

**Prefatory Note**

The attached document represents the most complete and accurate version available based on original files from the FOMC Secretariat at the Board of Governors of the Federal Reserve System.

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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

July 14, 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 the SPF forecast in 2017. The staff's projection for CPI inflation is below those of outside forecasters in 2017 and is above them in 2018. The staff's projections for both overall and core PCE price inflation are noticeably below the SPF forecasts in 2017 but only slightly below the SPF forecasts in 2018.

### Comparison of Tealbook and Outside Forecasts

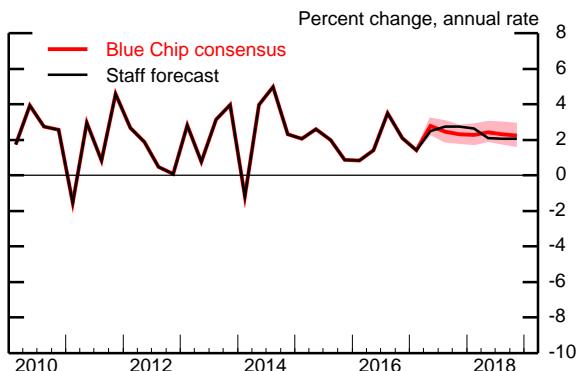
	2017	2018
<b>GDP (Q4/Q4 percent change)</b>		
July Tealbook	2.3	2.2
Blue Chip (7/10/17)	2.2	2.3
SPF median (5/12/17)	2.2	n.a.
<b>Unemployment rate (Q4 level)</b>		
July Tealbook	4.2	4.0
Blue Chip (7/10/17)	4.2	4.1
SPF median (5/12/17)	4.4	n.a.
<b>CPI inflation (Q4/Q4 percent change)</b>		
July Tealbook	1.7	2.4
Blue Chip (7/10/17)	1.9	2.3
SPF median (5/12/17)	2.3	2.3
<b>PCE price inflation (Q4/Q4 percent change)</b>		
July Tealbook	1.4	1.9
SPF median (5/12/17)	2.0	2.0
<b>Core PCE price inflation (Q4/Q4 percent change)</b>		
July Tealbook	1.5	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.

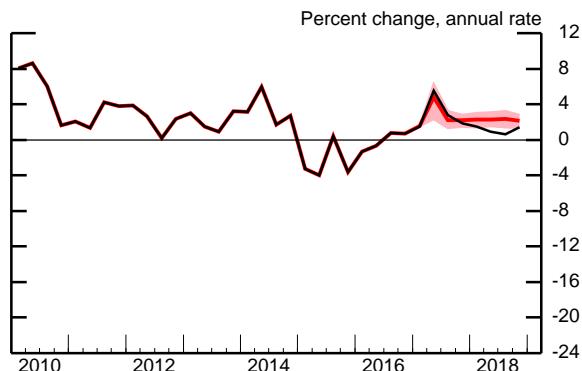
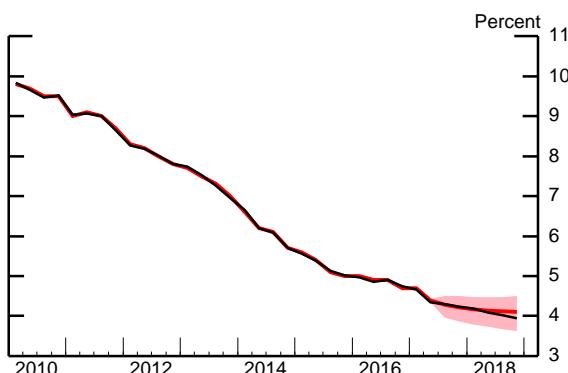
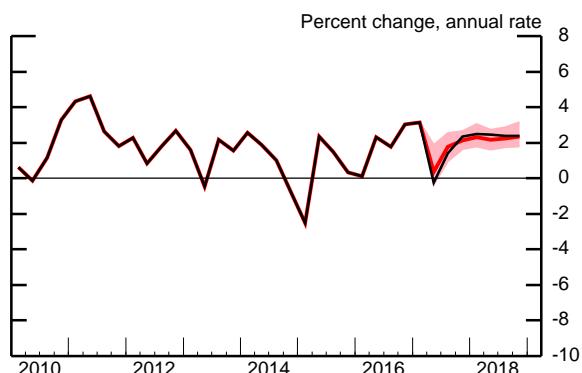
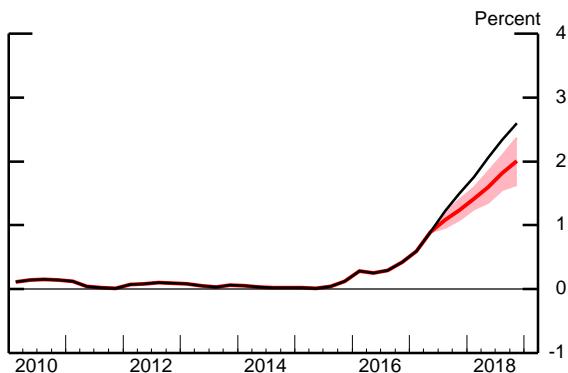
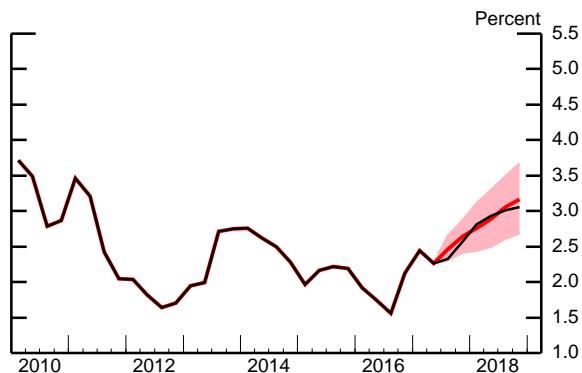
n.a. Not available.

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

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

**Real GDP**

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

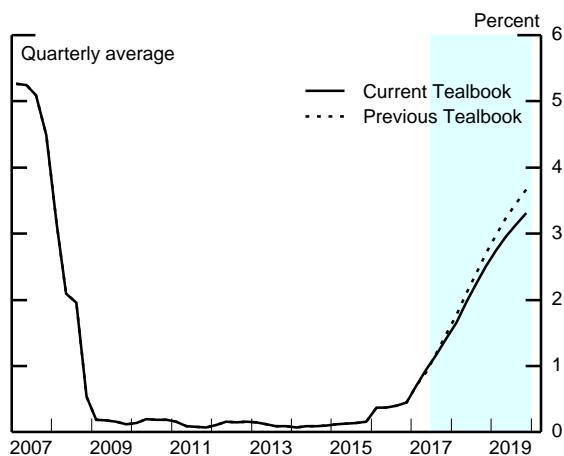
**Industrial Production****Unemployment Rate****Consumer Price Index****Treasury Bill Rate****10-Year Treasury Yield**

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.

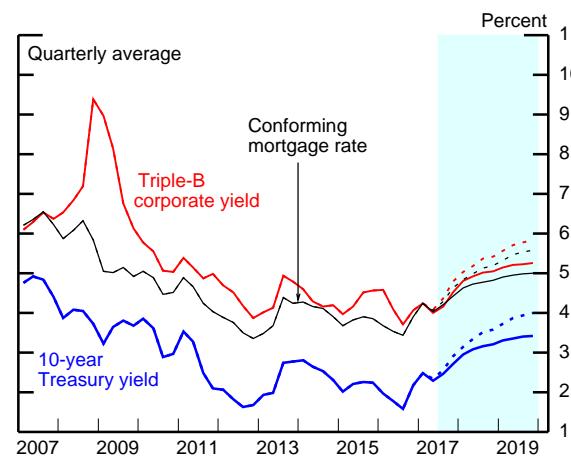
Note: The shaded area represents the area between the Blue Chip top 10 and bottom 10 averages.

## Key Background Factors underlying the Baseline Staff Projection

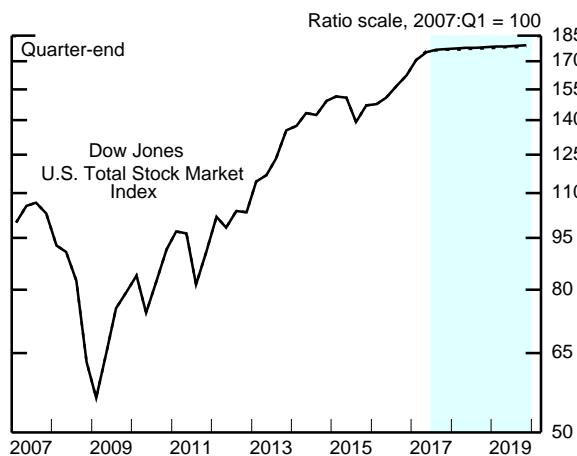
Federal Funds Rate



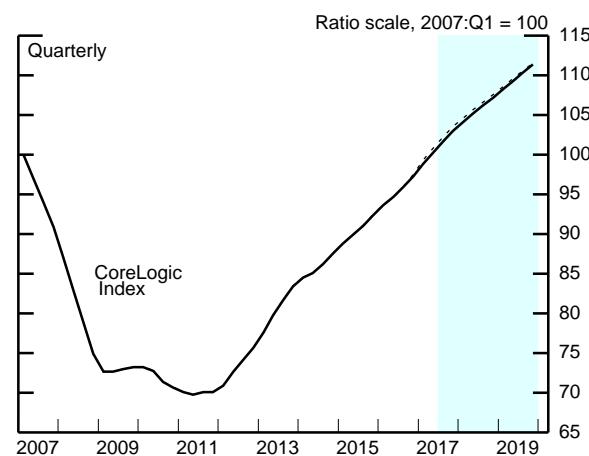
Long-Term Interest Rates



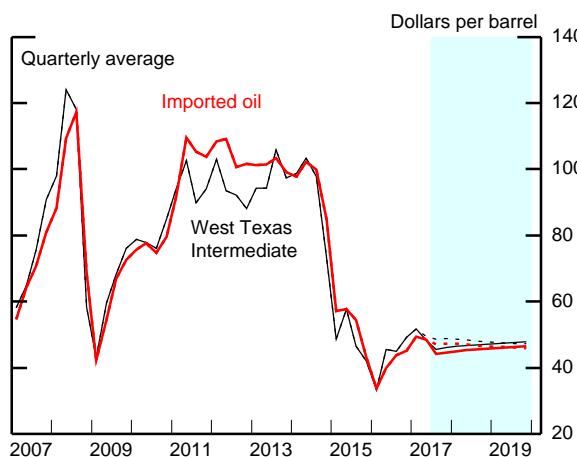
Equity Prices



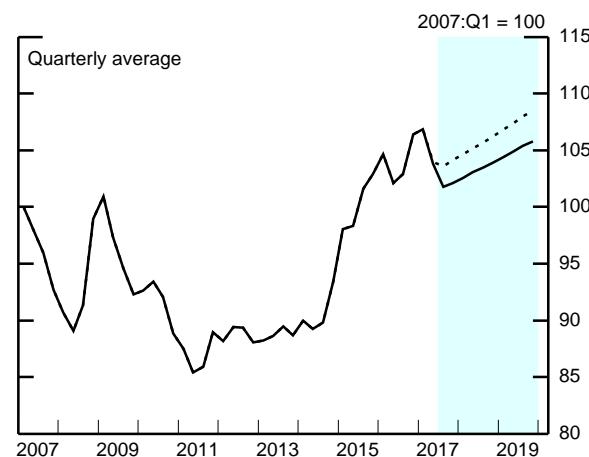
House Prices



Crude Oil Prices



Broad Real Dollar



**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 July 13, 2017
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	2.5
New York	• Factor-augmented autoregressive model combination • Factor-augmented autoregressive model combination, financial factors only • Dynamic factor model	2.5 2.2 1.9
Cleveland	• Bayesian regressions with stochastic volatility • Tracking model	2.7 2.8
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	2.6
Chicago	• Dynamic factor models • Bayesian VARs	1.3 2.0
St. Louis	• Dynamic factor models • News index model • Let-the-data-decide regressions	1.9 2.3 2.8
Kansas City	• Accounting-based tracking estimate	2.2
Board of Governors	• Board staff's forecast (judgmental tracking model) • Monthly dynamic factor models (DFM-45) • Mixed-frequency dynamic factor model (DFM-BM)	2.5 2.7 3.0
Memo: Median of Federal Reserve System nowcasts		2.5

## Summary of the Near-Term Outlook

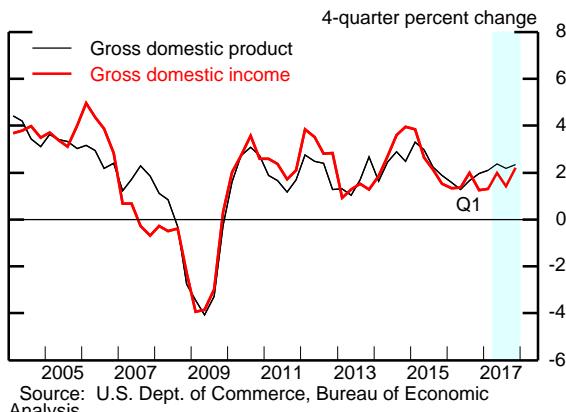
(Percent change at annual rate except as noted)

Measure	2017:Q1		2017:Q2		2017:H2	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
<b>Real GDP</b>	<b>1.2</b>	<b>1.4</b>	<b>2.6</b>	<b>2.5</b>	<b>2.9</b>	<b>2.7</b>
Private domestic final purchases	2.6	2.9	2.9	2.8	3.3	2.9
Personal consumption expenditures	.6	1.1	3.0	3.1	2.9	2.8
Residential investment	13.9	13.0	-1.1	-6.4	2.4	-.8
Nonres. private fixed investment	10.2	10.4	3.3	4.1	5.4	4.8
Government purchases	-.9	-.9	.3	-.1	1.7	1.8
<i>Contributions to change in real GDP</i>						
Inventory investment <sup>1</sup>	-1.0	-1.1	.4	.2	.1	.1
Net exports <sup>1</sup>	.2	.2	-.3	-.1	-.3	-.1
<b>Unemployment rate</b>	<b>4.7</b>	<b>4.7</b>	<b>4.3</b>	<b>4.4</b>	<b>4.2</b>	<b>4.2</b>
<b>PCE chain price index</b>	<b>2.4</b>	<b>2.4</b>	<b>.4</b>	<b>.2</b>	<b>1.7</b>	<b>1.5</b>
Ex. food and energy	2.1	2.0	1.1	.8	1.7	1.6

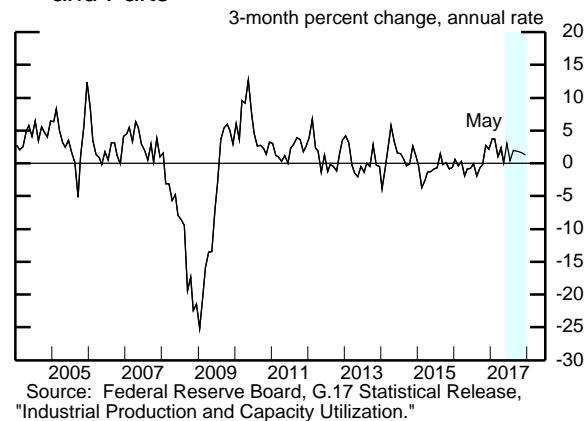
1. Percentage points.

### Recent Nonfinancial Developments (1)

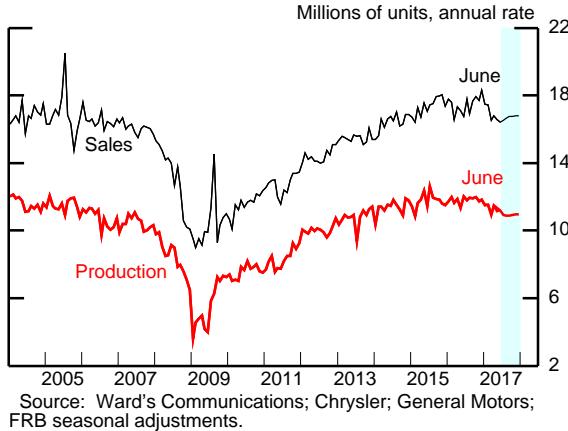
Real GDP and GDI



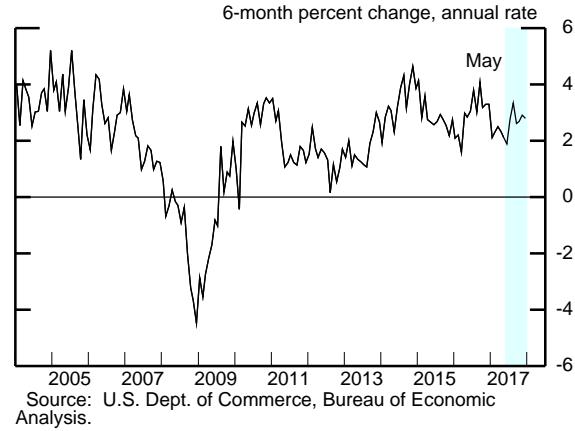
Manufacturing IP ex. Motor Vehicles and Parts



Sales and Production of Light Motor Vehicles

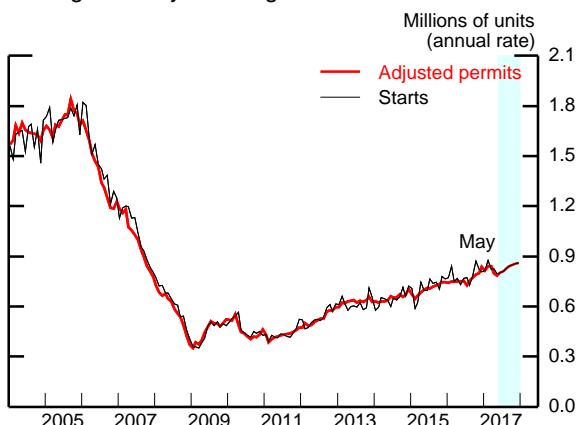


Real PCE Growth



## Recent Nonfinancial Developments (2)

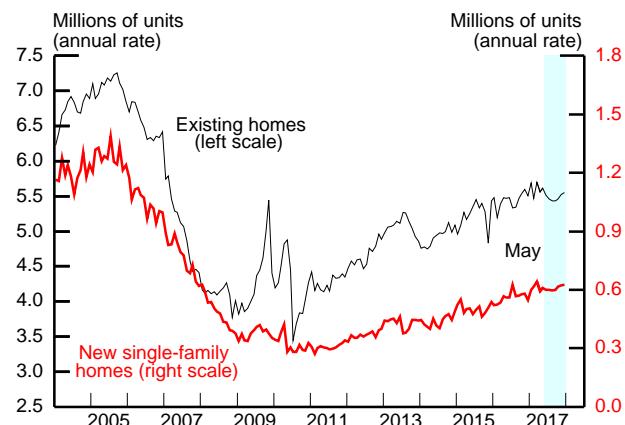
### Single-Family Housing Starts and Permits



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

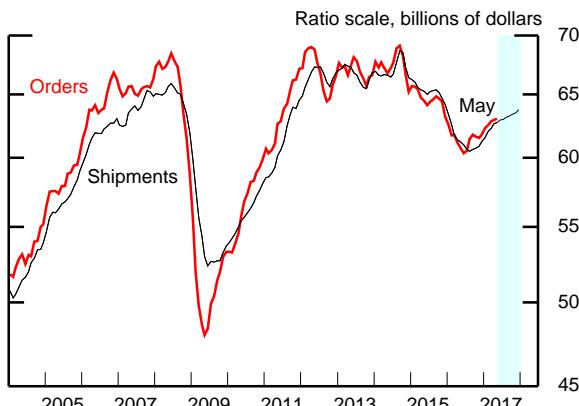
Source: U.S. Census Bureau.

