapped in low-permeability rock formations. However, between 2014 and 2016, oil prices fell about 70 percent, and the count of drilling rigs in operation—a widely used predictor of near-term crude oil production—plummeted by a similar magnitude. To the surprise of many industry analysts, total U.S. production fell only 6 percent and has turned up in recent quarters.

Why did oil production not fall by more? The answer lies in the large and widespread productivity gains in drilling and extraction technologies not reflected in some existing indicators of production. These gains in productivity imply that (1) a simple count of drilling rigs is, by itself, no longer a good predictor of near-term production, and (2) U.S. producers are able to remain profitable at far lower prices than in previous years. Thus, even with the expected path of oil prices below \$60 per barrel and the number of active drilling rigs far lower than a few years ago, the Energy Information Administration (EIA) projects U.S. oil production to average 9.3 million b/d in 2017 and to reach an all-time annual record of 10.0 million b/d in 2018 (figure 1, black dotted line). Understanding the factors behind the EIA’s projected growth in oil production is important, as these estimates are incorporated into the Board staff’s forecasts for real GDP and industrial production.<sup>1</sup>

**Mapping Rig Counts to Output.** Traditionally, the rig count has been seen as a good indicator of near-term production because a large fraction of a well’s output occurs in its first few months. However, the linkage between drilling rigs and oil extraction relies on the assumption that the productivity of successive cohorts of new wells is relatively stable. Since the onset of the tight-oil boom in 2010, the first-month output of new wells advanced rapidly, with a new well in the tight-oil areas producing roughly 700 b/d in early 2017, more than four times the 2010 level (figure 2).



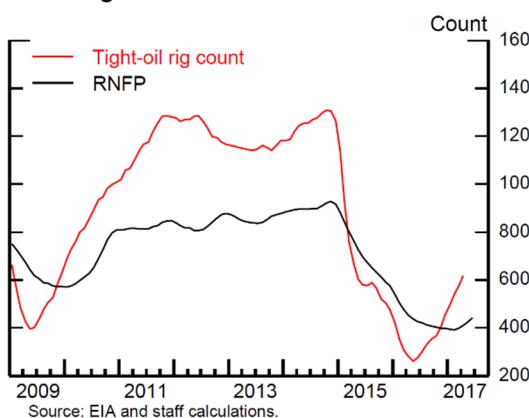
<sup>1</sup> Oil output is not a direct input into the spending-side calculation of GDP, but as domestic oil production rises, oil imports—which are subtracted from aggregate expenditures to measure GDP—decline. Thus, a shift toward domestically sourced oil boosts the level of real GDP.

Drawing on new EIA data for the main tight-oil regions, the staff have constructed a new measure—the number of rigs needed for flat production (RNFP)—that helps gauge the direction and magnitude of expected changes in domestic oil production. The RNFP uses estimates of the productivity of new wells to calculate the number of rigs required to keep total production constant in the tight-oil regions—that is, to exactly offset the natural decline in output from existing wells.<sup>2</sup> With conventional oil production roughly flat over the past decade—see figure 1, orange line—the RNFP and the tight-oil rig count can be used to predict changes in aggregate production. Figure 3 shows the RNFP (black line) and the tight-oil rig count (red line). With the number of rigs now trending above the RNFP, total oil production should continue to expand in the coming months, consistent with the EIA projection embedded in the staff forecast.

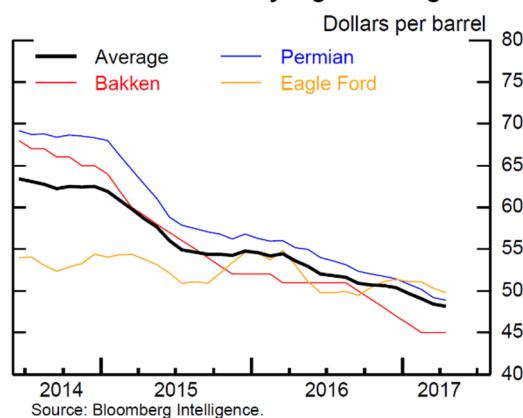
**Breakeven Prices.** The oil price required for a new drilling project to be economically viable has declined notably. The downward trend in those prices, known as break-even prices, also supports the strong production forecast. Break-even prices in the tight-oil areas have been falling over the past two years while also converging across regions toward more similar levels (figure 4).<sup>3</sup> While part of the decline likely reflects input costs for drilling that fell during the industry downturn (for example, rig rental rates, sand, and labor), structural changes—such as innovations in drilling and new well completion techniques—account for a substantial portion of the reduction. In April 2017, average breakevens were a little below spot oil prices, as shown by the black line in figure 4; however, average numbers hide a large degree of heterogeneity, even within regions.<sup>4</sup>

**Looking Forward.** Large productivity gains in recent years have altered historical relationships, making new indicators helpful in understanding current and future trends. Further production gains may face some headwinds in future months, as input costs are likely to increase with more drilling rigs returning to use, but new technologies also have considerable scope to spread across existing producers. Hence, current projections for near-record production levels of U.S. crude oil in 2017 and 2018 appear consistent with a path of moderate oil prices and modest levels of rigs in operation.

### 3. Rigs Needed for Flat Production



### 4. Breakeven Prices by Tight-Oil Region



<sup>2</sup> Rising production puts upward pressure on future values of the RNFP, but productivity gains counteract this effect, reducing the number of rigs needed to maintain a given level of output.

<sup>3</sup> Definitions of breakeven prices vary widely. We report wellhead half-cycle breakevens, a measure of well profitability that excludes transportation expenses, the cost of exploration, and other field developments.

<sup>4</sup> Within-region breakevens range from about \$30 per barrel in some areas of the Permian Basin to \$70 per barrel in some counties within the Bakken region.

## Summary of the Near-Term Outlook

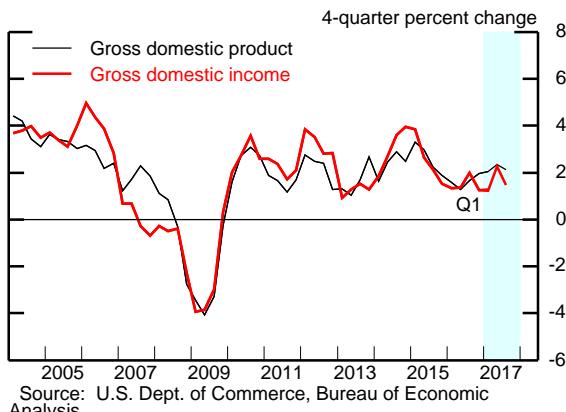
(Percent change at annual rate except as noted)

Measure	2017:Q1		2017:Q2		2017:Q3	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
<b>Real GDP</b>	.9	1.2	2.6	2.6	2.2	2.7
Private domestic final purchases	1.8	2.6	3.0	2.9	2.8	3.0
Personal consumption expenditures	.6	.6	3.1	3.0	3.0	2.8
Residential investment	11.4	13.9	-1.3	-1.1	-1.5	-2.6
Nonres. private fixed investment	5.4	10.2	4.4	3.3	3.0	5.9
Government purchases	-1.8	-.9	2.4	.3	2.2	1.8
<i>Contributions to change in real GDP</i>						
Inventory investment <sup>1</sup>	.0	-1.0	-.1	.4	-.1	.1
Net exports <sup>1</sup>	-.3	.2	-.3	-.3	-.5	-.3
<b>Unemployment rate</b>	4.7	4.7	4.5	4.3	4.5	4.3
<b>PCE chain price index</b>	2.4	2.4	1.2	.4	1.6	1.6
Ex. food and energy	2.0	2.1	1.6	1.1	1.7	1.8

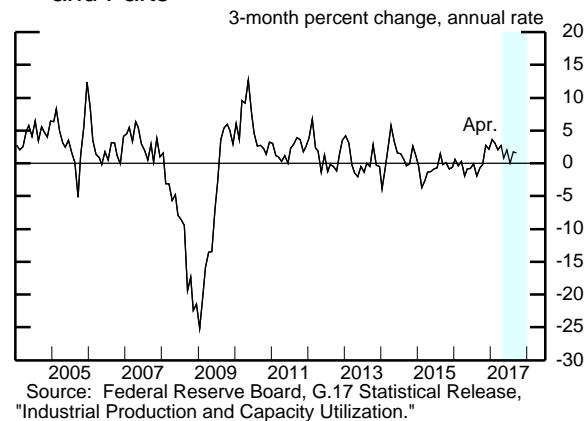
1. Percentage points.

### Recent Nonfinancial Developments (1)

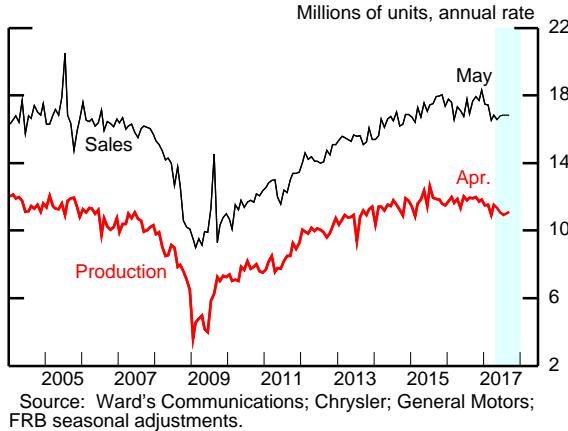
Real GDP and GDI



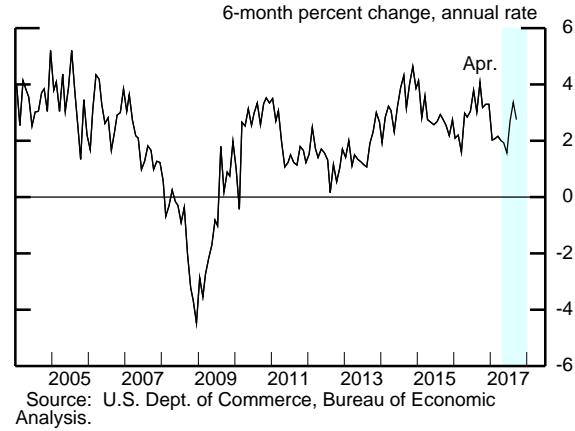
Manufacturing IP ex. Motor Vehicles and Parts



Sales and Production of Light Motor Vehicles

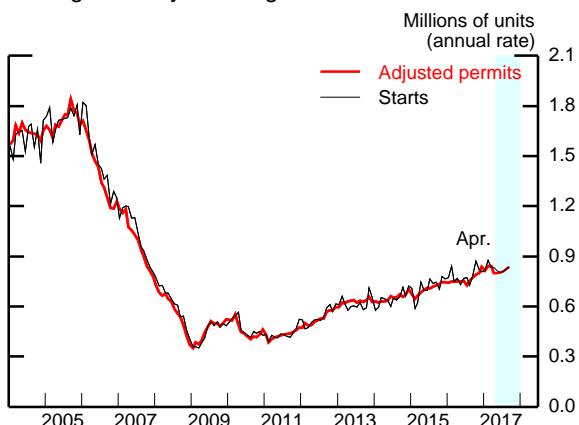


Real PCE Growth



## Recent Nonfinancial Developments (2)

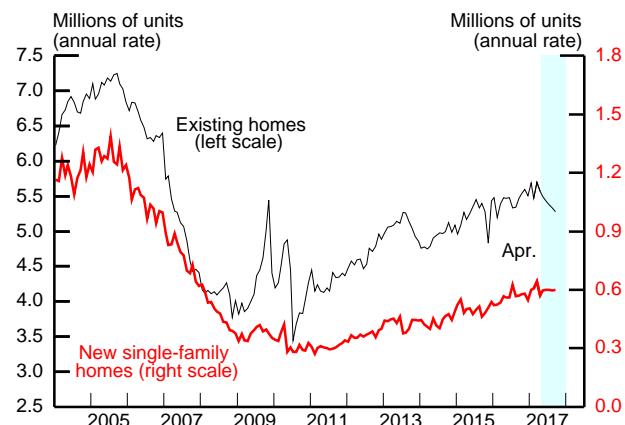
### Single-Family Housing Starts and Permits



Note: Adjusted permits equal permit issuance plus total starts outside of permit-issuing areas.

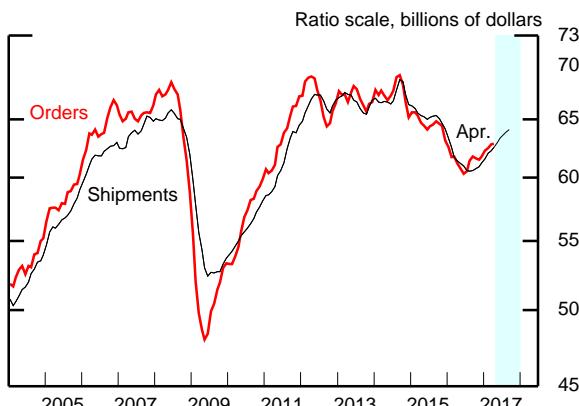
Source: U.S. Census Bureau.

### Home Sales



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

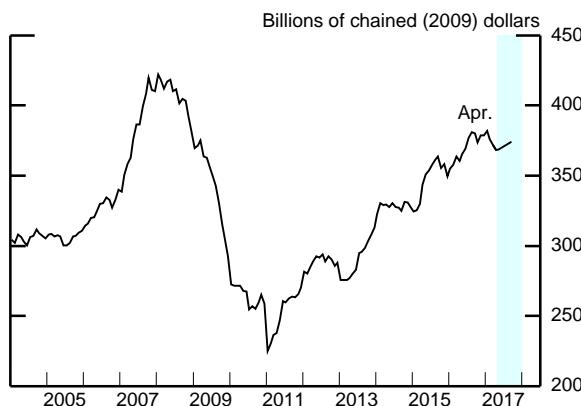
### Nondefense Capital Goods ex. Aircraft



Note: Data are 3-month moving averages.

Source: U.S. Census Bureau.

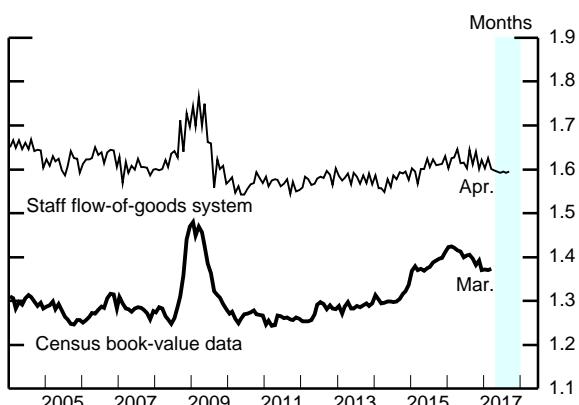
### Nonresidential Construction Put in Place



Note: Nominal CPIP deflated by BEA prices through 2016:Q4 and by the staff's estimated deflator thereafter.

Source: U.S. Census Bureau.

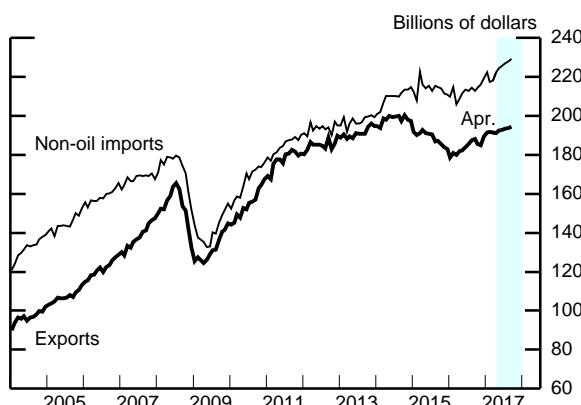
### Inventory Ratios



Note: Flow-of-goods system inventories include manufacturing and mining industries and are relative to consumption. Census data cover manufacturing and trade, and inventories are relative to sales.

Source: U.S. Census Bureau; staff calculations.

### Exports and Non-oil Imports

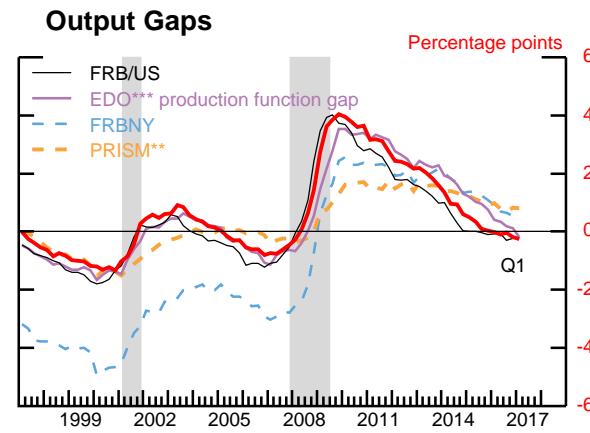


Note: Forecasts are linear interpolations of quarterly values.

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

**Alternative Measures of Slack**

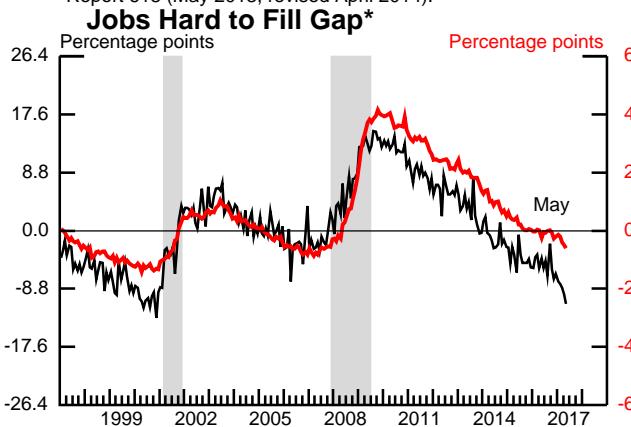
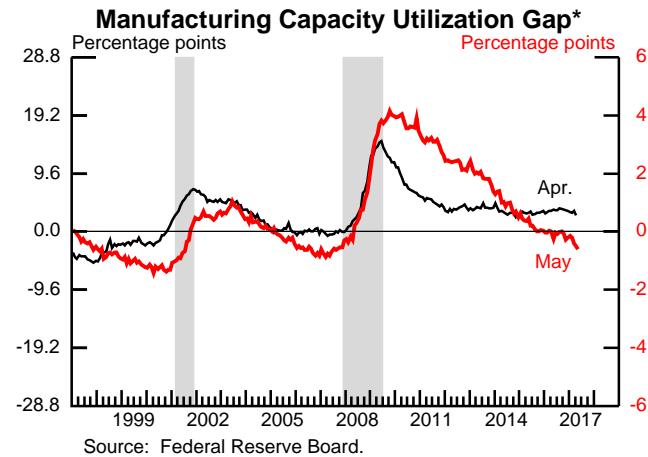
The red line in each panel is the staff's measure of the unemployment rate gap (right axis).



\*\* PRISM uses a flex-price output gap.

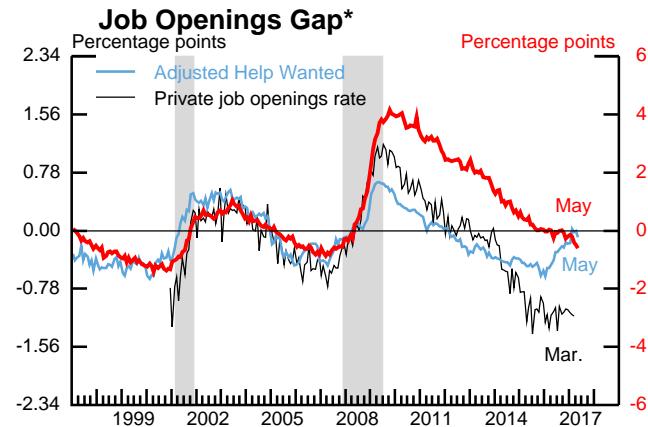
\*\*\* EDO is Estimated, Dynamic, Optimization-based model.

Source: Federal Reserve Board; PRISM: Federal Reserve Bank of Philadelphia, PRISM Model Documentation (June 2011); FRBNY: Federal Reserve Bank of New York Staff Report 618 (May 2013, revised April 2014).



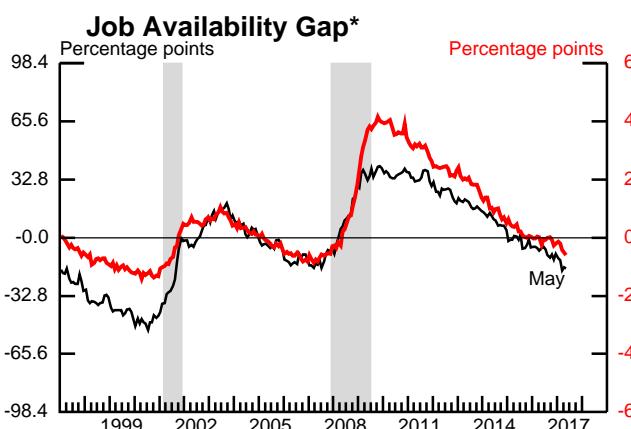
Note: Percent of small businesses surveyed with at least one "hard to fill" job opening. Seasonally adjusted by Federal Reserve Board Staff.

Source: National Federation of Independent Business, Small Business Economic Trends Survey.



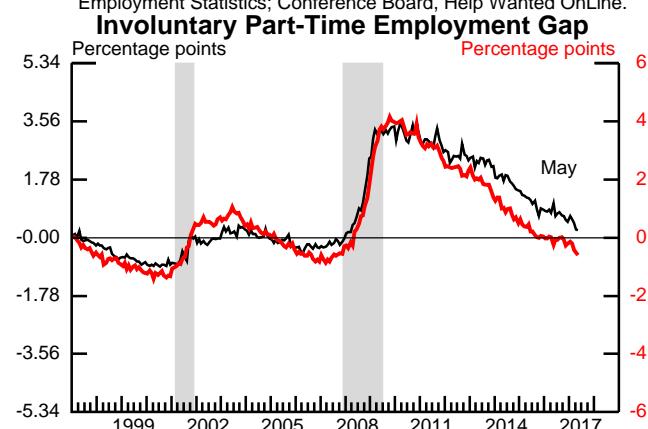
Note: Job openings rate is the number of job openings divided by employment plus job openings. Help Wanted adjusted following Cajner and Ratner (2016).

Source: Job Openings and Labor Turnover Survey; U.S. Department of Labor, Bureau of Labor Statistics, Current Employment Statistics; Conference Board, Help Wanted OnLine.



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

Source: Conference Board.



Note: Percent of employment.

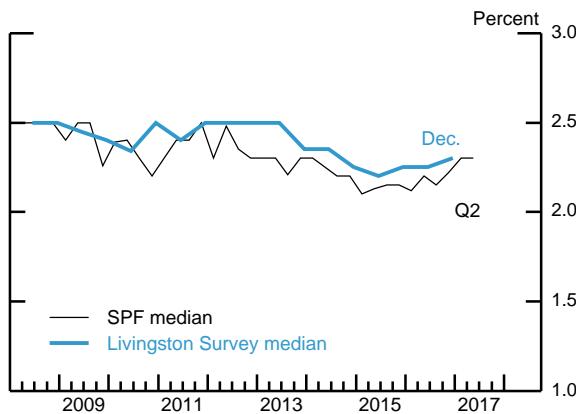
Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey.

\* Plots the negative of the gap to have the same sign as the unemployment rate gap.

Note: The shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research. Output gaps are multiplied by negative 0.54 to facilitate comparison with the unemployment rate gap. Manufacturing capacity utilization gap is constructed by subtracting its average rate from 1972 to 2013. Other gaps were constructed by subtracting each series' average in 2004:Q4 and 2005:Q1.

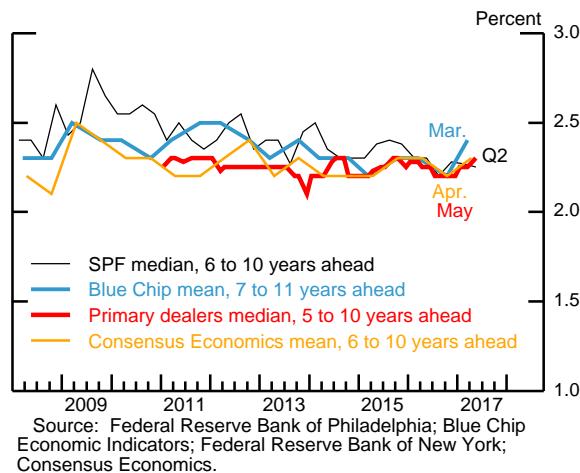
## Survey Measures of Longer-Term Inflation Expectations

CPI Next 10 Years

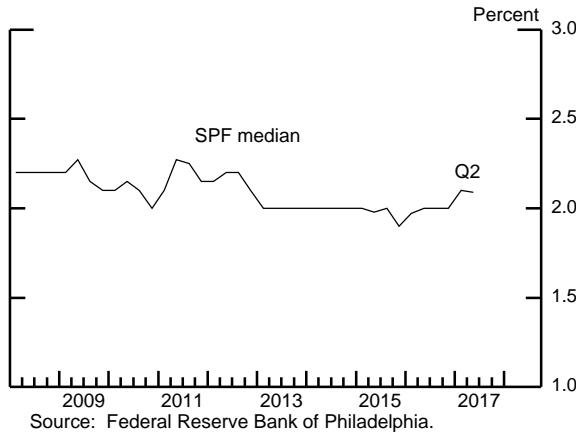


Note: SPF is Survey of Professional Forecasters.  
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations

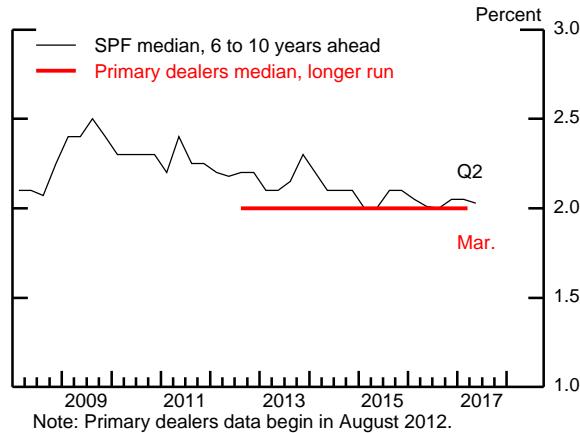


PCE Next 10 Years

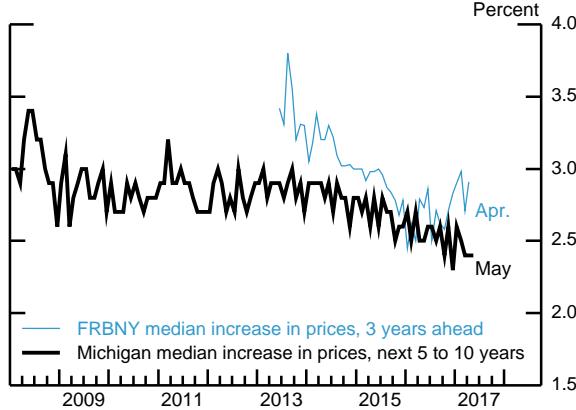


Source: Federal Reserve Bank of Philadelphia.

PCE Forward Expectations



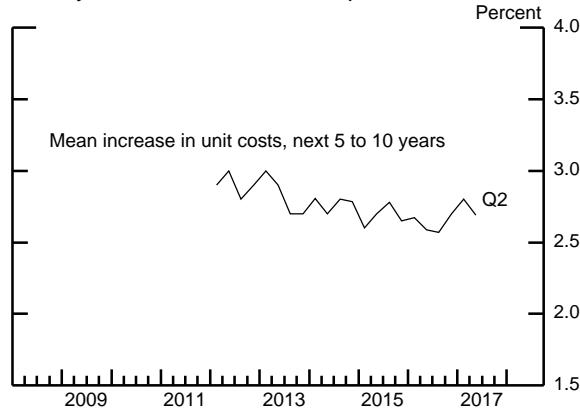
Surveys of Consumers



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

Source: University of Michigan Surveys of Consumers; Federal Reserve Bank of New York Survey of Consumer Expectations.

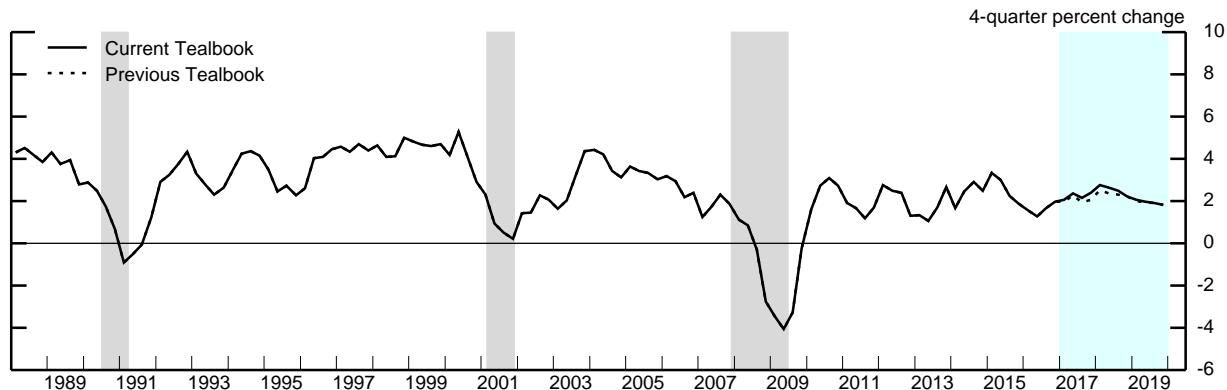
Survey of Business Inflation Expectations



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

Measure	2016	2017		2017	2018	2019
		H1	H2			
<b>Real GDP</b>						
Previous Tealbook	<b>2.0</b> 2.0	<b>1.9</b> 1.7	<b>2.9</b> 2.4	<b>2.4</b> 2.1	<b>2.2</b> 2.2	<b>1.8</b> 1.8
Final sales	2.0	2.2	2.8	2.5	2.3	1.9
Previous Tealbook	2.0	1.8	2.5	2.1	2.2	1.9
Personal consumption expenditures	3.1	1.8	2.9	2.4	2.9	2.5
Previous Tealbook	3.1	1.8	2.9	2.4	2.9	2.5
Residential investment	1.1	6.2	2.4	4.3	3.1	4.2
Previous Tealbook	1.1	4.8	3.3	4.1	2.7	4.4
Nonresidential structures	1.9	13.8	6.3	10.0	.7	-.7
Previous Tealbook	1.9	14.2	3.3	8.6	.2	-.6
Equipment and intangibles	-.6	4.7	5.2	5.0	3.6	1.7
Previous Tealbook	-.6	2.4	3.6	3.0	3.9	1.8
Federal purchases	-.2	-.8	2.1	.6	-.2	.2
Previous Tealbook	-.2	.2	2.0	1.1	.0	-.1
State and local purchases	.4	.0	1.5	.8	.8	.8
Previous Tealbook	.4	.3	1.6	.9	.8	.9
Exports	1.5	4.2	2.4	3.3	3.0	2.9
Previous Tealbook	1.5	3.3	1.8	2.6	2.6	2.9
Imports	2.6	3.7	4.1	3.9	4.5	4.2
Previous Tealbook	2.6	4.8	4.0	4.4	4.7	4.2
Contributions to change in real GDP (percentage points)						
Inventory change	.0	-.3	.1	-.1	-.1	-.1
Previous Tealbook	.0	-.1	-.1	-.1	.0	-.1
Net exports	-.2	.0	-.3	-.2	-.3	-.3
Previous Tealbook	-.2	-.3	-.4	-.3	-.4	-.3

### Real GDP

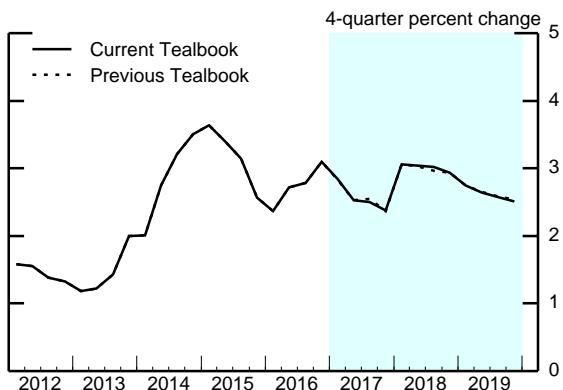


Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

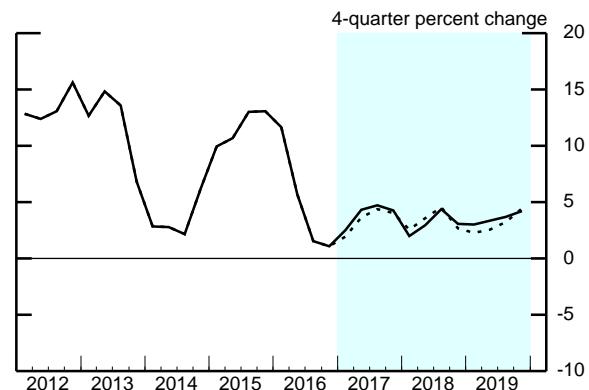
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

## Components of Final Demand

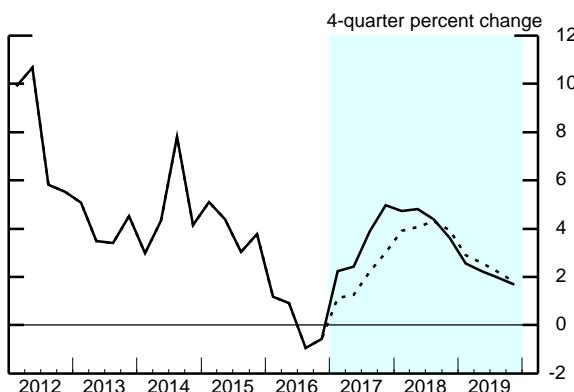
**Personal Consumption Expenditures**



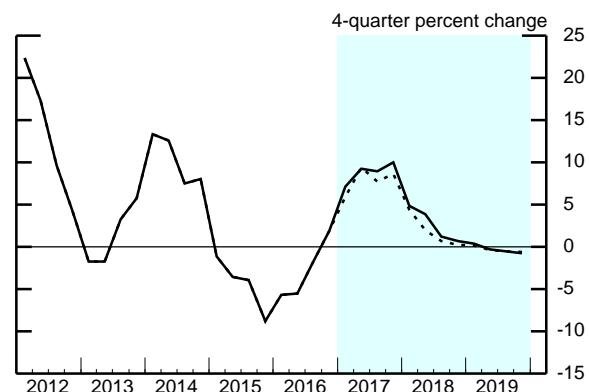
**Residential Investment**



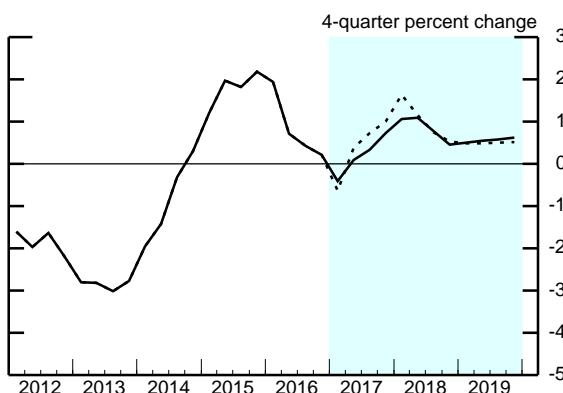
**Equipment and Intangibles**



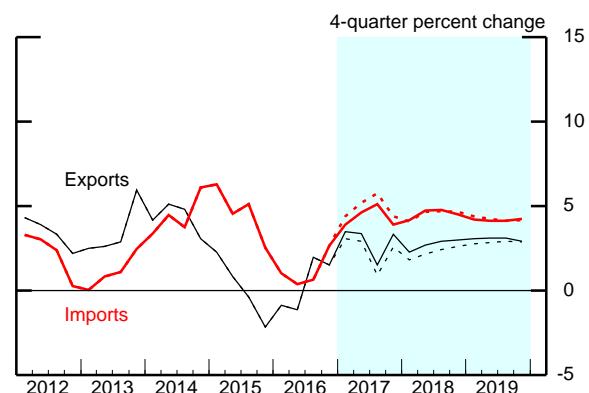
**Nonresidential Structures**



**Government Consumption and Investment**



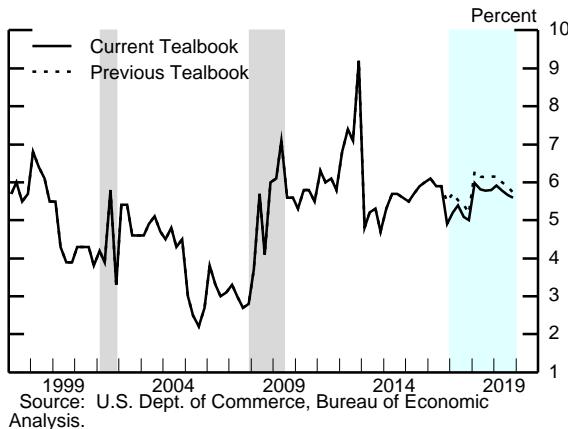
**Exports and Imports**



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

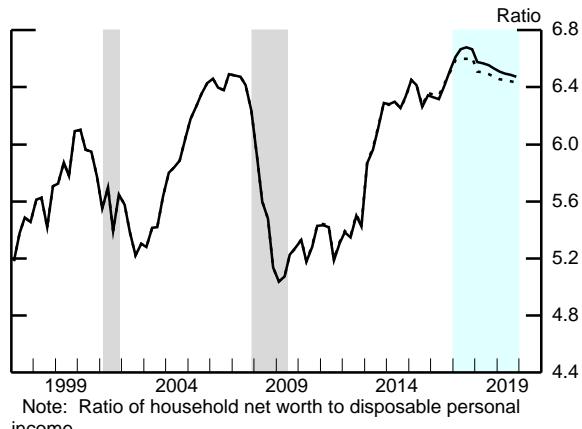
## Aspects of the Medium-Term Projection

**Personal Saving Rate**



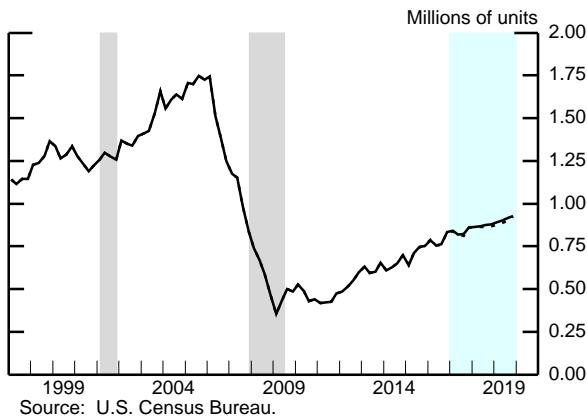
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

**Wealth-to-Income Ratio**



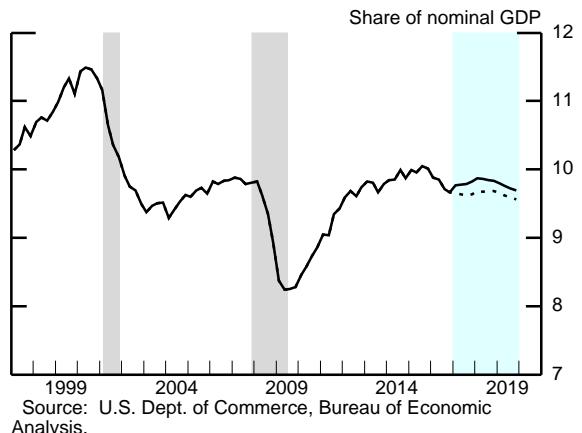
Note: Ratio of household net worth to disposable personal income.  
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

**Single-Family Housing Starts**



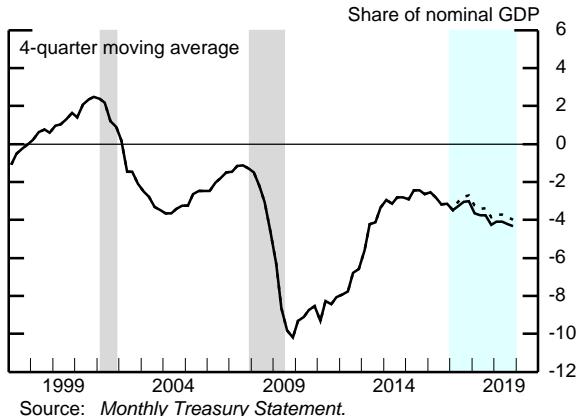
Source: U.S. Census Bureau.