### Home Sales



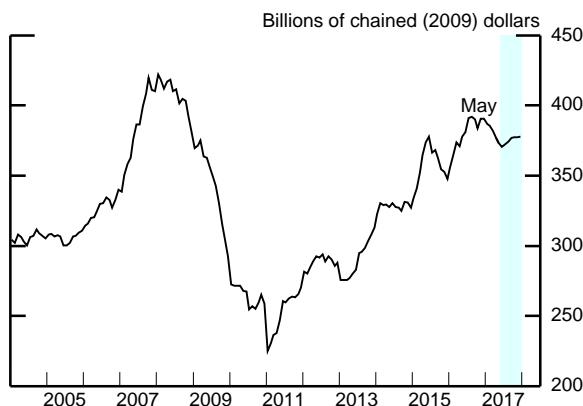
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

### Nondefense Capital Goods ex. Aircraft



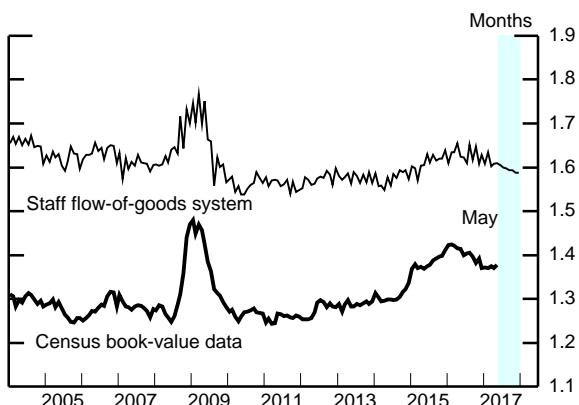
Note: Data are 3-month moving averages.  
Source: U.S. Census Bureau.

### Nonresidential Construction Put in Place



Note: Nominal CPIP deflated by BEA prices through 2017:Q1 and by the staff's estimated deflator thereafter.  
Source: U.S. Census Bureau.

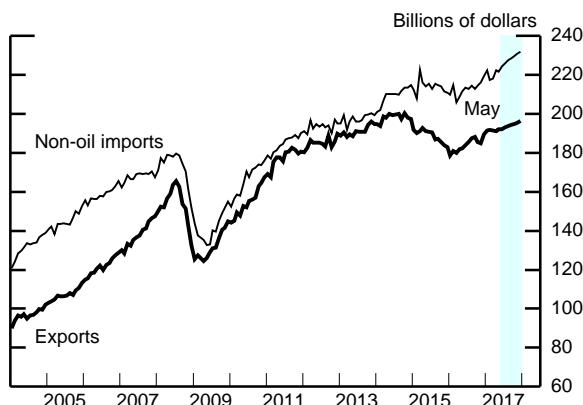
### Inventory Ratios



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

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

### Exports and Non-oil Imports



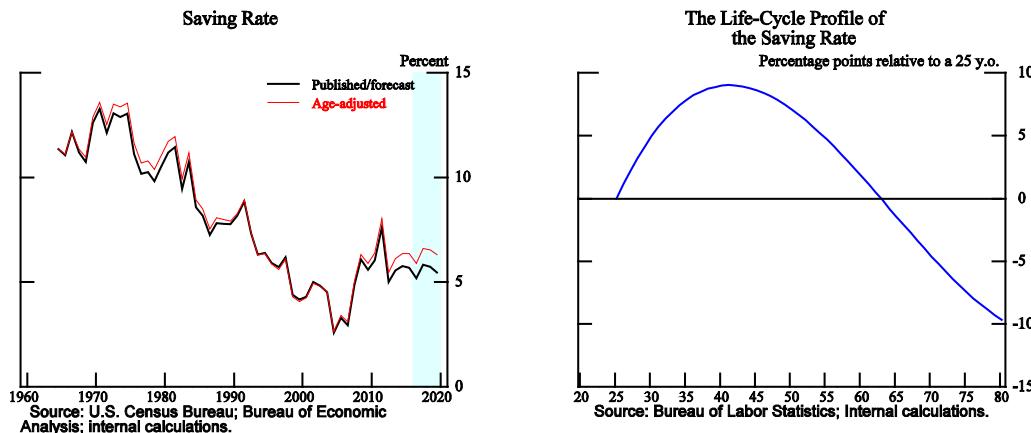
Note: Forecasts are linear interpolations of quarterly values.  
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis; U.S. Census Bureau.

## Population Aging and the Saving Rate

The aggregate personal saving rate, shown by the black line in the left panel of figure 1, declined substantially in the decades leading up to the Great Recession, falling to 2½ percent in 2005, and then moved up sharply during the recession and has stabilized around 5½ percent. This discussion explores whether shifts in the age distribution of the population can account for some of these movements in the saving rate and the extent to which population aging may affect the saving rate going forward. The main result is that changes in the age distribution cannot explain the broad movements in the saving rate over the past few decades. However, now that retirees are a large and growing share of the population, their dissaving may begin to put more material downward pressure on the saving rate in coming years.

Using household-level data from the Bureau of Labor Statistics Consumer Expenditure Survey, we derive a life-cycle saving rate as a function of age.<sup>1</sup> Each point on the curve in the right panel of figure 1 shows the saving rate at a particular age relative to that of a 25-year-old. In a given year, a typical household headed by a 40-year-old has a saving rate that is roughly 10 percentage points higher than the saving rate of the typical household of a 25-year-old. It is not surprising that young earners, who can often anticipate higher future income, have a lower saving rate than workers later in their career, who are frequently saving for house purchases, children's college tuition, and retirement. After age 55, the saving rate begins to drop rapidly and turns negative as the heads of households move into retirement and begin to tap into their wealth to support their consumption. This hump-shaped life-cycle path of the saving rate is consistent with prior theoretical and empirical work.<sup>2</sup>

**Figure 1**



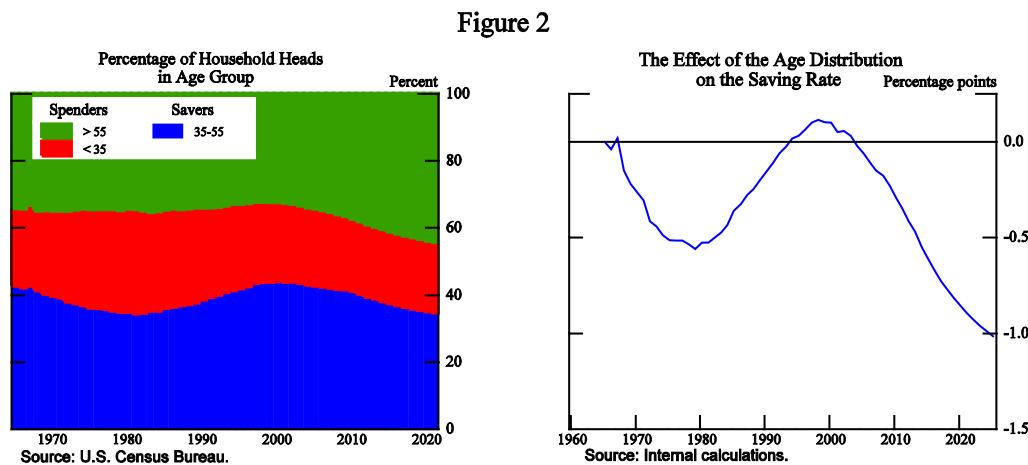
<sup>1</sup> Each year, roughly 6,000 households participating in the Consumer Expenditure Survey provide detailed information about their consumption and income, which we use to construct mean saving rates by the age of the head of household. We then fit these saving rates to a third-degree polynomial in age. The estimation uses data from 1986 to 2014 and includes year fixed effects—that is, the level of the saving rate is allowed to vary by year even though the relative life-cycle profile is fixed.

<sup>2</sup> For example, see Karen E. Dynan, Wendy Edelberg, and Michael G. Palumbo (2009), "The Effects of Population Aging on the Relationship among Aggregate Consumption, Saving, and Income," *American Economic Review*, vol. 99 (May), pp. 380–86; and Pierre-Olivier Gourinchas and Jonathan A. Parker (2002), "Consumption over the Life Cycle," *Econometrica*, vol. 70 (January), pp. 47–89.

The left panel of figure 2 summarizes information on the changing age distribution of the population. Household heads between the ages of 35 and 55 are categorized as “savers” and everyone else (which includes those under 35 and over 55) as “spenders.” The percentage of savers—the blue area—peaked around 2000 when the baby boomers hit their highest saving years. Since 2000, the percentage of spenders has gradually increased as baby boomers moved into their retirement years, as can be seen by the notable expansion of the percentage of the population over the age of 55—the green area.

The effect of population aging on the aggregate saving rate can be derived by combining the estimated life-cycle path of the saving rate with population data. As shown in the right panel of figure 2, changes in the age distribution put increasing downward pressure on the saving rate through the 1970s as young baby boomers had low savings rates. After 1980, that downward pressure diminished as the baby boomers moved into their saving years, and aging’s upward effect on the saving rate peaked in 2000. Since then, the age distribution has increasingly weighed on the aggregate saving rate as more baby boomers have moved into the dissaving phase of retirement.

In figure 1, the red line in the left panel puts the magnitude of this population-aging effect into perspective by showing how it would affect the published and forecast saving rate. This “age adjusted” saving rate subtracts the effect shown in figure 2 from the official rate—that is, it shows what the saving rate would have been if the population age distribution had not changed since 1965. Changes in the age distribution appear to account for very little of the movement in the saving rate over the past half-century.<sup>3</sup> However, as the population distribution continues to shift toward retirees, the downward pressure on the saving rate (and boost to consumer spending) will become more pronounced. Aging’s effect on the saving rate, all else being equal, may also partially mitigate the downward pressure on the natural rate of interest from other age-related channels such as slower labor force growth along with the associated higher capital-to-labor ratio.<sup>4</sup>

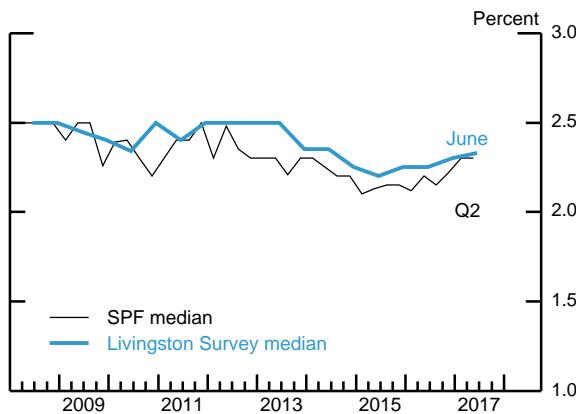


<sup>3</sup> The explanation for these movements must lie in other factors. For example, rising wealth and transfer income and expanding access to credit could explain the secular decline in the saving rate, while increased pessimism could explain the step-up in the saving rate since the Great Recession.

<sup>4</sup> For a full accounting of the effects of aging on the natural rate of interest, see Etienne Gagnon, Benjamin K. Johannsen, and David Lopez-Salido (2016), “Understanding the New Normal: The Role of Demographics,” Finance and Economics Discussion Series 2016-080 (Washington: Board of Governors of the Federal Reserve System, October), <http://dx.doi.org/10.17016/FEDS.2016.080>.

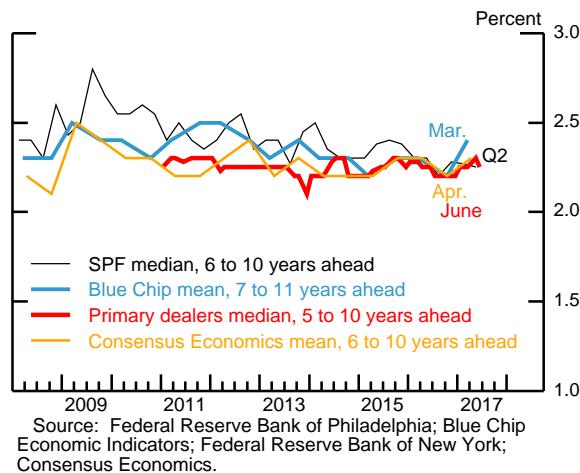
## Survey Measures of Longer-Term Inflation Expectations

CPI Next 10 Years



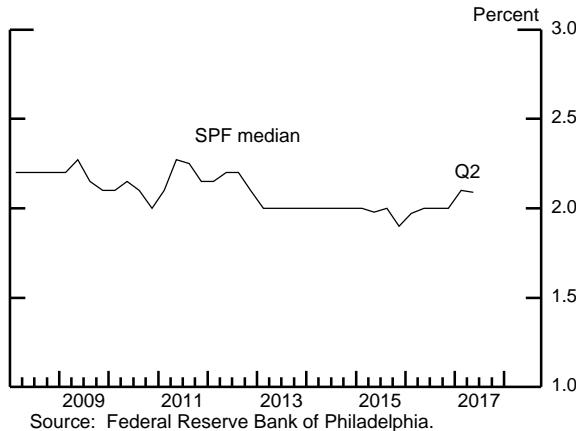
Note: SPF is Survey of Professional Forecasters.  
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations



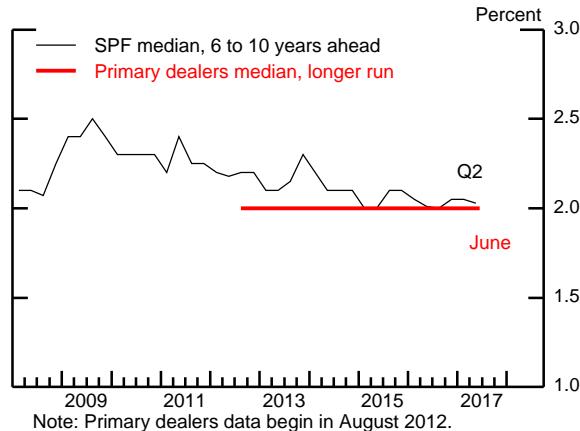
Source: Federal Reserve Bank of Philadelphia; Blue Chip Economic Indicators; Federal Reserve Bank of New York; Consensus Economics.

PCE Next 10 Years



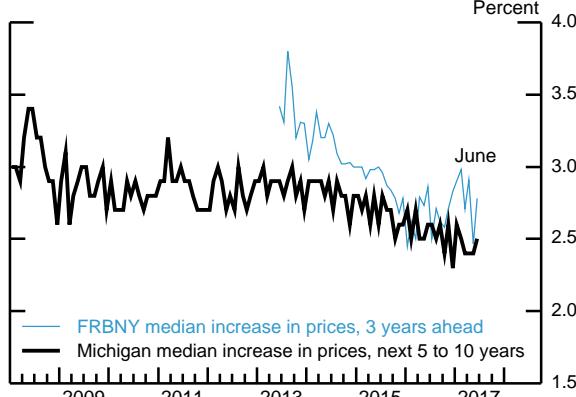
Source: Federal Reserve Bank of Philadelphia.