**Equipment and Intangibles Spending**



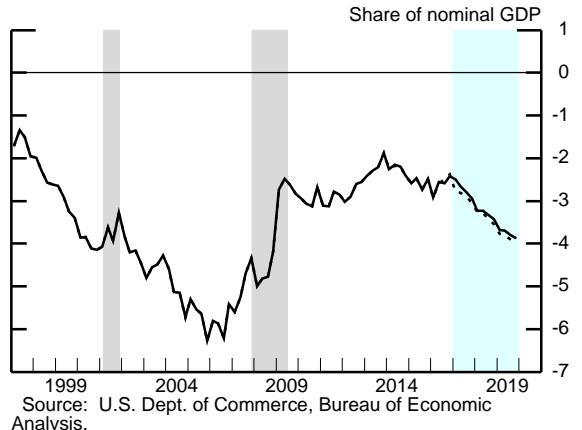
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

**Federal Surplus/Deficit**



Source: Monthly Treasury Statement.

**Current Account Surplus/Deficit**



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

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

### Decomposition of Potential GDP

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

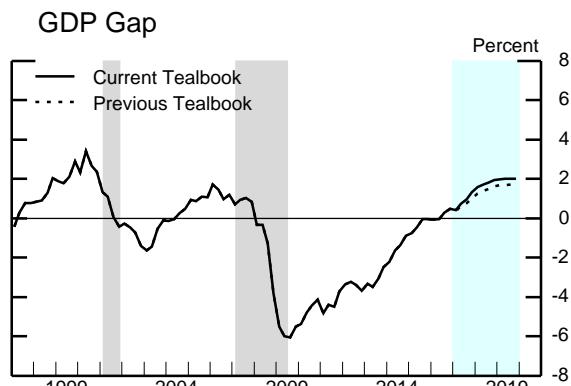
Measure	1974-95	1996-2000	2001-07	2008-10	2011-15	2016	2017	2018	2019
Potential real GDP	3.1	3.4	2.6	1.6	1.1	1.4	1.5	1.6	1.7
Previous Tealbook	3.1	3.4	2.6	1.6	1.1	1.4	1.5	1.6	1.7
<i>Selected contributions<sup>1</sup></i>									
Structural labor productivity <sup>2</sup>	1.6	2.9	2.8	1.4	.8	.9	1.1	1.2	1.3
Previous Tealbook	1.6	2.9	2.8	1.4	.8	.9	1.1	1.1	1.2
Capital deepening	.6	1.5	1.0	.3	.5	.5	.5	.5	.5
Multifactor productivity	.6	1.0	1.5	.9	.0	.2	.4	.5	.6
Structural hours	1.6	1.2	.8	.0	.6	.7	.1	.4	.4
Previous Tealbook	1.6	1.2	.8	.0	.6	.7	.1	.4	.4
Labor force participation	.4	-.1	-.2	-.5	-.6	-.4	-.4	-.4	-.4
Previous Tealbook	.4	-.1	-.2	-.5	-.6	-.4	-.4	-.4	-.4
Memo:									
GDP gap <sup>3</sup>	-1.9	2.4	.8	-4.2	.0	.5	1.3	1.9	2.0
Previous Tealbook	-1.9	2.4	.8	-4.2	.0	.5	1.0	1.6	1.8

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.

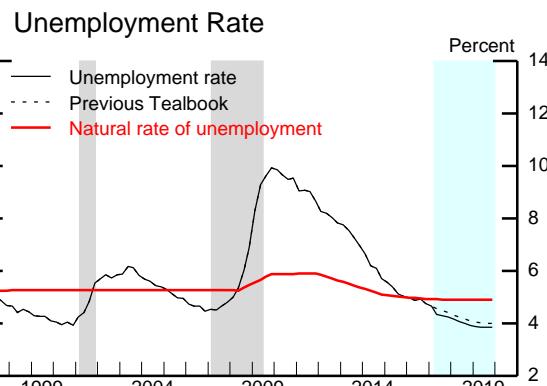
2. Total business sector.

3. Percent difference between actual and potential GDP in the final quarter of the period indicated. A negative number indicates that the economy is operating below potential.

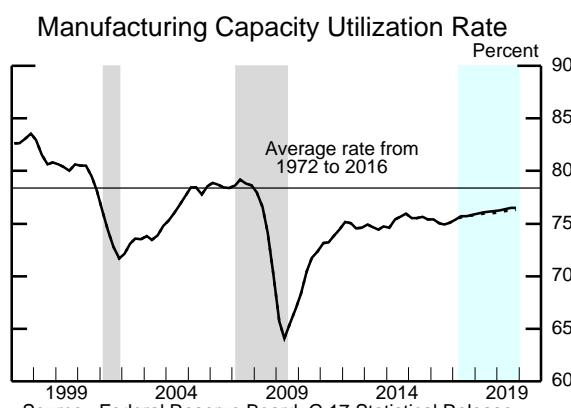


Note: The GDP gap is the percent difference between actual and potential GDP; a negative number indicates that the economy is operating below potential.

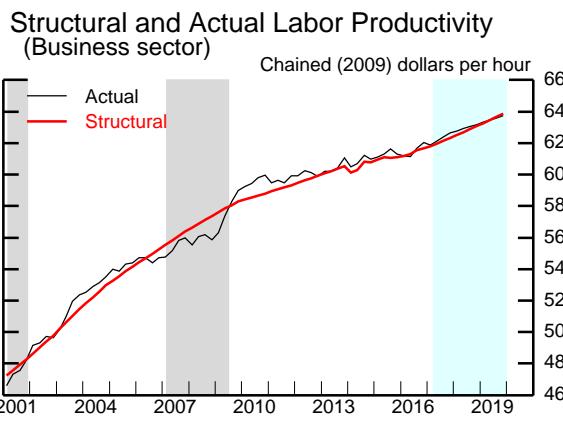
Source: U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.



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



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



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.

**The Outlook for the Labor Market**

Measure	2016	2017		2017	2018	2019
		H1	H2			
Output per hour, business <sup>1</sup> Previous Tealbook	1.2 1.3	.2 .1	1.8 1.5	1.0 .8	.9 .9	.9 .9
Nonfarm payroll employment <sup>2</sup> Previous Tealbook	187 187	163 179	169 174	166 176	167 169	122 122
Private employment <sup>2</sup> Previous Tealbook	170 170	161 172	160 165	160 168	158 160	113 113
Labor force participation rate <sup>3</sup> Previous Tealbook	62.7 62.7	62.8 62.8	62.7 62.7	62.7 62.7	62.5 62.5	62.3 62.3
Civilian unemployment rate <sup>3</sup> Previous Tealbook	4.7 4.7	4.3 4.5	4.2 4.4	4.2 4.4	3.9 4.1	3.8 4.0

1. Percent change from final quarter of preceding period at annual rate.

2. Thousands, average monthly changes.

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

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

**Inflation Projections**

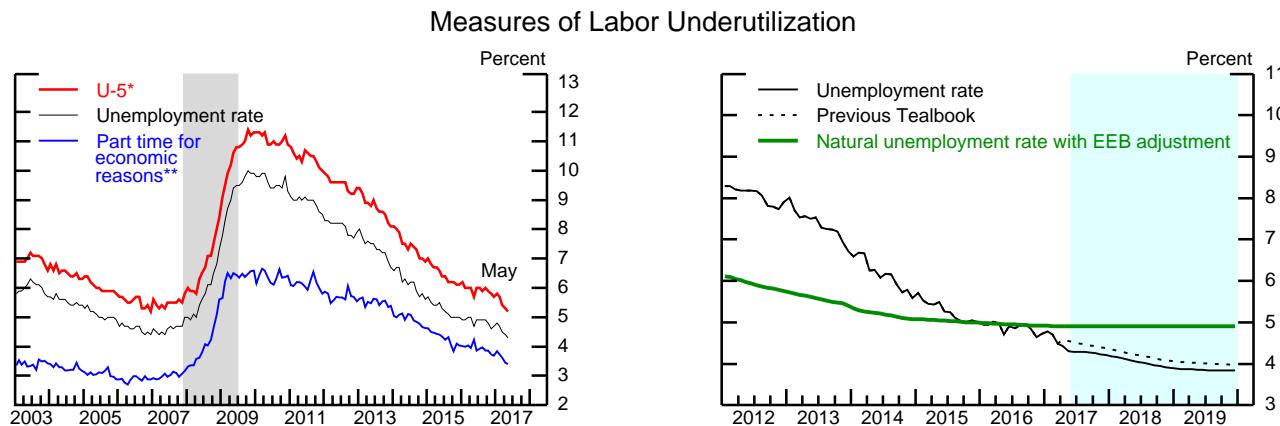
Measure	2016	2017		2017	2018	2019
		H1	H2			
<i>Percent change at annual rate from final quarter of preceding period</i>						
PCE chain-weighted price index Previous Tealbook	1.4 1.4	1.4 1.8	1.7 1.6	1.6 1.7	1.9 1.8	2.0 1.9
Food and beverages Previous Tealbook	-1.7 -1.7	1.4 1.3	1.8 2.0	1.6 1.7	2.1 2.1	2.2 2.2
Energy Previous Tealbook	.8 .8	-1.6 2.6	.8 .2	-.4 1.4	1.1 .3	.9 .7
Excluding food and energy Previous Tealbook	1.7 1.7	1.6 1.8	1.7 1.6	1.6 1.7	1.9 1.9	2.0 2.0
Prices of core goods imports <sup>1</sup> Previous Tealbook	.0 .0	1.4 1.4	1.6 1.3	1.5 1.3	.6 .7	.6 .7
	Mar. 2017	Apr. 2017	May 2017 <sup>2</sup>	June 2017 <sup>2</sup>	July 2017 <sup>2</sup>	Aug. 2017 <sup>2</sup>
<i>12-month percent change</i>						
PCE chain-weighted price index Previous Tealbook	1.9 1.9	1.7 1.7	1.5 1.8	1.5 1.8	1.6 1.9	1.6 1.8
Excluding food and energy Previous Tealbook	1.6 1.6	1.5 1.6	1.5 1.6	1.6 1.7	1.6 1.7	1.5 1.6

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)

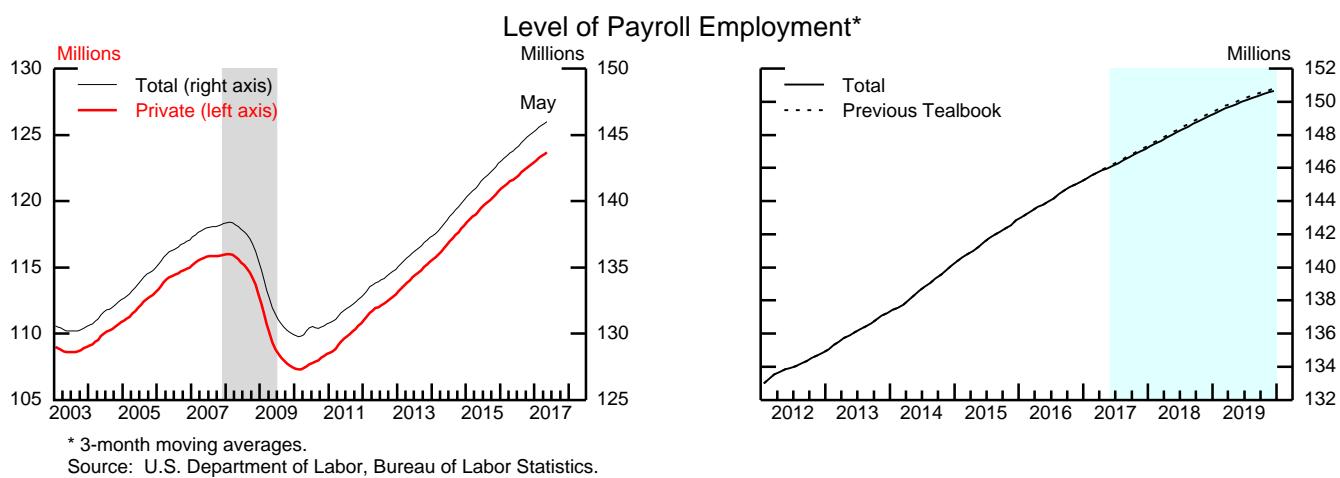


\* U-5 measures total unemployed persons plus all marginally attached to the labor force, as a percent of the labor force plus persons marginally attached to the labor force.

\*\* Percent of Current Population Survey employment.

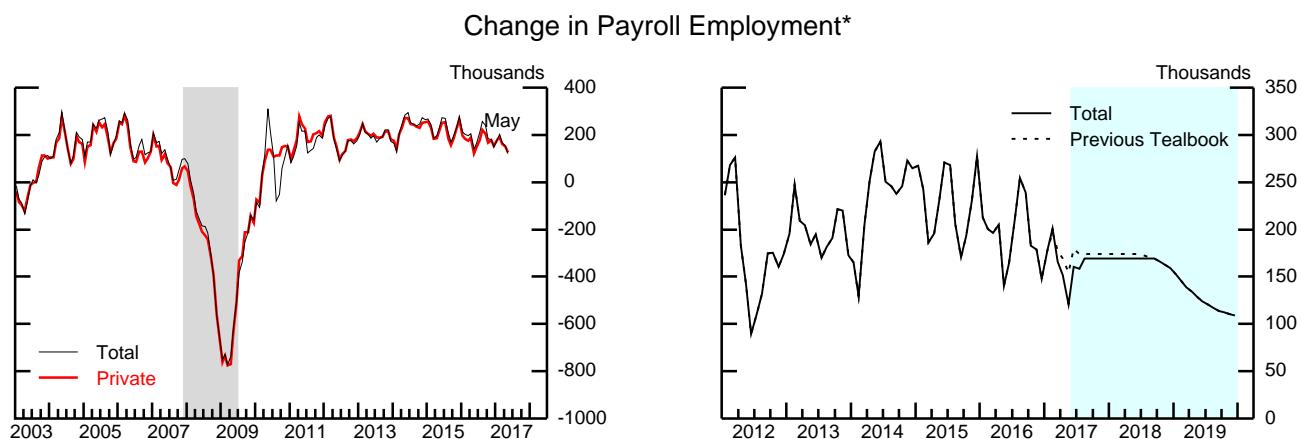
EEB Extended and emergency unemployment benefits.

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



\* 3-month moving averages.

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



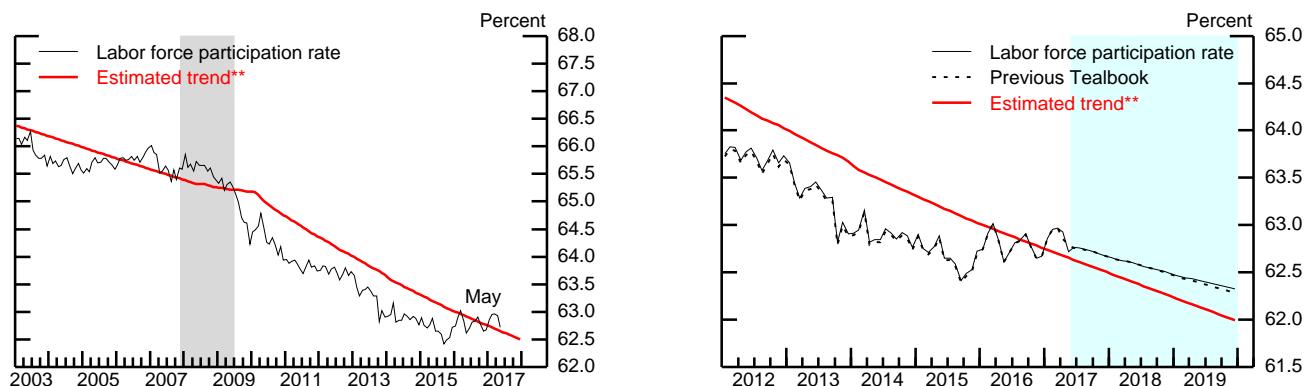
\* 3-month moving averages.

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\*

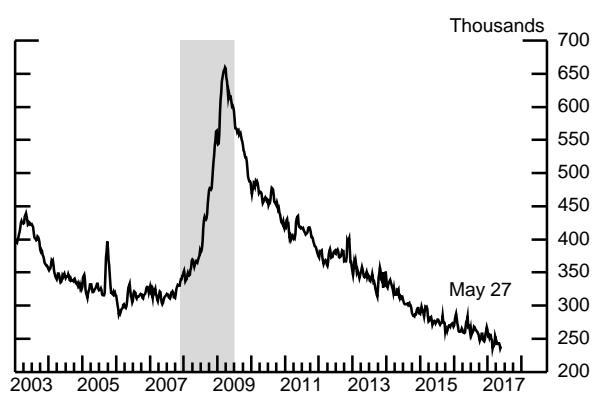


\* Published data adjusted by staff to account for changes in population weights.

\*\* Includes staff estimate of the effect of extended and emergency unemployment benefits.

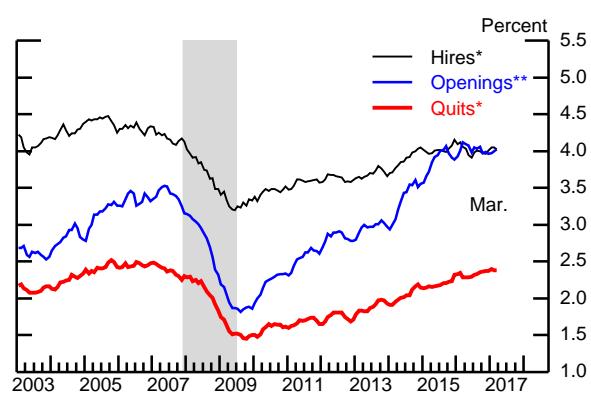
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

### Initial Unemployment Insurance Claims\*



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

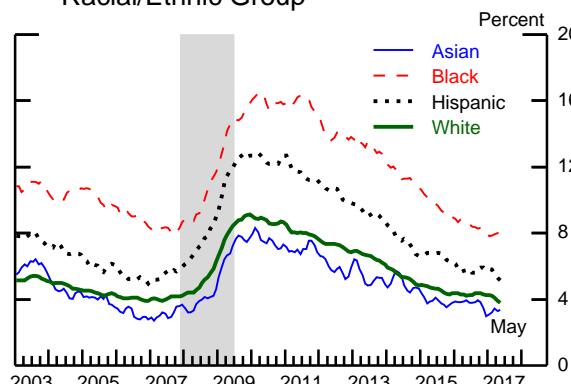
### Hires, Quits, and Job Openings



\* 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.

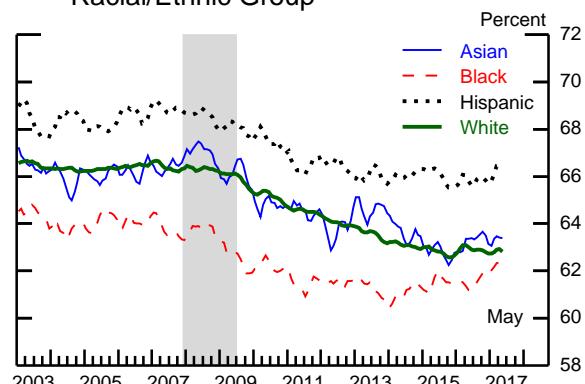
### Unemployment Rate by Racial/Ethnic Group



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



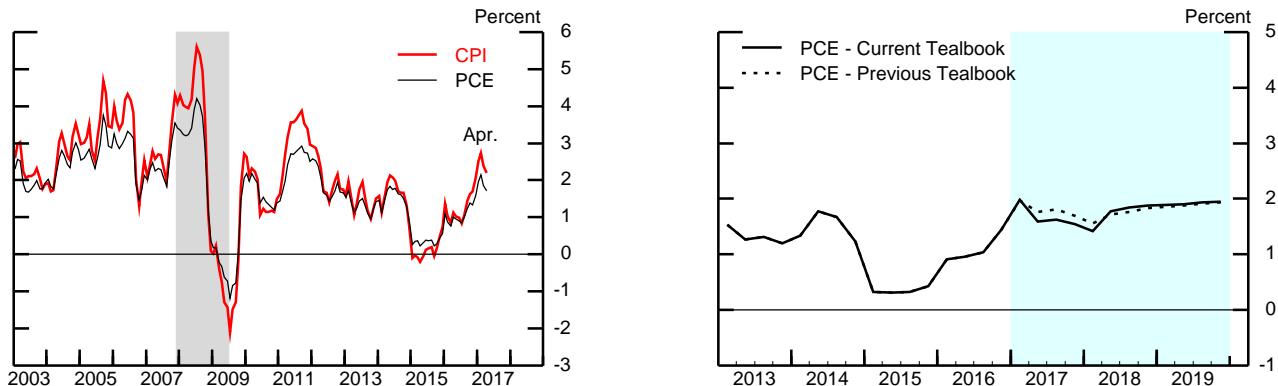
Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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

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

## Inflation Developments and Outlook (1)

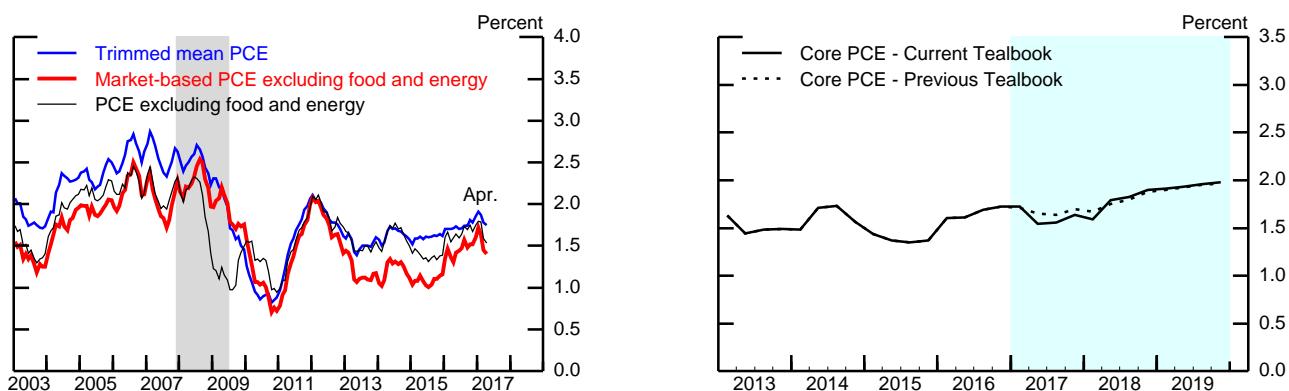
(Percent change from year-earlier period)

### Headline Consumer Price Inflation



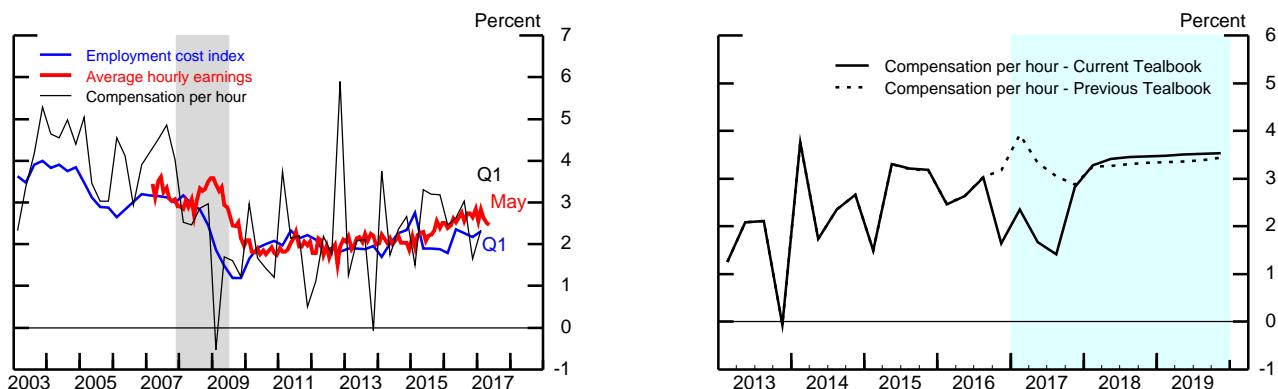
Source: For CPI, U.S. Department of Labor, Bureau of Labor Statistics; for PCE, U.S. Department of Commerce, Bureau of Economic Analysis.

### Measures of Underlying PCE Price Inflation



Source: For trimmed mean PCE, Federal Reserve Bank of Dallas; otherwise, U.S. Department of Commerce, Bureau of Economic Analysis.

### Labor Cost Growth



Note: Compensation per hour is for the business sector. Average hourly earnings are for the private nonfarm sector. The employment cost index is for the private sector.

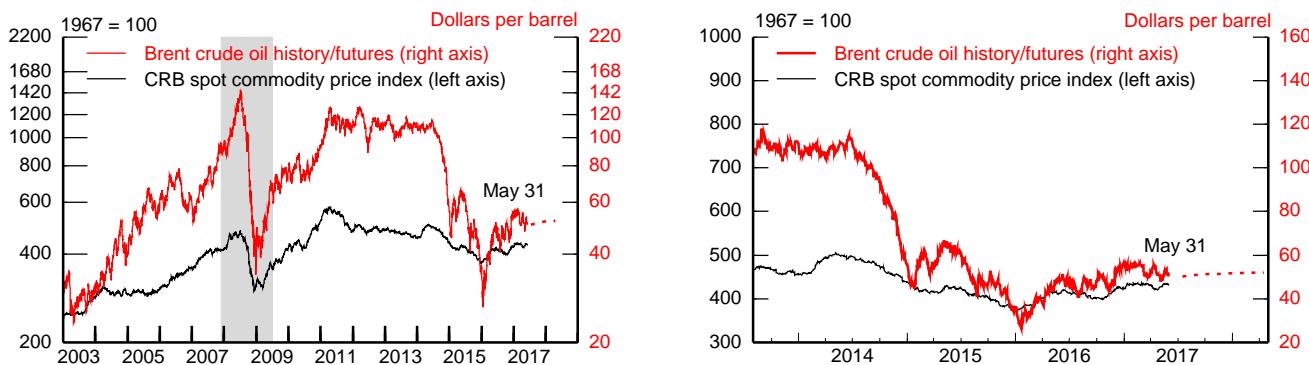
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

## Inflation Developments and Outlook (2)

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

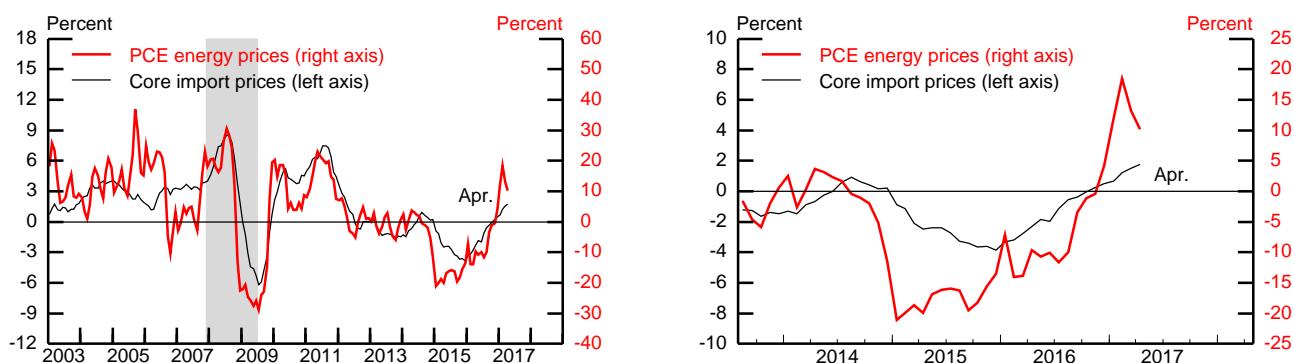
### Commodity and Oil Price Levels



Note: Futures prices (dotted lines) are the latest observations on monthly futures contracts.

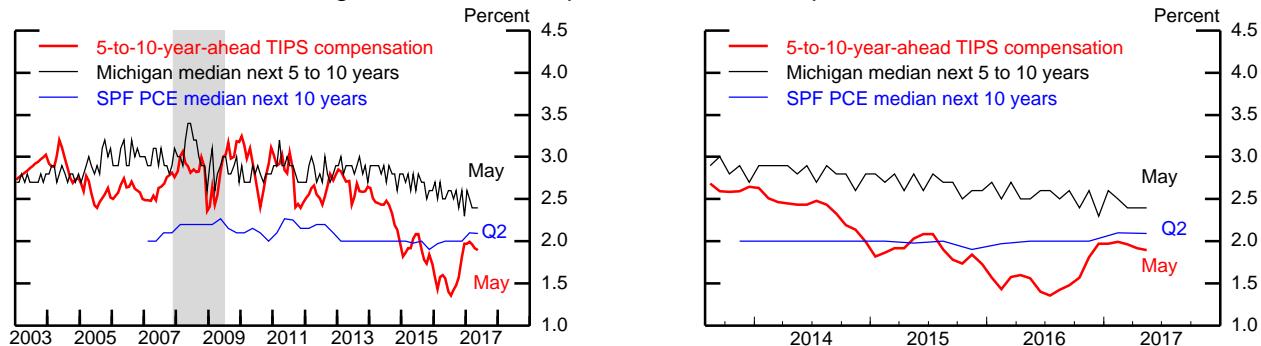
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

### Energy and Import Price Inflation



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

### Long-Term Inflation Expectations and Compensation



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

SPF Survey of Professional Forecasters.

Source: For Michigan, University of Michigan Surveys of Consumers; for SPF, the Federal Reserve Bank of Philadelphia; for TIPS, Federal Reserve Board staff calculations.

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

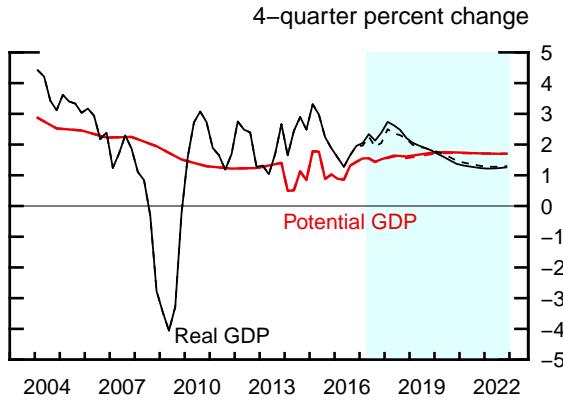
**The Long-Term Outlook**

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

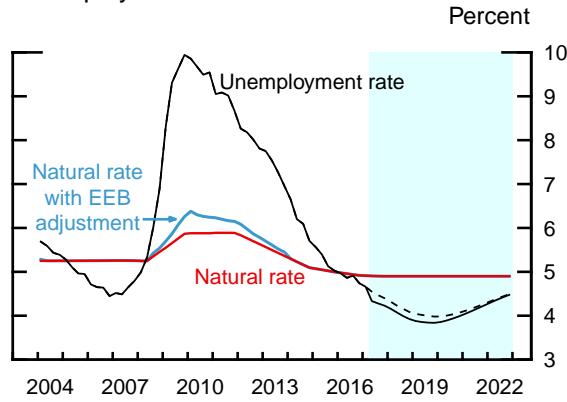
Measure	2017	2018	2019	2020	2021	2022	Longer run
Real GDP Previous Tealbook	2.4 2.1	2.2 2.2	1.8 1.8	1.4 1.5	1.2 1.3	1.3 1.3	1.7 1.7
Civilian unemployment rate <sup>1</sup> Previous Tealbook	4.2 4.4	3.9 4.1	3.8 4.0	4.0 4.1	4.2 4.3	4.5 4.5	4.9 4.9
PCE prices, total Previous Tealbook	1.6 1.7	1.9 1.8	2.0 1.9	2.1 2.1	2.1 2.1	2.1 2.1	2.0 2.0
Core PCE prices Previous Tealbook	1.6 1.7	1.9 1.9	2.0 2.0	2.1 2.0	2.1 2.1	2.1 2.1	2.0 2.0
Federal funds rate <sup>1</sup> Previous Tealbook	1.48 1.47	2.70 2.55	3.67 3.46	4.17 3.97	4.25 4.10	4.09 3.99	3.00 3.00
10-year Treasury yield <sup>1</sup> Previous Tealbook	2.9 2.9	3.6 3.5	4.0 3.9	4.0 3.9	3.9 3.9	3.8 3.8	3.5 3.5

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

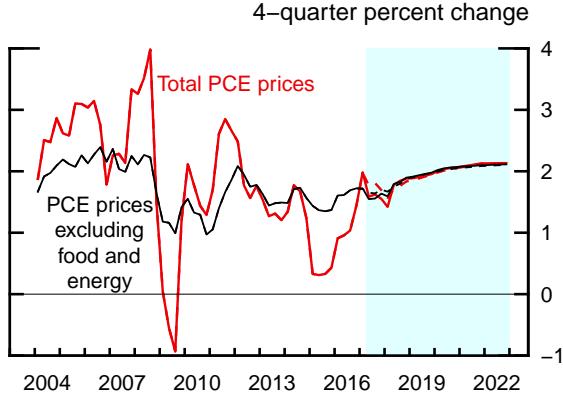
Real GDP



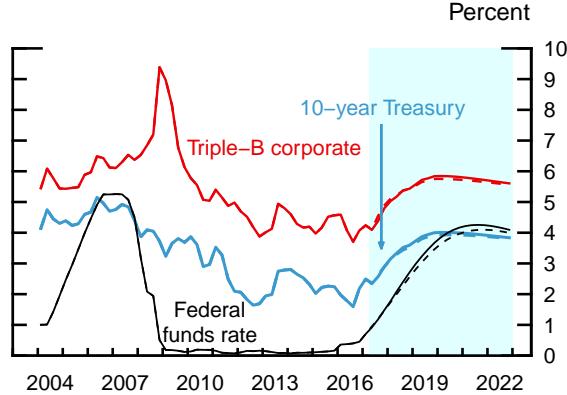
Unemployment Rate



PCE Prices



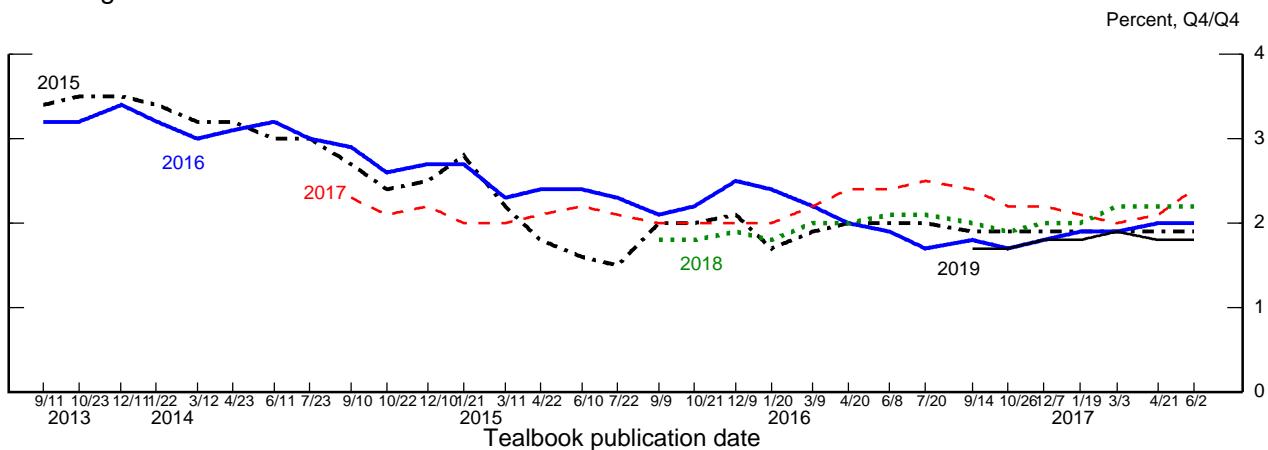
Interest Rates



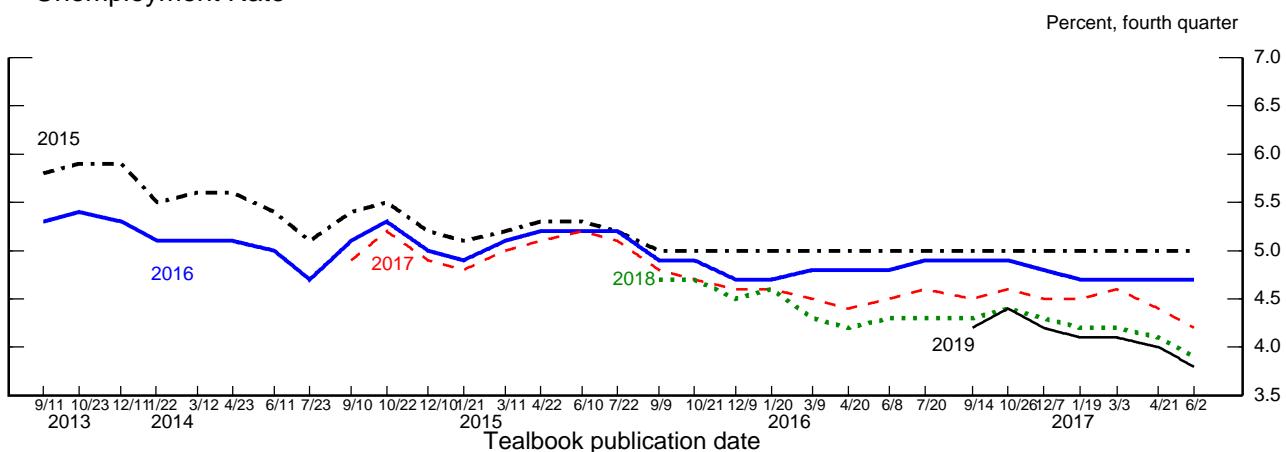
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

## Evolution of the Staff Forecast

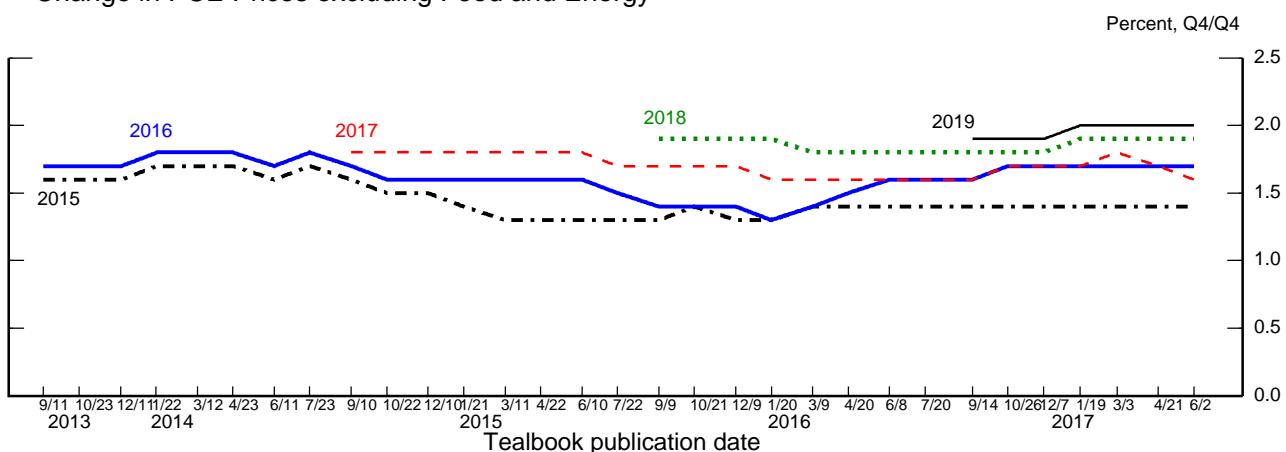
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



## The Foreign GDP Outlook

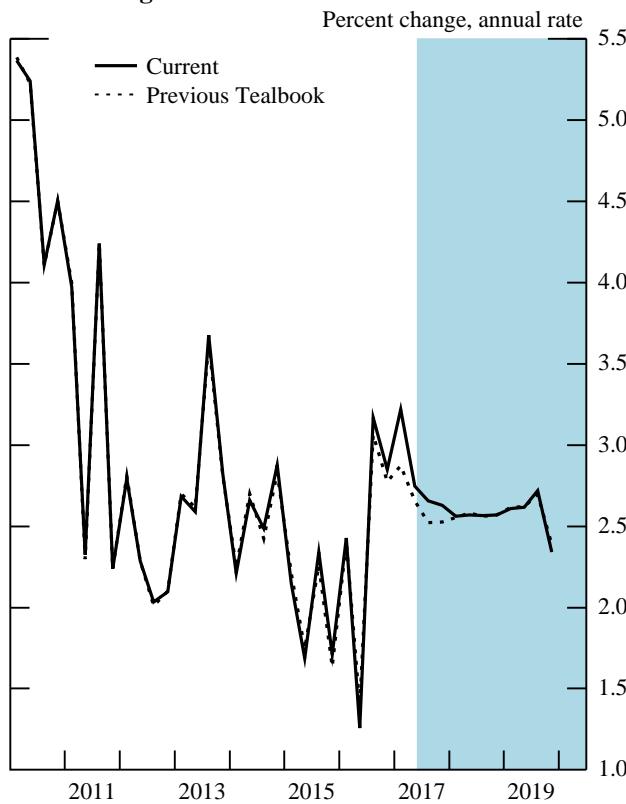
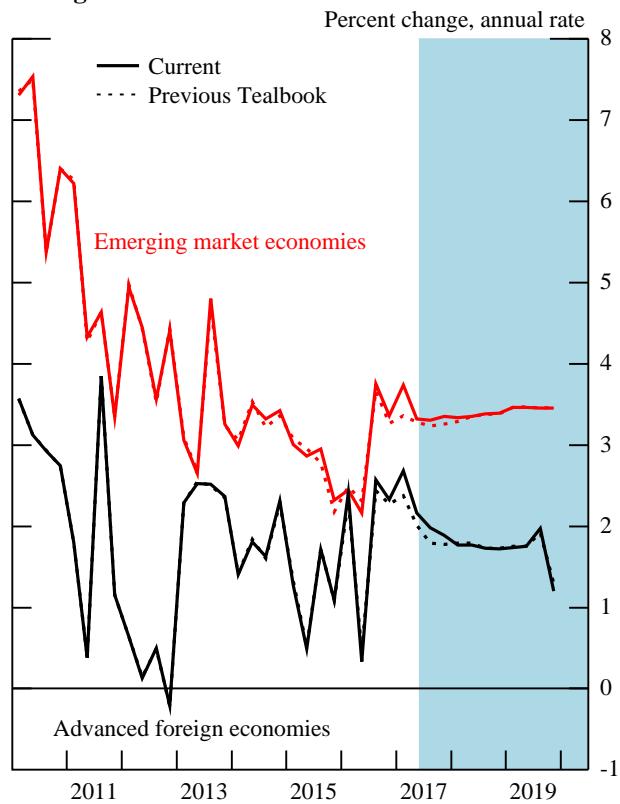
Real GDP\*

Percent change, annual rate

	2016			2017			2018	2019
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	1.8	3.2	2.8	3.2	2.7	2.6	2.6	2.6
Previous Tealbook	1.9	3.1	2.8	2.9	2.7	2.5	2.6	2.6
2. Advanced Foreign Economies	1.4	2.6	2.3	2.7	2.2	1.9	1.7	1.7
Previous Tealbook	1.4	2.4	2.3	2.4	2.0	1.8	1.8	1.7
3. Canada	.7	4.2	2.7	3.7	2.4	2.1	1.8	1.8
4. Euro Area	1.8	1.7	1.9	2.0	2.2	1.9	1.8	1.8
5. Japan	2.1	1.0	1.4	2.2	1.7	1.2	.8	.0
6. United Kingdom	1.5	2.0	2.7	.7	1.6	1.7	1.6	1.6
7. Emerging Market Economies	2.3	3.8	3.4	3.7	3.3	3.3	3.4	3.5
Previous Tealbook	2.4	3.7	3.3	3.4	3.3	3.2	3.4	3.5
8. China	6.8	6.8	6.6	7.3	6.5	6.2	5.8	5.7
9. Emerging Asia ex. China	3.7	3.3	3.5	4.4	4.0	3.8	3.6	3.5
10. Mexico	1.0	4.4	2.9	2.7	2.1	2.3	2.4	2.6
11. Brazil	-2.6	-2.3	-2.2	4.3	.7	1.9	2.1	2.2

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

Int'l Econ Devel &amp; Outlook

**Total Foreign GDP****Foreign GDP**

## The Foreign Inflation Outlook

Consumer Prices\*

Percent change, annual rate

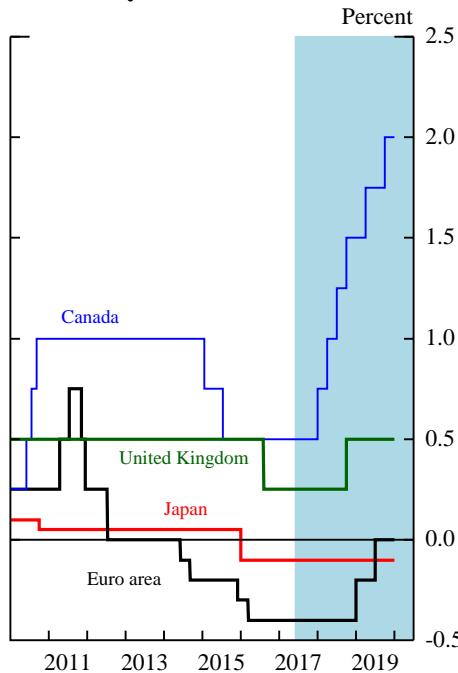
	2016			2017			2018	2019
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign Previous Tealbook	1.7	1.7	2.6	3.0	2.4	2.4	2.4	2.6
	1.7	1.6	2.6	3.0	2.4	2.4	2.4	2.6
2. Advanced Foreign Economies Previous Tealbook	.4	.9	1.8	2.3	1.1	1.3	1.5	1.9
	.4	.9	1.8	2.5	1.4	1.4	1.6	1.9
3. Canada	1.4	1.0	1.7	2.6	1.8	1.7	1.9	2.0
4. Euro Area	-.0	1.2	1.9	2.9	.6	1.0	1.4	1.6
5. Japan	-.3	-.5	2.4	-.1	.3	.5	.8	2.5
6. United Kingdom	.4	2.1	1.9	3.9	3.1	2.3	2.1	2.1
7. Emerging Market Economies Previous Tealbook	2.7	2.2	3.1	3.4	3.4	3.2	3.1	3.1
	2.7	2.2	3.1	3.4	3.0	3.2	3.1	3.1
8. China	2.4	1.3	2.6	-.6	2.6	2.6	2.5	2.5
9. Emerging Asia ex. China	1.7	1.1	2.7	3.6	1.6	2.9	3.2	3.4
10. Mexico	2.6	3.6	4.1	9.9	6.0	3.5	3.2	3.2
11. Brazil	9.6	6.5	2.6	3.2	3.1	4.9	4.4	4.5

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

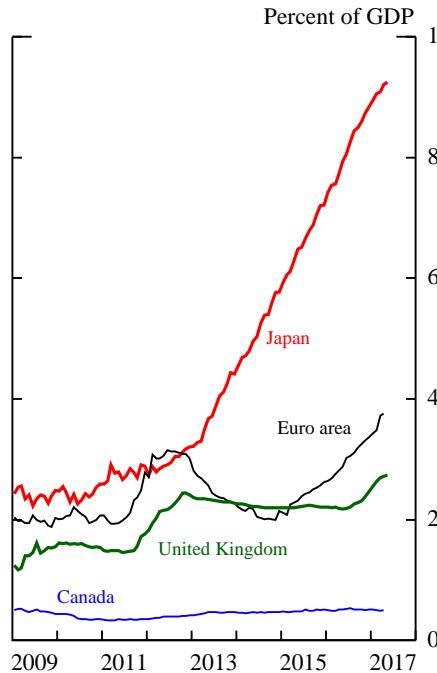
Int'l Econ Devel &amp; Outlook

## Foreign Monetary Policy

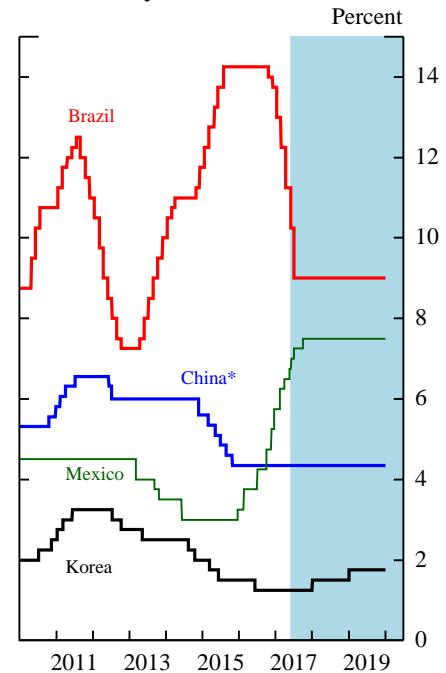
### AFE Policy Rates



### AFE Central Bank Balance Sheets

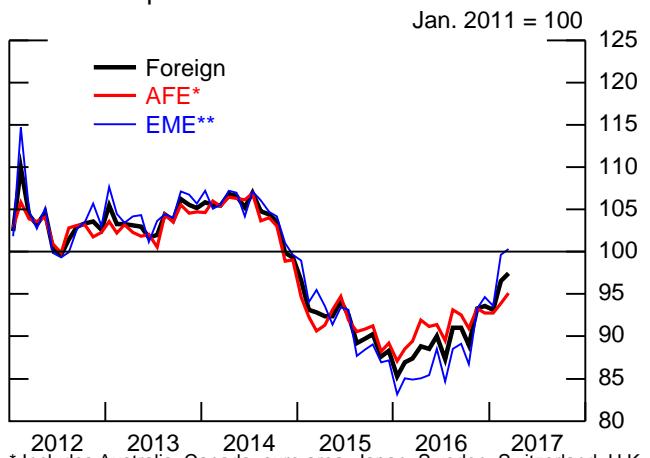
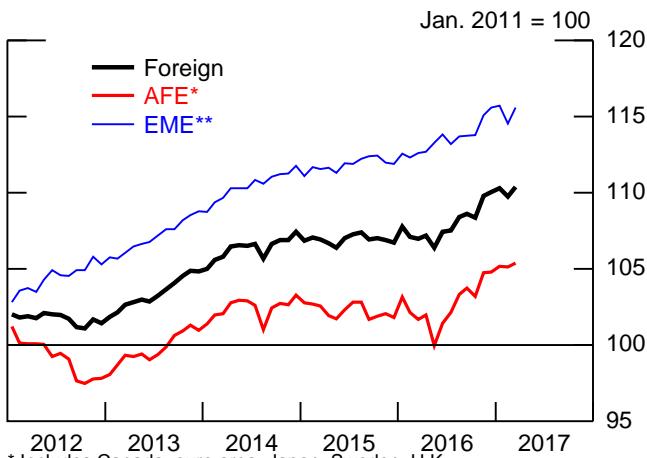
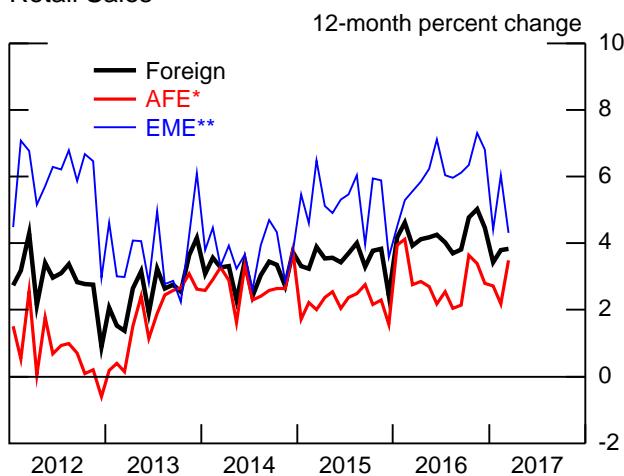
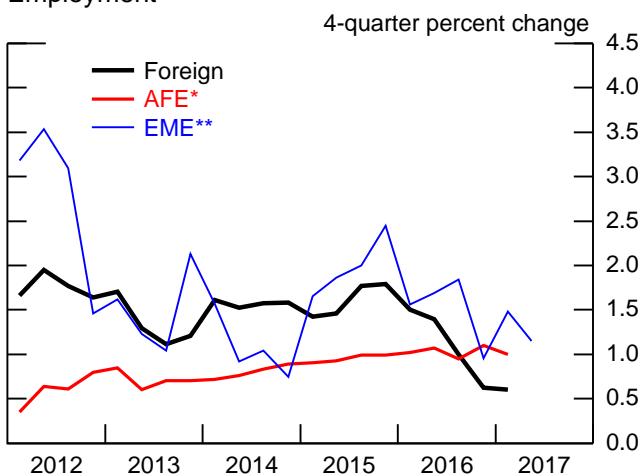
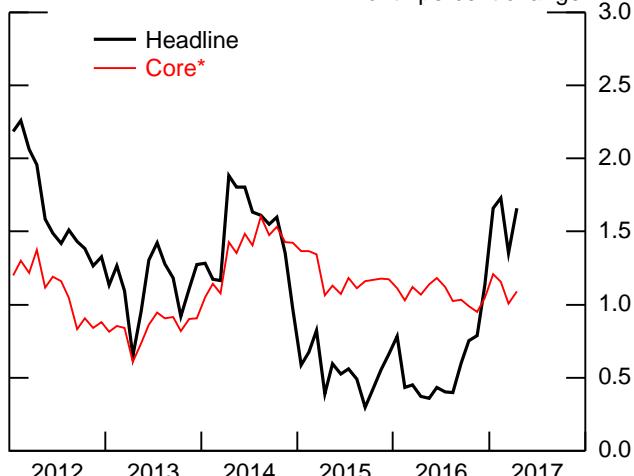
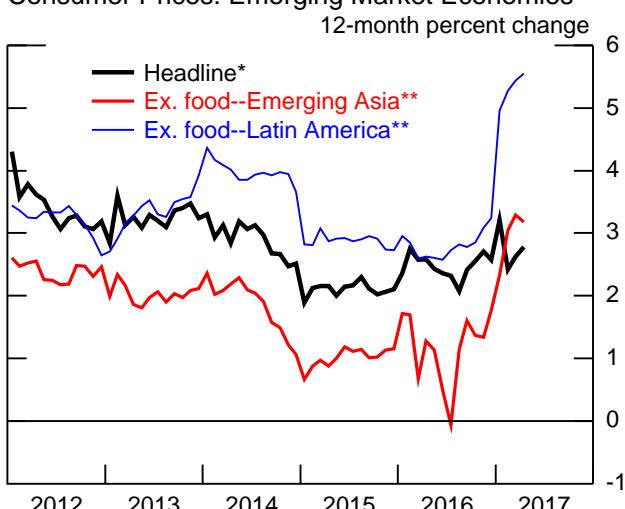


### EME Policy Rates



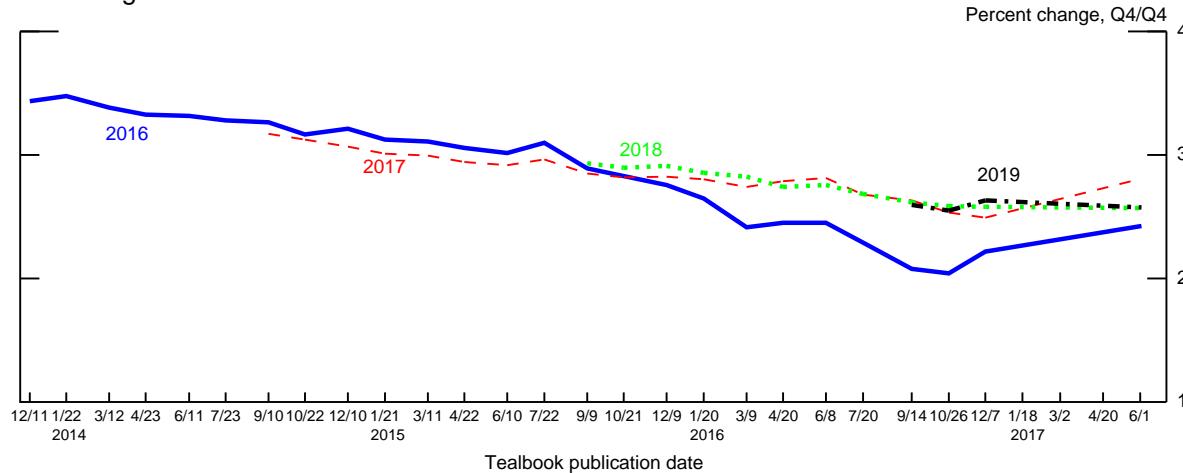
## Recent Foreign Indicators

Int'l Econ Devel &amp; Outlook

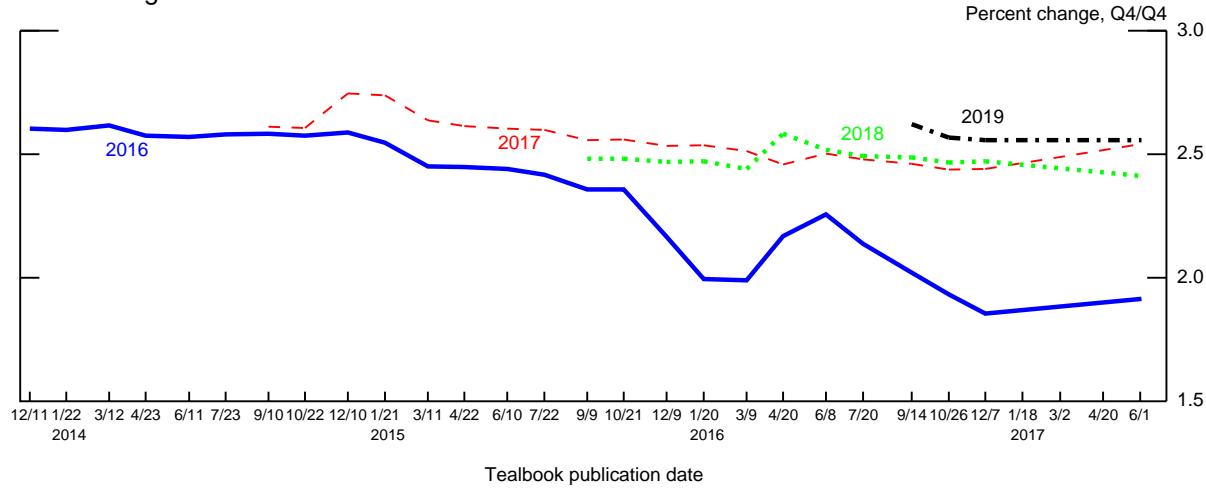
**Nominal Exports****Industrial Production****Retail Sales****Employment****Consumer Prices: Advanced Foreign Economies****Consumer Prices: Emerging Market Economies**

## Evolution of Staff's International Forecast

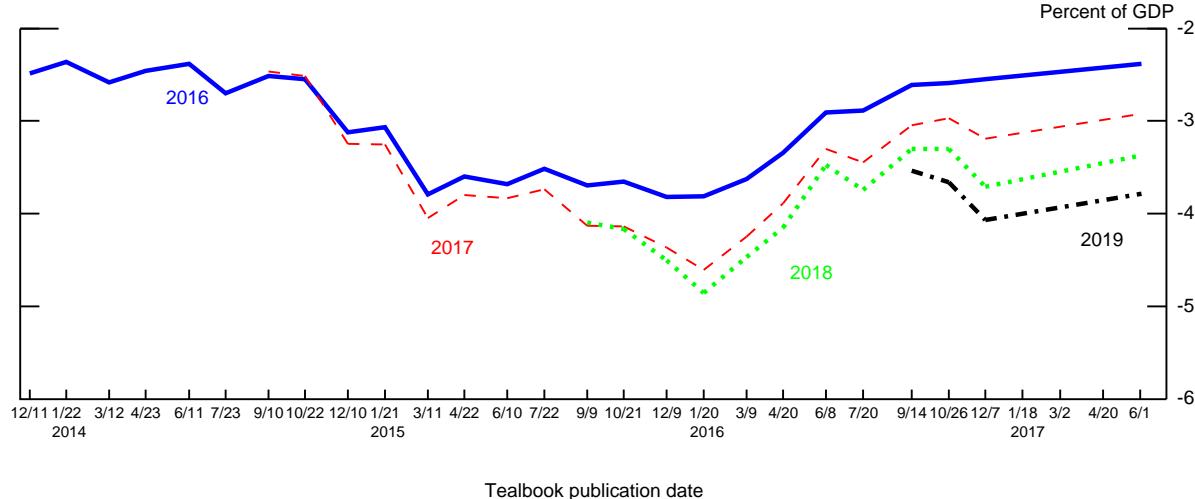
Total Foreign GDP



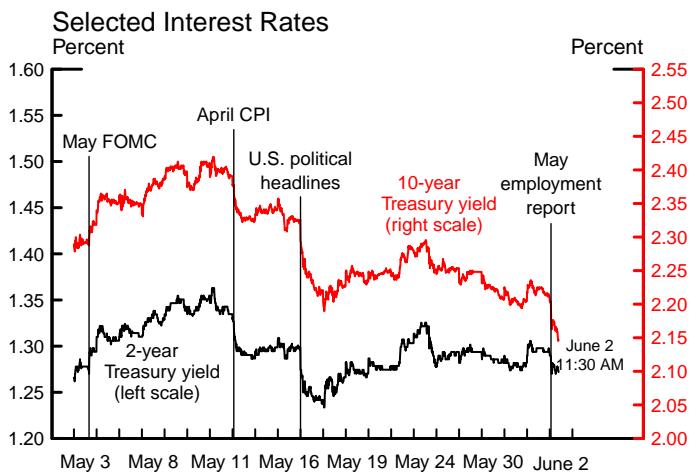
Total Foreign CPI



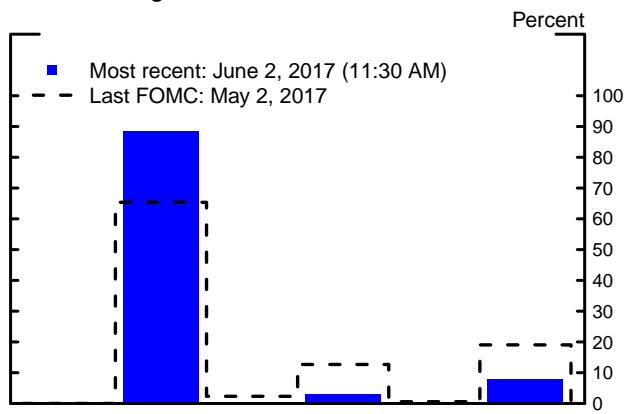
U.S. Current Account Balance



Int'l Econ Devel &amp; Outlook

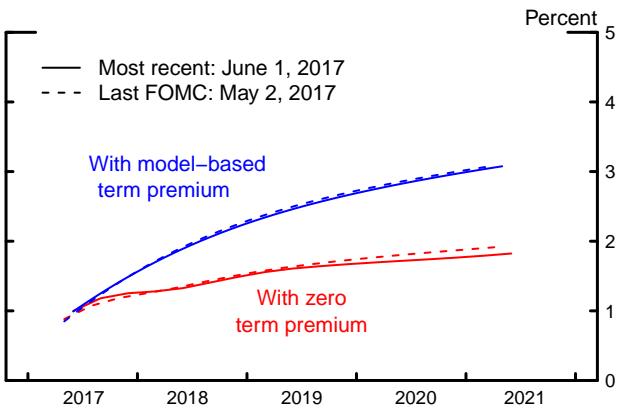
**Policy Expectations and Treasury Yields**

Note: 5-minute intervals, 8:00 a.m. to 4:00 p.m. Data shown are for 2017.  
Source: Bloomberg.

**Market-Implied Probability Distribution of the Timing of Next Rate Increase**

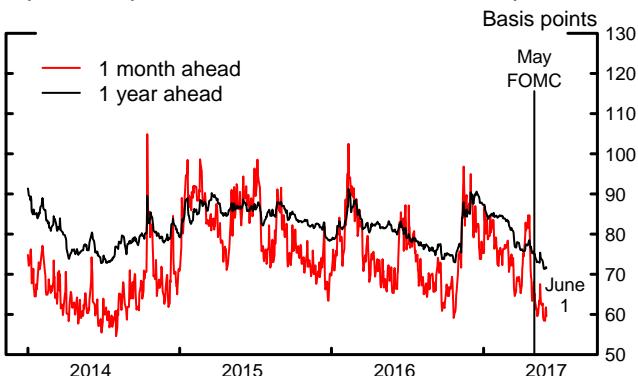
Note: Probabilities implied by a binomial tree fitted to settlement prices on fed funds futures contracts, assuming the next policy action is either no change or a 25 basis point increase in rates and no intervening moves. The effective federal funds rate until the next FOMC meeting is assumed to be equal to the observed rate on the previous non-month-end business day.

Source: Bloomberg; Federal Reserve Board staff estimates.

**Implied Federal Funds Rate**

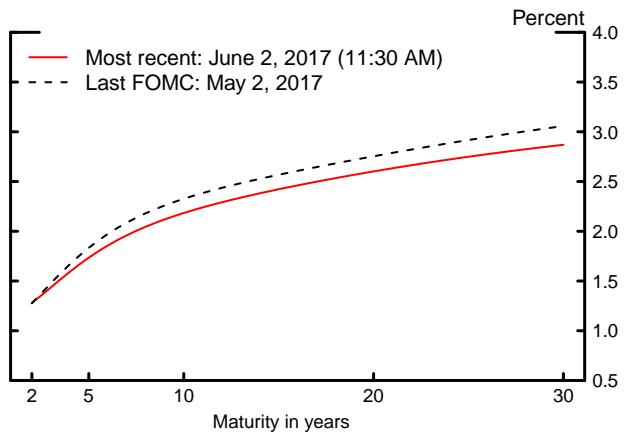
Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points. Model-based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premium.

Source: Bloomberg; Federal Reserve Board staff estimates.