PCE Forward Expectations



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

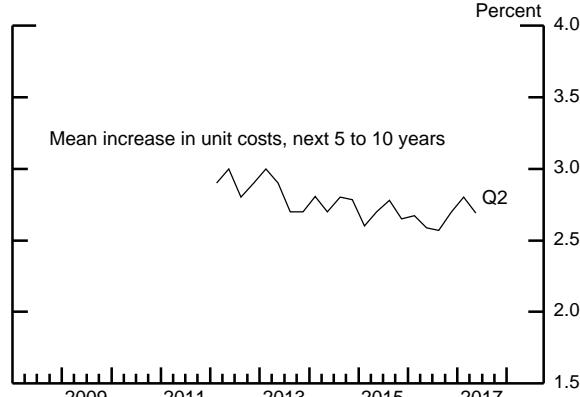
Surveys of Consumers



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

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

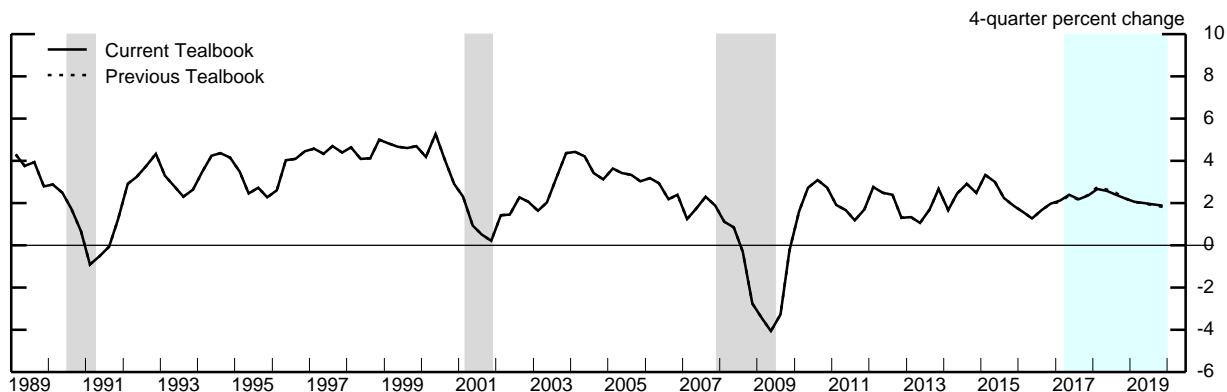
Survey of Business Inflation Expectations



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

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

Measure	2016	2017		2017	2018	2019
		H1	H2			
<b>Real GDP</b>						
Previous Tealbook	<b>2.0</b> 2.0	<b>1.9</b> 1.9	<b>2.7</b> 2.9	<b>2.3</b> 2.4	<b>2.2</b> 2.2	<b>1.9</b> 1.8
Final sales	2.0	2.4	2.7	2.6	2.2	1.9
Previous Tealbook	2.0	2.2	2.8	2.5	2.3	1.9
Personal consumption expenditures	3.1	2.1	2.8	2.4	2.6	2.4
Previous Tealbook	3.1	1.8	2.9	2.4	2.9	2.5
Residential investment	1.1	2.8	-.8	1.0	3.8	5.1
Previous Tealbook	1.1	6.2	2.4	4.3	3.1	4.2
Nonresidential structures	1.9	12.1	5.7	8.9	.8	-.2
Previous Tealbook	1.9	13.8	6.3	10.0	.7	-.7
Equipment and intangibles	-.6	5.9	4.6	5.2	3.4	1.9
Previous Tealbook	-.6	4.7	5.2	5.0	3.6	1.7
Federal purchases	-.2	-.8	2.1	.6	-.2	.2
Previous Tealbook	-.2	-.8	2.1	.6	-.2	.2
State and local purchases	.4	-.3	1.6	.6	.8	.8
Previous Tealbook	.4	.0	1.5	.8	.8	.8
Exports	1.5	4.0	2.9	3.5	3.5	3.3
Previous Tealbook	1.5	4.2	2.4	3.3	3.0	2.9
Imports	2.6	2.8	3.1	2.9	4.2	4.1
Previous Tealbook	2.6	3.7	4.1	3.9	4.5	4.2
Contributions to change in real GDP (percentage points)						
Inventory change	.0	-.5	.1	-.2	.0	.0
Previous Tealbook	.0	-.3	.1	-.1	-.1	-.1
Net exports	-.2	.1	-.1	.0	-.2	-.2
Previous Tealbook	-.2	.0	-.3	-.2	-.3	-.3

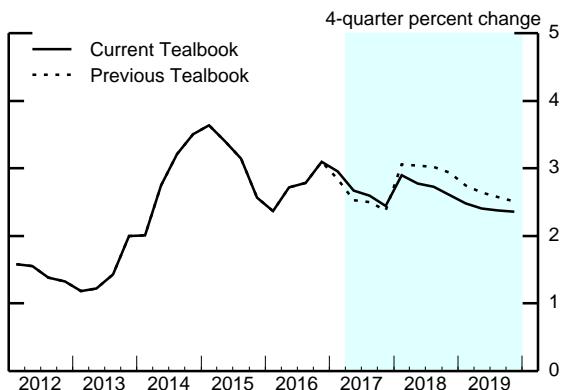
**Real GDP**

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

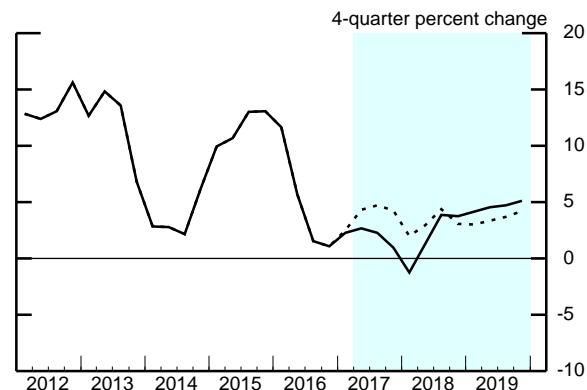
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

## Components of Final Demand

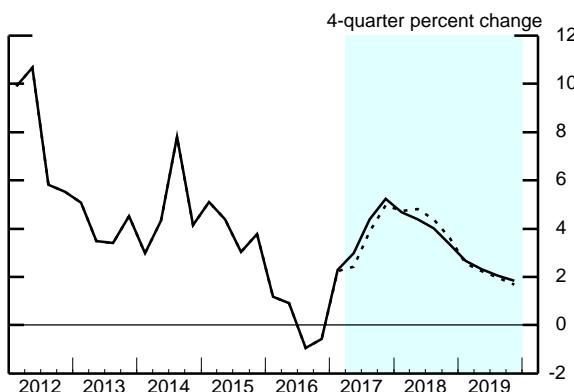
Personal Consumption Expenditures



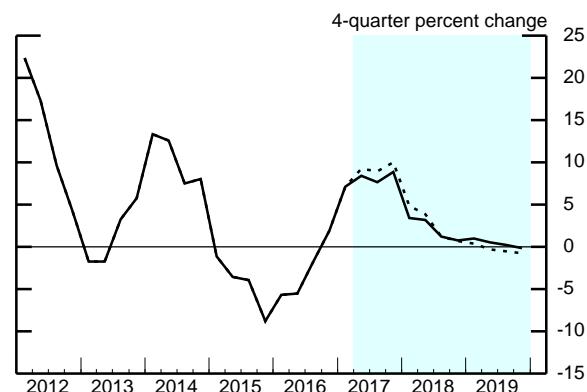
Residential Investment



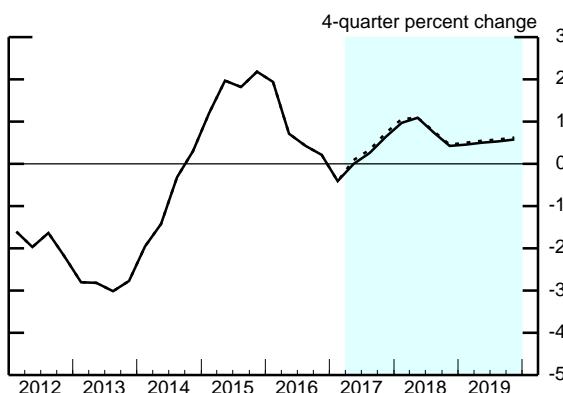
Equipment and Intangibles



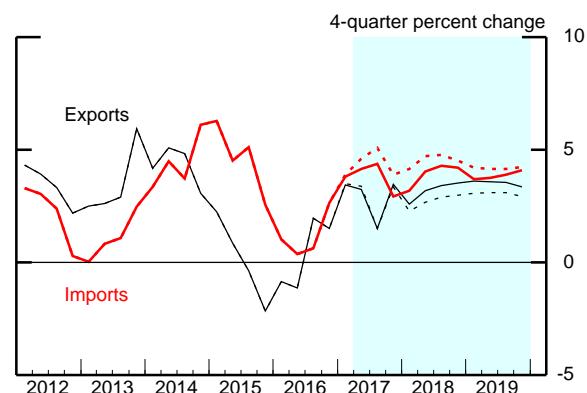
Nonresidential Structures



Government Consumption and Investment



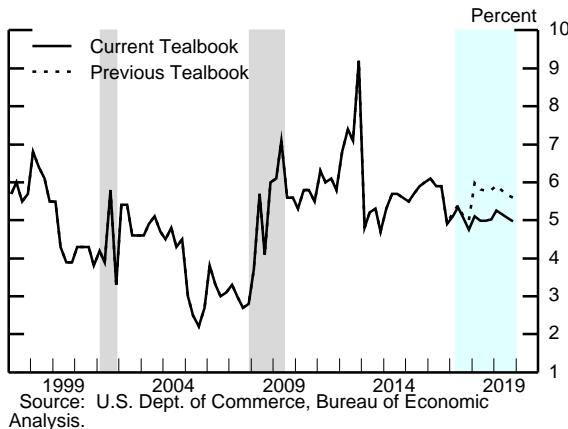
Exports and Imports



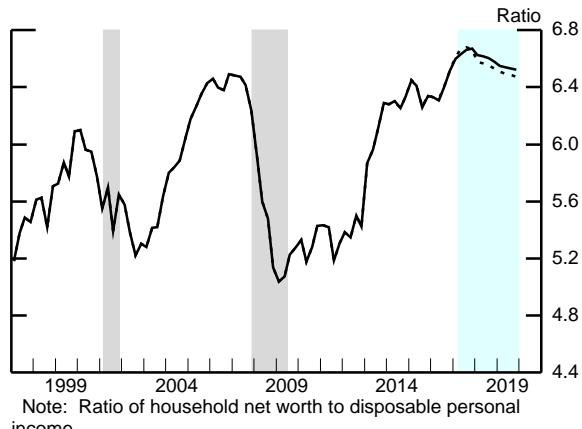
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

## Aspects of the Medium-Term Projection

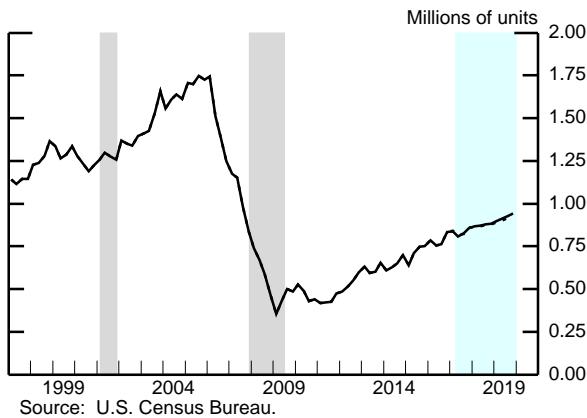
**Personal Saving Rate**



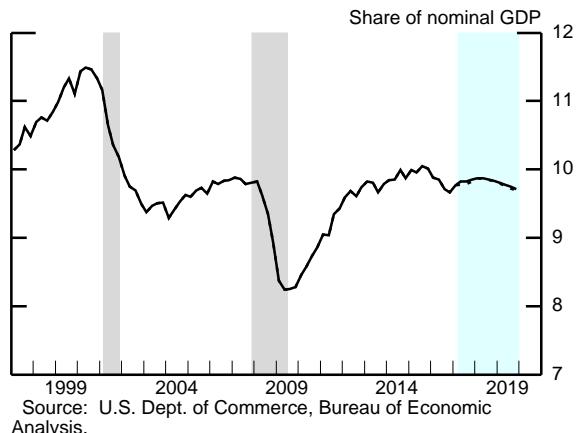
**Wealth-to-Income Ratio**



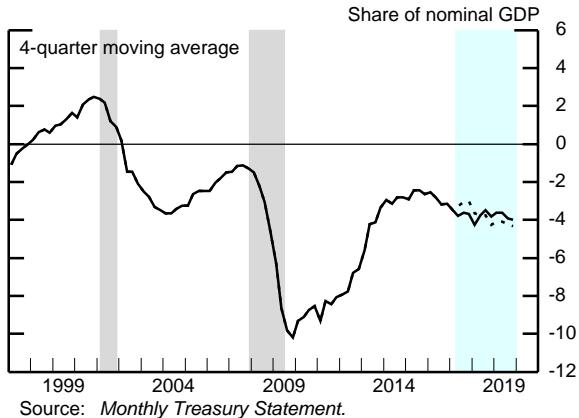
**Single-Family Housing Starts**



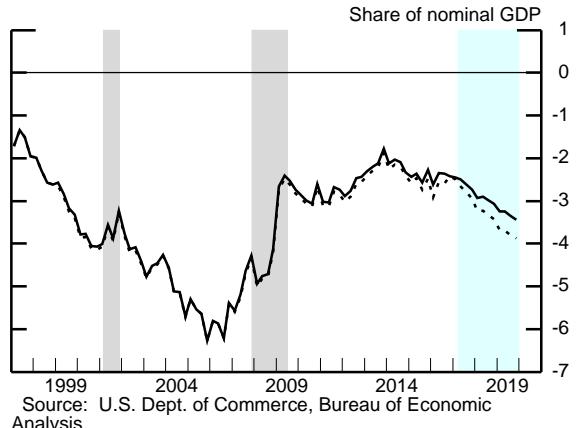
**Equipment and Intangibles Spending**



**Federal Surplus/Deficit**



**Current Account Surplus/Deficit**



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	1.2	1.3
Capital deepening	.6	1.5	1.0	.3	.5	.5	.5	.5	.4
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	1.3	1.9	2.0

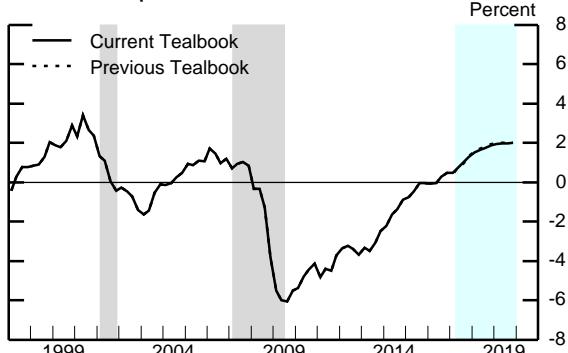
Note: For multiyear periods, the percent change is the annual average from Q4 of the year preceding the first year shown to Q4 of the last year shown.

1. Percentage points.

2. Total business sector.

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

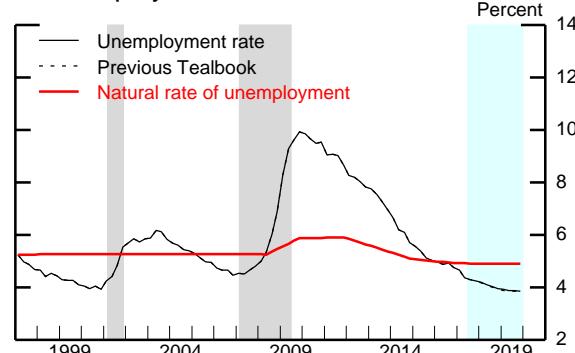
#### GDP Gap



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

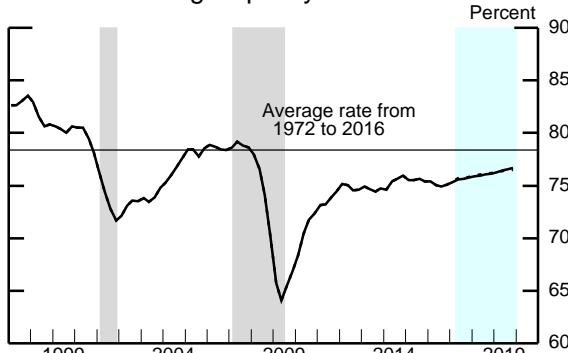
Source: U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.