**Option-Implied Volatilities on 10-Year Swap Rate**

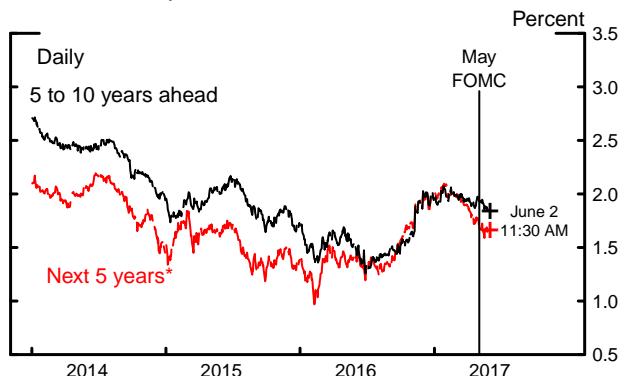
Note: Implied volatility on the 10-year swap rate one month and one year ahead is derived from swaptions.

Source: Barclays; Federal Reserve Board staff estimates.

**Treasury Yield Curve**

Note: Smoothed yield curve estimated from off-the-run Treasury coupon securities. Yields shown are those on notional par Treasury securities with semiannual coupons.

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

**Inflation Compensation**

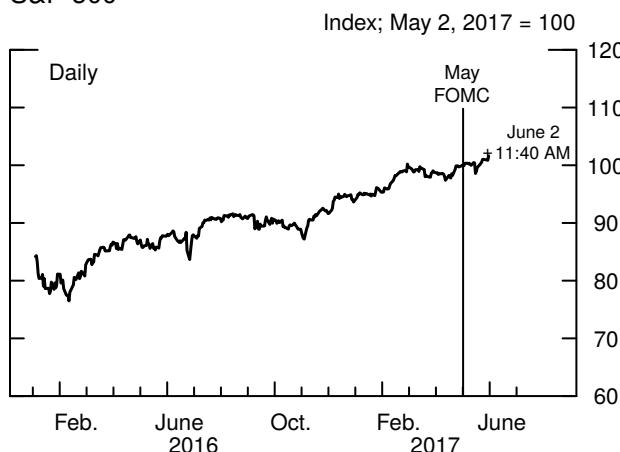
Note: Estimates based on smoothed nominal and inflation-indexed Treasury yield curves.

\* Adjusted for lagged indexation of Treasury Inflation-Protected Securities (carry effect).

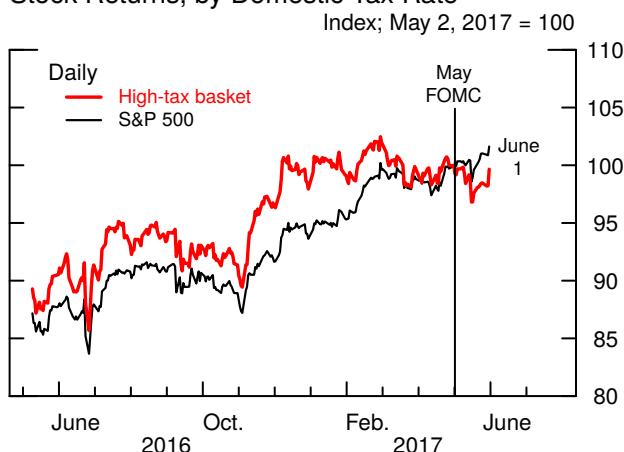
Source: Federal Reserve Bank of New York; Federal Reserve Board staff estimates.

## Corporate Asset Market Developments

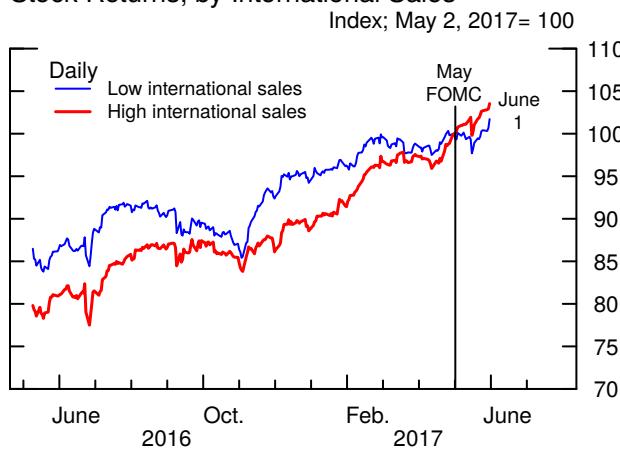
S&amp;P 500



Stock Returns, by Domestic Tax Rate



Stock Returns, by International Sales



Note: Groups with high and low international sales exposure include all Compustat firms except those in the energy, financial, and utility industries. International sales exposure is defined as the ratio of foreign sales to total sales, with high (low) exposure defined as being above (below) the 67th (33rd) percentile.

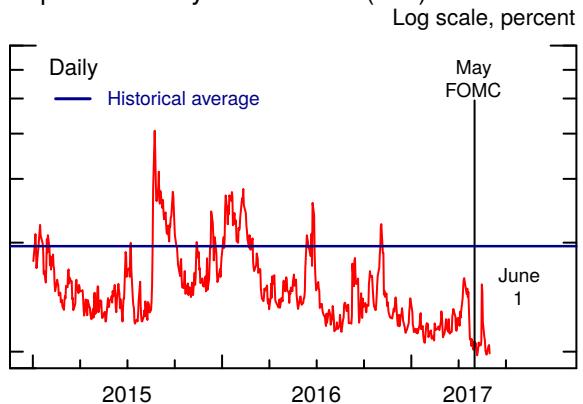
Source: Compustat; Yahoo Finance.

Equity Risk Premium



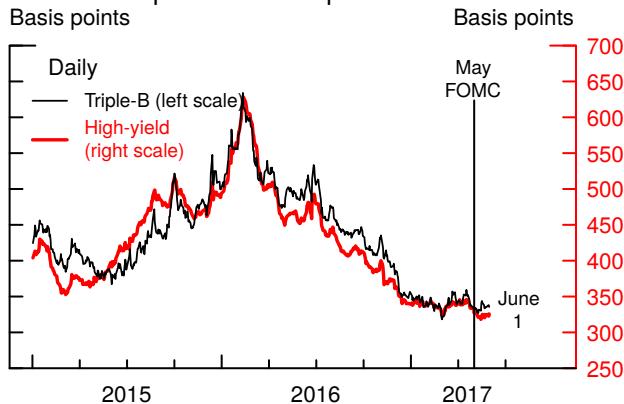
Source: Staff projections.

Implied Volatility on S&amp;P 500 (VIX)



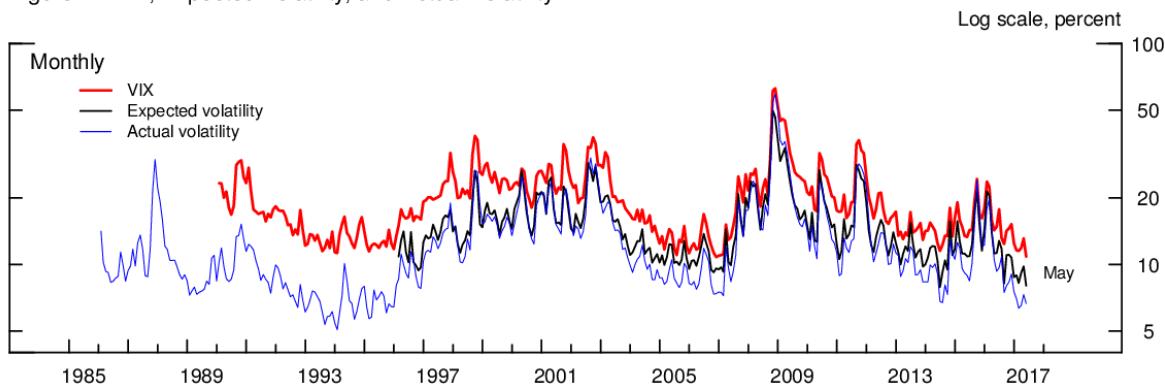
Note: Historical average is taken from 1990 onward.  
Source: Chicago Board Options Exchange.

10-Year Corporate Bond Spreads



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

Figure 1: VIX, Expected Volatility, and Actual Volatility



Source: Federal Reserve Board and FRBNY.

Figure 2: Variance Risk Premium

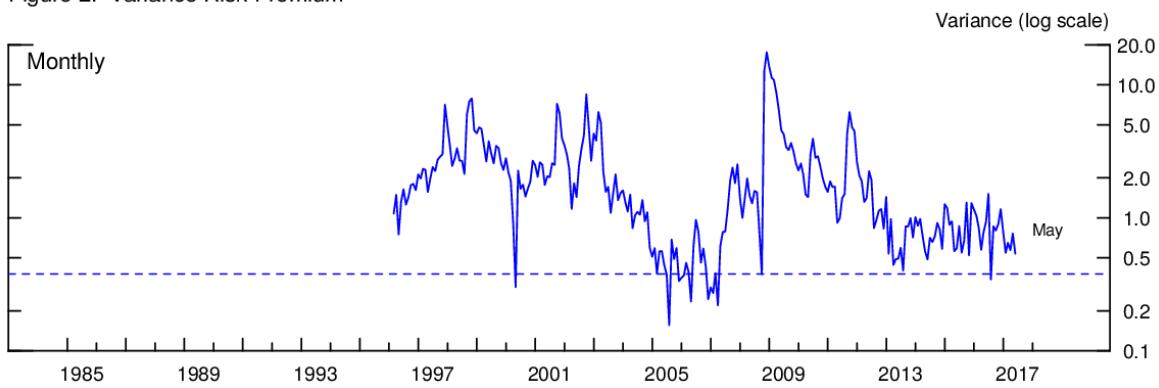
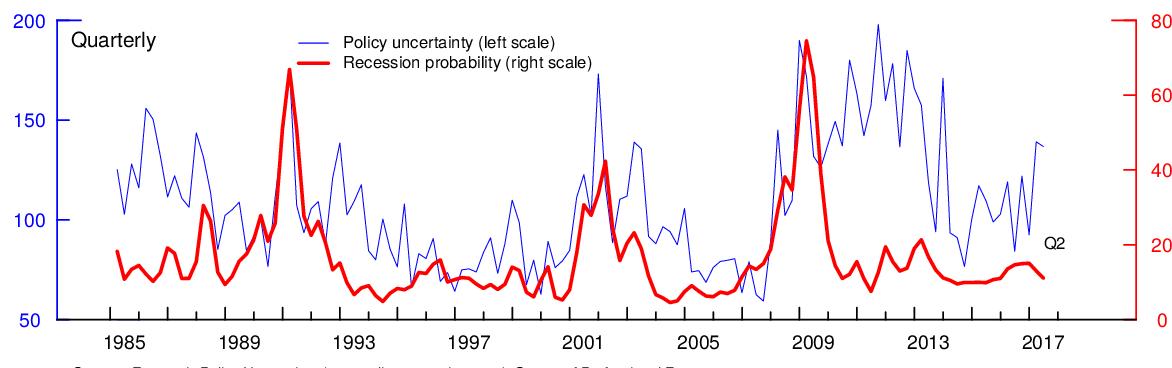
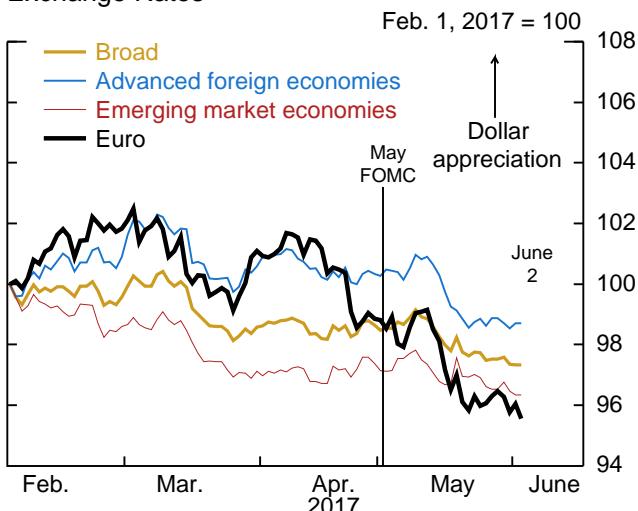
Note: Dashed line indicates 5th percentile of distribution since 1996.  
Source: FRBNY.

Figure 3: Recession Probability and Policy Uncertainty

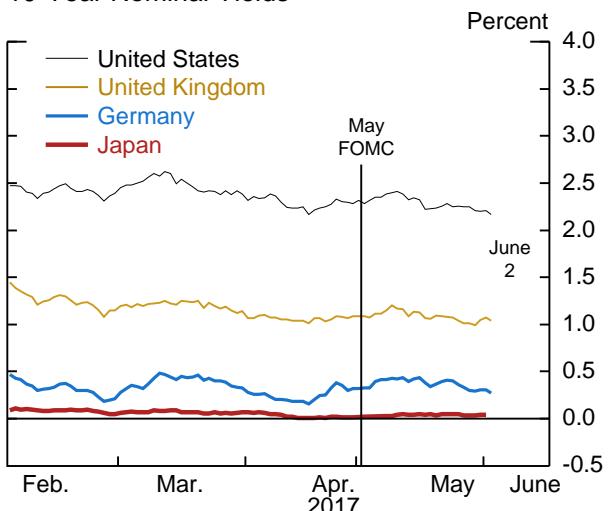
Source: Economic Policy Uncertainty ([www.policyuncertainty.com](http://www.policyuncertainty.com)); Survey of Professional Forecasters.

## Foreign Developments

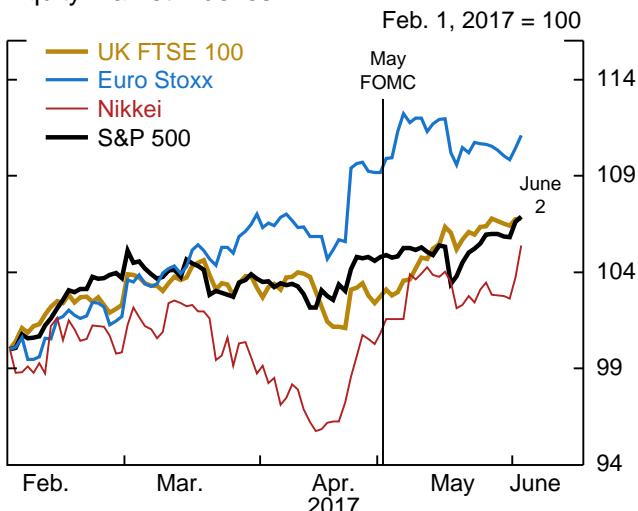
(All daily series updated on June 2 at 11:15 a.m.)

**Exchange Rates**

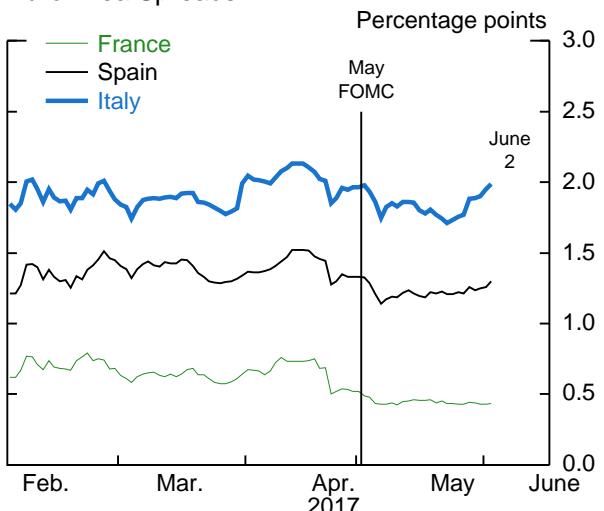
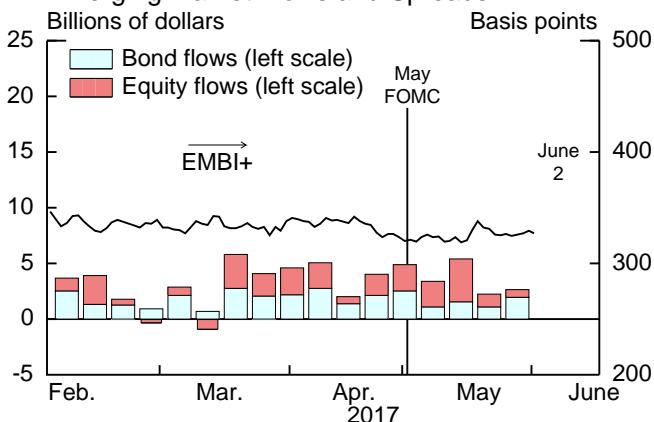
Source: Bloomberg.

**10-Year Nominal Yields**

Source: Bloomberg.

**Equity Market Indexes**

Source: Bloomberg; Datastream.

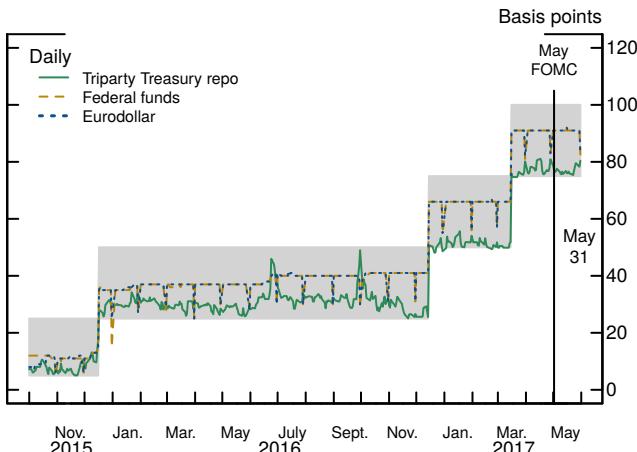
**Euro-Area Spreads**Note: European bond spreads over German yields.  
Source: Bloomberg.**Emerging Market Flows and Spreads**

Note: Emerging market bond spreads over zero-coupon Treasury securities. Excludes intra-China flows. EMBI+ is the J.P. Morgan Emerging Markets Bond Index Plus.

Source: Bloomberg; Emerging Portfolio Fund Research.

## Short-Term Funding Markets and Federal Reserve Operations

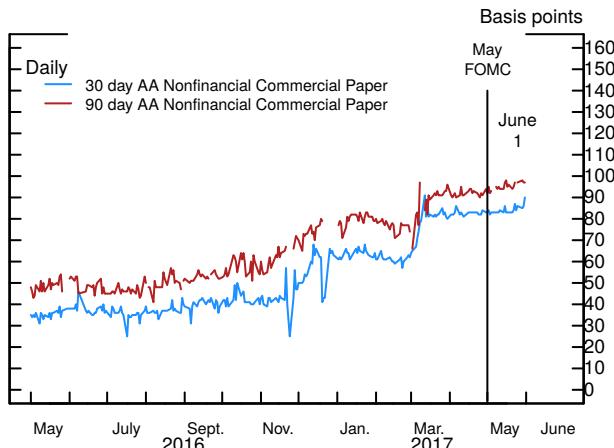
### Selected Money Market Rates



Note: Federal funds rate is a weighted median, and shaded area is the target range for the federal funds rate. Repo is repurchase agreement.

Source: Federal Reserve Bank of New York; Federal Reserve Board, Form FR 2420, Report of Selected Money Market Rates.

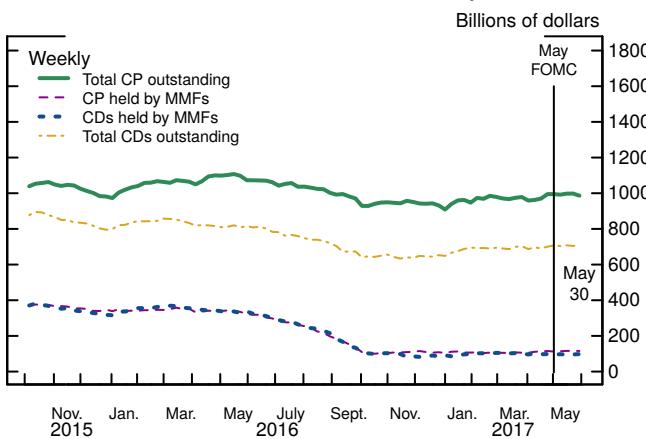
### Commercial Paper Rates



Note: These rates only include domestic issuers.

Source: The Depository Trust & Clearing Corporation.

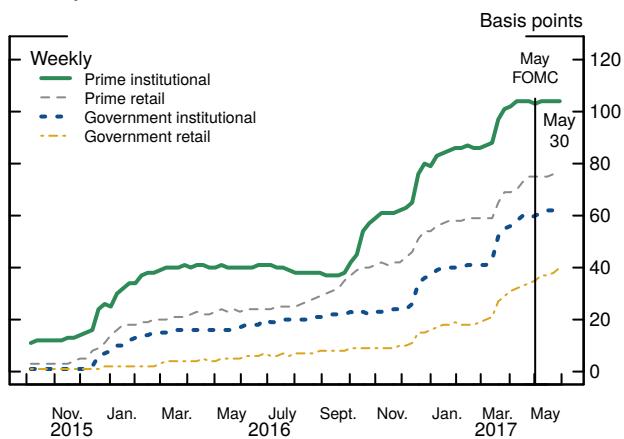
### CP and CDs: Totals and Amounts Held by MMFs



Note: Commercial paper (CP) includes asset-backed commercial paper. MMF is money market fund; CD is negotiable certificate of deposit.

Source: The Depository Trust & Clearing Corporation; iMoneyNet.

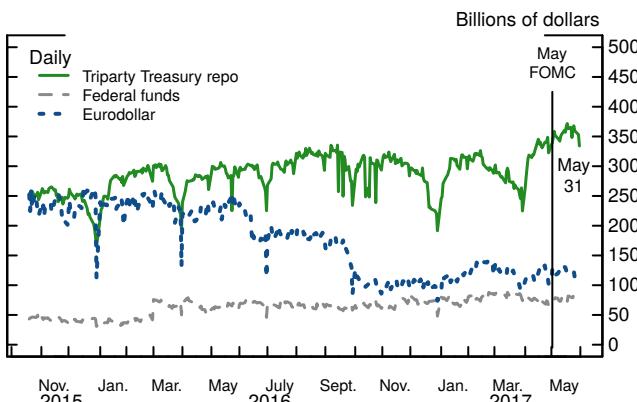
### Money Market Fund Net Yields



Note: Net yields are the annualized average yield, net of expense ratio, earned over the past 7 days without reinvesting dividends.

Source: iMoneyNet.

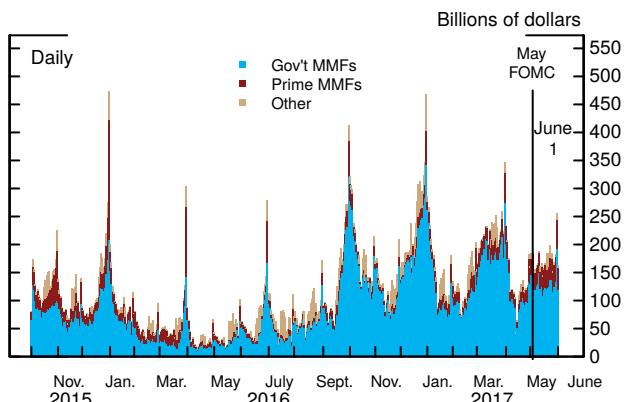
### Selected Money Market Volumes



Note: Repo is repurchase agreement.

Source: For federal funds and Eurodollar, Federal Reserve Board, Form FR 2420, Report of Selected Money Market Rates; for Triparty Treasury repo, Federal Reserve Bank of New York.

### ON RRP Take-Up, by Type



Note: ON RRP is overnight reverse repurchase agreement; MMFs are money market funds.

Source: Federal Reserve Bank of New York.

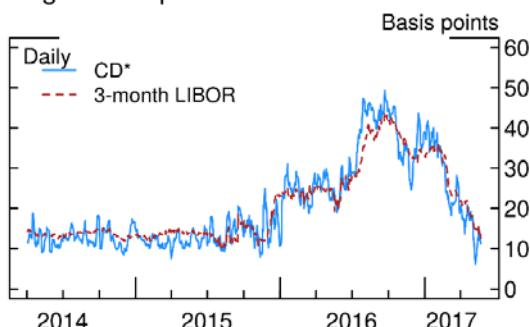
## The Recent Decline in the LIBOR–OIS Spread

Since February, the spread between the three-month LIBOR (London interbank offered rate) and the OIS (the overnight index swap) has narrowed notably and now stands at 11 basis points, near its average from 2013 to 2015, as shown in figure 1. Short-term funding pressures, which intensified in the summer of 2016 as money market fund (MMF) reforms were causing prime MMFs to shrink, appear to have abated as banks acquired new funding sources for their commercial paper (CP) and negotiable certificates of deposit (CDs) as well as additional funding via other types of instruments.<sup>1</sup>

In the year leading up to the October 2016 implementation deadline for these reforms, prime MMFs greatly reduced their unsecured lending to banks through CP, CDs, and Eurodollar deposits. This reduction in the supply of funds was widely cited as driving up bank unsecured term funding costs. The spread between three-month LIBOR—which closely tracks CD and CP rates—and OIS increased from about 15 basis points to a bit above 40 basis points over this period, as banks offered higher rates to attract funding.<sup>2</sup>

Temporarily higher yields attracted additional demand from money market investors and allowed banks to replace part of the funding lost from MMFs. To be sure, total CP and CDs outstanding have declined about \$300 billion since early 2015, but the decline has not been as steep as the \$700 billion drop in MMF holdings, as shown in figure 2.

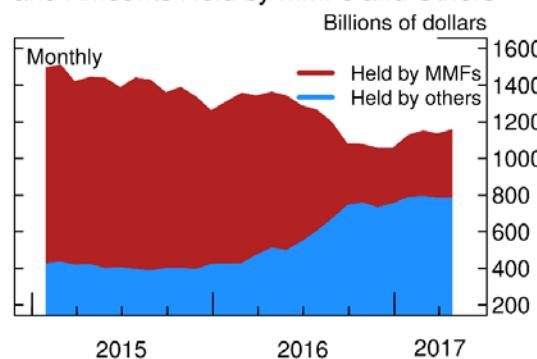
Figure 1: Spreads to Three-Month OIS



\* 5 day moving average of certificates of deposit with original maturities between 80 and 120 days.

Source: For CDs, Federal Reserve Board, Form FR 2420. For LIBOR and OIS, Bloomberg.

Figure 2: CP and CDs--Total Outstanding and Amounts Held by MMFs and Others



Source: For CP and CDs outstanding, DTCC. For holdings by MMFs, SEC form N-MFP.

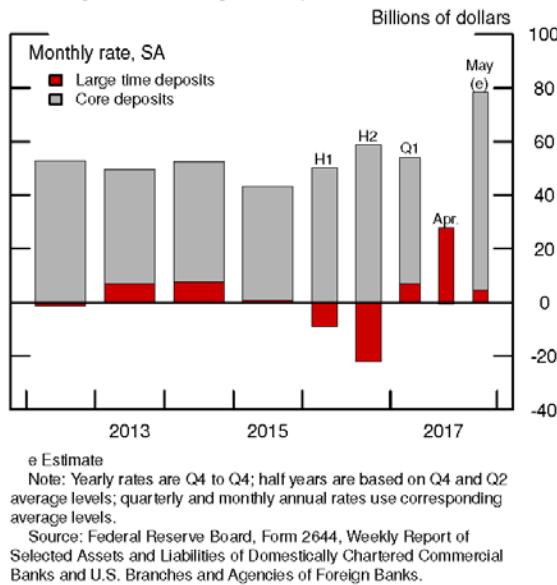
<sup>1</sup> The reform imposed floating net asset values, or NAVs, for institutional prime funds and municipal funds and permits liquidity fees and redemption gates for all nongovernment funds.

<sup>2</sup> The significant movements in the LIBOR–OIS spread over the past year do not appear to have been driven by perceptions of changing bank credit quality. Moreover, despite concerns over LIBOR's calculation methodology, its co-movement with CP and CD rates suggests that LIBOR remains a useful measure of banks' unsecured borrowing costs. LIBOR also serves as a reference rate for trillions of dollars in adjustable-rate loans and interest rate derivatives.

Available data on investors in CP and CDs outside of MMFs are very limited. Market participants suggest that the sources of new demand for money market instruments have included bond funds and nonfinancial corporations. MMF substitutes, such as private liquidity funds and offshore money market funds, do not appear to have substantially increased their holdings of CP and CDs.

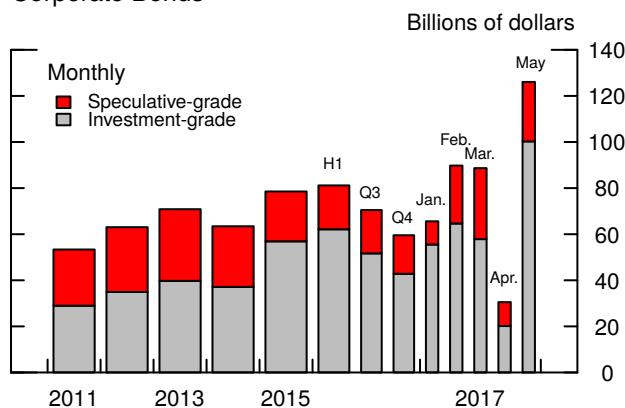
Short-term funding pressures have also been alleviated as banks that had previously relied on prime MMFs for funding replaced some CP and CD issuance with other instruments. In particular, banks have raised funds through repos, advances from Federal Home Loan Banks, issuance of dollar-denominated bonds and shorter-term debt, and growth in deposits other than CDs, as shown in figure 3.

Figure 3: Change in Deposits at Banks



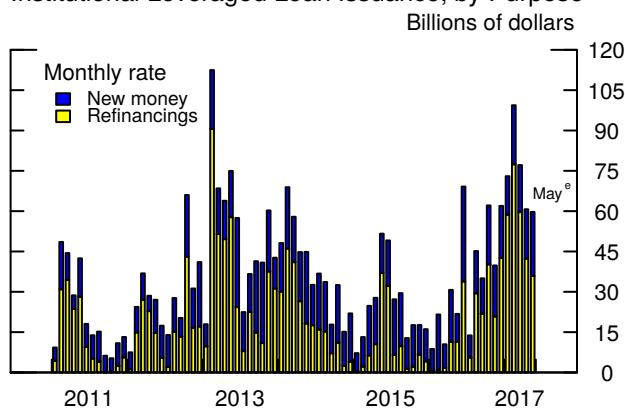
## Business Finance

### Gross Issuance of Nonfinancial Corporate Bonds



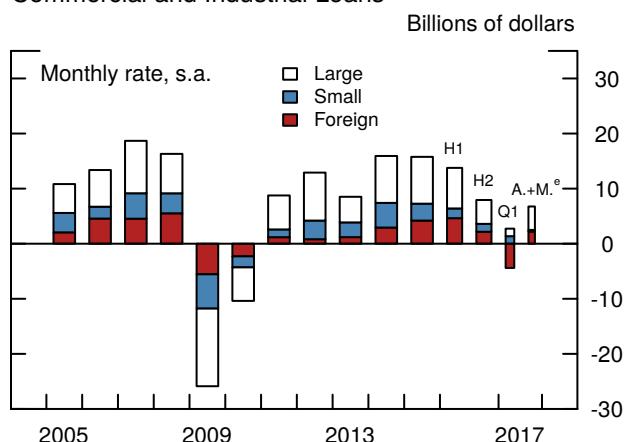
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.  
Source: Mergent Fixed Income Securities Database.

### Institutional Leveraged Loan Issuance, by Purpose



<sup>e</sup> Estimate.  
Source: Thomson Reuters LPC LoanConnector.

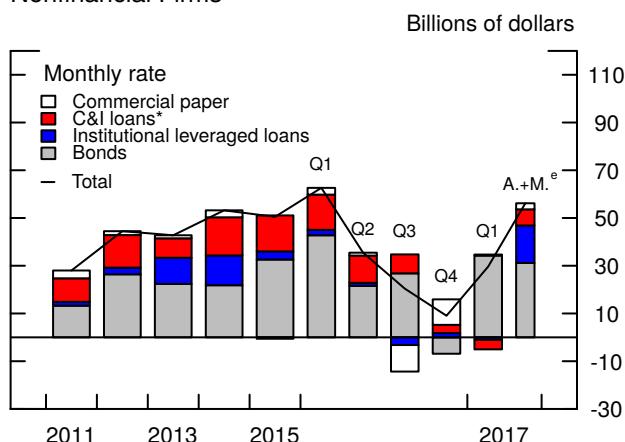
### Commercial and Industrial Loans



Note: Yearly rates are Q4 to Q4. Half-years are based on Q4 and Q2 average levels, and quarterly and monthly annual rates use corresponding average levels. Large banks are defined as the largest 25 banks by assets.  
<sup>e</sup> Estimate.

Source: 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.

### Selected Components of Net Debt Financing, Nonfinancial Firms



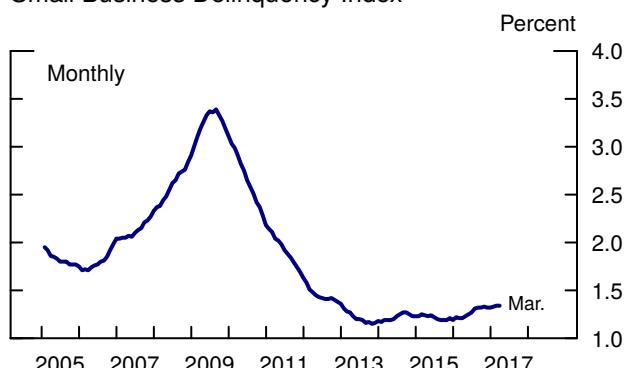
Note: C&I is commercial and industrial.  
\* Period-end basis, seasonally adjusted.  
<sup>e</sup> May estimate for C&I loans and institutional leveraged loans.  
Source: Depository Trust & Clearing Corporation; Mergent Fixed Income Securities Database; Federal Reserve Board; Thomson Reuters LPC.

### Percent of Firms Reporting That It Was Somewhat or Very Easy to Obtain Small Business Credit over the Previous 12 Months



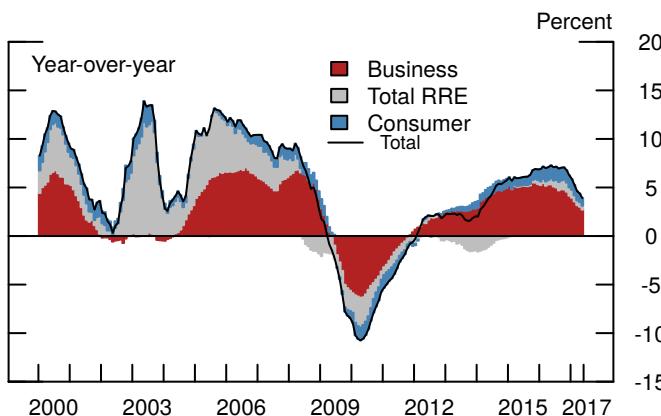
Note: Data not seasonally adjusted.  
Source: Wells Fargo/Gallup Small Business Index.

### Small Business Delinquency Index



Note: Percent of loans between 30 and 90 days past due.  
Source: Paynet.

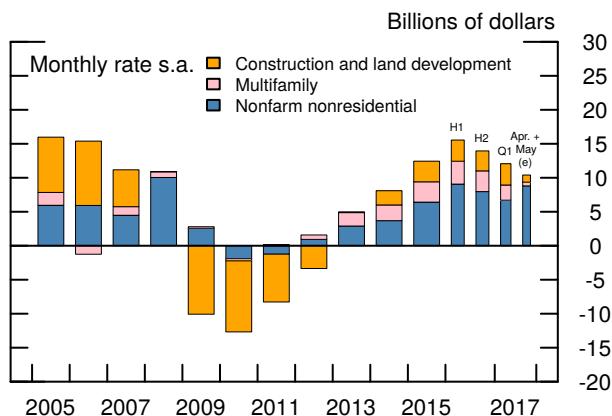
## Core Loan Growth at Banks



Note: Business loans include commercial and industrial as well as commercial real estate. Consumer loans include credit card, auto, and other consumer loans. RRE is residential real estate.

Source: 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.

## Commercial Real Estate Loans at Banks

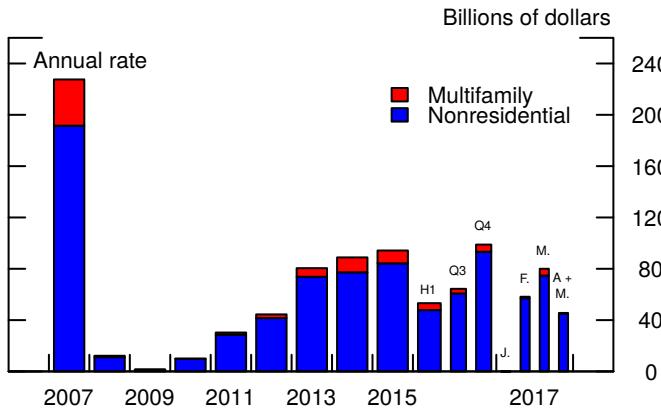


Note: Yearly rates are Q4 to Q4. Half-years are based on Q4 and Q2 average levels, and quarterly and monthly annual rates use corresponding average levels. Large banks are defined as the largest 25 banks by assets.

e Estimate.

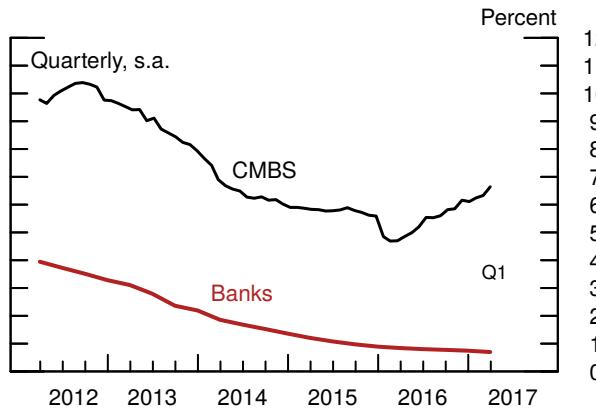
Source: Federal Reserve Board, Form FR 2644, Weekly Report of Selected Assets and Liabilities of Domestically Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks.

## CMBS Issuance



Note: Multifamily excludes agency issuance.  
Source: Consumer Mortgage Alert.

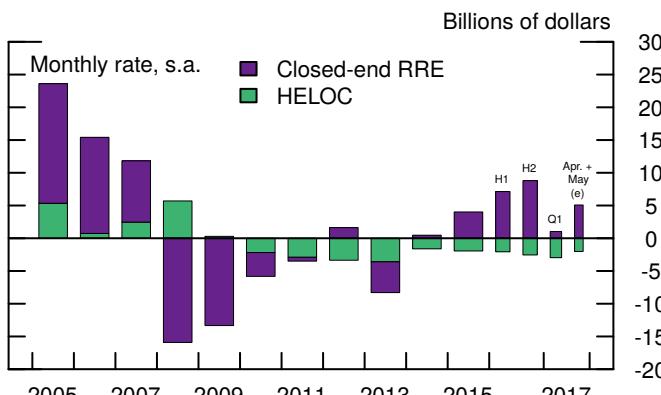
## Commercial Real Estate Delinquency Rates



Note: Commercial mortgage-backed securities (CMBS) rate includes lending that is more than 30 days delinquent, foreclosures, and properties that are real estate owned. Commercial real estate delinquency rate at banks is the percentage of nonfarm nonresidential and multifamily lending that is more than 30 days delinquent or nonaccrual.

Source: For CMBS, Citigroup; for banks, FR Y9-C, Consolidated Financial Statements for Holding Companies.

## Residential Real Estate at Banks

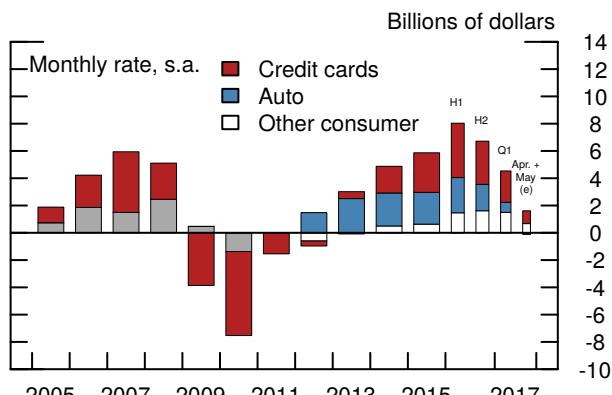


Note: Yearly rates are Q4 to Q4. Half-years are based on Q4 and Q2 average levels, and quarterly and monthly annual rates use corresponding average levels. Large banks are defined as the largest 25 banks by assets. RRE is residential real estate; HELOC is home equity line of credit.

e Estimate.  
Source: 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.

Financing Conditions

## Consumer Loans at Banks

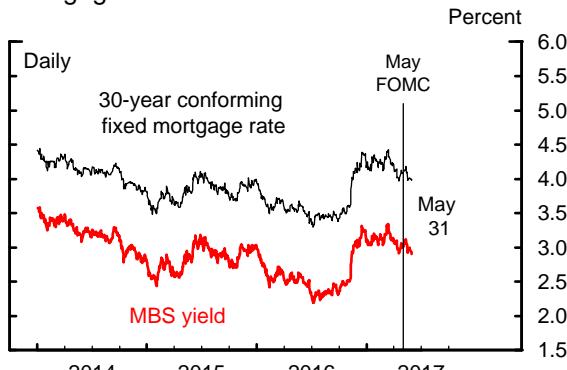


Note: Prior to 2012, data on auto and other consumer loans were not separately available. The combined series is depicted here by the gray bars. Yearly rates are Q4 to Q4. Half-years are based on Q4 and Q2 average levels. Quarterly and monthly annual rates use corresponding average levels.

e Estimate.  
Source: Federal Reserve Board, Form FR 2644.

## Household Finance

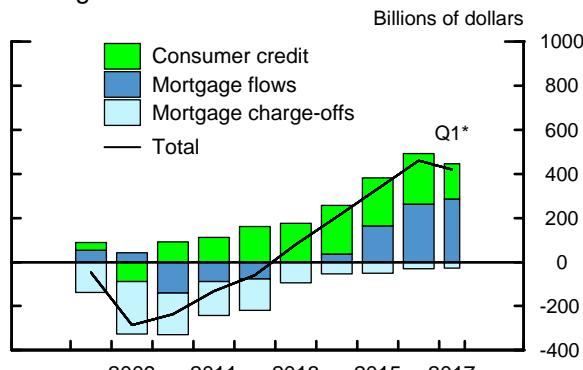
### Mortgage Rate and MBS Yield



Note: The MBS yield is the Fannie Mae 30-year current-coupon rate.

Source: For MBS yield, Barclays; for mortgage rate, Loansifter.

### Changes in Household Debt

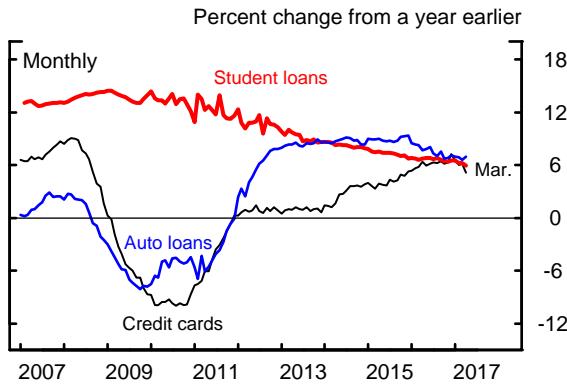


Note: Includes only home mortgage debt and consumer credit.

\* Q1 flows are annualized. Q1 value is preliminary.

Source: Federal Reserve Board, Financial Accounts of the United States.

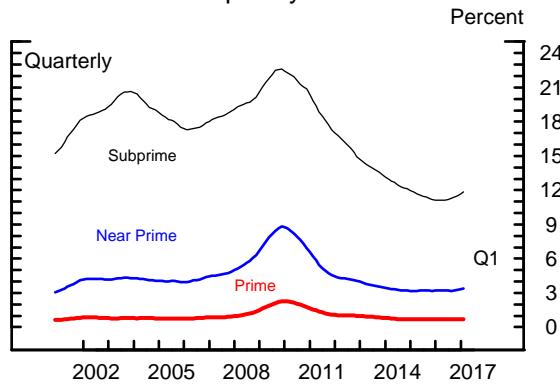
### Consumer Credit



Note: The data are not seasonally adjusted.

Source: Federal Reserve Board.

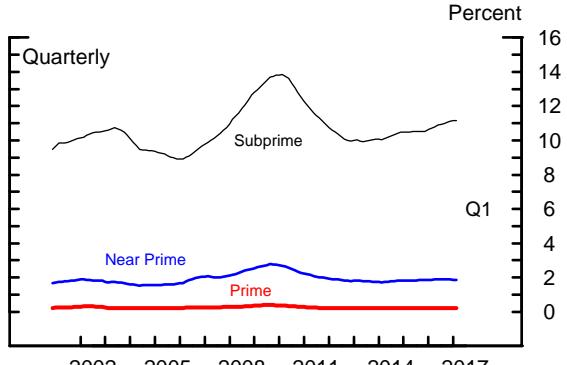
### Credit Card Delinquency Rates



Note: Four-quarter moving average. Credit scores lagged 4 quarters. Delinquency is at least 30 days past due, excluding severe derogatory loans. Near prime between 620 and 719, prime greater than 719.

Source: FRBNY CCP/Equifax.

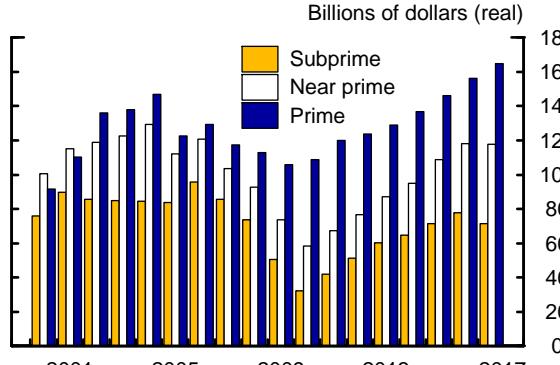
### Auto Loan Delinquency Rates



Note: Four-quarter moving average. Credit scores lagged 4 quarters. Delinquency is at least 30 days past due, excluding severe derogatory loans. Near prime between 620 and 719, prime greater than 719.

Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax.

### New Extensions: Auto



Note: New credit extensions in the past year; data for the first quarter of each year. Near prime between 620 and 719, prime greater than 719; scores measured a year ago.

Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax.

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

Measure and scenario	2017		2018	2019	2020	2021-22
	H1	H2				
<i>Real GDP</i>						
Extended Tealbook baseline	1.9	2.9	2.2	1.8	1.4	1.2
Broad policy disappointment	1.9	2.9	1.1	1.6	1.5	1.6
Stronger demand, higher inflation	1.9	4.1	2.5	1.7	1.3	1.1
Lower natural rate, misperception	1.9	2.9	2.2	1.8	1.4	1.3
Greenspan conundrum	1.9	2.9	2.8	2.9	2.0	.9
EME turbulence and stronger dollar	1.9	2.9	1.5	1.2	1.5	1.5
Stronger foreign growth	1.9	3.1	2.6	2.1	1.3	1.1
<i>Unemployment rate<sup>1</sup></i>						
Extended Tealbook baseline	4.3	4.2	3.9	3.8	4.0	4.5
Broad policy disappointment	4.3	4.2	4.4	4.5	4.6	4.7
Stronger demand, higher inflation	4.3	3.9	3.5	3.5	3.7	4.3
Lower natural rate, misperception	4.3	4.1	3.6	3.4	3.5	3.8
Greenspan conundrum	4.3	4.2	3.7	3.1	3.0	3.9
EME turbulence and stronger dollar	4.3	4.2	4.2	4.4	4.6	4.9
Stronger foreign growth	4.3	4.2	3.7	3.5	3.6	4.2
<i>Total PCE prices</i>						
Extended Tealbook baseline	1.4	1.7	1.9	2.0	2.1	2.1
Broad policy disappointment	1.4	1.7	1.8	1.8	1.9	2.0
Stronger demand, higher inflation	1.4	2.1	2.3	2.3	2.4	2.3
Lower natural rate, misperception	1.4	1.7	1.9	1.9	2.0	2.1
Greenspan conundrum	1.4	1.7	1.9	2.0	2.2	2.2
EME turbulence and stronger dollar	1.4	2.2	1.2	1.5	1.9	2.1
Stronger foreign growth	1.4	2.0	2.4	2.3	2.2	2.2
<i>Core PCE prices</i>						
Extended Tealbook baseline	1.6	1.7	1.9	2.0	2.1	2.1
Broad policy disappointment	1.6	1.7	1.8	1.9	1.9	1.9
Stronger demand, higher inflation	1.6	2.1	2.3	2.3	2.4	2.3
Lower natural rate, misperception	1.6	1.7	1.9	1.9	2.0	2.0
Greenspan conundrum	1.6	1.7	1.9	2.1	2.2	2.2
EME turbulence and stronger dollar	1.6	2.2	1.5	1.6	1.9	2.0
Stronger foreign growth	1.6	1.9	2.3	2.3	2.2	2.2
<i>Federal funds rate<sup>1</sup></i>						
Extended Tealbook baseline	.9	1.5	2.7	3.7	4.2	4.1
Broad policy disappointment	.9	1.5	2.3	2.8	3.0	3.1
Stronger demand, higher inflation	.9	1.7	3.4	4.6	5.1	4.8
Lower natural rate, misperception	.9	1.5	2.9	3.8	4.2	3.9
Greenspan conundrum	.9	1.5	2.9	4.3	5.3	5.3
EME turbulence and stronger dollar	.9	2.0	2.5	2.9	3.2	3.5
Stronger foreign growth	.9	1.6	3.2	4.3	4.8	4.6

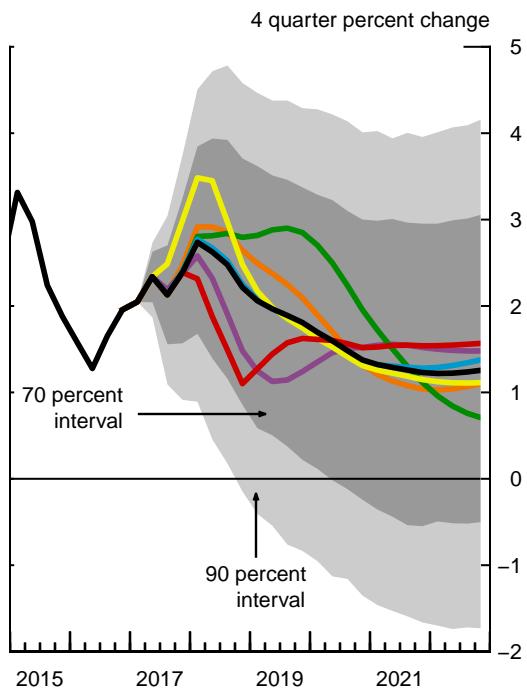
1. Percent, average for the final quarter of the period.

## Forecast Confidence Intervals and Alternative Scenarios

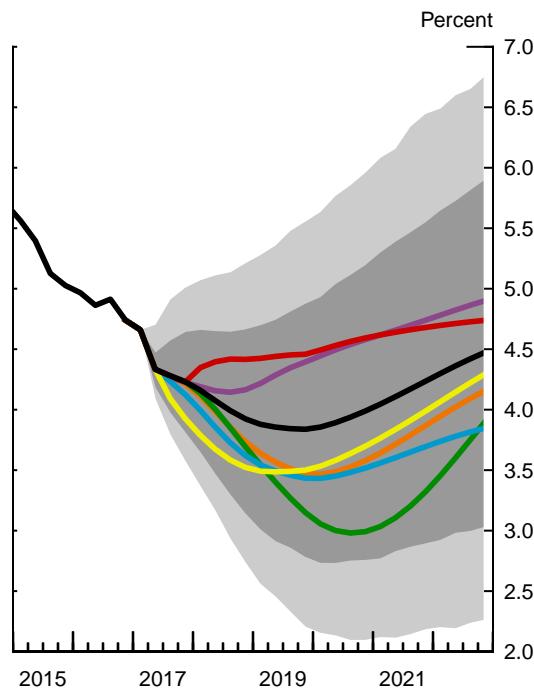
Confidence Intervals Based on FRB/US Stochastic Simulations

- Extended Tealbook baseline
- Broad policy disappointment
- Stronger demand, higher inflation
- Lower natural rate, misperception
- Greenspan conundrum
- EME turbulence and stronger dollar
- Stronger foreign growth

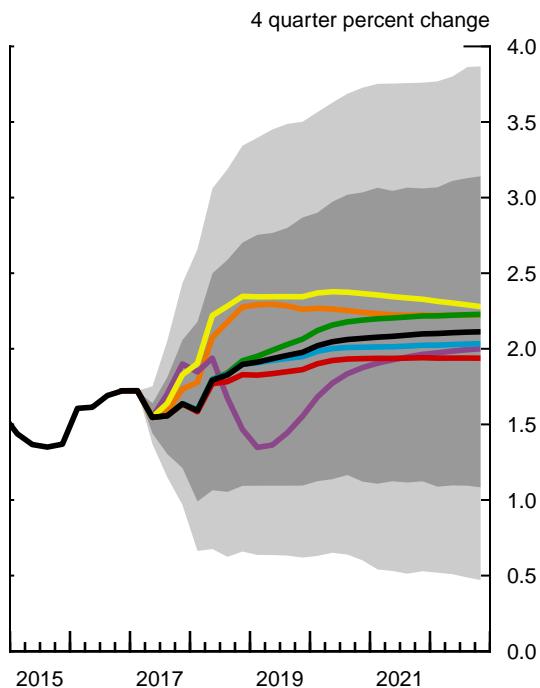
Real GDP



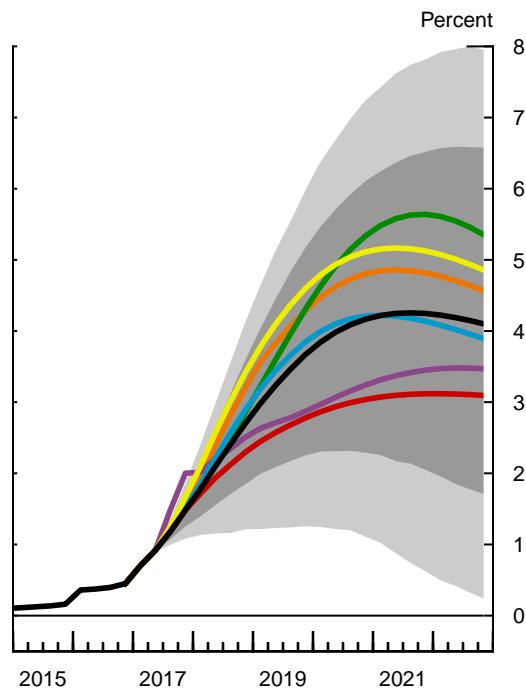
Unemployment Rate



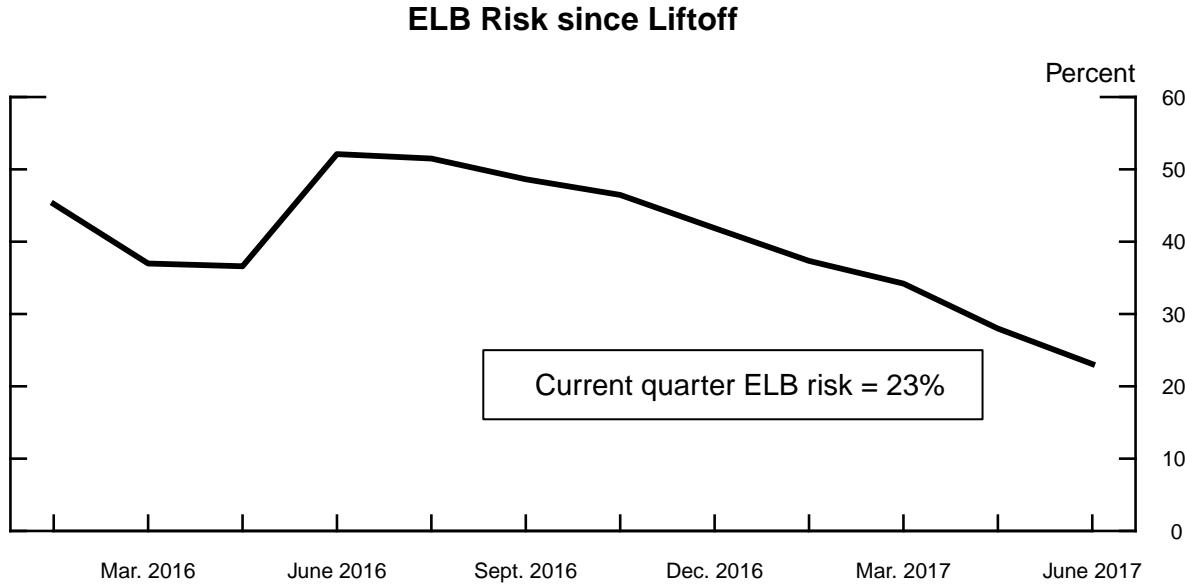
PCE Prices excluding Food and Energy



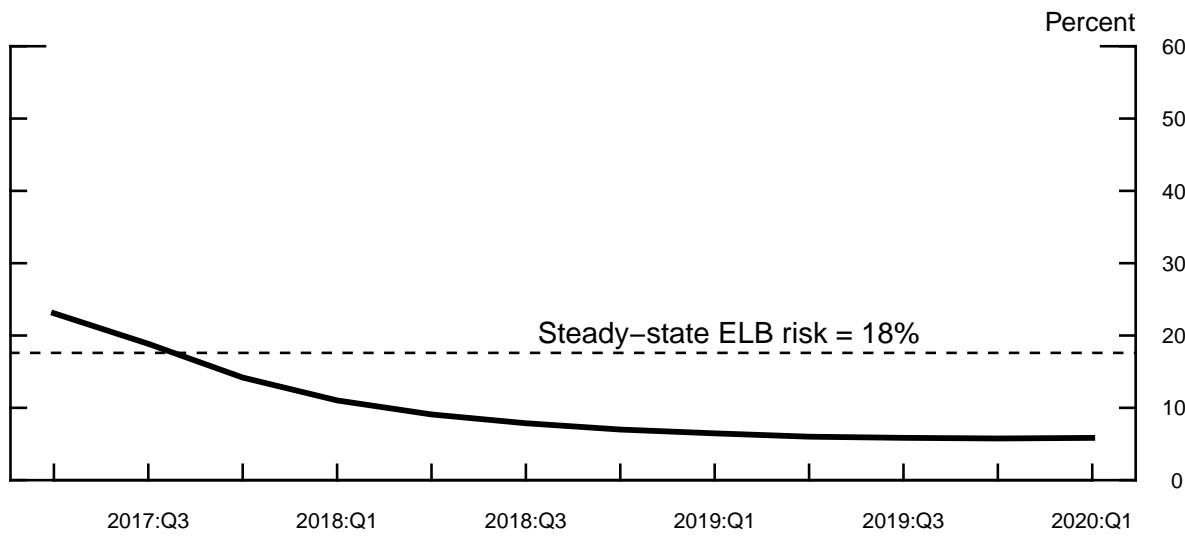
Federal Funds Rate



## Effective Lower Bound Risk Estimate



## Forecast of ELB Risk



Note: Figures show the probability that the federal funds rate reaches the effective lower bound (ELB) over the next 3 years starting in the given quarter. Details behind the computation of the ELB risk measure are provided in the box "A Guidepost for Dropping the Effective Lower Bound Risk from the Assessment of Risks" in the Risks and Uncertainty section of the April 2017 Tealbook A.

Source: Calculation based on FRB/US stochastic simulations around the staff baseline projection.

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

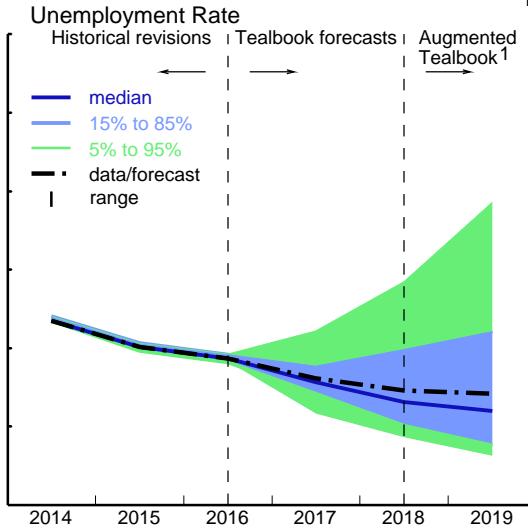
Measure	2017	2018	2019	2020	2021	2022
<i>Real GDP</i> <i>(percent change, Q4 to Q4)</i>						
Projection	2.4	2.2	1.8	1.4	1.2	1.3
Confidence interval						
Tealbook forecast errors	1.0–4.0	-.1–3.7	-.8–3.2	...	...	...
FRB/US stochastic simulations	1.6–3.2	.9–3.7	.2–3.4	-.2–3.0	-.5–3.0	-.5–3.1
<i>Civilian unemployment rate</i> <i>(percent, Q4)</i>						
Projection	4.2	3.9	3.8	4.0	4.2	4.5
Confidence interval						
Tealbook forecast errors	3.8–4.5	3.0–5.0	2.5–5.4	...	...	...
FRB/US stochastic simulations	3.8–4.6	3.1–4.7	2.8–4.9	2.8–5.2	2.9–5.5	3.0–5.9
<i>PCE prices, total</i> <i>(percent change, Q4 to Q4)</i>						
Projection	1.6	1.9	2.0	2.1	2.1	2.1
Confidence interval						
Tealbook forecast errors	.9–2.1	1.0–3.5	1.0–3.5	...	...	...
FRB/US stochastic simulations	1.0–2.0	1.0–2.8	1.0–2.9	1.0–3.1	1.1–3.2	1.0–3.2
<i>PCE prices excluding food and energy</i> <i>(percent change, Q4 to Q4)</i>						
Projection	1.6	1.9	2.0	2.1	2.1	2.1
Confidence interval						
Tealbook forecast errors	1.3–1.9	1.2–2.6	...	...	...	...
FRB/US stochastic simulations	1.2–2.1	1.1–2.7	1.1–2.9	1.1–3.0	1.1–3.1	1.1–3.1
<i>Federal funds rate</i> <i>(percent, Q4)</i>						
Projection	1.5	2.7	3.7	4.2	4.2	4.1
Confidence interval						
FRB/US stochastic simulations	1.3–1.7	1.8–3.6	2.3–5.2	2.3–6.1	2.0–6.5	1.7–6.6

Note: Shocks underlying FRB/US stochastic simulations are randomly drawn from the 1969–2016 set of model equation residuals. Intervals derived from Tealbook forecast errors are based on projections made from 1980 to 2016 for real GDP and unemployment and from 1998 to 2016 for PCE prices. The intervals for real GDP, unemployment, and total PCE prices are extended into 2019 using information from the Blue Chip survey and forecasts from the CBO and CEA.

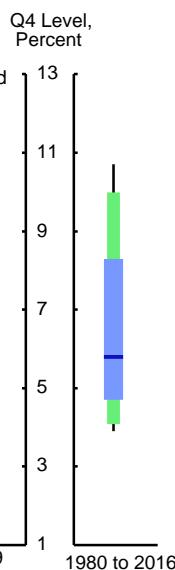
... Not applicable.

## Prediction Intervals Derived from Historical Tealbook Forecast Errors

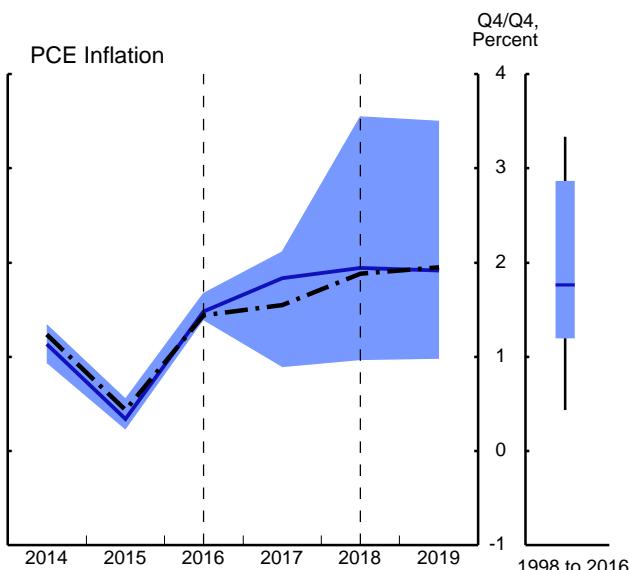
### Forecast Error Percentiles



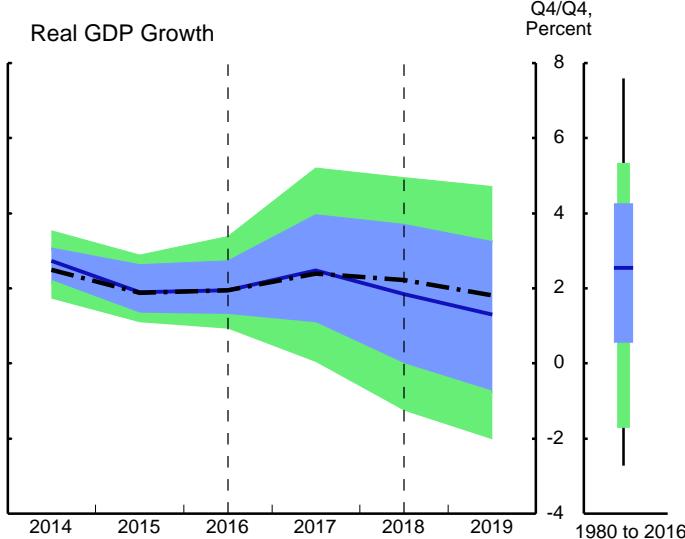
### Historical Distributions



### PCE Inflation

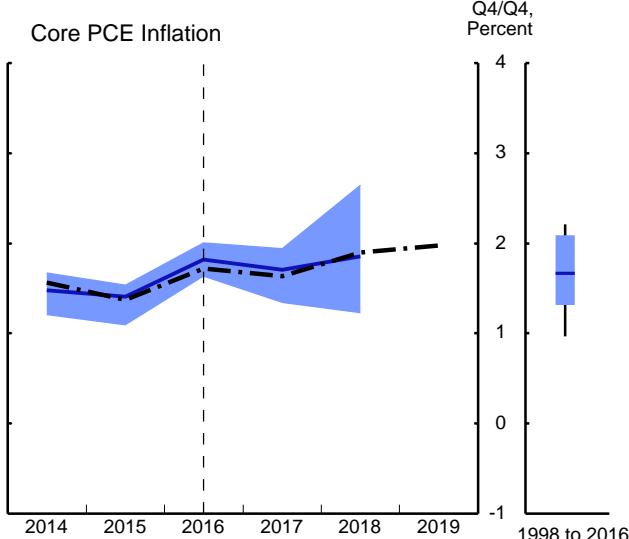


### Real GDP Growth



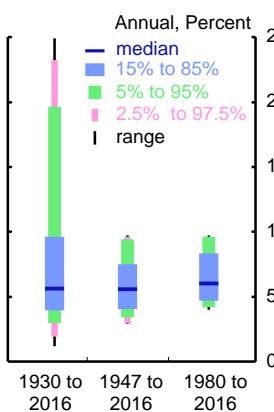
### Q4/Q4, Percent

### Core PCE Inflation

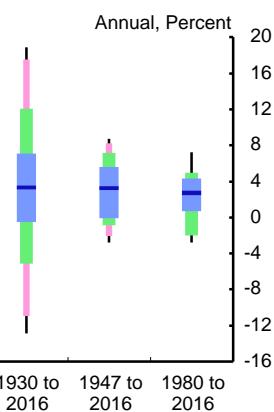


### Historical Distributions

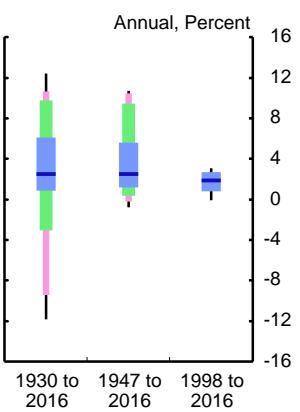
#### Unemployment Rate



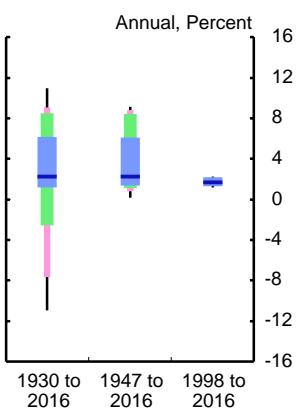
#### Real GDP Growth



#### PCE Inflation



#### Core PCE Inflation



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

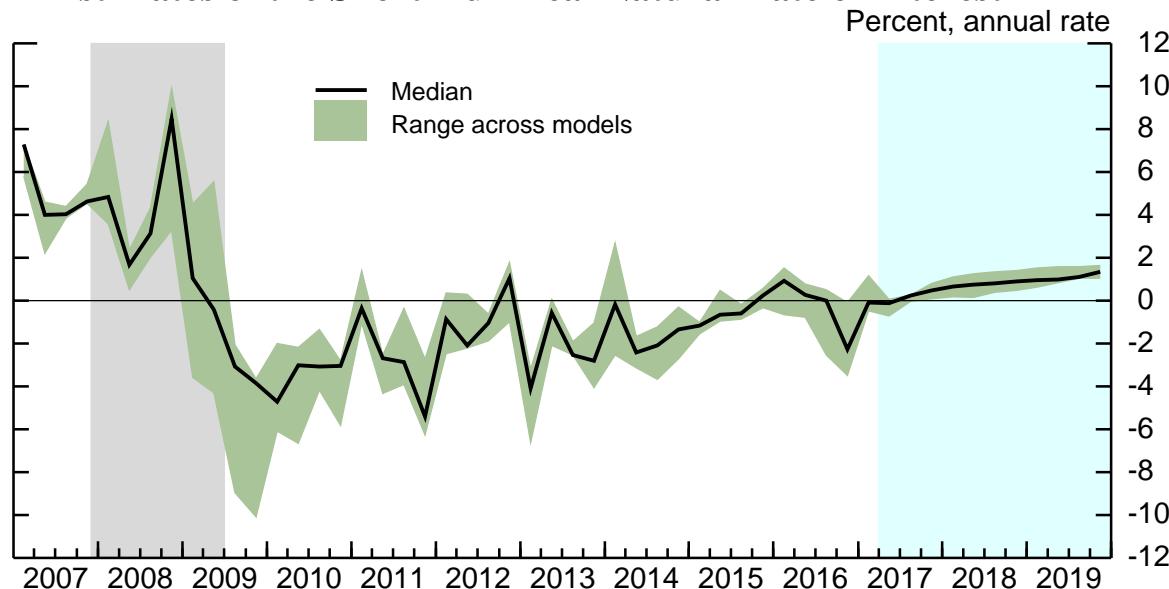
1. Augmented Tealbook prediction intervals use 1- and 2-year-ahead forecast errors from Blue Chip, CBO, and CEA to extend the Tealbook prediction intervals through 2019.