#### Unemployment Rate



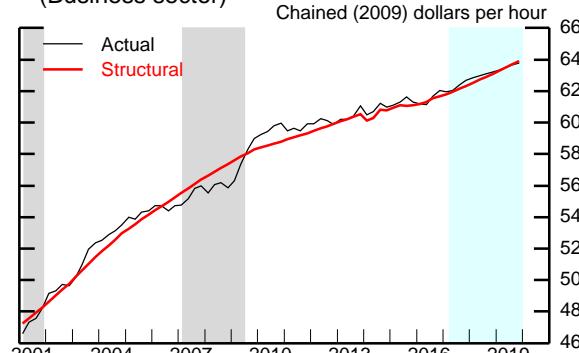
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

#### Manufacturing Capacity Utilization Rate



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

#### Structural and Actual Labor Productivity (Business sector)



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

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

**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 1.2	.0 .2	2.0 1.8	1.0 1.0	.9 .9
Nonfarm payroll employment <sup>2</sup> Previous Tealbook		187 187	180 163	174 169	177 166	167 167
Private employment <sup>2</sup> Previous Tealbook		170 170	171 161	162 160	167 160	158 158
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	62.3 62.3
Civilian unemployment rate <sup>3</sup> Previous Tealbook		4.7 4.7	4.4 4.3	4.2 4.2	4.2 4.2	4.0 3.9

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**

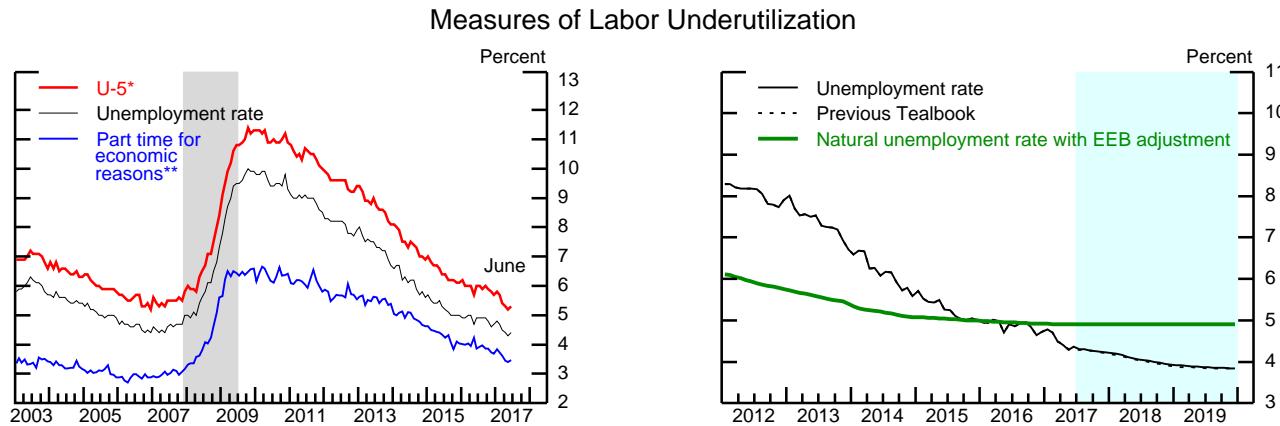
Measure	2016	2017		2017	2018	2019
		H1	H2			
<i>Percent change at annual rate from final quarter of preceding period</i>						
PCE chain-weighted price index Previous Tealbook		1.4 1.4	1.3 1.4	1.5 1.7	1.4 1.6	1.9 1.9
Food and beverages Previous Tealbook		-1.7 -1.7	1.3 1.4	1.7 1.8	1.5 1.6	2.2 2.1
Energy Previous Tealbook		.8 .8	-1.5 -1.6	-1.5 .8	-1.5 -.4	2.2 1.1
Excluding food and energy Previous Tealbook		1.7 1.7	1.4 1.6	1.6 1.7	1.5 1.6	1.9 1.9
Prices of core goods imports <sup>1</sup> Previous Tealbook		.0 .0	1.2 1.4	2.8 1.6	2.0 1.5	.7 .6
	June 2017 <sup>2</sup>	July 2017 <sup>2</sup>	Aug. 2017 <sup>2</sup>	Sept. 2017 <sup>2</sup>	Oct. 2017 <sup>2</sup>	Nov. 2017 <sup>2</sup>
<i>12-month percent change</i>						
PCE chain-weighted price index Previous Tealbook		1.4 1.5	1.5 1.6	1.5 1.6	1.4 1.6	1.3 1.4
Excluding food and energy Previous Tealbook		1.4 1.6	1.4 1.6	1.4 1.5	1.4 1.6	1.4 1.5

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)

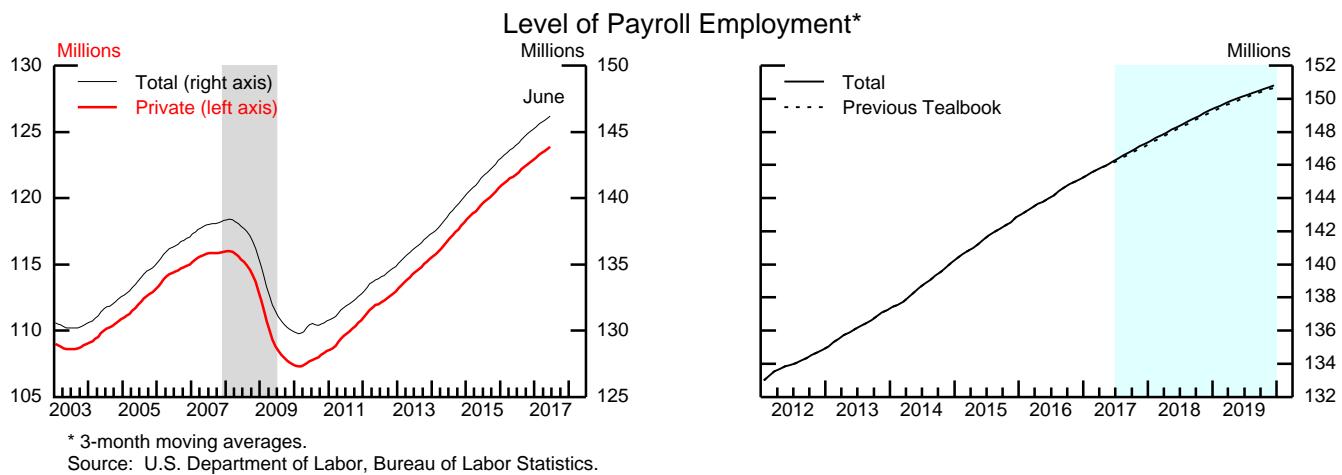


\* U-5 measures total unemployed persons plus all marginally attached to the labor force, as a percent of the labor force plus persons marginally attached to the labor force.

\*\* Percent of Current Population Survey employment.

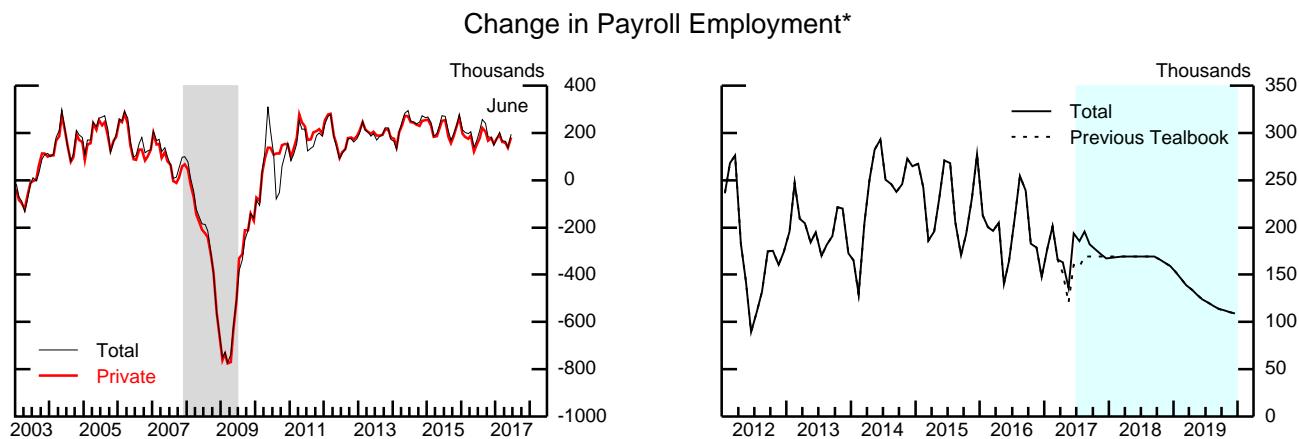
EEB Extended and emergency unemployment benefits.

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



\* 3-month moving averages.

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



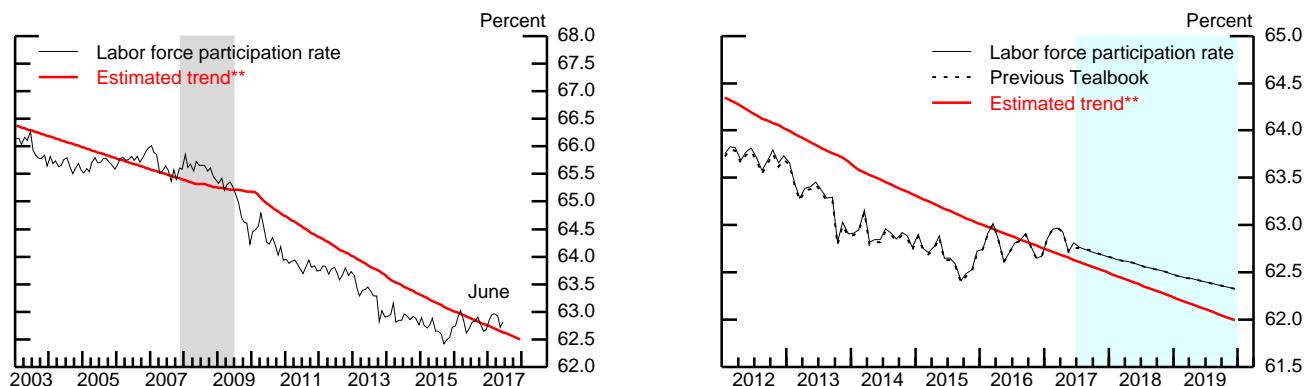
\* 3-month moving averages.

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\*

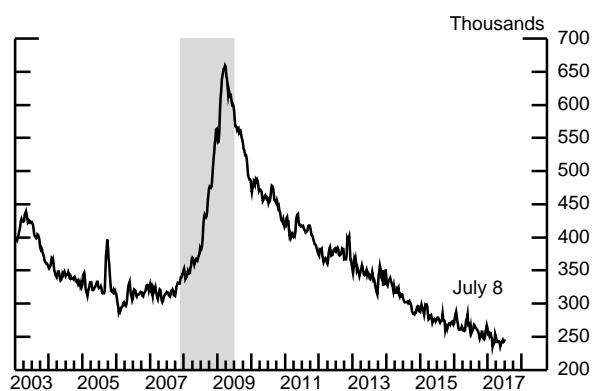


\* Published data adjusted by staff to account for changes in population weights.

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

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

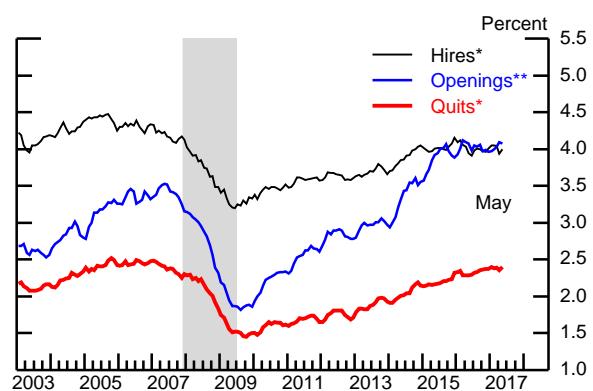
### Initial Unemployment Insurance Claims\*



\* 4-week moving average.

Source: U.S. Department of Labor, Employment and Training Administration.

### Hires, Quits, and Job Openings

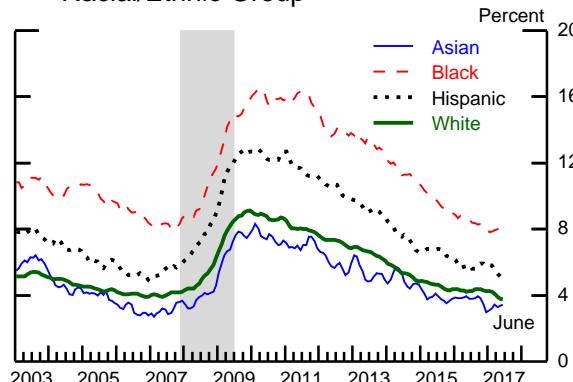


\* Percent of private nonfarm payroll employment, 3-month moving average.

\*\* Percent of private nonfarm payroll employment plus unfilled jobs, 3-month moving average.

Source: Job Openings and Labor Turnover Survey.

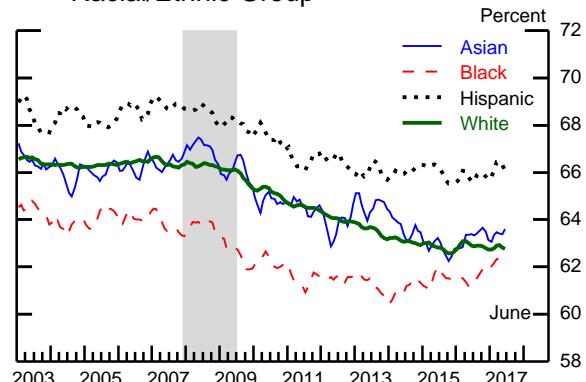
### Unemployment Rate by Racial/Ethnic Group



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



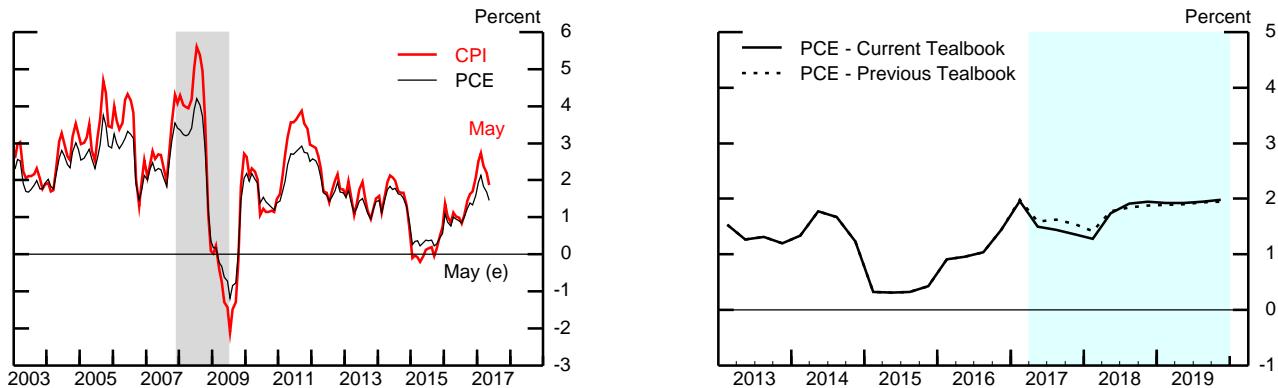
Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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

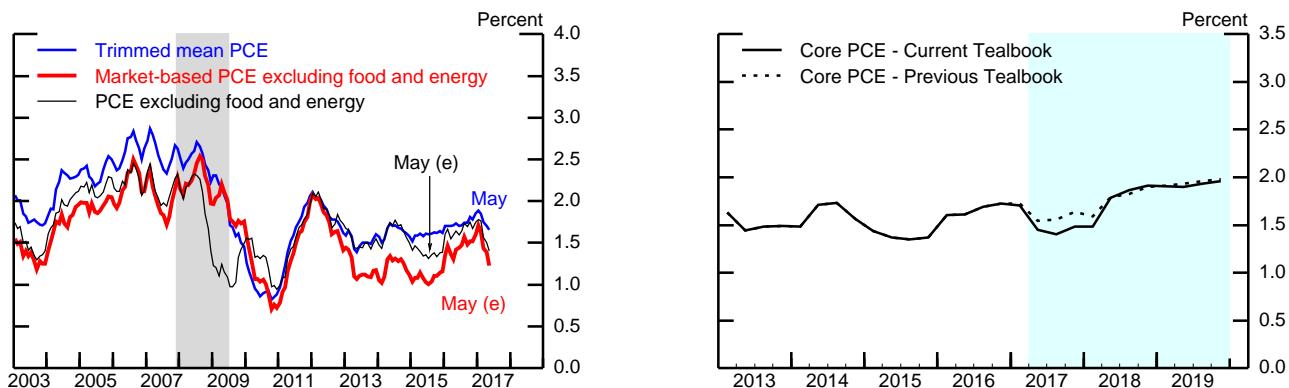
### Headline Consumer Price Inflation



Note: PCE prices from April to May 2017 are staff estimates (e).

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

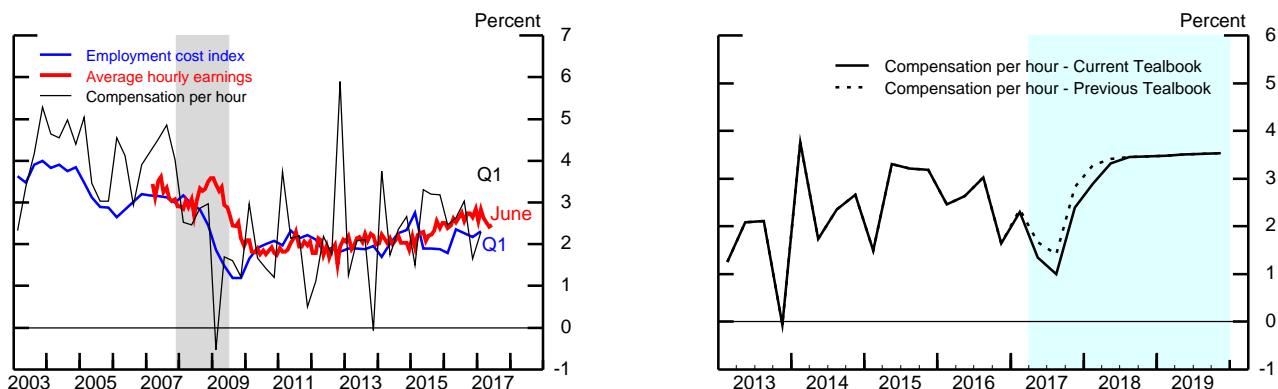
### Measures of Underlying PCE Price Inflation



Note: Core PCE prices from April to May 2017 are staff estimates (e).

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

### Labor Cost Growth



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

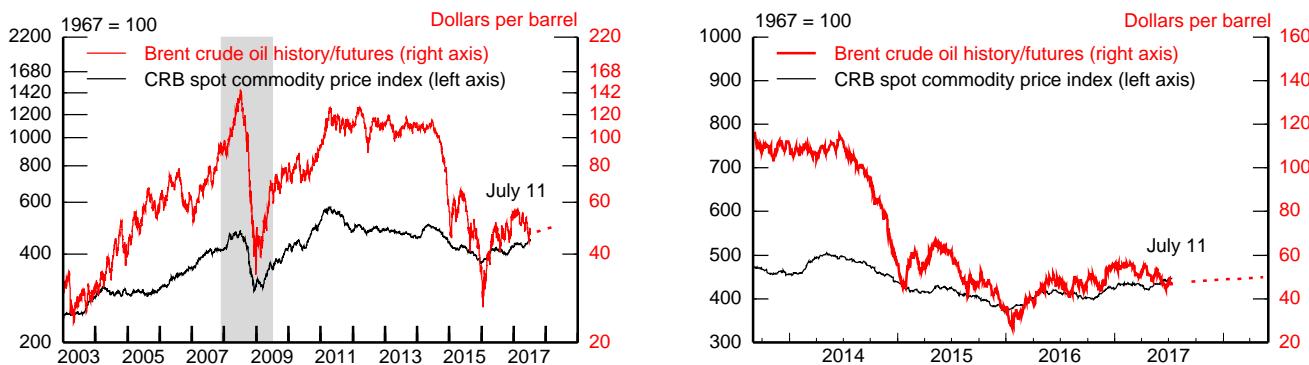
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

## Inflation Developments and Outlook (2)

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

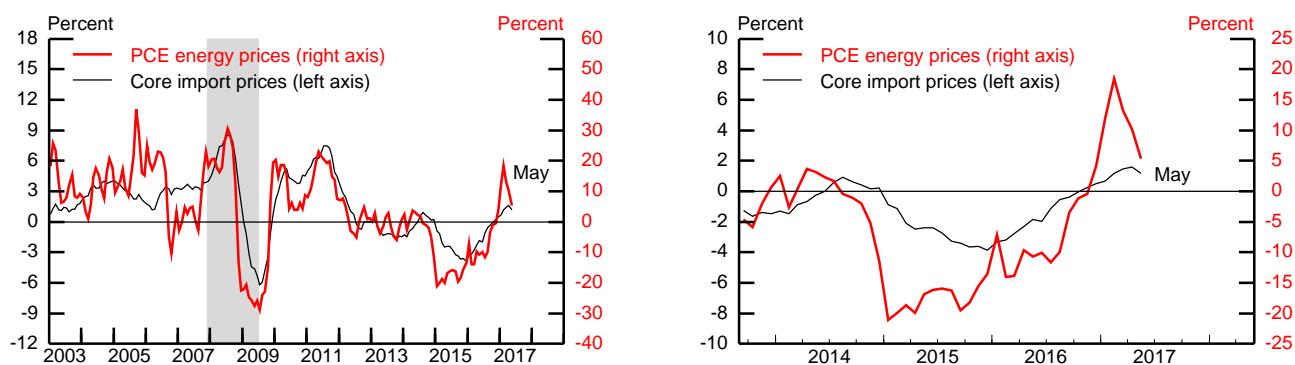
### Commodity and Oil Price Levels



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

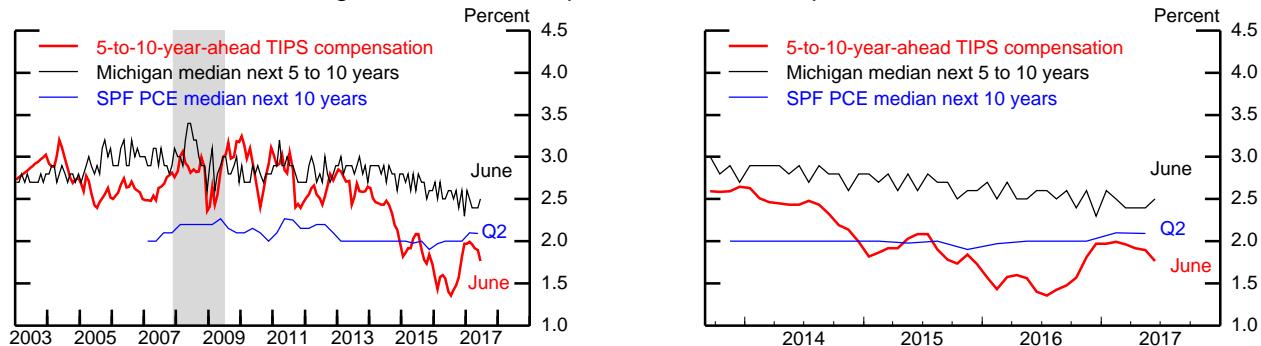
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

### Energy and Import Price Inflation



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

### Long-Term Inflation Expectations and Compensation



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

SPF Survey of Professional Forecasters.

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

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

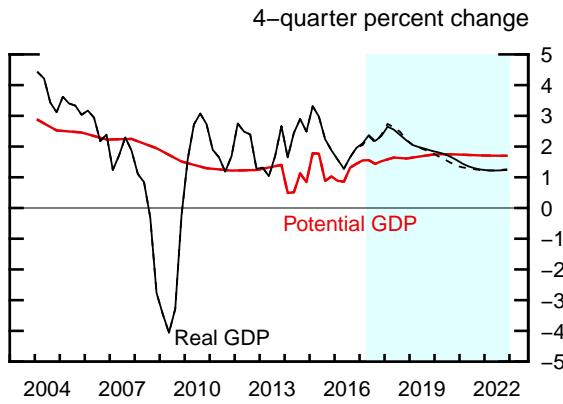
**The Long-Term Outlook**

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

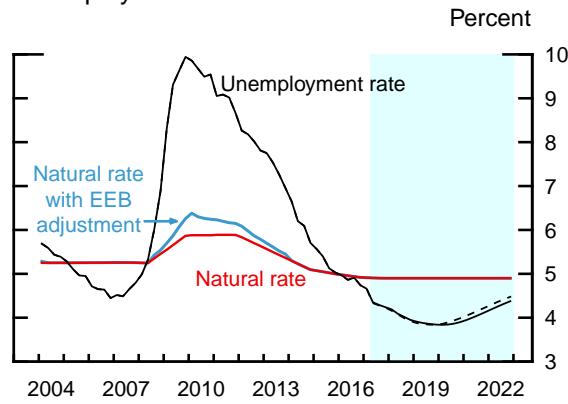
Measure	2017	2018	2019	2020	2021	2022	Longer run
Real GDP Previous Tealbook	2.3 2.4	2.2 2.2	1.9 1.8	1.6 1.4	1.2 1.2	1.2 1.3	1.7 1.7
Civilian unemployment rate <sup>1</sup> Previous Tealbook	4.2 4.2	4.0 3.9	3.8 3.8	3.9 4.0	4.1 4.2	4.4 4.5	4.9 4.9
PCE prices, total Previous Tealbook	1.4 1.6	1.9 1.9	2.0 2.0	2.0 2.1	2.1 2.1	2.1 2.1	2.0 2.0
Core PCE prices Previous Tealbook	1.5 1.6	1.9 1.9	2.0 2.0	2.0 2.1	2.1 2.1	2.1 2.1	2.0 2.0
Federal funds rate <sup>1</sup> Previous Tealbook	1.41 1.48	2.51 2.70	3.31 3.67	3.77 4.17	3.87 4.25	3.75 4.09	2.50 3.00
10-year Treasury yield <sup>1</sup> Previous Tealbook	2.7 2.9	3.2 3.6	3.4 4.0	3.4 4.0	3.3 3.9	3.2 3.8	2.9 3.5

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

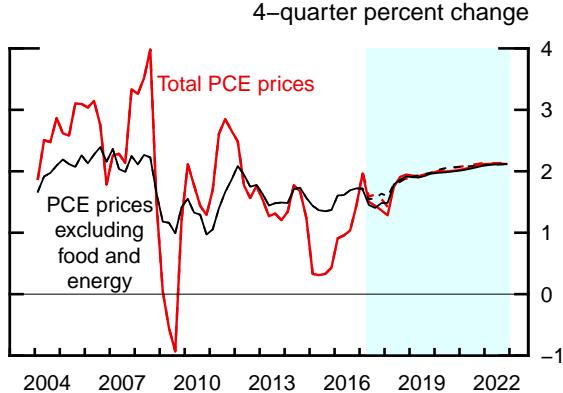
Real GDP



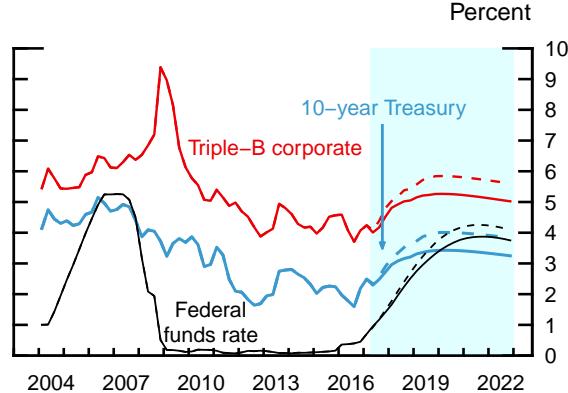
Unemployment Rate



PCE Prices



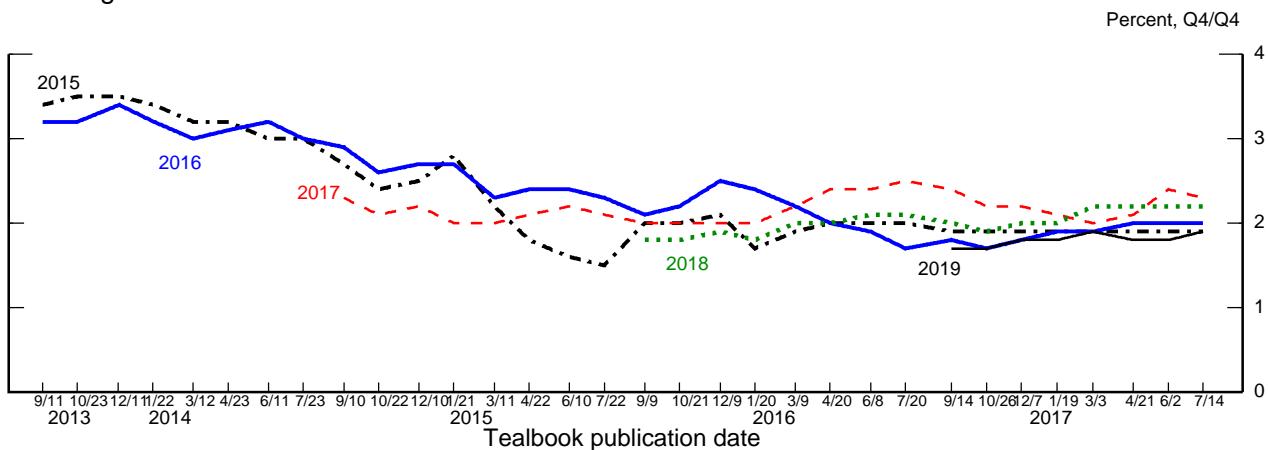
Interest Rates



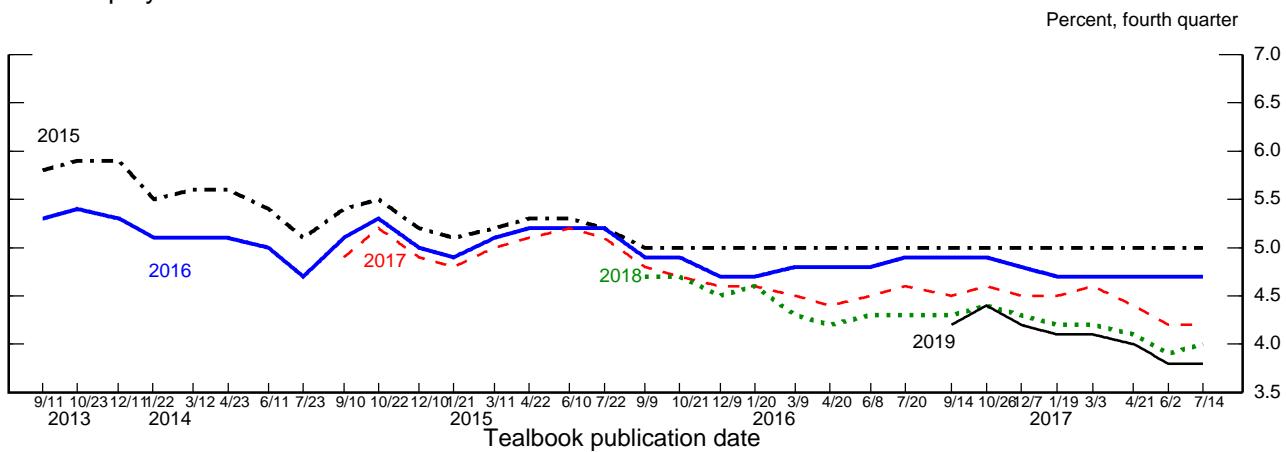
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

## Evolution of the Staff Forecast

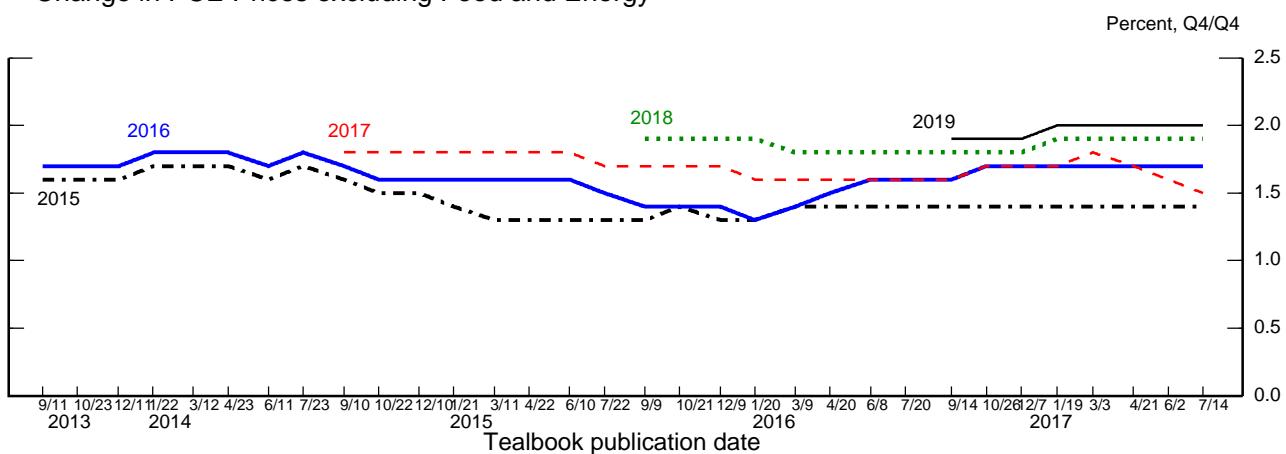
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



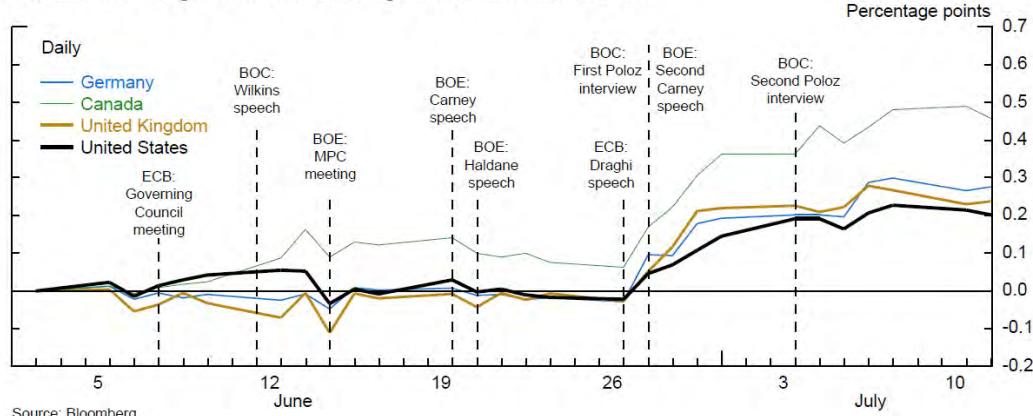
We view the BOC's shift to a less accommodative stance, in part, as reflecting greater confidence in the recovery. The BOC also emphasized that the recent soft inflation readings partly reflect idiosyncratic factors and should be temporary. Accordingly, we expect monetary policy to be slightly less accommodative over the nearer term and anticipate that the BOC will raise its policy rate again in the first quarter of 2018. Nevertheless, our new assumptions for Canadian monetary policy entail only an adjustment in the timing of policy rate actions over the forecast horizon, and, with our longer-term outlook for the Canadian economy little changed, our forecast for the policy rate at the end of 2019 remains at 2 percent.

### Bank of England

On June 14, the BOE's Monetary Policy Committee (MPC) surprised markets with an unexpectedly close vote to keep the policy rate at  $\frac{1}{4}$  percent. Three dissenting MPC members preferred a rate hike, expressing concern that, amid limited resource slack, the recent overshoot of inflation above target could be more persistent than previously thought. Subsequently, Governor Carney stated that "some removal of monetary stimulus is likely to become necessary" if spare capacity erodes further.<sup>2</sup>

Overall, these developments are responses to persistently elevated inflation (reflecting the post-Brexit depreciation of the sterling) and a record-low unemployment rate. Given the uncertain growth outlook, we still see the BOE as maintaining its current policy stance through this year and tightening that stance only very gradually thereafter. But, consistent with our higher inflation projection and the more hawkish BOE tone, we now expect the BOE to hike its policy rate in the second quarter of 2018, two quarters earlier than previously assumed, and to raise it to  $\frac{3}{4}$  percent by the end of 2019,  $\frac{1}{4}$  percentage point higher than in the June Tealbook.

Cumulative Change in 10-Year Sovereign Yields since June 2, 2017



<sup>2</sup> See Mark Carney (2017), "Policy Panel: Investment and Growth in Advanced Economies," speech delivered at the ECB Forum on Central Banking, Sintra, June 28, p. 6, [www.bankofengland.co.uk/publications/Documents/speeches/2017/speech986.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech986.pdf).