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

Measure and projection	2017		2018		2019	
	March Tealbook	Current Tealbook	March Tealbook	Current Tealbook	March Tealbook	Current Tealbook
<i>Real GDP</i>						
Staff	2.0	2.4	2.2	2.2	1.9	1.8
FRB/US	2.0	2.3	2.5	2.3	1.8	1.6
EDO	2.3	2.5	2.2	2.3	2.4	2.3
<i>Unemployment rate<sup>1</sup></i>						
Staff	4.6	4.2	4.2	3.9	4.1	3.8
FRB/US	4.7	4.2	4.5	4.1	4.6	4.2
EDO	4.7	4.3	4.9	4.5	5.0	4.8
<i>Total PCE prices</i>						
Staff	1.7	1.6	1.8	1.9	1.9	2.0
FRB/US	2.1	1.5	1.8	2.0	1.7	2.0
EDO	2.4	1.6	2.4	2.2	2.3	2.3
<i>Core PCE prices</i>						
Staff	1.8	1.6	1.9	1.9	2.0	2.0
FRB/US	2.1	1.6	1.9	2.0	1.8	2.0
EDO	2.3	1.7	2.4	2.2	2.3	2.3
<i>Federal funds rate<sup>1</sup></i>						
Staff	1.4	1.5	2.5	2.7	3.4	3.7
FRB/US	1.5	1.5	2.5	2.6	3.0	3.4
EDO	2.1	1.8	3.0	3.0	3.5	3.6

1. Percent, average for Q4.

### Estimates of the Short-Run Real Natural Rate of Interest



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

## Assessment of Key Macroeconomic Risks (1)

### Probability of Inflation Events

(4 quarters ahead)

Probability that the 4-quarter change in total PCE prices will be . . .	Staff	FRB/US	EDO	BVAR
<i>Greater than 3 percent</i>				
Current Tealbook	.07	.07	.04	.03
Previous Tealbook	.05	.07	.12	.06
<i>Less than 1 percent</i>				
Current Tealbook	.15	.14	.07	.25
Previous Tealbook	.24	.14	.02	.16

### Probability of Unemployment Events

(4 quarters ahead)

Probability that the unemployment rate will . . .	Staff	FRB/US	EDO	BVAR
<i>Increase by 1 percentage point</i>				
Current Tealbook	.03	.03	.12	.01
Previous Tealbook	.02	.02	.14	.05
<i>Decrease by 1 percentage point</i>				
Current Tealbook	.08	.08	.10	.26
Previous Tealbook	.11	.09	.11	.03

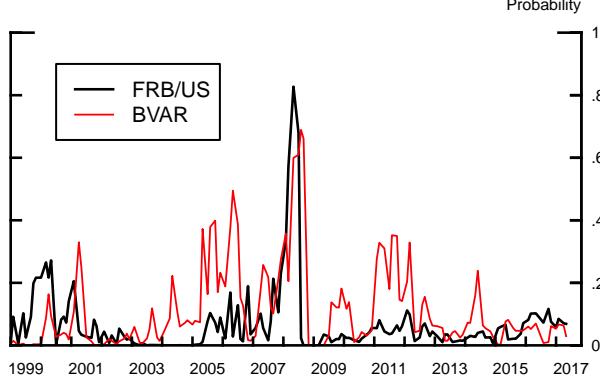
### Probability of Near-Term Recession

Probability that real GDP declines in the next two quarters	Staff	FRB/US	EDO	BVAR	Factor Model
Current Tealbook	.01	.01	.03	.04	.00
Previous Tealbook	.02	.02	.04	.12	.01

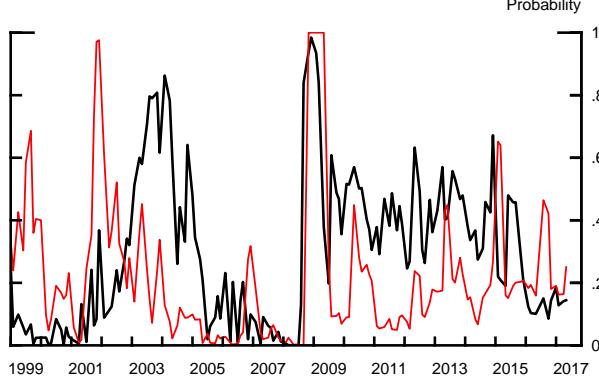
Note: "Staff" represents stochastic simulations in FRB/US around the staff baseline; baselines for FRB/US, BVAR, EDO, and the factor model are generated by those models themselves, up to the current-quarter estimate. Data for the current quarter are taken from the staff estimate for the second Tealbook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

## Assessment of Key Macroeconomic Risks (2)

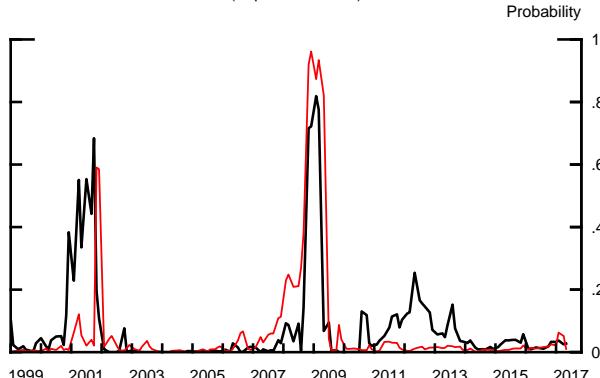
Probability that Total PCE Inflation Is above 3 Percent  
(4 quarters ahead)



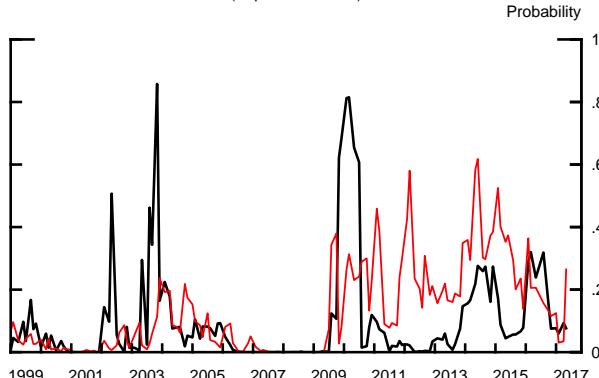
Probability that Total PCE Inflation Is below 1 Percent  
(4 quarters ahead)



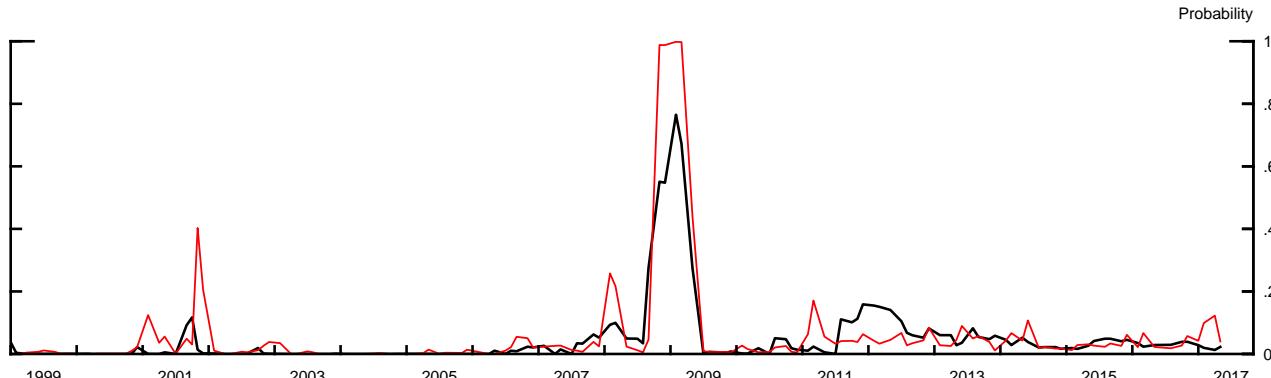
Probability that the Unemployment Rate Increases 1 ppt  
(4 quarters ahead)



Probability that the Unemployment Rate Decreases 1 ppt  
(4 quarters ahead)



Probability that Real GDP Declines in Each of the Next Two Quarters



Note: See notes on facing page. Recession and inflation probabilities for FRB/US and the BVAR are real-time estimates. See Robert J. Tetlow and Brian Ironside (2007), "Real-Time Model Uncertainty in the United States: The Fed, 1996–2003," *Journal of Money, Credit and Banking*, vol. 39 (October), pp. 1533–61.

## Policy Rules and the Staff Projection

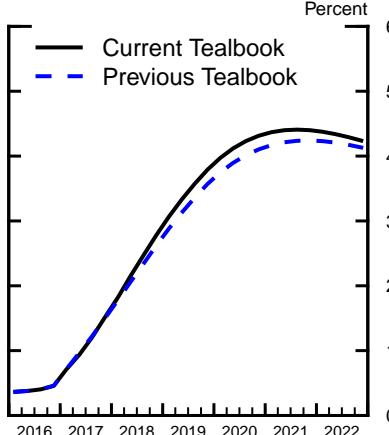
### Near-Term Prescriptions of Selected Simple Policy Rules<sup>1</sup>

(Percent)

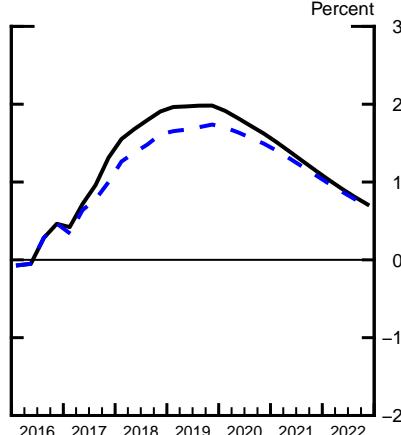
	<u>2017:Q3</u>	<u>2017:Q4</u>
Taylor (1993) rule	<b>2.82</b>	<b>3.11</b>
<i>Previous Tealbook</i>	2.85	3.05
Taylor (1999) rule	<b>3.28</b>	<b>3.74</b>
<i>Previous Tealbook</i>	3.22	3.53
Inertial Taylor (1999) rule	<b>1.28</b>	<b>1.65</b>
<i>Previous Tealbook projection</i>	1.27	1.61
First-difference rule	<b>1.29</b>	<b>1.62</b>
<i>Previous Tealbook projection</i>	1.16	1.41
<i>Addendum:</i>		
Tealbook baseline	<b>1.18</b>	<b>1.48</b>

### Key Elements of the Staff Projection

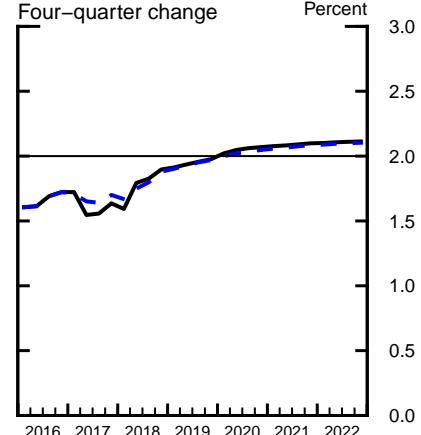
Federal Funds Rate



GDP Gap



PCE Prices Excluding Food and Energy



### A Medium-Term Equilibrium Real Federal Funds Rate<sup>2</sup>

(Percent)

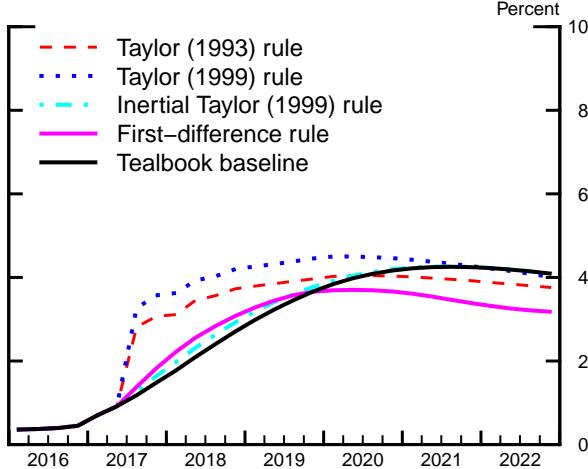
	Current Tealbook	Previous Tealbook
Tealbook-consistent FRB/US $r^*$	2.05	1.76
Average projected real federal funds rate	0.69	0.56

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

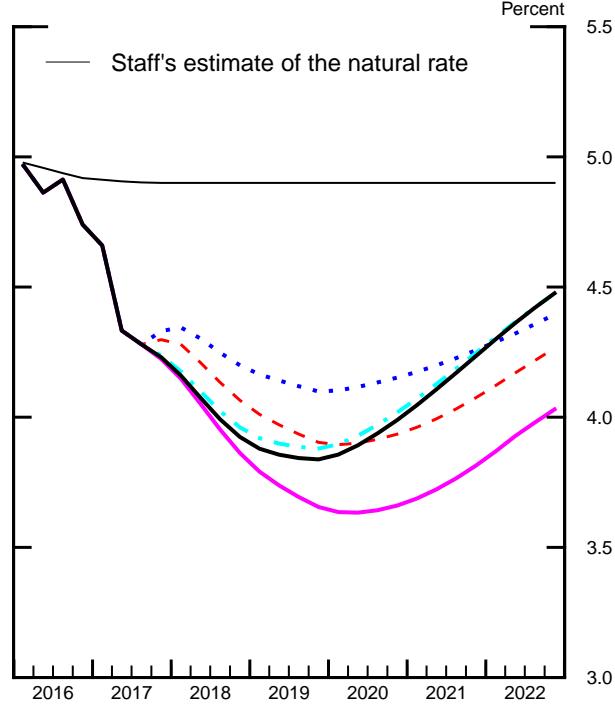
2. The "Tealbook-consistent FRB/US  $r^*$ " is the level of the real federal funds rate that, if maintained over a 12-quarter period (beginning in the current quarter) in the FRB/US model, sets the output gap equal to zero in the final quarter of that period. The "average projected real federal funds rate" is calculated under the Tealbook baseline projection over the same 12-quarter period as the Tealbook-consistent FRB/US  $r^*$ .

## Simple Policy Rule Simulations

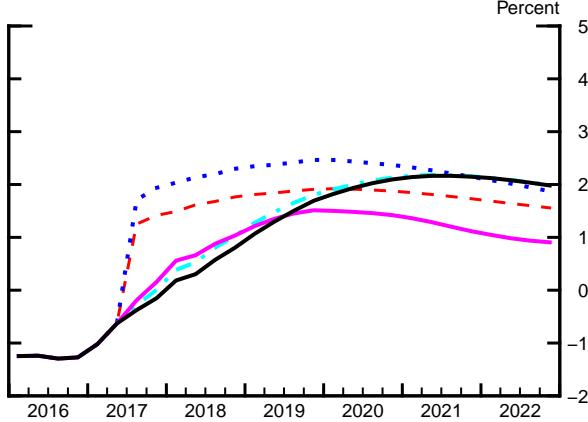
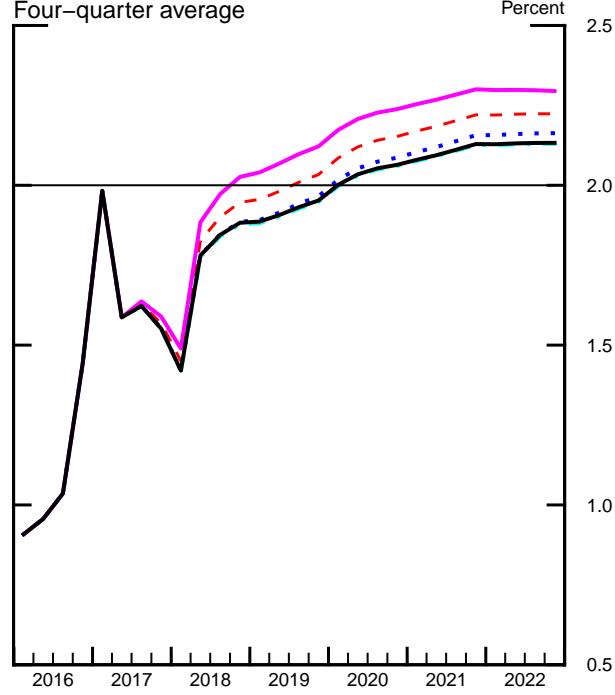
Nominal Federal Funds Rate



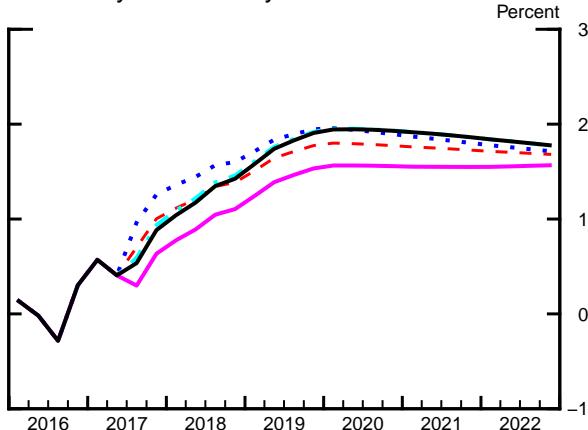
Unemployment Rate



Real Federal Funds Rate

PCE Inflation  
Four-quarter average

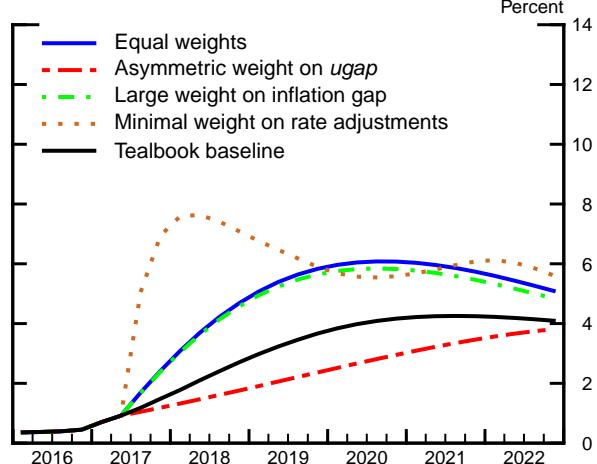
Real 10-year Treasury Yield



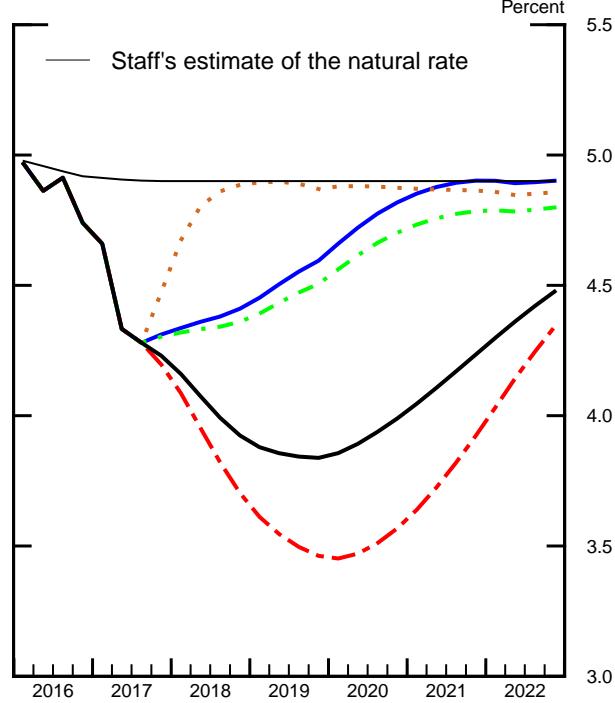
Note: The policy rule simulations in this exhibit are based on rules that respond to core inflation. This choice of rule specification was made in light of a tendency for current and near-term core inflation rates to outperform headline inflation rates as predictors of the medium-term behavior of headline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

## Optimal Control Simulations under Commitment

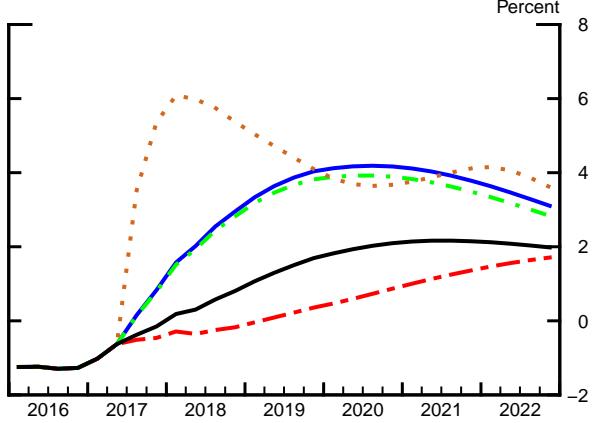
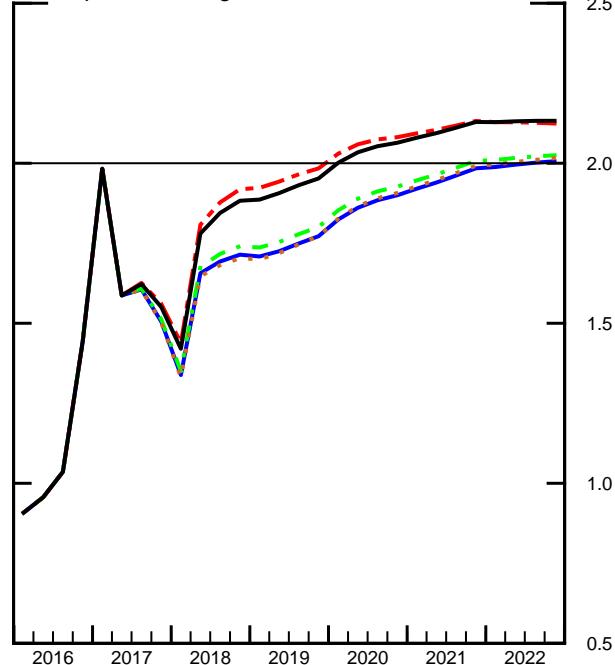
Nominal Federal Funds Rate



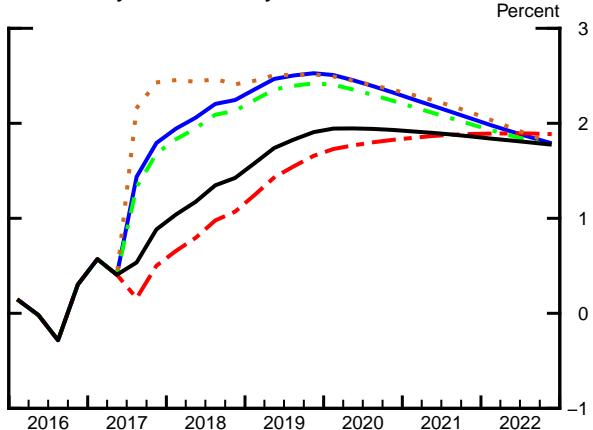
Unemployment Rate



Real Federal Funds Rate

PCE Inflation  
Four-quarter average

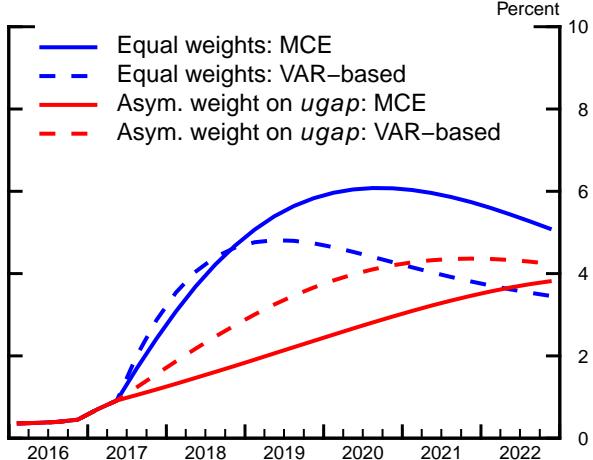
Real 10-year Treasury Yield



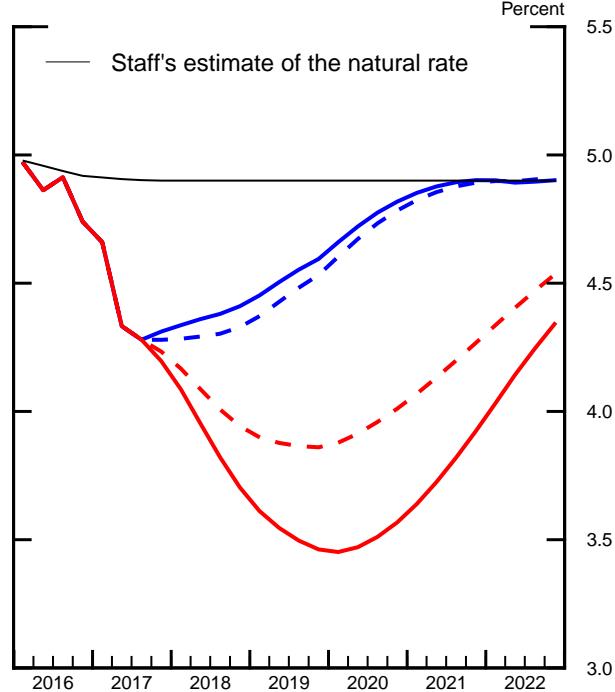
Note: Each set of lines corresponds to an optimal control policy under commitment in which policymakers minimize a discounted weighted sum of squared deviations of four-quarter headline PCE inflation from the Committee's 2 percent objective, of squared deviations of the unemployment rate from the staff's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

## Optimal Control: Alternative Assumptions About Expectations Formation

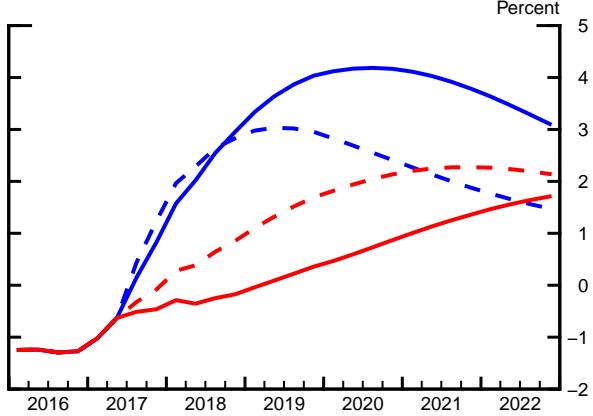
Federal Funds Rate



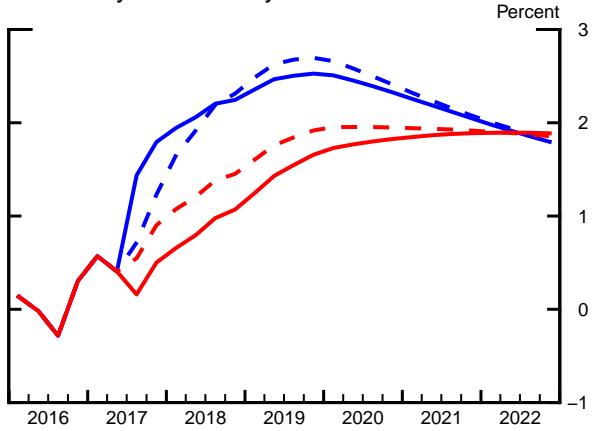
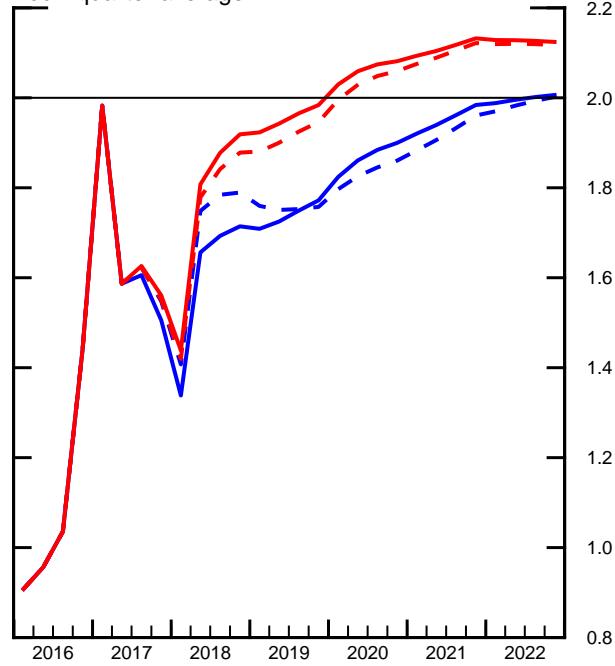
Unemployment Rate



Real Federal Funds Rate



Real 10-year Treasury Yield

PCE Inflation  
Four-quarter average

Note: The simulations whose labels include "MCE" and "VAR-based" use the version of the FRB/US model with model-consistent expectations and VAR-based expectations, respectively.

**Outcomes of Simple Policy Rule Simulations**  
 (Percent change, annual rate, from end of preceding period except as noted)

Measure and policy	2017	2018	2019	2020	2021	2022
<i>Nominal federal funds rate<sup>1</sup></i>						
Taylor (1993)	3.1	3.7	4.0	4.0	3.9	3.8
Taylor (1999)	3.6	4.2	4.5	4.5	4.3	4.0
Inertial Taylor (1999)	1.6	2.9	3.8	4.2	4.3	4.1
First-difference	1.8	3.1	3.7	3.7	3.4	3.2
Extended Tealbook baseline	1.5	2.7	3.7	4.2	4.2	4.1
<i>Real GDP</i>						
Taylor (1993)	2.3	2.1	1.9	1.6	1.4	1.4
Taylor (1999)	2.2	1.9	1.8	1.6	1.5	1.4
Inertial Taylor (1999)	2.4	2.2	1.8	1.4	1.3	1.3
First-difference	2.4	2.4	2.1	1.6	1.4	1.4
Extended Tealbook baseline	2.4	2.2	1.8	1.4	1.2	1.3
<i>Unemployment rate<sup>1</sup></i>						
Taylor (1993)	4.3	4.1	3.9	3.9	4.1	4.3
Taylor (1999)	4.3	4.2	4.1	4.2	4.3	4.4
Inertial Taylor (1999)	4.2	4.0	3.9	4.0	4.2	4.5
First-difference	4.2	3.9	3.7	3.7	3.8	4.0
Extended Tealbook baseline	4.2	3.9	3.8	4.0	4.2	4.5
<i>Total PCE prices</i>						
Taylor (1993)	1.6	1.9	2.0	2.2	2.2	2.2
Taylor (1999)	1.6	1.9	2.0	2.1	2.2	2.2
Inertial Taylor (1999)	1.5	1.9	1.9	2.1	2.1	2.1
First-difference	1.6	2.0	2.1	2.2	2.3	2.3
Extended Tealbook baseline	1.6	1.9	2.0	2.1	2.1	2.1
<i>Core PCE prices</i>						
Taylor (1993)	1.7	2.0	2.1	2.2	2.2	2.2
Taylor (1999)	1.6	1.9	2.0	2.1	2.1	2.1
Inertial Taylor (1999)	1.6	1.9	2.0	2.1	2.1	2.1
First-difference	1.7	2.0	2.1	2.2	2.3	2.3
Extended Tealbook baseline	1.6	1.9	2.0	2.1	2.1	2.1

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

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

Measure and policy	2017				2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<i>Nominal federal funds rate<sup>1</sup></i>								
Taylor (1993)	0.7	0.9	2.8	3.1	3.1	3.5	3.6	3.7
Taylor (1999)	0.7	0.9	3.3	3.6	3.6	3.9	4.0	4.2
Inertial Taylor (1999)	0.7	0.9	1.3	1.6	2.0	2.3	2.6	2.9
First-difference	0.7	0.9	1.4	1.8	2.2	2.6	2.8	3.1
Extended Tealbook baseline	0.7	0.9	1.2	1.5	1.8	2.1	2.4	2.7
<i>Real GDP</i>								
Taylor (1993)	2.0	2.3	2.1	2.3	2.6	2.4	2.3	2.1
Taylor (1999)	2.0	2.3	2.1	2.2	2.5	2.2	2.0	1.9
Inertial Taylor (1999)	2.0	2.3	2.1	2.4	2.7	2.6	2.4	2.2
First-difference	2.0	2.3	2.1	2.4	2.8	2.7	2.6	2.4
Extended Tealbook baseline	2.0	2.3	2.1	2.4	2.7	2.6	2.5	2.2
<i>Unemployment rate<sup>1</sup></i>								
Taylor (1993)	4.7	4.3	4.3	4.3	4.3	4.2	4.1	4.1
Taylor (1999)	4.7	4.3	4.3	4.3	4.3	4.3	4.2	4.2
Inertial Taylor (1999)	4.7	4.3	4.3	4.2	4.2	4.1	4.0	4.0
First-difference	4.7	4.3	4.3	4.2	4.1	4.1	4.0	3.9
Extended Tealbook baseline	4.7	4.3	4.3	4.2	4.2	4.1	4.0	3.9
<i>Total PCE prices</i>								
Taylor (1993)	2.0	1.6	1.6	1.6	1.5	1.8	1.9	1.9
Taylor (1999)	2.0	1.6	1.6	1.6	1.4	1.8	1.8	1.9
Inertial Taylor (1999)	2.0	1.6	1.6	1.5	1.4	1.8	1.8	1.9
First-difference	2.0	1.6	1.6	1.6	1.5	1.9	2.0	2.0
Extended Tealbook baseline	2.0	1.6	1.6	1.6	1.4	1.8	1.8	1.9
<i>Core PCE prices</i>								
Taylor (1993)	1.7	1.5	1.6	1.7	1.6	1.8	1.9	2.0
Taylor (1999)	1.7	1.5	1.6	1.6	1.6	1.8	1.8	1.9
Inertial Taylor (1999)	1.7	1.5	1.6	1.6	1.6	1.8	1.8	1.9
First-difference	1.7	1.5	1.6	1.7	1.7	1.9	2.0	2.0
Extended Tealbook baseline	1.7	1.5	1.6	1.6	1.6	1.8	1.8	1.9

1. Percent, average for the quarter.

**Outcomes of Optimal Control Simulations under Commitment**

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

Measure and policy	2017	2018	2019	2020	2021	2022
<i>Nominal federal funds rate<sup>1</sup></i>						
Equal weights	2.4	4.7	5.8	6.1	5.7	5.1
Aymmetric weight on <i>ugap</i>	1.2	1.8	2.4	3.0	3.5	3.8
Large weight on inflation gap	2.4	4.6	5.6	5.8	5.5	4.8
Minimal weight on rate adjustments	6.9	7.1	5.9	5.6	6.1	5.6
Extended Tealbook baseline	1.5	2.7	3.7	4.2	4.2	4.1
<i>Real GDP</i>						
Equal weights	2.2	1.4	1.3	1.3	1.5	1.6
Aymmetric weight on <i>ugap</i>	2.5	2.6	2.1	1.4	1.1	1.0
Large weight on inflation gap	2.2	1.5	1.4	1.3	1.5	1.6
Minimal weight on rate adjustments	2.0	0.8	1.6	1.7	1.6	1.6
Extended Tealbook baseline	2.4	2.2	1.8	1.4	1.2	1.3
<i>Unemployment rate<sup>1</sup></i>						
Equal weights	4.3	4.4	4.6	4.8	4.9	4.9
Aymmetric weight on <i>ugap</i>	4.2	3.7	3.5	3.6	3.9	4.3
Large weight on inflation gap	4.3	4.4	4.5	4.7	4.8	4.8
Minimal weight on rate adjustments	4.5	4.9	4.9	4.9	4.9	4.9
Extended Tealbook baseline	4.2	3.9	3.8	4.0	4.2	4.5
<i>Total PCE prices</i>						
Equal weights	1.5	1.7	1.8	1.9	2.0	2.0
Aymmetric weight on <i>ugap</i>	1.6	1.9	2.0	2.1	2.1	2.1
Large weight on inflation gap	1.5	1.7	1.8	1.9	2.0	2.0
Minimal weight on rate adjustments	1.5	1.7	1.8	1.9	2.0	2.0
Extended Tealbook baseline	1.6	1.9	2.0	2.1	2.1	2.1
<i>Core PCE prices</i>						
Equal weights	1.6	1.7	1.8	1.9	2.0	2.0
Aymmetric weight on <i>ugap</i>	1.6	1.9	2.0	2.1	2.1	2.1
Large weight on inflation gap	1.6	1.8	1.8	1.9	2.0	2.0
Minimal weight on rate adjustments	1.6	1.7	1.8	1.9	2.0	2.0
Extended Tealbook baseline	1.6	1.9	2.0	2.1	2.1	2.1