## The Foreign GDP Outlook

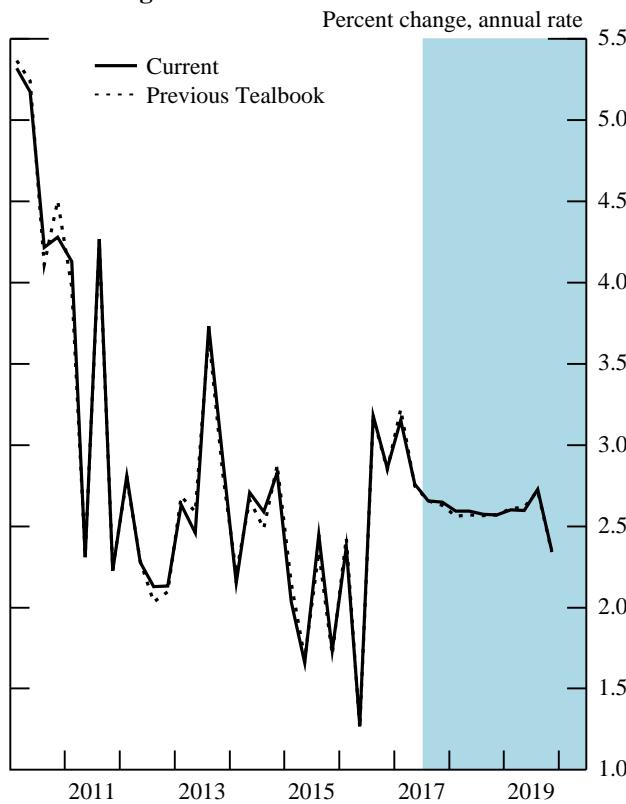
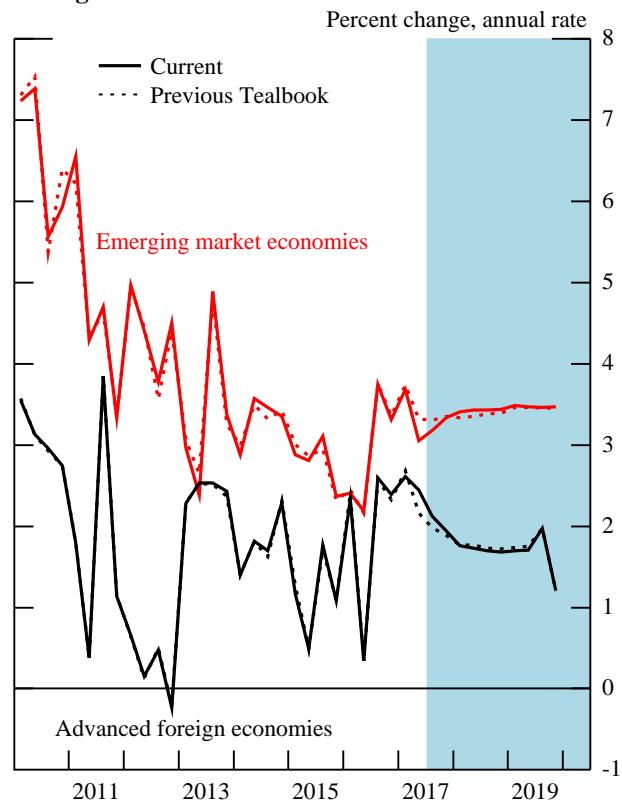
Real GDP\*

Percent change, annual rate

	2016			2017			2018	2019
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	1.8	3.2	2.9	3.2	2.8	2.7	2.6	2.6
Previous Tealbook	1.8	3.2	2.8	3.2	2.7	2.6	2.6	2.6
2. Advanced Foreign Economies	1.3	2.6	2.4	2.6	2.4	2.0	1.7	1.6
Previous Tealbook	1.4	2.6	2.3	2.7	2.2	1.9	1.7	1.7
3. Canada	.7	4.2	2.7	3.7	2.7	2.0	1.7	1.8
4. Euro Area	1.8	1.8	2.1	2.3	2.7	2.2	1.9	1.8
5. Japan	2.0	1.0	1.4	1.0	2.0	1.4	1.0	.1
6. United Kingdom	1.5	2.0	2.7	.9	1.2	1.7	1.7	1.7
7. Emerging Market Economies	2.3	3.7	3.3	3.7	3.1	3.3	3.4	3.5
Previous Tealbook	2.3	3.8	3.4	3.7	3.3	3.3	3.4	3.5
8. China	6.8	6.8	6.6	7.3	6.7	6.3	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	1.5	2.1	2.6	2.7
11. Brazil	-2.6	-2.3	-2.2	4.3	-.5	1.6	2.0	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

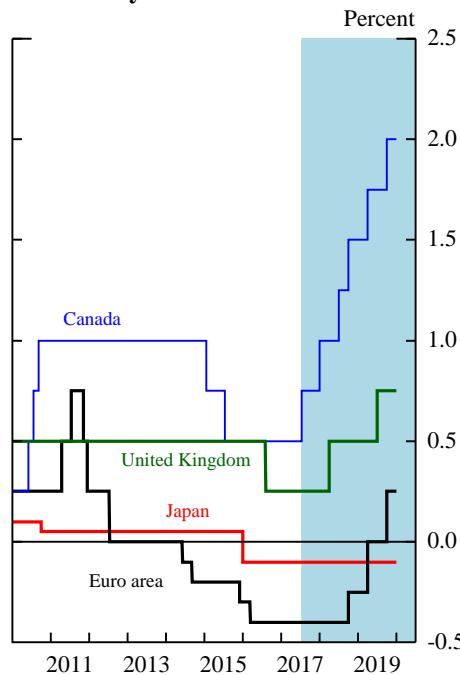
	2016			2017			2018	2019
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign Previous Tealbook	1.7	1.7	2.6	3.0	2.2	2.3	2.4	2.5
	1.7	1.7	2.6	3.0	2.4	2.4	2.4	2.6
2. Advanced Foreign Economies Previous Tealbook	.4	.9	1.8	2.3	.6	1.2	1.5	1.9
	.4	.9	1.8	2.3	1.1	1.3	1.5	1.9
3. Canada	1.4	1.0	1.7	2.6	1.0	1.4	1.7	1.9
4. Euro Area	-.1	1.3	1.9	2.9	-.1	1.1	1.4	1.7
5. Japan	-.3	-.5	2.4	-.1	.1	.6	.9	2.5
6. United Kingdom	.4	2.1	2.0	3.8	3.3	2.4	2.3	2.2
7. Emerging Market Economies Previous Tealbook	2.7	2.2	3.1	3.4	3.3	3.0	3.0	3.0
	2.7	2.2	3.1	3.4	3.4	3.2	3.1	3.1
8. China	2.4	1.3	2.6	-.6	2.3	2.5	2.5	2.5
9. Emerging Asia ex. China	1.7	1.1	2.6	3.5	.8	2.5	3.1	3.1
10. Mexico	2.6	3.6	4.1	9.9	6.9	3.8	3.2	3.2
11. Brazil	9.6	6.5	2.6	3.2	2.3	3.7	4.3	4.3

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

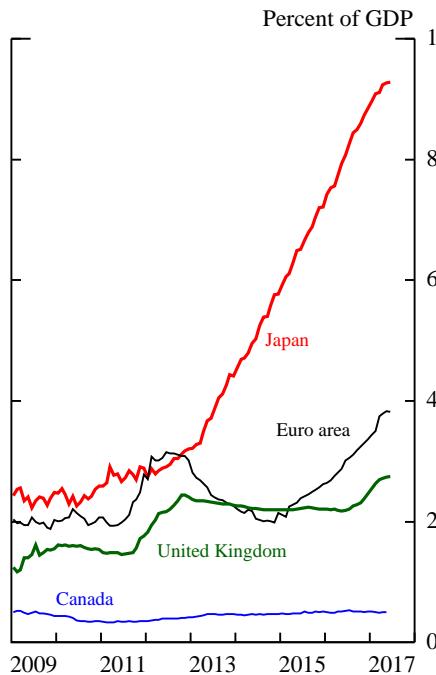
Int'l Econ Devel &amp; Outlook

## Foreign Monetary Policy

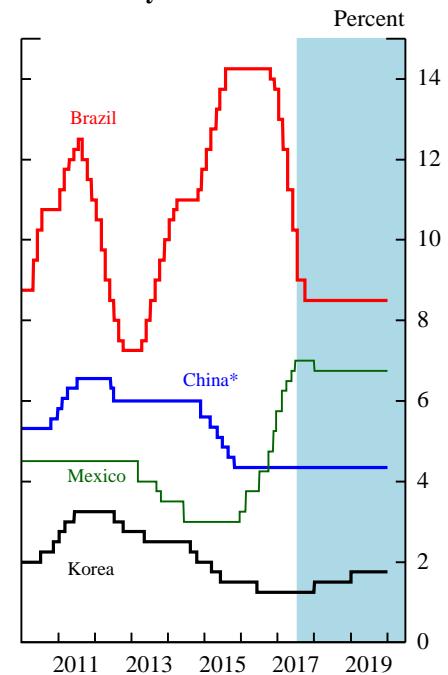
### AFF Policy Rates



### AFF Central Bank Balance Sheets



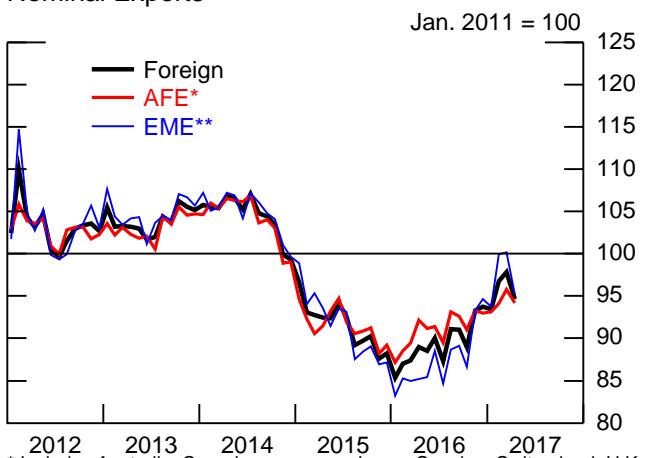
### EME Policy Rates



\* 1-year benchmark lending rate.

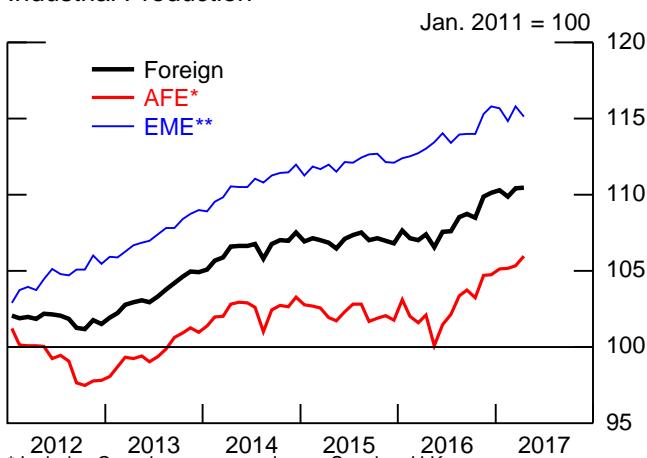
## Recent Foreign Indicators

### Nominal Exports



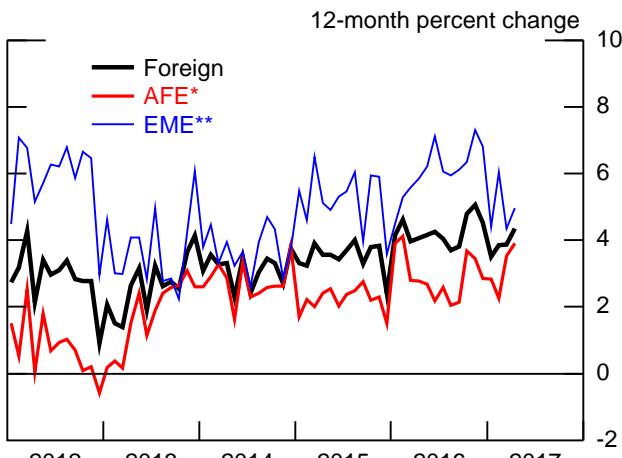
\* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.  
\*\* Includes Argentina, Brazil, Chile, Colombia, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand.

### Industrial Production



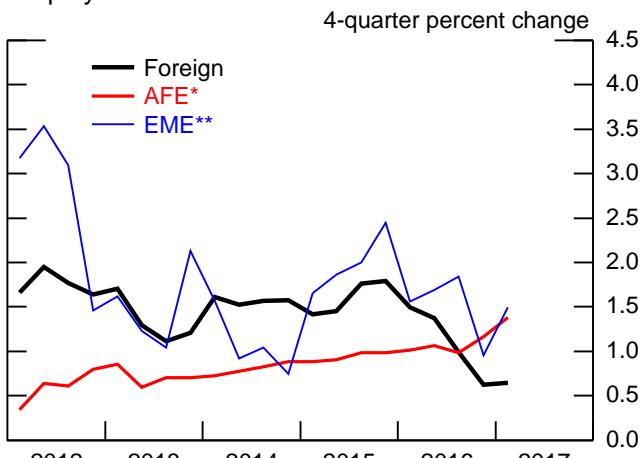
\* Includes Canada, euro area, Japan, Sweden, U.K.  
\*\* Includes Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand.

### Retail Sales



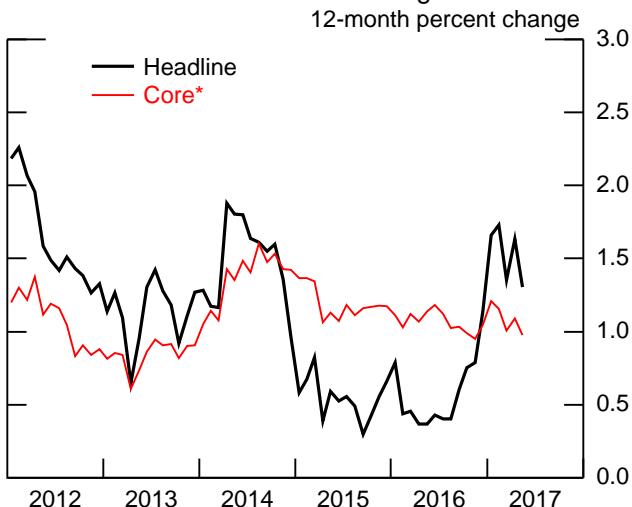
\* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.  
\*\* Includes Brazil, Chile, China, Korea, Mexico, Taiwan.

### Employment



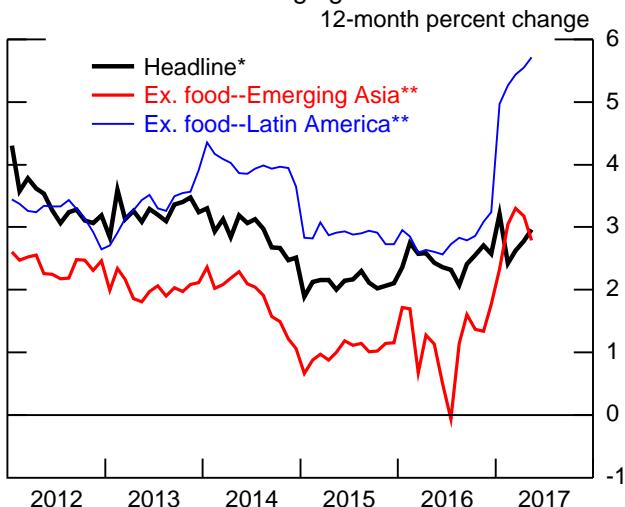
\* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.  
\*\* Includes Chile, Colombia, Hong Kong, Israel, Korea, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand, Turkey.

### Consumer Prices: Advanced Foreign Economies



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

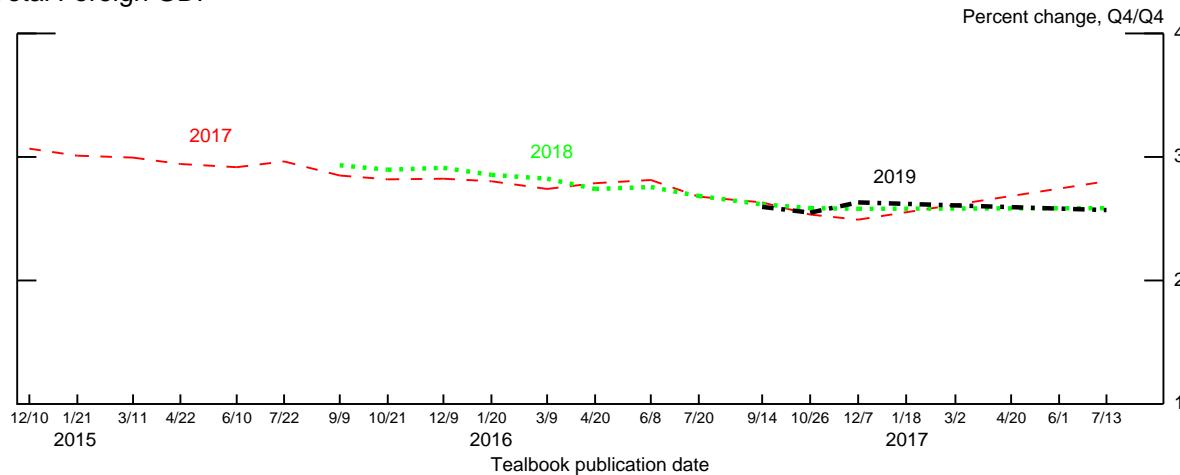
### Consumer Prices: Emerging Market Economies



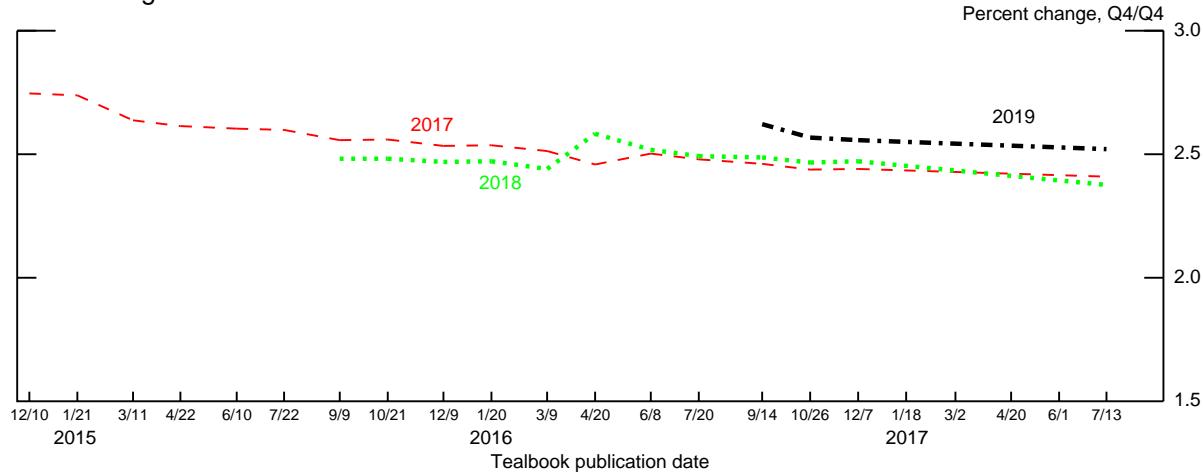
\* Includes Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand.  
\*\* Excludes all food; staff calculation. Excludes Argentina and Venezuela.

## Evolution of Staff's International Forecast

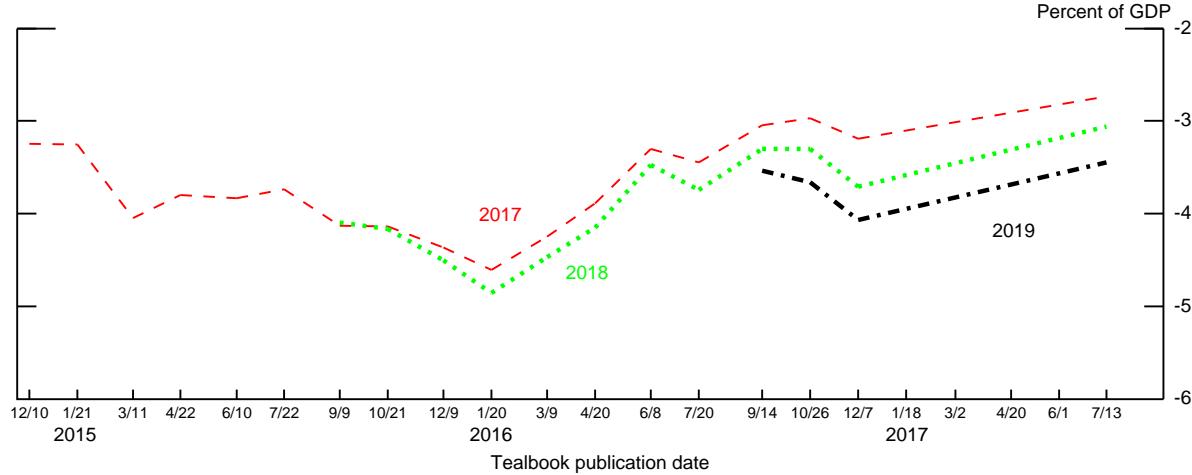
Total Foreign GDP



Total Foreign CPI

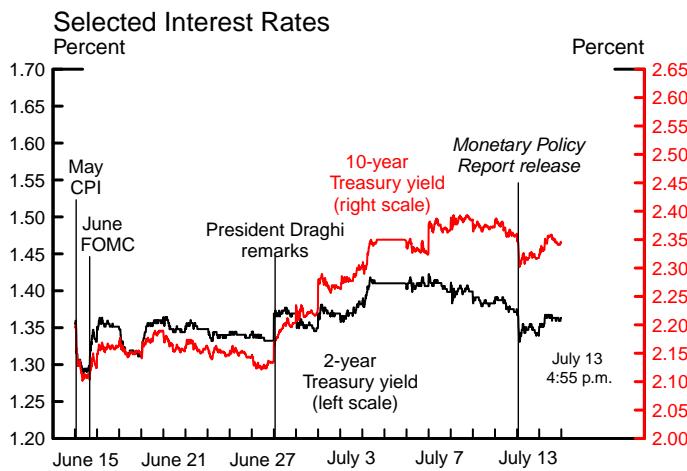


U.S. Current Account Balance



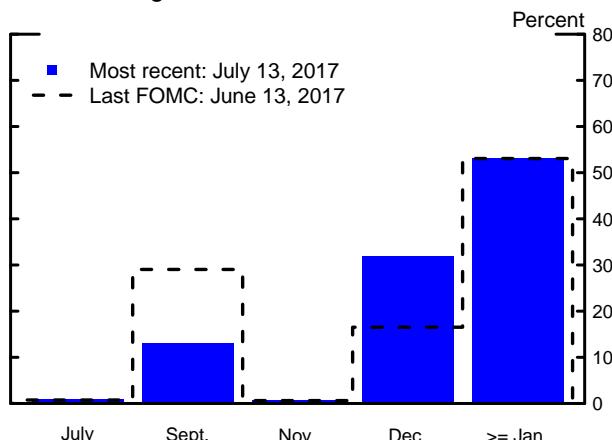
Int'l Econ Devel &amp; Outlook

## 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.

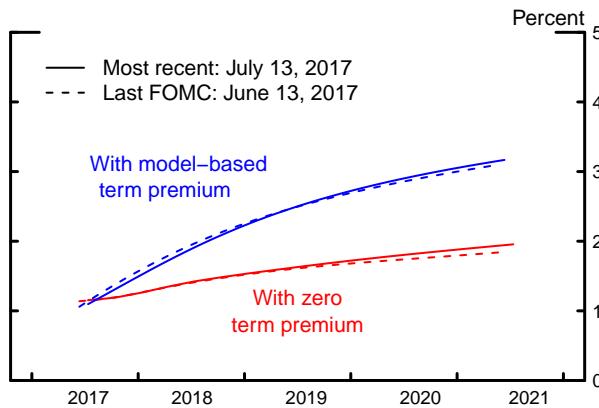
### Market-Implied Probability Distribution of the Timing of Next Rate Increase



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 intermeeting moves. The effective federal funds rate until the next FOMC meeting is assumed to be equal to the observed rate on the previous non-month-end business day. The dashed line shows the probability distribution of the next rate hike after the March meeting.

Source: CME Group; Federal Reserve Board staff estimates.

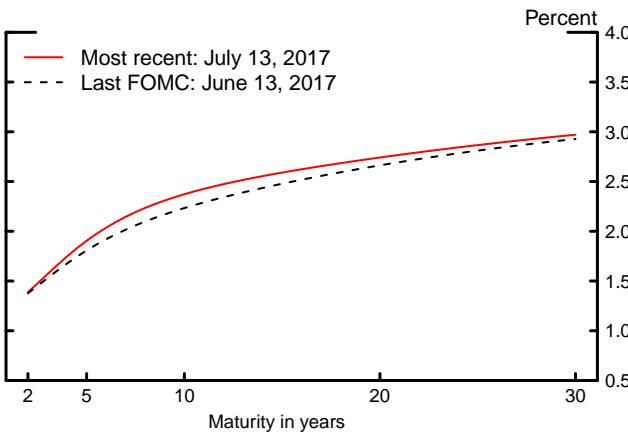
### Implied Federal Funds Rate



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

Source: Bloomberg; Federal Reserve Board staff estimates.

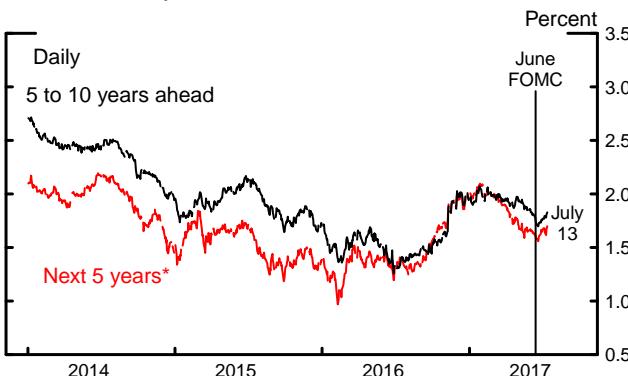
### Treasury Yield Curve



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.

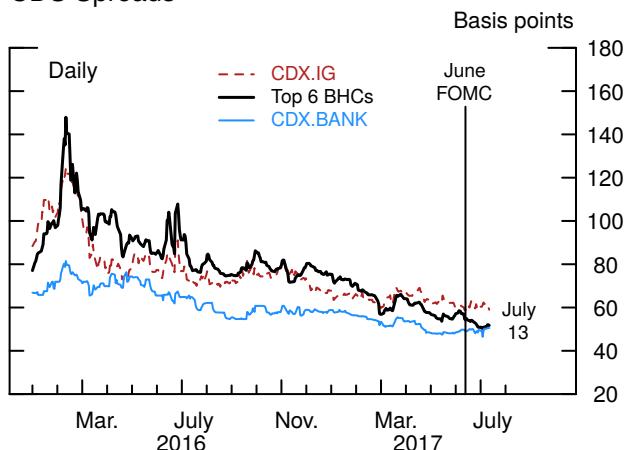
## Corporate Asset Market Developments

### S&P 500



Source: Bloomberg.

### CDS Spreads



Note: Top 6 bank holding companies (BHCs) are Bank of America, Citigroup, Goldman Sachs, Morgan Stanley, JPMorgan Chase, and Wells Fargo. CDX.IG plots the median 5-year spread and is the on-the-run investment-grade credit default swap (CDS) index. CDX.BANK is the median of all available quotes.

Source: Markit.

### Equity Risk Premium

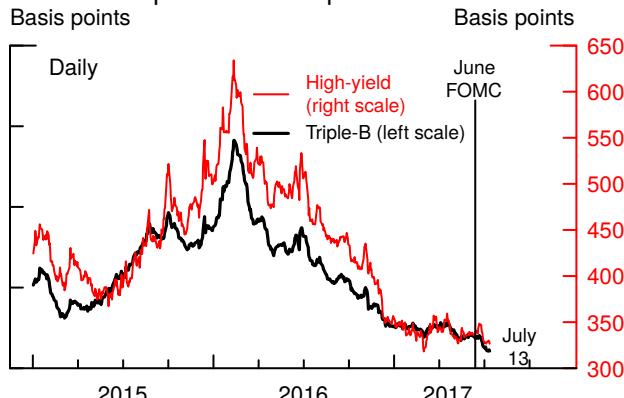


\* Off-the-run 10-year Treasury yield less Philadelphia Fed 10-year expected inflation.

+ Denotes latest observation using daily interest rates and stock prices as well as staff forecast of corporate profits.

Source: Staff projections.

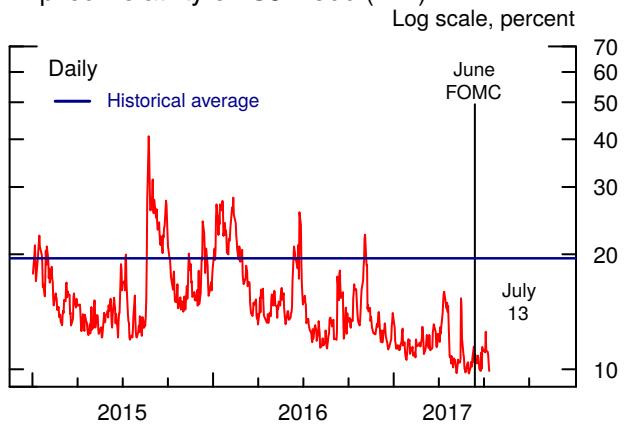
### 10-Year Corporate Bond Spreads



Note: Spreads over 10-year Treasury yield.

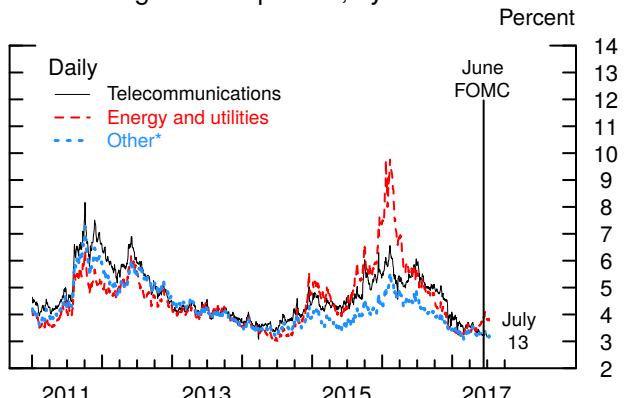
Source: Staff estimates of smoothed yield curves based on Merrill Lynch bond data and smoothed Treasury yield curve.

### Implied Volatility on S&P 500 (VIX)



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

### 10-Year High-Yield Spreads, by Sector



Note: Spreads over 10-year Treasury yield.

\* Includes high-yield firms that are not in the energy, utility, or telecommunications sector.

Source: Staff estimates of smoothed corporate yield curves based on Merrill Lynch data and smoothed Treasury yield curve.

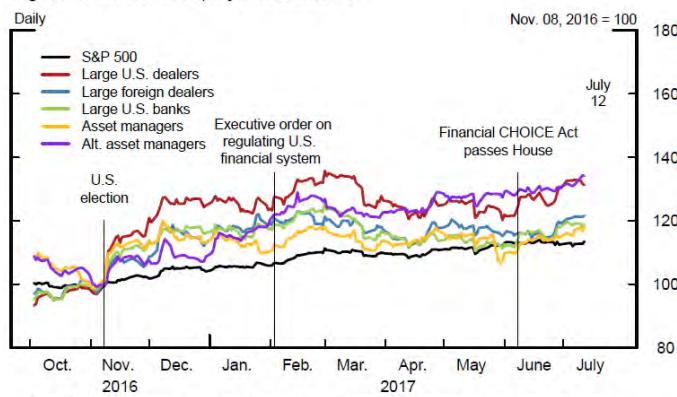
## Explaining the Recent Outperformance of Financial Equities

Since the U.S. election last November, equity prices of domestic financial firms have significantly outperformed the broader market. For example, over this period, indexes of stock prices of large U.S. dealer banks and of alternative asset managers increased 33 percent, while the S&P 500 index rose less than half that amount (figure 1). To explain this differential performance, market participants have pointed to higher growth expectations from a shifted fiscal policy regime, the effect of higher interest rates and a steeper yield curve in the post-election period, and expectations for lighter financial-sector regulation. In this discussion we examine how well these factors explain the performance of financial equities since the U.S. election.

As a first step, we calculate risk-adjusted returns (that is, alphas) from the capital asset pricing model (CAPM). As shown in figure 2, many domestic financial institutions earned significant abnormal returns in the post-election period. In particular, large U.S. dealers and asset managers had the highest alphas.<sup>1</sup> To understand the factors that explain financial stocks' abnormal performance, we regress firms' estimated alphas on three sets of explanatory variables:

1. Interest rates: Daily changes in the short-term interest rate (2-year Treasury yield) and slope of the term structure (10-year minus 2-year yield),
2. Volatility: Daily changes in equity (VIX) and fixed-income (MOVE) volatility indexes, and
3. Regulatory sentiment: Google search indexes for “Dodd-Frank Act” and “deregulation.”

Figure 1. Financial Equity Performance



Note: This figure shows the indexed values of median stock prices for each subgroup. Dealers includes only primary dealers. Large banks include USB, BK, PNC, COF, TD, STI, and BBT. Asset managers include AB, AMG, APAM, BEN, BLK, EV, FII, IYZ, JNS, LM, TROW, WDR, STT, and NTRS. Alternative asset managers include APO, ARES, BX, CG, FIG, KKR, OAK, and OZM.

Source: Bloomberg.

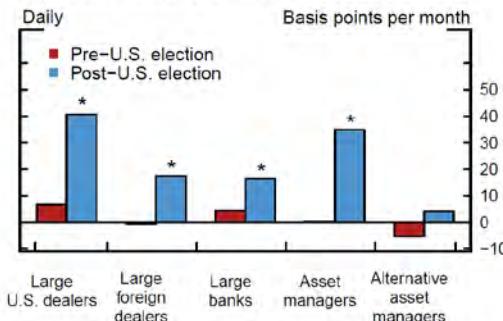
<sup>1</sup> The alphas are estimated using the CAPM betas from the two-year period before the U.S. election. For more information on the methodology, see Lubomir Petrasek, Sean Savage, and Michael Ng (2017), “Explaining the Post-Election Surge in Financial Stocks,” staff memo, Board of Governors of the Federal Reserve System, Division of Monetary Affairs, May 26.

Our analysis reveals that much of the post-election rally in financial stock prices can be attributed to macroeconomic factors. Specifically, we find that investors in financial stocks reacted positively to the higher level of short-term interest rates and to the steepening term structure of interest rates over this period. These interest rate factors alone explain more than 40 percent of the alphas of large U.S. dealers and banks in the post-election period (figure 3). Presumably, these factors tend to benefit banks and other lenders by increasing such firms' expected net interest margins on balance.

Although market volatility has declined, on net, since the election, volatility spiked in the immediate aftermath of the election. We find that the temporary increases in equity and fixed-income volatility after the election are also related to the post-election alphas of U.S. dealers and asset managers. In theory, volatility should benefit broker-dealers' trading businesses through increased client activity, while asset managers would potentially benefit from increased trading opportunities and fund flows. Our regression results show that changes in volatility explain about 20 percent of the time-series variation of U.S. dealers' and asset managers' abnormal performance since the election.

Finally, we find that our proxies of investor sentiment regarding the potential for financial deregulation also played a statistically significant—albeit comparatively small—role in explaining U.S. dealers' and banks' post-election alphas. In particular, the indexes of Google searches for the topics "Dodd-Frank Act" and "deregulation" explain about 5 percent of the abnormal performance of U.S. dealers and banks in the post-election period. In contrast, we find that the post-election performance of foreign dealers is not significantly related to our sentiment indexes, likely because foreign dealers are perceived to be less exposed to U.S. regulatory developments. We note that our proxies are imperfect and thus are likely to underestimate the importance of regulatory sentiment on the stock price performance of domestic financial institutions.

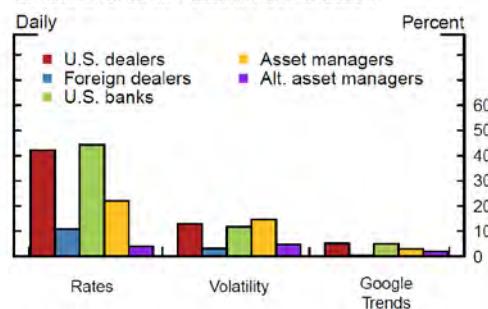
Figure 2. Average CAPM Alphas



Note: "Pre-U.S. election" includes the 2 years preceding the U.S. election; "post-U.S. election" is all days after the election. All alphas are based on the estimates of CAPM betas from the pre-election period. Asterisks indicate statistical significance from a one-sample, two-tailed t-test with 95% confidence.