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

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

Measure and policy	2017				2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<i>Nominal federal funds rate<sup>1</sup></i>								
Equal weights	0.7	0.9	1.7	2.4	3.1	3.7	4.2	4.7
Asymmetric weight on <i>ugap</i>	0.7	0.9	1.0	1.2	1.3	1.5	1.6	1.8
Large weight on inflation gap	0.7	0.9	1.7	2.4	3.0	3.6	4.1	4.6
Minimal weight on rate adjustments	0.7	0.9	5.1	6.9	7.6	7.6	7.4	7.1
Extended Tealbook baseline	0.7	0.9	1.2	1.5	1.8	2.1	2.4	2.7
<i>Real GDP</i>								
Equal weights	2.0	2.3	2.1	2.2	2.4	2.0	1.6	1.4
Asymmetric weight on <i>ugap</i>	2.0	2.3	2.1	2.5	2.9	2.9	2.9	2.6
Large weight on inflation gap	2.0	2.3	2.1	2.2	2.4	2.1	1.7	1.5
Minimal weight on rate adjustments	2.0	2.3	2.1	2.0	1.9	1.3	0.9	0.8
Extended Tealbook baseline	2.0	2.3	2.1	2.4	2.7	2.6	2.5	2.2
<i>Unemployment rate<sup>1</sup></i>								
Equal weights	4.7	4.3	4.3	4.3	4.3	4.4	4.4	4.4
Asymmetric weight on <i>ugap</i>	4.7	4.3	4.3	4.2	4.1	4.0	3.8	3.7
Large weight on inflation gap	4.7	4.3	4.3	4.3	4.3	4.3	4.3	4.4
Minimal weight on rate adjustments	4.7	4.3	4.3	4.5	4.7	4.8	4.9	4.9
Extended Tealbook baseline	4.7	4.3	4.3	4.2	4.2	4.1	4.0	3.9
<i>Total PCE prices</i>								
Equal weights	2.0	1.6	1.6	1.5	1.3	1.7	1.7	1.7
Asymmetric weight on <i>ugap</i>	2.0	1.6	1.6	1.6	1.4	1.8	1.9	1.9
Large weight on inflation gap	2.0	1.6	1.6	1.5	1.4	1.7	1.7	1.7
Minimal weight on rate adjustments	2.0	1.6	1.6	1.5	1.3	1.6	1.7	1.7
Extended Tealbook baseline	2.0	1.6	1.6	1.6	1.4	1.8	1.8	1.9
<i>Core PCE prices</i>								
Equal weights	1.7	1.5	1.5	1.6	1.5	1.7	1.7	1.7
Asymmetric weight on <i>ugap</i>	1.7	1.5	1.6	1.6	1.6	1.8	1.9	1.9
Large weight on inflation gap	1.7	1.5	1.5	1.6	1.5	1.7	1.7	1.8
Minimal weight on rate adjustments	1.7	1.5	1.5	1.6	1.5	1.7	1.7	1.7
Extended Tealbook baseline	1.7	1.5	1.6	1.6	1.6	1.8	1.8	1.9

1. Percent, average for the quarter.

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

	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate <sup>1</sup>	
Interval	04/21/17	06/02/17	04/21/17	06/02/17	04/21/17	06/02/17	04/21/17	06/02/17	04/21/17	06/02/17
<i>Quarterly</i>										
2016:Q1	1.3	1.3	0.8	0.8	0.3	0.3	2.1	2.1	5.0	5.0
Q2	3.7	3.7	1.4	1.4	2.0	2.0	1.8	1.8	4.9	4.9
Q3	5.0	5.0	3.5	3.5	1.5	1.5	1.7	1.7	4.9	4.9
Q4	4.2	4.2	2.1	2.1	2.0	2.0	1.3	1.3	4.7	4.7
2017:Q1	3.3	3.5	0.9	1.2	2.4	2.4	2.0	2.1	4.7	4.7
Q2	3.9	3.4	2.6	2.6	1.2	0.4	1.6	1.1	4.5	4.3
Q3	4.1	4.4	2.2	2.7	1.6	1.6	1.7	1.8	4.5	4.3
Q4	4.4	5.0	2.6	3.1	1.6	1.7	1.6	1.6	4.4	4.2
2018:Q1	4.8	4.7	2.6	2.6	1.9	1.9	1.9	1.9	4.3	4.2
Q2	4.1	4.2	2.0	2.1	1.8	1.9	1.9	1.9	4.2	4.1
Q3	4.0	4.1	2.0	2.1	1.8	1.9	1.9	1.9	4.2	4.0
Q4	4.1	4.1	2.1	2.1	1.8	1.9	1.9	1.9	4.1	3.9
<i>Two-quarter<sup>2</sup></i>										
2016:Q2	2.5	2.5	1.1	1.1	1.1	1.1	1.9	1.9	-0.1	-0.1
Q4	4.6	4.6	2.8	2.8	1.7	1.7	1.5	1.5	-0.2	-0.2
2017:Q2	3.6	3.4	1.7	1.9	1.8	1.4	1.8	1.6	-0.2	-0.4
Q4	4.2	4.7	2.4	2.9	1.6	1.7	1.6	1.7	-0.1	-0.1
2018:Q2	4.4	4.5	2.3	2.4	1.8	1.9	1.9	1.9	-0.2	-0.1
Q4	4.0	4.1	2.0	2.1	1.8	1.9	1.9	1.9	-0.1	-0.2
<i>Four-quarter<sup>3</sup></i>										
2015:Q4	3.0	3.0	1.9	1.9	0.4	0.4	1.4	1.4	-0.7	-0.7
2016:Q4	3.5	3.5	2.0	2.0	1.4	1.4	1.7	1.7	-0.3	-0.3
2017:Q4	3.9	4.0	2.1	2.4	1.7	1.6	1.7	1.6	-0.3	-0.5
2018:Q4	4.2	4.3	2.2	2.2	1.8	1.9	1.9	1.9	-0.3	-0.3
2019:Q4	3.9	4.0	1.8	1.8	1.9	2.0	2.0	2.0	-0.1	-0.1
<i>Annual</i>										
2015	3.7	3.7	2.6	2.6	0.3	0.3	1.4	1.4	5.3	5.3
2016	3.0	3.0	1.6	1.6	1.1	1.1	1.7	1.7	4.9	4.9
2017	4.0	4.0	2.0	2.2	1.8	1.7	1.7	1.6	4.5	4.4
2018	4.3	4.4	2.3	2.5	1.7	1.7	1.8	1.8	4.2	4.0
2019	4.0	4.0	1.9	1.9	1.9	1.9	1.9	1.9	4.0	3.9

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

Item	2016				2017				2018				2019 <sup>1</sup>			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2016 <sup>1</sup>	2017 <sup>1</sup>	2018 <sup>1</sup>	2019 <sup>1</sup>	
Real GDP <i>Previous Tealbook</i>	1.4	3.5	2.1	1.2	2.6	2.7	3.1	2.6	2.1	2.1	2.1	2.0	2.0	2.4	2.2	1.8
Final sales <i>Previous Tealbook</i>	2.6	3.0	1.1	2.2	2.2	2.5	3.0	2.7	2.1	2.2	2.0	2.0	2.5	2.3	2.3	1.9
Priv. dom. final purch. <i>Previous Tealbook</i>	3.2	2.4	3.4	.9	2.7	2.3	2.7	2.7	2.0	2.1	2.1	2.1	2.2	2.1	2.2	1.8
Personal cons. expend. <i>Previous Tealbook</i>	4.3	3.0	3.5	.6	3.0	2.8	3.0	3.3	3.0	2.8	2.7	3.0	2.8	2.7	3.1	2.9
Durables	9.8	11.6	11.4	-1.4	5.7	4.7	5.8	5.6	5.0	4.5	4.0	7.9	3.6	4.8	2.0	2.0
Nondurables	5.7	-.5	3.3	1.2	3.8	3.1	2.9	3.6	3.1	2.9	2.6	2.6	2.7	3.1	2.6	2.6
Services	3.0	2.7	2.4	.8	2.4	2.5	2.6	2.9	2.6	2.4	2.4	2.5	2.1	2.1	2.6	2.6
Residential investment <i>Previous Tealbook</i>	-7.7	-4.1	9.6	13.9	-1.1	-2.6	7.8	4.2	2.6	3.1	2.4	1.1	4.3	3.1	4.2	4.4
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	1.0	1.4	.9	10.2	3.3	5.9	5.0	4.9	2.6	2.1	2.2	-1	6.1	2.9	1.1	1.1
Equipment & intangibles <i>Previous Tealbook</i>	1.8	-1.3	1.7	7.0	2.6	4.5	4.4	4.6	2.6	2.5	2.5	-1	4.2	3.1	1.2	1.2
Nonres. structures <i>Previous Tealbook</i>	1.8	-1.3	1.7	2.4	2.4	2.4	4.9	6.0	2.9	2.7	2.9	-6	5.0	3.6	1.7	1.7
Net exports <sup>2</sup> <i>Previous Tealbook</i> <sup>2</sup>	-558	-522	-605	-597	-627	-640	-662	-684	-698	-703	-747	-747	-563	-618	-687	-741
Exports	1.8	10.0	-4.5	7.3	1.3	2.2	2.7	2.9	2.9	3.1	3.0	1.5	3.3	3.0	2.9	2.9
Imports	.2	2.2	9.0	4.4	3.0	4.1	4.1	5.4	5.3	4.3	3.0	2.6	3.9	4.5	4.2	4.2
Gov't. cons. & invest. <i>Previous Tealbook</i>	-1.7	.8	.2	-.9	1.8	1.7	4	.5	.5	.5	.5	.2	.7	.5	.6	.6
Federal	-1.7	.8	.2	-1.8	2.4	2.2	1.3	.7	.5	.4	.2	.2	1.0	.5	.5	.5
Defense	-.4	2.4	-1.2	-2.0	.4	2.2	2.0	-2	-2	-2	-2	.6	-.2	.2	.2	.2
Nonddefense	-3.2	2.0	-3.6	-3.9	.0	3.7	3.7	1.1	1.1	1.1	1.1	-2.0	1.1	1.1	1.0	1.0
State & local	3.8	3.0	2.3	.7	.9	0	-.3	-2.0	-2.0	-2.0	-2.0	.8	.8	.4	-.9	-.9
Change in priv. inventories <sup>2</sup> <i>Previous Tealbook</i> <sup>2</sup>	-9	7	50	4	20	25	29	25	26	18	22	22	20	24	15	15
	-9	7	50	46	39	34	30	29	28	28	22	40	29	22	22	22

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	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Real GDP <i>Previous Tealbook</i>	2.7	1.7	1.3	2.7	2.5	1.9	2.0	2.4	2.2	1.8
Final sales <i>Previous Tealbook</i>	2.0	1.5	1.7	2.0	2.7	2.0	2.0	2.5	2.3	1.9
Priv. dom. final purch. <i>Previous Tealbook</i>	3.5	2.6	2.3	2.6	3.8	2.7	2.5	3.0	2.1	1.9
Personal cons. expend. <i>Previous Tealbook</i>	3.1	1.5	1.3	2.0	3.5	2.6	3.1	2.4	2.9	2.5
Durables	3.1	1.5	1.3	2.0	3.5	2.6	3.1	2.4	2.9	2.5
Nondurables	9.3	4.8	7.2	5.2	8.6	5.5	7.9	3.6	4.8	2.0
Services	3.3	.4	.8	2.6	2.8	2.3	2.6	2.7	3.1	2.6
Residential investment <i>Previous Tealbook</i>	-5.2	6.0	15.7	6.8	6.2	13.1	1.1	4.3	3.1	4.2
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	8.1	9.0	5.2	4.8	5.0	.8	-1	6.1	2.9	1.1
Equipment & intangibles <i>Previous Tealbook</i>	12.0	9.2	5.5	4.5	4.1	3.8	-6	4.2	3.1	1.2
Nonres. structures <i>Previous Tealbook</i>	-4.0	8.0	4.1	5.8	8.0	-8.8	1.9	10.0	7	-7
Net exports <sup>1</sup> <i>Previous Tealbook</i>	-459	-459	-447	-405	-426	-540	-563	-618	-687	-741
Exports	10.1	4.2	2.2	5.9	3.1	-2.2	1.5	3.3	3.0	2.9
Imports	12.0	3.5	.3	2.5	6.1	2.5	2.6	3.9	4.5	4.2
Gov't. cons. & invest. <i>Previous Tealbook</i>	-1.1	-3.0	-2.2	-2.8	.3	2.2	.2	.7	.5	.6
Federal	-1.1	-3.0	-2.2	-2.8	.3	2.2	.2	1.0	.5	.5
Defense	3.2	-4.0	-2.1	-6.7	-1.3	1.7	-.2	.6	-.2	.2
Nondefense	2.0	-4.1	-3.9	-7.1	-4.1	.6	-2.0	.8	1.1	1.0
State & local	5.5	-3.9	1.0	-6.0	3.4	3.4	2.5	3	-2.0	-.9
Change in priv. inventories <sup>1</sup> <i>Previous Tealbook</i>	58	38	55	79	58	84	22	20	24	15
	58	38	55	79	58	84	22	40	29	22

1. Billions of chained (2009) dollars.

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

Item	2016			2017			2018			2016 <sup>1</sup>			2017 <sup>1</sup>			2018 <sup>1</sup>		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2016 <sup>1</sup>	2017 <sup>1</sup>	2018 <sup>1</sup>	2017 <sup>1</sup>	2018 <sup>1</sup>	2019 <sup>1</sup>	
Real GDP <i>Previous Tealbook</i>	1.4	3.5	2.1	1.2	2.6	2.7	3.1	2.6	2.1	2.1	2.1	2.0	2.0	2.4	2.0	2.2	1.8	
Final sales <i>Previous Tealbook</i>	2.6	3.0	1.1	2.2	2.2	2.5	3.0	2.7	2.1	2.2	2.0	2.0	2.0	2.5	2.0	2.1	1.8	
Priv. dom. final purch. <i>Previous Tealbook</i>	2.7	2.1	2.9	2.2	2.4	2.6	3.0	3.1	2.5	2.3	2.2	2.1	2.1	2.5	2.1	2.5	2.1	
Personal cons. expend. <i>Previous Tealbook</i>	2.9	2.0	2.4	.4	2.1	2.0	2.1	2.3	2.0	1.9	1.9	2.1	2.1	1.6	2.1	2.0	1.7	
Durables	.7	.8	.5	-.1	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.6	-.3	.4	.4	.4	.1	
Nondurables	.8	-.1	1.3	1.1	.4	.2	.5	.4	.5	.4	.4	.4	.4	.5	.5	.4	.4	
Services	1.4	1.1	1.4	1.1	1.2	1.2	1.2	1.4	1.2	1.1	1.2	1.2	1.0	1.2	1.2	1.2	1.2	
Residential investment <i>Previous Tealbook</i>	-.3	-.2	.4	.5	.0	-.1	.3	.2	.1	.1	.1	.0	.0	.2	.1	.1	.2	
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	.1	.2	.1	1.2	.4	.7	.6	.6	.3	.3	.3	.3	.0	.7	.7	.4	.1	
Equipment & intangibles <i>Previous Tealbook</i>	.1	.2	.1	.7	.5	.4	.5	.6	.3	.3	.3	.3	.0	.5	.5	.4	.2	
Nonres. structures <i>Previous Tealbook</i>	.2	-.1	.2	.7	.2	.2	.2	.5	.6	.3	.3	.3	.3	-.1	.5	.4	.2	
Net exports <i>Previous Tealbook</i>	2	.9	-1.8	-.3	-.3	-.3	-.3	-.3	-.5	-.4	-.3	-.5	-.4	-.2	-.2	-.3	-.3	
Exports	2	1.2	-.6	.8	.2	.3	.3	.3	.4	.4	.4	.4	.4	.2	.4	.4	.3	
Imports	0	-.3	-1.3	-.6	-.4	-.6	-.6	-.8	-.8	-.6	-.5	-.5	-.4	-.6	-.7	-.6	-.6	
Gov't. cons. & invest. <i>Previous Tealbook</i>	-.3	-.1	.0	-.2	-.1	.3	.3	.1	.1	.1	.1	.1	.1	.0	.1	.1	.1	
Federal Defense	-.3	.1	.0	-.3	.4	.4	.2	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	
Nondefense	-.1	.1	-.1	-.1	-.2	0	0	0	0	0	0	0	0	0	0	0	0	
State & local	-.3	.0	.1	.0	.0	.0	.2	.2	.1	.1	.1	.1	.1	.0	.1	.1	.1	
Change in priv. inventories <i>Previous Tealbook</i>	-1.2	.5	1.0	-1.0	.4	.1	-.1	-.1	0	0	0	0	0	0	0	0	0	
	-1.2	.5	1.0	0.0	-.1	-.1	-.1	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	

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

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

Class II FOMC – Restricted (FR)

Authorized for Public Release

June 5, 2017

Item	2016				2017				2018				2019 <sup>1</sup>			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2016 <sup>1</sup>	2017 <sup>1</sup>	2018 <sup>1</sup>	2019 <sup>1</sup>	
GDP chain-wt. price index	2.3	1.4	2.1	2.2	.8	1.7	1.8	2.1	2.0	2.0	2.0	1.6	1.6	2.0	2.1	
<i>Previous Tealbook</i>	2.3	1.4	2.1	2.4	1.3	1.8	1.8	2.1	2.0	2.0	2.0	1.6	1.8	2.0	2.1	
PCE chain-wt. price index	2.0	1.5	2.0	2.4	.4	1.6	1.7	1.9	1.9	1.9	1.8	1.4	1.6	1.9	2.0	
<i>Previous Tealbook</i>	2.0	1.5	2.0	2.4	1.2	1.6	1.6	1.9	1.8	1.8	1.8	1.4	1.7	1.8	1.9	
Energy	15.5	2.1	26.3	15.5	-16.2	-1.9	3.5	2.0	1.1	.7	.7	.8	-.4	1.1	.9	
<i>Previous Tealbook</i>	15.5	2.1	26.3	15.2	-8.5	-.4	.8	.6	.4	.0	.3	.8	1.4	.3	.7	
Food	-1.8	-2.1	-1.2	.4	2.5	1.6	2.0	2.2	2.1	2.1	2.2	-1.7	1.6	2.1	2.2	
<i>Previous Tealbook</i>	-1.8	-2.1	-1.2	.4	2.3	1.9	2.0	2.2	2.1	2.1	2.2	-1.7	1.7	2.1	2.2	
Ex. food & energy	1.8	1.7	1.3	2.1	1.1	1.8	1.6	1.9	1.9	1.9	1.9	1.7	1.6	1.9	2.0	
<i>Previous Tealbook</i>	1.8	1.7	1.3	2.0	1.6	1.7	1.6	1.9	1.9	1.9	1.9	1.7	1.7	1.9	2.0	
Ex. food & energy, market based	1.6	1.6	1.3	2.0	.7	1.6	1.6	1.8	1.8	1.9	1.9	1.5	1.5	1.8	1.9	
<i>Previous Tealbook</i>	1.6	1.6	1.3	2.0	1.4	1.5	1.5	1.8	1.8	1.8	1.8	1.5	1.6	1.8	1.9	
CPI	2.3	1.8	3.0	3.1	.1	2.0	2.4	2.4	2.3	2.3	2.4	1.8	1.9	2.3	2.4	
<i>Previous Tealbook</i>	2.3	1.8	3.0	3.1	1.3	2.1	2.2	2.3	2.3	2.3	2.4	1.8	1.9	2.3	2.4	
Ex. food & energy	2.1	2.1	2.0	2.5	1.0	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.2	2.0	2.5	
<i>Previous Tealbook</i>	2.1	2.1	2.0	2.5	1.9	2.3	2.2	2.4	2.4	2.4	2.5	2.4	2.2	2.2	2.5	
ECI, hourly compensation <sup>2</sup>	2.3	1.9	3.2	2.3	2.3	2.4	2.6	2.4	2.4	2.4	2.5	2.2	2.5	2.5	2.6	
<i>Previous Tealbook</i>	2.3	1.9	3.2	2.5	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.2	2.3	2.4	2.5	
Business sector																
Output per hour	-3	3.7	2.4	-1.2	1.6	2.0	1.6	.8	.9	.8	.9	1.2	1.0	.9	.9	
<i>Previous Tealbook</i>	-3	3.7	2.4	-.8	1.0	1.4	1.5	.9	.8	.9	.9	1.3	.8	.9	.9	
Compensation per hour	5.7	4.3	-2.1	1.7	2.9	3.3	3.5	3.5	3.5	3.5	3.5	1.6	2.8	3.5	3.5	
<i>Previous Tealbook</i>	5.7	4.3	3.9	1.8	3.3	3.2	3.2	3.3	3.4	3.4	3.4	3.2	2.9	3.3	3.4	
Unit labor costs	6.0	.6	-4.4	2.9	1.3	1.3	1.8	2.7	2.5	2.6	2.4	.4	1.8	2.6	2.6	
<i>Previous Tealbook</i>	6.0	.6	1.5	2.6	2.3	1.8	1.6	2.4	2.5	2.4	2.4	1.9	2.1	2.4	2.5	
Core goods imports chain-wt. price index <sup>3</sup>	.5	2.0	-.4	.6	2.2	2.3	.9	.4	.6	.6	.7	.0	1.5	.6	.6	
<i>Previous Tealbook</i>	.5	2.0	-.4	1.1	1.7	1.9	.7	.6	.8	.7	.7	.0	1.3	.7	.7	

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

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

Item	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GDP chain-wt. price index <i>Previous Tealbook</i>	1.8	1.9	1.9	1.6	1.5	1.1	1.6	1.6	2.0	2.1
PCE chain-wt. price index <i>Previous Tealbook</i>	1.3	2.7	1.8	1.2	1.2	.4	1.4	1.6	1.9	2.0
Energy <i>Previous Tealbook</i>	6.4	12.0	2.3	-2.5	-6.2	-15.8	.8	-4	1.1	.9
Food <i>Previous Tealbook</i>	1.3	5.1	1.2	.7	2.7	.3	-1.7	1.6	2.1	2.2
Ex. food & energy <i>Previous Tealbook</i>	1.0	1.9	1.8	1.5	1.6	1.4	1.7	1.7	1.9	2.0
Ex. food & energy, market based <i>Previous Tealbook</i>	.7	1.9	1.5	1.1	1.2	1.1	1.5	1.5	1.8	1.9
CPI <i>Previous Tealbook</i>	1.2	3.3	1.9	1.2	1.2	.4	1.8	1.9	2.3	2.4
Ex. food & energy <i>Previous Tealbook</i>	.6	2.2	1.9	1.7	1.7	2.0	2.2	2.0	2.4	2.5
ECL, hourly compensation <sup>1</sup> <i>Previous Tealbook</i>	2.0	2.2	1.8	2.0	2.3	1.9	2.2	2.5	2.5	2.6
Business sector										
Output per hour <i>Previous Tealbook</i>	1.6	-.1	-.1	1.9	-.1	.5	1.2	1.0	.9	.9
Compensation per hour <i>Previous Tealbook</i>	1.2	.5	5.9	-.1	2.7	3.2	1.6	2.8	3.5	3.5
Unit labor costs <i>Previous Tealbook</i>	-.4	.6	6.0	-2.0	2.8	2.6	.4	1.8	2.6	2.6
Core goods imports chain-wt. price index <sup>2</sup> <i>Previous Tealbook</i>	2.3	4.3	.1	-1.5	.5	-3.3	.0	1.5	.6	.6
	2.3	4.3	.1	-1.5	.5	-3.3	.0	1.3	.7	.7

1. Private-industry workers.

2. Core goods imports exclude computers, semiconductors, oil, and natural gas.

## Other Macroeconomic Indicators

Item	2016				2017				2018				2016 <sup>1</sup>	2017 <sup>1</sup>	2018 <sup>1</sup>	2019 <sup>1</sup>
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1				
<i>Employment and production</i>																
Nonfarm payroll employment <sup>2</sup>	164	239	148	166	160	169	169	169	169	169	159	187	166	167	122	122
Unemployment rate <sup>3</sup>	4.9	4.9	4.7	4.7	4.3	4.3	4.2	4.2	4.1	4.0	3.9	4.7	4.2	3.9	3.8	3.8
<i>Previous Tealbook<sup>3</sup></i>	4.9	4.9	4.7	4.7	4.5	4.5	4.4	4.3	4.2	4.2	4.1	4.7	4.4	4.1	4.0	4.0
Natural rate of unemployment <sup>3</sup>	5.0	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
<i>Previous Tealbook<sup>3</sup></i>	5.0	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Employment-to-Population Ratio <sup>3</sup>	59.7	59.8	59.7	59.7	60.0	60.1	60.0	60.0	60.1	60.1	59.7	59.7	60.0	60.1	59.9	59.9
Employment-to-Population Trend <sup>3</sup>	59.8	59.7	59.7	59.6	59.6	59.5	59.5	59.4	59.3	59.3	59.2	59.7	59.5	59.2	59.0	59.0
GDP gap <sup>4</sup>	-1	3	5	4	7	10	13	16	17	18	19	5	13	19	20	20
<i>Previous Tealbook<sup>4</sup></i>	-1	3	5	3	6	8	10	13	14	15	16	5	10	16	16	18
Industrial production <sup>5</sup>	-7	.8	.7	1.8	5.7	2.2	2.1	1.5	1.1	.9	1.5	-1	2.9	1.2	.9	.9
<i>Previous Tealbook<sup>5</sup></i>	-7	.8	.7	1.5	4.6	2.7	1.7	1.7	1.2	.6	1.3	-1	2.6	1.2	.8	.8
Manufacturing industr. prod. <sup>5</sup>	-1.1	-1	1.6	2.3	2.2	.7	1.3	1.0	1.1	.9	.8	.3	1.6	1.0	.8	.8
<i>Previous Tealbook<sup>5</sup></i>	-1.1	-1	1.7	2.7	1.3	.8	.7	1.0	.7	.6	.3	.3	1.5	.7	.7	.7
Capacity utilization rate - mfg. <sup>3</sup>	75.1	74.9	75.1	75.4	75.7	75.7	75.8	75.9	76.1	76.1	76.2	75.1	75.8	76.2	76.5	76.5
<i>Previous Tealbook<sup>3</sup></i>	75.1	74.9	75.1	75.4	75.6	75.7	75.8	75.9	76.0	76.0	75.1	75.8	76.0	76.3	76.3	76.3
Housing starts <sup>6</sup>	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.4	1.4
Light motor vehicle sales <sup>6</sup>	17.1	17.5	18.0	17.2	16.7	16.8	16.9	17.0	17.0	16.8	16.8	17.5	16.9	16.9	16.6	16.6
<i>Income and saving</i>																
Nominal GDP <sup>5</sup>	3.7	5.0	4.2	3.5	3.4	4.4	5.0	4.7	4.2	4.1	4.1	3.5	4.0	4.3	4.0	4.0
Real disposable pers. income <sup>5</sup>	2.9	2.9	-.3	1.7	3.8	1.6	2.7	7.7	2.2	2.6	2.8	1.9	2.4	3.8	2.3	2.3
<i>Previous Tealbook<sup>5</sup></i>	2.9	2.9	2.0	1.7	2.3	2.4	1.8	8.3	2.4	2.7	2.8	2.5	2.1	4.0	2.1	2.1
Personal saving rate <sup>3</sup>	5.9	5.9	4.9	5.2	5.4	5.1	5.0	6.0	5.8	5.8	5.8	4.9	5.0	5.8	5.6	5.6
<i>Previous Tealbook<sup>3</sup></i>	5.9	5.9	5.5	5.7	5.5	5.4	5.2	6.3	6.2	6.1	6.1	5.5	5.2	6.1	5.7	5.7
Corporate profits <sup>7</sup>	-2.4	25.4	2.1	-7.3	4.4	3.7	3.2	3.5	2.0	2.2	2.2	9.3	.9	2.5	1.4	1.4
Profit share of GNP <sup>3</sup>	10.8	11.3	11.2	10.9	11.0	11.0	11.0	10.9	10.9	10.8	10.8	11.2	11.0	10.8	10.6	10.6
Gross national saving rate <sup>3</sup>	18.2	18.6	17.7	17.6	18.1	17.9	17.8	17.6	17.6	17.5	17.4	17.7	17.8	17.4	17.0	17.0
Net national saving rate <sup>3</sup>	3.1	3.7	2.8	2.9	3.3	3.0	3.0	2.8	2.7	2.6	2.5	2.8	3.0	2.5	1.8	1.8

1. Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise indicated.

2. Average monthly change, thousands.

3. Percent; annual values are for the fourth quarter of the year indicated.

4. Percent difference between actual and potential GDP; 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

### Other Macroeconomic Indicators

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

Item	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<i>Employment and production</i>										
Nonfarm payroll employment <sup>1</sup>	88	174	179	192	250	226	187	166	167	122
Unemployment rate <sup>2</sup>	9.5	8.7	7.8	7.0	5.7	5.0	4.7	4.2	3.9	3.8
<i>Previous Tealbook</i> <sup>2</sup>	9.5	8.7	7.8	7.0	5.7	5.0	4.7	4.4	4.1	4.0
Natural rate of unemployment <sup>2</sup>	5.9	5.9	5.6	5.4	5.1	5.0	4.9	4.9	4.9	4.9
<i>Previous Tealbook</i> <sup>2</sup>	5.9	5.9	5.6	5.4	5.1	5.0	4.9	4.9	4.9	4.9
Employment-to-Population Ratio <sup>2</sup>	58.3	58.5	58.7	58.5	59.2	59.4	59.7	60.0	60.1	59.9
Employment-to-Population Trend <sup>2</sup>	61.1	60.7	60.3	60.2	60.1	59.9	59.7	59.5	59.2	59.0
GDP gap <sup>3</sup>	-4.2	-3.7	-3.7	-2.5	-2.5	-9	0	.5	1.3	2.0
<i>Previous Tealbook</i> <sup>3</sup>	-4.2	-3.7	-3.7	-2.5	-2.5	-9	0	.5	1.0	1.8
Industrial production <sup>4</sup>	6.0	2.8	2.3	2.2	3.4	-2.7	-1	2.9	1.2	.9
<i>Previous Tealbook</i> <sup>4</sup>	6.0	2.8	2.3	2.2	3.4	-2.7	-1	2.6	1.2	.8
Manufacturing industr. prod. <sup>4</sup>	5.9	2.5	1.7	.9	1.5	-6	.3	1.6	1.0	.8
<i>Previous Tealbook</i> <sup>4</sup>	5.9	2.5	1.7	.9	1.5	-6	.3	1.5	.7	.7
Capacity utilization rate - mfg. <sup>2</sup>	72.3	74.4	74.6	74.7	75.9	75.4	75.1	75.8	76.2	76.5
<i>Previous Tealbook</i> <sup>2</sup>	72.3	74.4	74.6	74.7	75.9	75.4	75.1	75.8	76.0	76.3
Housing starts <sup>5</sup>	.6	12.7	14.4	.8	.9	1.0	1.1	1.2	1.3	1.4
Light motor vehicle sales <sup>5</sup>	11.6	12.7	14.4	15.5	16.5	17.4	17.5	16.9	16.9	16.6
<i>Income and saving</i>										
Nominal GDP <sup>4</sup>	4.6	3.6	3.2	4.3	4.1	3.0	3.5	4.0	4.3	4.0
Real disposable pers. income <sup>4</sup>	2.6	1.7	5.1	-2.8	4.5	3.0	1.9	2.4	3.8	2.3
<i>Previous Tealbook</i> <sup>4</sup>	2.6	1.7	5.1	-2.8	4.5	3.0	2.5	2.1	4.0	2.1
Personal saving rate <sup>2</sup>	5.5	5.8	9.2	4.7	5.6	6.0	4.9	5.0	5.8	5.6
<i>Previous Tealbook</i> <sup>2</sup>	5.5	5.8	9.2	4.7	5.6	6.0	5.5	5.2	6.1	5.7
Corporate profits <sup>6</sup>	18.0	6.8	.6	4.7	6.6	-11.2	9.3	.9	2.5	1.4
Profit share of GNP <sup>2</sup>	12.0	12.3	12.0	12.0	12.4	10.7	11.2	11.0	10.8	10.6
Gross national saving rate <sup>2</sup>	15.2	16.1	18.0	18.2	19.2	18.8	17.7	17.8	17.4	17.0
Net national saving rate <sup>2</sup>	-.3	.8	2.9	3.1	4.3	3.9	2.8	3.0	2.5	1.8

1. Average monthly change, thousands.

2. Percent; values are for the fourth quarter of the year indicated.

3. Percent difference between actual and potential GDP; a negative number indicates that the economy is operating below potential.

Values are for the fourth quarter of the year indicated.

4. Percent change.

5. Level, millions; values are annual averages.

6. Percent change, with inventory valuation and capital consumption adjustments.

**Staff Projections of Federal Sector Accounts and Related Items**  
(Billions of dollars except as noted)

Class II FOMC – Restricted (FR)

Authorized for Public Release

June 5, 2017

Item	Fiscal year				2016				2017				2018			
	2016	2017	2018	2019	Q1 <sup>a</sup>	Q2 <sup>a</sup>	Q3 <sup>a</sup>	Q4 <sup>a</sup>	Q1 <sup>a</sup>	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Unified budget</b>																
Receipts	3,268	3,345	3,351	3,520	711	993	798	741	732	1,045	827	784	669	1,087	811	792
Outlays	3,853	3,925	4,101	4,394	956	932	984	951	1,049	953	972	997	1,114	1,025	964	1,112
Surplus/deficit	-585	-579	-750	-875	-245	61	-186	-210	-317	92	-145	-213	-445	62	-154	-319
<i>Previous Tealbook</i>	-586	-530	-677	-798	-245	61	-186	-210	-317	136	-138	-204	-424	96	-145	-304
Means of financing:																
Borrowing	1,052	136	1,140	1,012	251	8	241	259	-68	-117	62	388	547	4	202	358
Cash decrease	-155	442	-271	-17	20	-50	10	-46	419	43	26	-144	-72	-36	-18	-9
Other <sup>1</sup>	-313	1	-120	-120	-25	-18	-65	-5	-33	-18	56	-30	-30	-30	-30	-30
Cash operating balance, end of period	353	-89	182	199	314	364	353	399	-19	-63	-89	56	128	164	182	191
<b>NIPA federal sector</b>																
Receipts	3,495	3,558	3,576	3,707	3,442	3,485	3,537	3,528	3,613	3,533	3,560	3,610	3,519	3,570	3,603	3,644
Expenditures	4,124	4,262	4,489	4,782	4,111	4,137	4,189	4,215	4,274	4,255	4,304	4,365	4,472	4,524	4,595	4,665
Consumption expenditures	974	990	1,008	1,019	969	975	985	984	991	997	1,003	1,008	1,009	1,008	1,011	1,012
Defense	589	586	601	613	587	586	591	586	590	595	601	603	605	607	605	607
Nondefense	386	403	407	405	382	389	394	397	402	405	407	408	406	405	405	404
Other spending	3,150	3,273	3,482	3,763	3,142	3,163	3,204	3,232	3,288	3,306	3,362	3,464	3,515	3,585	3,654	3,654
Current account surplus	-629	-704	-914	-1,075	-668	-652	-652	-688	-661	-723	-744	-756	-953	-954	-992	-1,021
Current account surplus	266	274	287	297	265	265	267	269	274	275	279	283	286	288	291	293
Gross investment	-623	-705	-926	-1,095	-662	-646	-647	-685	-662	-724	-749	-765	-964	-967	-1,007	-1,038
<b>Fiscal indicators</b>																
High-employment (HEB) surplus/deficit <sup>3</sup>	-636.6	-755.8	-1,040.3	-1,247.6	-670.2	-657.3	-671.4	-722.1	-697.1	-780.0	-823.8	-860.4	-1,069.8	-1,088.4	-1,142.7	-1,185.7
Change in HEB, percent of potential GDP	.4	.5	1.3	.8	.7	-.1	.0	.2	-.2	.4	.2	.2	1.0	.0	.2	.2
Fiscal impetus (FI), percent of GDP <sup>4</sup>	.2	.2	.4	.3	.5	-.1	.3	.2	-.1	.2	.4	.4	.7	.3	.3	.3
<i>Previous Tealbook</i>	.2	.3	.4	.3	.5	-.1	.3	.2	-.2	.5	.5	.3	.7	.3	.3	.3
Federal purchases	.0	.0	.1	.0	-.1	.0	.2	-.1	-.1	.0	.1	.1	.0	.0	.0	.0
State and local purchases	.2	.1	.3	.2	.2	.2	.2	.2	.1	.1	.1	.1	.1	.1	.1	.1
Taxes and transfers	.2	.1	.3	.2	.2	.2	.2	.2	.1	.1	.1	.1	.6	.2	.2	.2

1. Other means of financing include checks issued less checks paid, accrued items, and changes in other financial assets and liabilities.

2. Gross saving is the current account surplus plus consumption of fixed capital of the general government as well as government enterprises.

3. HEB is gross saving less gross investment (NIPA) of the federal government in current dollars, with cyclically sensitive receipts and outlays adjusted to the staff's measure of potential output and the natural rate of unemployment. The sign on Change in HEB, as a percent of nominal potential GDP, is reversed. Quarterly figures for change in HEB are not at annual rates.

4. Fiscal impetus measures the contribution to growth of real GDP from fiscal policy actions at the general government level (excluding multiplier effects). It equals the sum of the direct contributions to real GDP growth from changes in federal purchases and state and local purchases, plus the estimated contribution from real consumption and investment that is induced by discretionary policy changes in transfers and taxes.

a Actual.

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

Measure and country	2016				2017				Projected 2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Real GDP<sup>1</sup></b>												
Total foreign	2.4	1.3	3.2	2.8	3.2	2.7	2.7	2.6	2.6	2.6	2.6	2.6
<i>Previous Tealbook</i>	2.4	1.4	3.1	2.8	2.9	2.7	2.5	2.5	2.6	2.6	2.6	2.6
Advanced foreign economies	2.4	.3	2.6	2.3	2.7	2.2	2.0	1.9	1.8	1.7	1.7	1.7
Canada	2.8	-1.4	4.2	2.7	3.7	2.4	2.1	1.9	1.9	1.8	1.8	1.8
Japan	2.6	1.7	1.0	1.4	2.2	1.7	1.3	1.1	1.0	.9	.8	.7
United Kingdom	.6	2.4	2.0	2.7	.7	1.6	1.7	1.6	1.6	1.6	1.6	1.6
Euro area	2.2	1.3	1.7	1.9	2.0	2.2	2.0	1.9	1.8	1.8	1.8	1.8
Germany	2.9	1.9	.5	1.7	2.4	2.3	2.0	1.9	1.7	1.5	1.5	1.5
Emerging market economies	2.4	2.2	3.8	3.4	3.7	3.3	3.3	3.4	3.4	3.4	3.4	3.4
Asia	4.4	5.3	4.6	4.7	5.5	5.0	4.7	4.7	4.5	4.5	4.5	4.5
Korea	2.0	3.7	1.9	2.0	4.3	3.6	3.4	3.2	3.0	3.0	3.0	3.0
China	6.6	7.1	6.8	6.6	7.3	6.5	6.4	6.1	5.9	5.9	5.8	5.8
Latin America	.6	-.5	3.0	2.0	2.4	2.0	2.1	2.3	2.4	2.4	2.5	2.5
Mexico	1.8	.2	4.4	2.9	2.7	2.1	2.2	2.3	2.3	2.3	2.4	2.5
Brazil	-4.0	-1.3	-2.3	-2.2	4.3	.7	1.9	2.0	2.1	2.1	2.1	2.1
<i>Consumer prices<sup>2</sup></i>												
Total foreign	1.4	2.1	1.7	2.6	3.0	2.4	2.4	2.4	2.4	2.4	2.4	2.4
<i>Previous Tealbook</i>	1.4	2.0	1.6	2.6	3.0	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Advanced foreign economies	-.4	1.2	.9	1.8	2.3	1.1	1.2	1.3	1.4	1.5	1.5	1.6
Canada	.5	2.2	1.0	1.7	2.6	1.8	1.8	1.7	1.8	1.9	1.9	1.9
Japan	-.3	-.4	-.5	2.4	-.1	.3	.5	.6	.7	.8	.9	1.0
United Kingdom	.1	.8	2.1	1.9	3.9	3.1	2.4	2.2	2.2	2.1	2.1	2.1
Euro area	-1.2	1.2	1.2	1.9	2.9	.6	.9	1.2	1.2	1.3	1.4	1.5
Germany	-1.3	1.2	1.3	3.0	2.1	.8	1.2	1.5	1.6	1.7	1.8	1.9
Emerging market economies	2.6	2.7	2.2	3.1	3.4	3.4	3.2	3.1	3.1	3.1	3.1	3.1
Asia	2.0	2.3	1.2	2.6	.9	2.2	2.7	2.7	2.8	2.8	2.8	2.8
Korea	.5	1.0	.4	4.0	2.9	.9	2.3	2.6	3.0	3.0	3.0	3.0
China	2.5	2.3	1.3	2.6	-.6	2.6	2.7	2.5	2.5	2.5	2.5	2.5
Latin America	4.3	3.9	4.5	4.5	9.8	6.4	4.3	4.1	3.9	3.8	3.7	3.7
Mexico	2.8	2.4	3.6	4.1	9.9	6.0	3.6	3.4	3.2	3.2	3.2	3.2
Brazil	11.8	7.5	6.5	2.6	3.2	3.1	4.9	4.9	4.6	4.4	4.4	4.4

<sup>1</sup>Foreign GDP aggregates calculated using shares of U.S. exports.

<sup>2</sup>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)

Class II FOMC – Restricted (FR)

Authorized for Public Release

June 5, 2017

Measure and country	2011	2012	2013	2014	2015	2016	2017	2018	2019	Projected
<b>Real GDP<sup>1</sup></b>										
Total foreign	3.2	2.3	2.9	2.6	2.0	2.4	2.8	2.6	2.6	2.6
<i>Previous Tealbook</i>	3.2	2.3	2.9	2.6	2.0	2.4	2.6	2.6	2.6	2.6
Advanced foreign economies	1.8	3	2.4	1.8	1.1	1.9	2.2	1.7	1.7	1.7
Canada	3.1	.7	3.6	2.2	.4	2.0	2.6	1.8	1.8	1.8
Japan	.2	3	2.7	-.3	1.0	1.7	1.6	.8	.0	.0
United Kingdom	1.3	1.3	2.4	3.5	1.7	1.9	1.4	1.6	1.6	1.6
Euro area	.5	-1.1	.7	1.3	2.0	1.8	2.0	1.8	1.8	1.8
Germany	2.4	.2	1.6	1.6	1.3	1.8	2.2	1.5	1.4	1.4
Emerging market economies	4.6	4.3	3.4	3.3	2.8	2.9	3.4	3.4	3.5	3.5
Asia	5.1	5.7	5.4	5.0	4.4	4.8	5.0	4.5	4.4	4.4
Korea	2.9	2.1	3.5	2.8	3.3	2.4	3.6	3.0	2.9	2.9
China	8.7	8.0	7.6	7.1	6.8	6.8	6.6	5.8	5.7	5.7
Latin America	4.1	3.4	1.6	1.9	1.3	1.2	2.2	2.4	2.6	2.6
Mexico	4.2	3.4	1.0	2.7	2.5	2.3	2.3	2.4	2.6	2.6
Brazil		2.7	2.5	2.6	-.2	-5.7	-2.4	2.2	2.1	2.2
<i>Consumer prices<sup>2</sup></i>										
Total foreign	3.4	2.3	2.4	2.0	1.4	1.9	2.5	2.4	2.4	2.6
<i>Previous Tealbook</i>	3.4	2.3	2.4	2.0	1.4	1.9	2.6	2.4	2.4	2.6
Advanced foreign economies	2.2	1.3	1.0	1.2	.5	.9	1.5	1.5	1.5	1.9
Canada	2.7	1.0	1.0	2.0	1.3	1.4	2.0	1.9	1.9	2.0
Japan	-.3	-.2	1.4	2.6	.2	.3	.3	.8	.8	2.5
United Kingdom	4.6	2.6	2.1	.9	.1	1.2	2.9	2.1	2.1	2.1
Euro area	2.9	2.3	.8	.2	.2	.7	1.4	1.4	1.4	1.6
Germany	2.6	1.9	1.4	.4	.2	1.0	1.4	1.7	1.7	2.0
Emerging market economies	4.3	3.1	3.4	2.7	2.1	2.7	3.3	3.1	3.1	3.1
Asia	4.4	2.6	3.1	1.8	1.5	2.0	2.1	2.8	2.8	2.9
Korea	3.9	1.7	1.1	1.0	.9	1.5	2.2	3.0	3.0	3.0
China	4.6	2.1	2.9	1.5	1.5	2.2	1.8	2.5	2.5	2.5
Latin America	4.1	4.4	4.1	4.8	3.4	4.3	6.1	3.8	3.6	3.6
Mexico	3.5	4.1	3.6	4.2	2.3	3.2	5.7	3.2	3.2	3.2
Brazil	6.7	5.6	5.8	6.5	10.4	7.1	4.0	4.4	4.5	4.5

<sup>1</sup>Foreign GDP aggregates calculated using shares of U.S. exports.

<sup>2</sup>Foreign CPI aggregates calculated using shares of U.S. non-oil imports.

**U.S. Current Account  
Quarterly Data**

	<i>Billions of dollars, s.a.a.r.</i>								<i>Projected</i>			
	<i>2016</i>				<i>2017</i>				<i>2018</i>			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>U.S. current account balance</b>												
<i>Previous Tealbook</i>	<b>-531.8</b>	<b>-470.9</b>	<b>-482.7</b>	<b>-456.4</b>	<b>-475.2</b>	<b>-509.6</b>	<b>-542.4</b>	<b>-579.5</b>	<b>-640.4</b>	<b>-647.4</b>	<b>-675.8</b>	<b>-702.0</b>
Current account as percent of GDP	-2.9	-2.6	-2.6	-2.4	-2.5	-2.7	-2.8	-3.0	-3.2	-3.3	-3.3	-3.4
<i>Previous Tealbook</i>	-2.9	-2.6	-2.5	-2.4	-2.8	-2.9	-3.0	-3.3	-3.3	-3.4	-3.4	-3.5
Net goods & services	-504.3	-495.1	-483.6	-536.2	-555.9	-567.1	-583.5	-604.7	-641.4	-640.6	-647.5	-656.6
Investment income, net	146.0	186.5	177.5	257.1	257.2	224.8	214.5	194.5	179.2	160.5	145.0	124.0
Direct, net	218.6	254.5	254.0	343.2	356.6	314.7	322.1	321.2	326.9	330.7	339.3	342.2
Portfolio, net	-72.6	-68.1	-76.5	-86.1	-99.3	-89.9	-107.7	-126.7	-147.7	-170.2	-194.3	-218.2
Other income and transfers, net	-173.4	-162.2	-176.6	-177.3	-176.5	-167.3	-173.4	-169.4	-178.3	-167.3	-173.4	-169.4
<i>Annual Data</i>												
	2011	2012	2013	2014	2015	2016	2017	2018	2019			
<b>U.S. current account balance</b>												
<i>Previous Tealbook</i>	<b>-460.4</b>	<b>-446.5</b>	<b>-366.4</b>	<b>-366.4</b>	<b>-391.4</b>	<b>-463.1</b>	<b>-481.4</b>	<b>-526.7</b>	<b>-666.4</b>	<b>-789.2</b>	<b>-810.4</b>	
Current account as percent of GDP	-3.0	-2.8	-2.2	-2.2	-2.2	-2.2	-2.6	-2.6	-2.7	-3.3	-3.3	-3.8
<i>Previous Tealbook</i>	-3.0	-2.8	-2.2	-2.2	-2.3	-2.3	-2.6	-2.6	-2.9	-3.4	-3.4	-3.9
Net goods & services	-548.6	-536.8	-461.9	-489.5	-500.4	-504.8	-504.8	-577.8	-646.5	-646.5	-692.8	
Investment income, net	229.0	224.4	228.4	234.3	193.4	191.8	191.8	222.8	152.2	152.2	75.7	
Direct, net	298.6	293.8	296.3	289.0	265.4	267.6	267.6	328.7	334.8	334.8	353.3	
Portfolio, net	-69.5	-69.4	-67.9	-54.8	-72.0	-75.8	-75.8	-105.9	-182.6	-182.6	-277.7	
Other income and transfers, net	-140.8	-134.2	-132.9	-136.1	-156.0	-172.4	-172.4	-171.6	-172.1	-172.1	-172.1	

## Abbreviations

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AFE	advanced foreign economy
AHE	average hourly earnings
BEA	Bureau of Economic Analysis
C&I	commercial and industrial
CMBS	commercial mortgage-backed securities
CPI	consumer price index
CRE	commercial real estate
ECI	employment cost index
E&I	equipment and intangibles
ELB	effective lower bound
EME	emerging market economy
FOMC	Federal Open Market Committee; also, the Committee
GDP	gross domestic product
M&A	mergers and acquisitions
MBS	mortgage-backed securities
MCE	model-consistent expectations
Michigan survey	University of Michigan Surveys of Consumers
MMF	money market fund
LFPR	labor force participation rate
LIBOR	London interbank offered rate
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
PMI	purchasing managers index

repo	repurchase agreement
SOMA	System Open Market Account
S&P	Standard & Poor's
TIPS	Treasury Inflation-Protected Securities
VAR	value at risk

Class I FOMC – Restricted Controlled (FR)

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# Report to the FOMC on Economic Conditions and Monetary Policy



## Book B Monetary Policy Alternatives

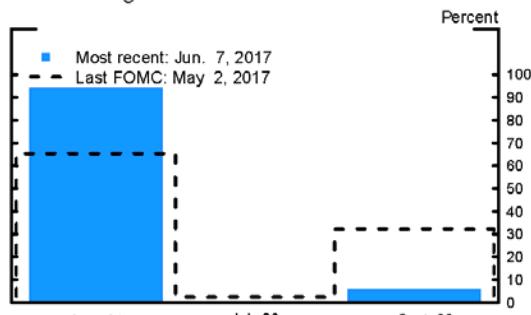
June 8, 2017

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

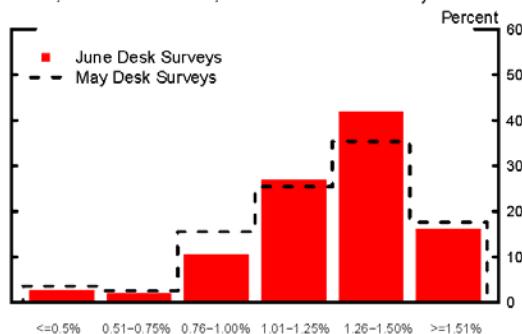
Figure 1: Market-Implied Probability Distribution of the Timing of Next Rate Increase



Note: Probabilities implied by a binomial tree fitted to settlement prices on fed funds futures contracts, assuming the next policy action is either no change or a 25 basis point increase in rates and no intermediate 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. The dashed line shows the probability distribution of the next rate hike after the May meeting.

Source: CME Group, Federal Reserve Board staff estimates.

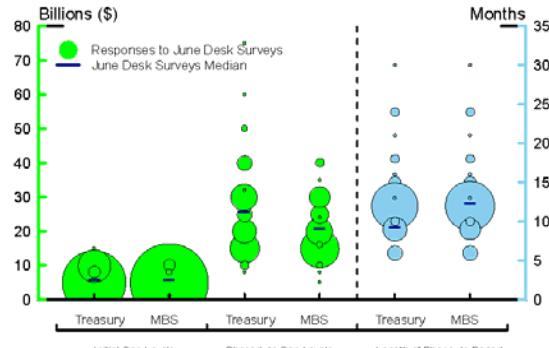
Figure 3: Probability Distribution of the Federal Funds Rate, Year-End 2017, from the Desk Surveys



Note: Average unconditional probabilities across the Survey of Primary Dealers and Survey of Market Participants for different ranges of the federal funds rate at the end of 2017.

Source: FRBNY.

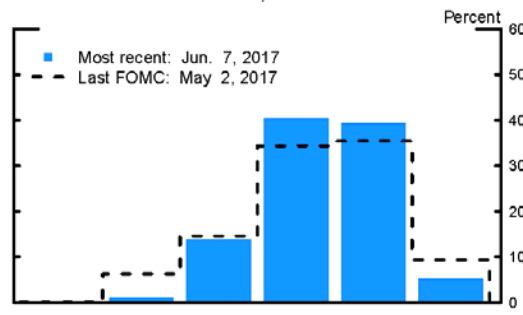
Figure 5: Expectations of Cap Levels and Phase-in Period



Note: Based on all responses from the Survey of Primary Dealers and Survey of Market Participants. Dots scaled by number of respondents.

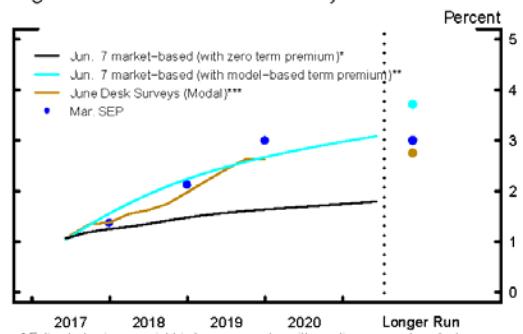
Source: FRBNY.

Figure 2: Market-Implied Probability Distribution of the Federal Funds Rate, Year-End 2017



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

Figure 4: Federal Funds Rate Projections



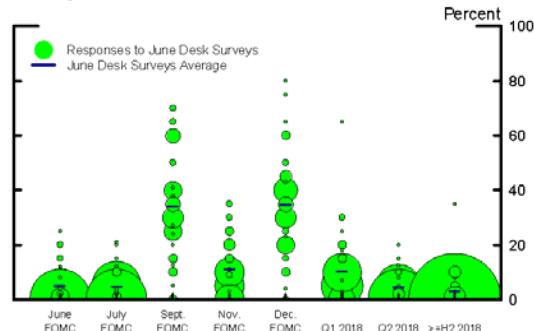
\* Estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points.

\*\* Estimated using a term structure model maintained by Board staff and adjusted for term premiums. The longer-run model-implied forecast is for the expected federal funds rate 5 to 10 years ahead.

\*\*\* Median of the respondents' modal paths for the federal funds rate.

Source: Bloomberg, Blue Chip Financial Forecasts, Federal Reserve Board staff estimates, FRBNY.

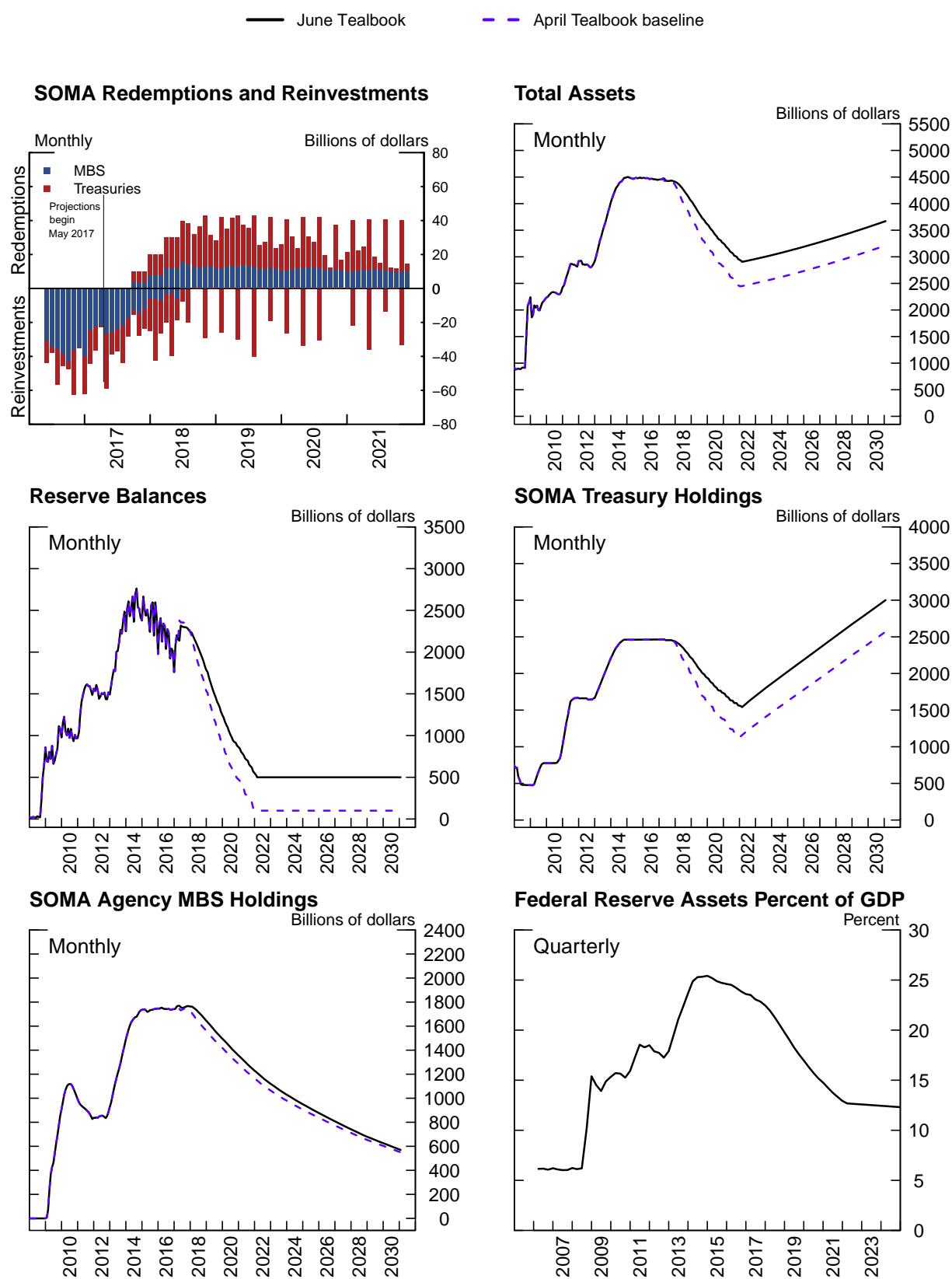
Figure 6: Probability Distribution of the Timing of a Change in Reinvestment



Note: Based on all responses from the Survey of Primary Dealers and Survey of Market Participants. Dots scaled by number of respondents.

Source: FRBNY.

## Total Assets and Selected Balance Sheet Items



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

	Apr 30, 2017	2017	2019	2021	2023	2025	2030
Total assets	4,471	4,411	3,613	2,944	3,030	3,189	3,661
Selected assets							
Loans and other credit extensions*	2	0	0	0	0	0	0
Securities held outright	4,246	4,206	3,438	2,792	2,894	3,066	3,564
U.S. Treasury securities	2,465	2,438	1,940	1,560	1,863	2,187	2,987
Agency debt securities	12	4	2	2	2	2	2
Agency mortgage-backed securities	1,769	1,763	1,495	1,230	1,029	877	574
Unamortized premiums	168	159	126	101	83	69	42
Unamortized discounts	-15	-14	-11	-8	-7	-6	-4
Total other assets	51	52	52	52	52	52	52
Total liabilities	4,431	4,369	3,569	2,896	2,978	3,132	3,590
Selected liabilities							
Federal Reserve notes in circulation	1,496	1,555	1,751	1,874	2,006	2,160	2,619
Reverse repurchase agreements	423	341	341	241	241	241	241
Deposits with Federal Reserve Banks	2,505	2,469	1,472	776	726	726	726
Reserve balances held by depository institutions	2,136	2,243	1,246	550	500	500	500
U.S. Treasury, General Account	273	150	150	150	150	150	150
Other deposits	96	76	76	76	76	76	76
Earnings remittances due to the U.S. Treasury	2	0	0	0	0	0	0
Total capital**	41	41	44	48	52	57	71

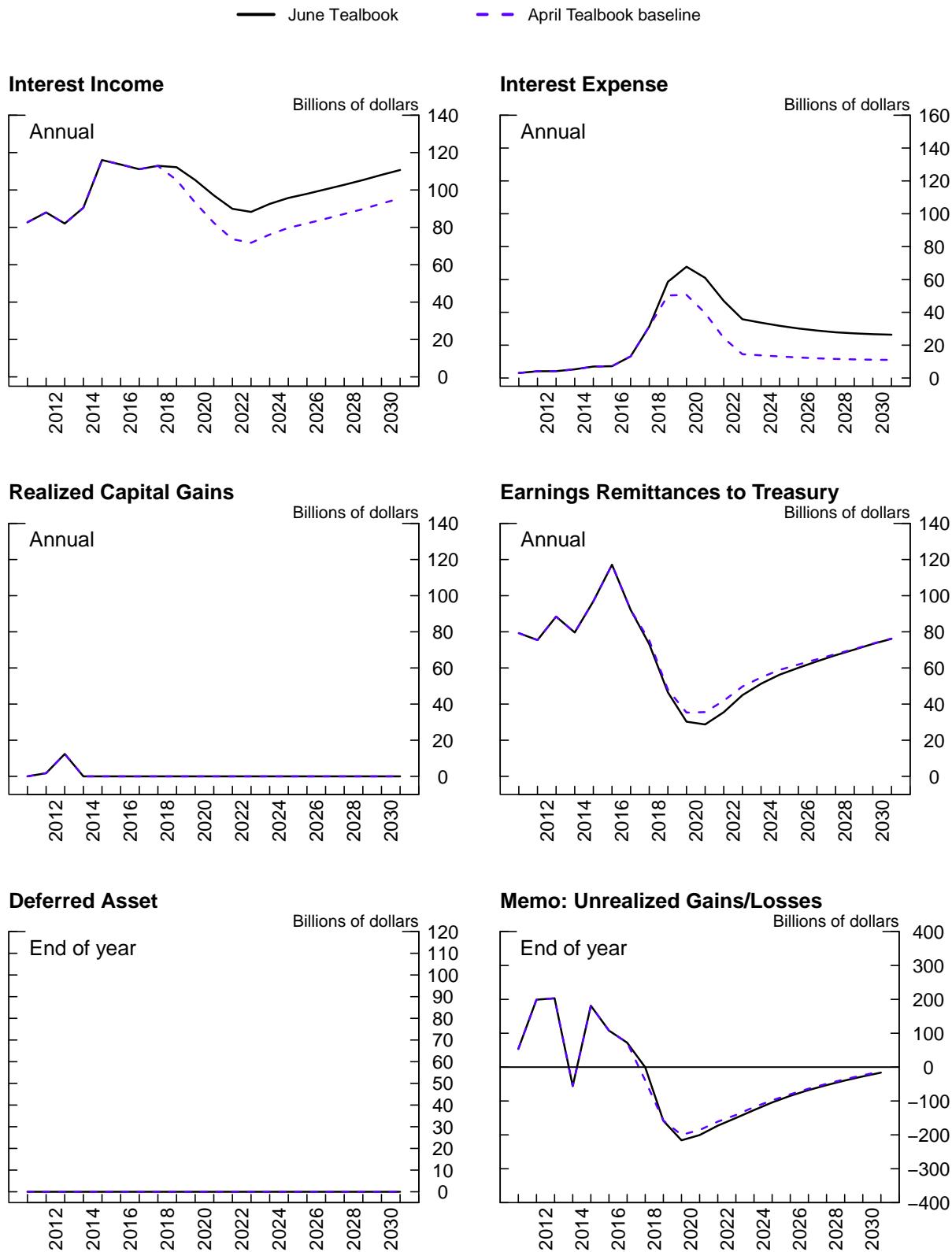
Source: Federal Reserve H.4.1 statistical releases and staff calculations.

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

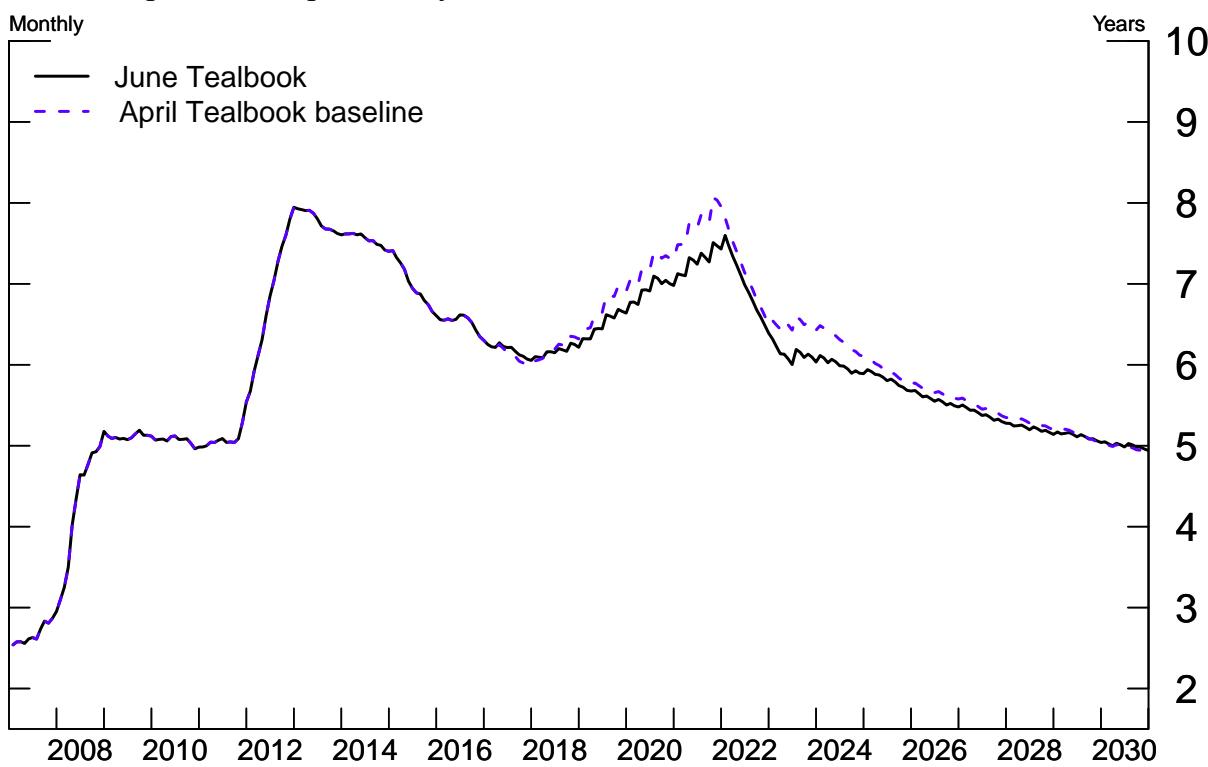


**Projections for the 10-Year Treasury Term Premium Effect**  
**(Basis Points)**

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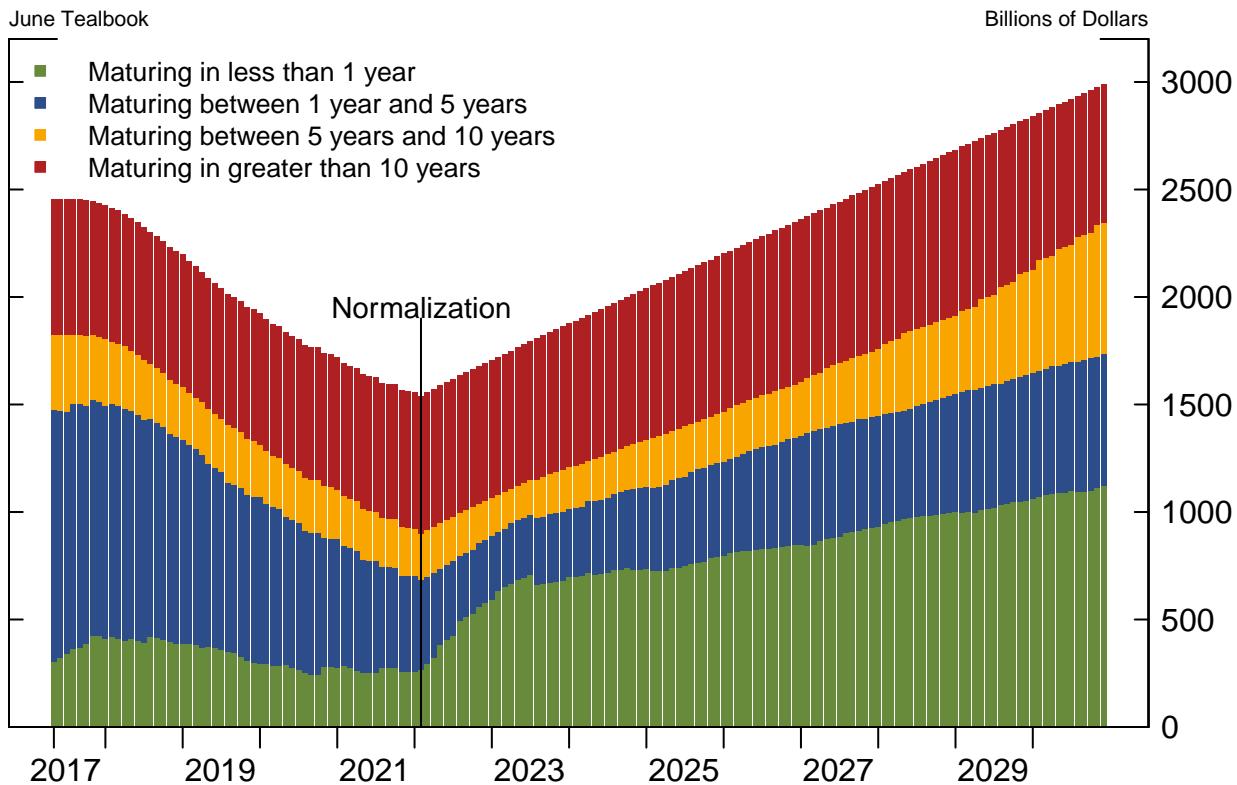
Date	June Tealbook	April Tealbook baseline
Quarterly Averages		
2017:Q2	-95	-83
Q3	-91	-79
Q4	-88	-75
2018:Q4	-75	-61
2019:Q4	-64	-50
2020:Q4	-56	-42
2021:Q4	-49	-36
2022:Q4	-44	-33
2023:Q4	-41	-30
2024:Q4	-37	-26
2025:Q4	-34	-24
2026:Q4	-31	-21
2027:Q4	-29	-19
2028:Q4	-27	-17
2029:Q4	-24	-15
2030:Q4	-23	-14

**Projections for the Characteristics of SOMA Holdings**  
**SOMA Weighted-Average Treasury Duration**



Balance Sheet &amp; Income

**Maturity Composition of SOMA Treasury Portfolio**



## Abbreviations

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ABS	asset-backed securities
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
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)
TGA	U.S. Treasury's General Account
TIPS	Treasury inflation-protected securities
TPE	Term premium effects