Source: Bloomberg.

Figure 3. Percentage of Alpha Explained by Macro Effects and Other Factors Post-Election

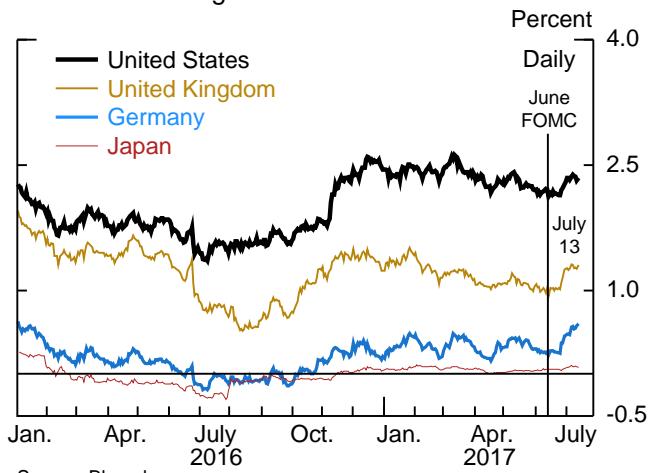


Note: This figure shows the R-squared of ex post alphas post-election regressed on market indicators for rates, volatility, and Google trends for regulatory terms.

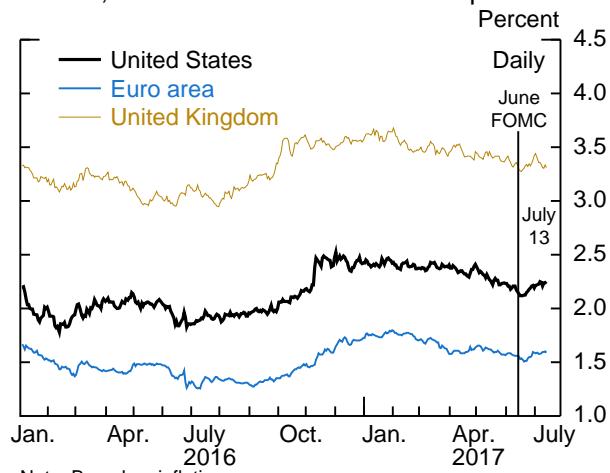
Source: Google Trends.

## Foreign Developments

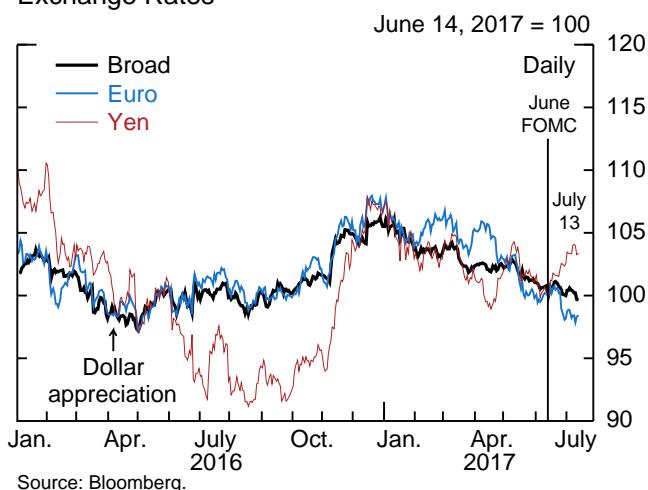
### 10-Year Sovereign Yields



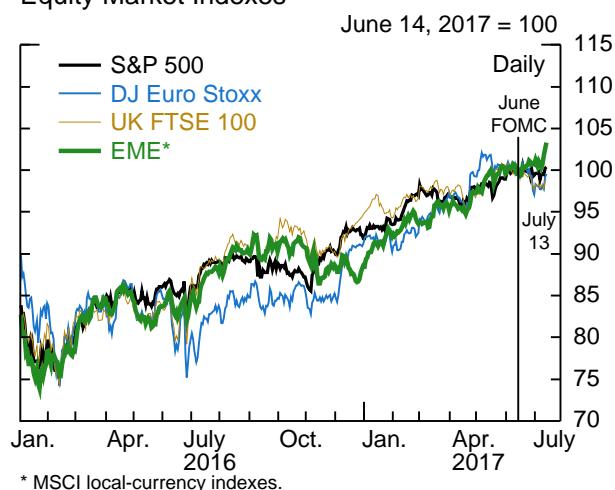
### 5-Year, 5-Year-Forward Inflation Compensation



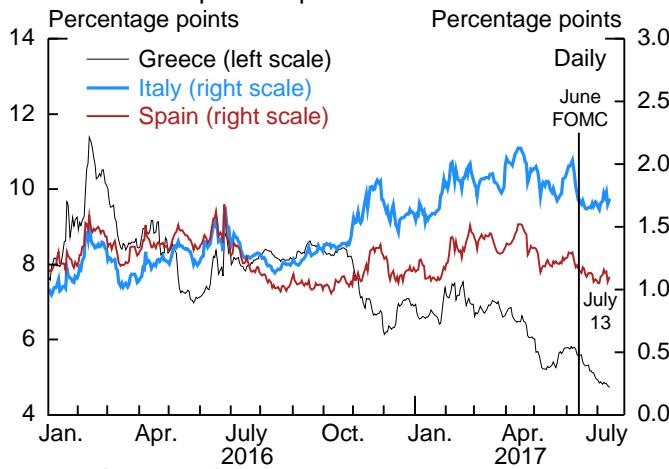
### Exchange Rates



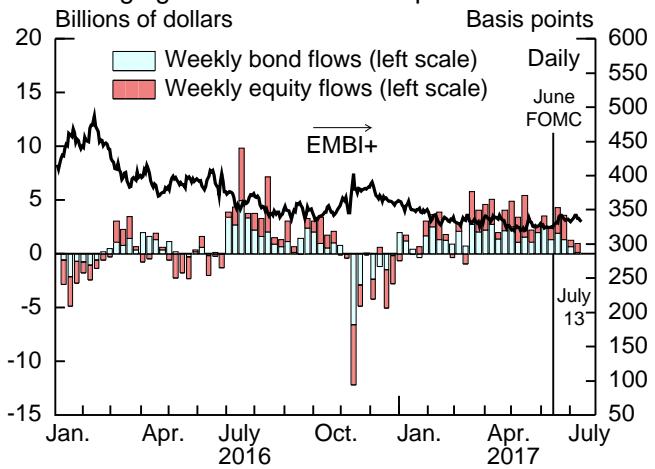
### Equity Market Indexes



### 10-Year Peripheral Spreads



### Emerging Market Flows and Spreads



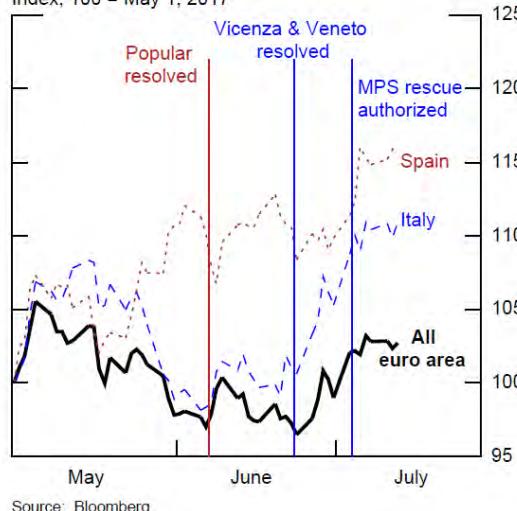
A plan to rescue (not resolve) MPS was approved under a BRRD exception called “precautionary recapitalization.” This exception permits state aid for solvent banks that have capital shortfalls under a stress test while protecting senior liabilities from bail-in. Unlike the Intesa case, the injection of roughly €5 billion of state funds to MPS will give the Italian government an ownership stake, estimated at 70 percent of the bank’s equity.

Market reaction to these interventions ranged from muted to positive. Bank share prices in Spain, Italy, and the broader euro area rose, on average, after the resolution actions (figure 1). Spreads of Italian and Spanish 10-year government bonds to German equivalents were also stable or slightly narrower (figure 2). This market reaction contrasts markedly with previous bouts of localized bank distress, which resulted in sizable negative spillovers to broader euro-area bank equities and government bonds.

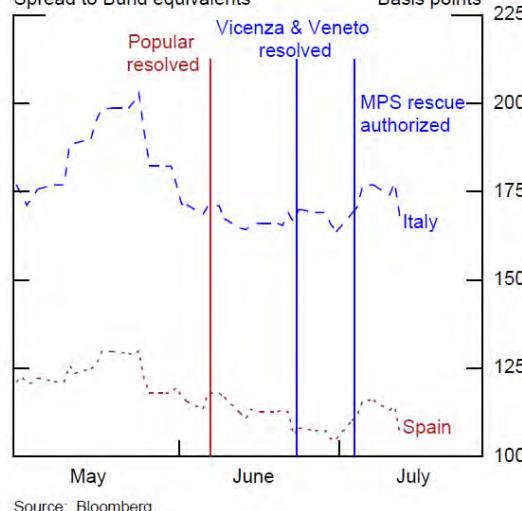
However, because these resolutions of medium- and small-sized banks were facilitated by the presence of healthy buyers, it remains unclear whether EU authorities would be able to resolve larger and more systemically important banks as smoothly. Moreover, EU authorities’ approaches to these first resolutions highlighted shortcomings in the banking union.

First, the supervisory framework is not yet as effective as envisioned. Although asset quality and capital deficiencies at all four banks were identified, deficiencies were not adequately remediated. In addition, supervisors were slow to declare the three resolved banks likely to fail, a condition that triggers the resolution process. Second, significant amounts of state aid were used in the Italian case, casting doubt on the willingness of EU authorities to use the BRRD to break the doom loop between bank recapitalizations and national budgets. Finally, the Italian resolutions highlight the lack of a European deposit guarantee program, which had been proposed as an element of the banking union. In Italy, deposit insurance is largely funded after the fact with contributions from domestic banks. Absent public funds, the remaining banks would have had to cover the losses of the failed banks’ insured depositors—which many Italian lenders, weakened by bad loans and thin capital buffers, reportedly could ill afford.

**Figure 1: Bank Equity Indexes**  
Index, 100 = May 1, 2017

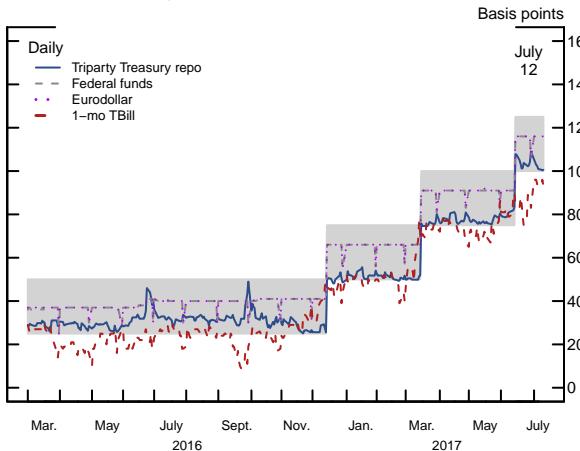


**Figure 2: Sovereign 10-Year Bonds**  
Spread to Bund equivalents



## Short-Term Funding Markets and Federal Reserve Operations

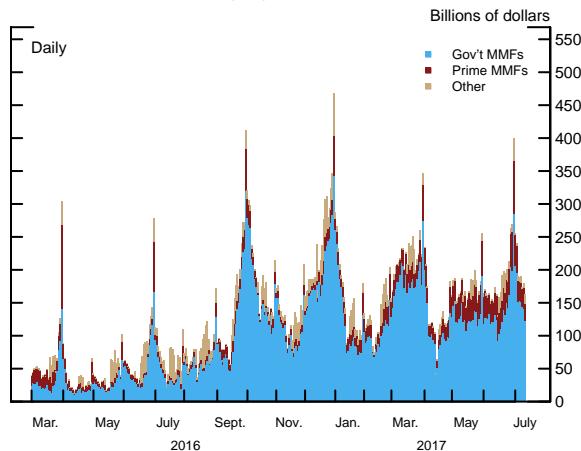
### Selected Money Market Rates



Note: Effective federal funds rate is a weighted median; shaded area is the target range for the federal funds rate.

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

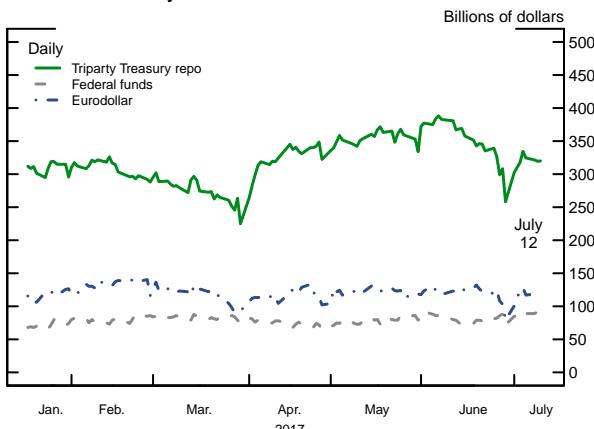
### ON RRP Take-Up, by Type



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

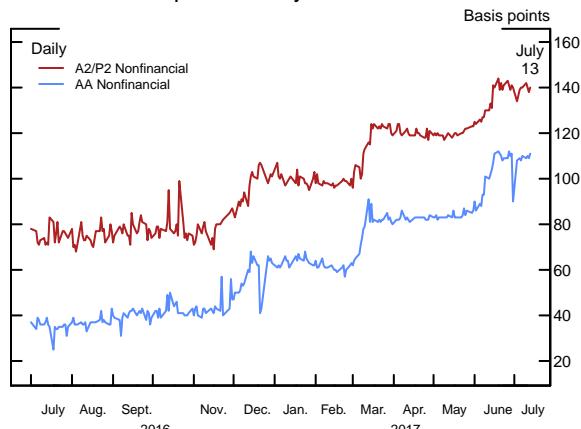
Source: Federal Reserve Bank of New York.

### Selected Money Market Volumes



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

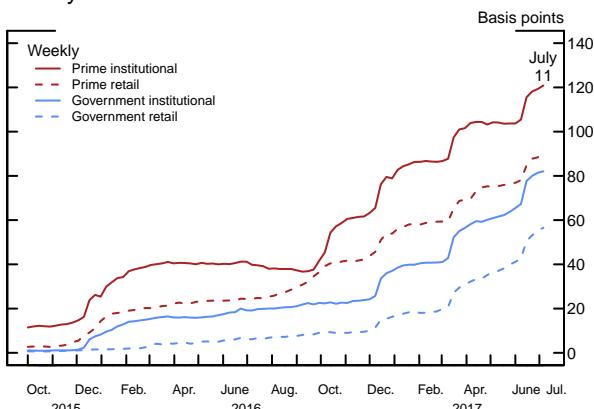
### Commercial Paper: 30-Day Rates



Note: Rates are for domestic issuers.

Source: Depository Trust & Clearing Corporation.

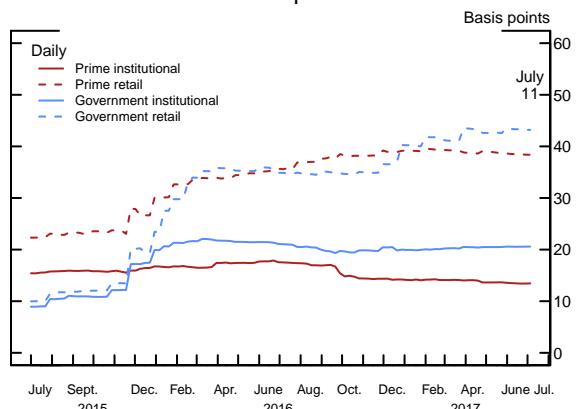
### Money Market Fund Net Yields



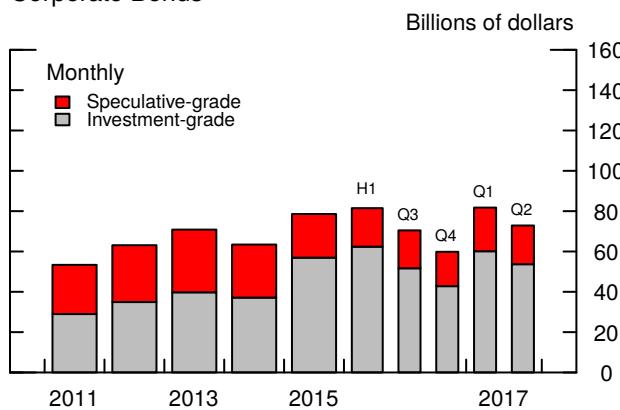
Note: Net yields are the annualized average yield, net of expense ratio, earned over the past 7 days without reinvesting dividends.

Source: iMoneynet.

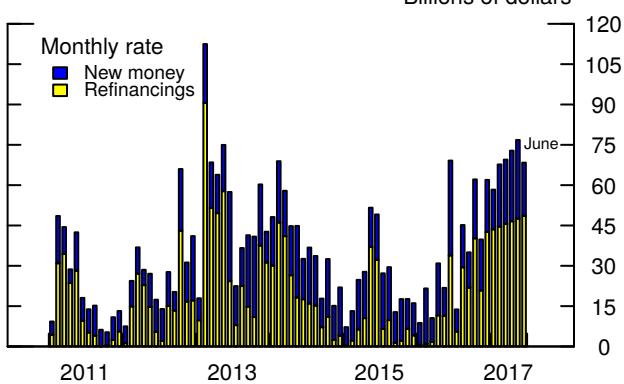
### Government and Prime Expense Ratios



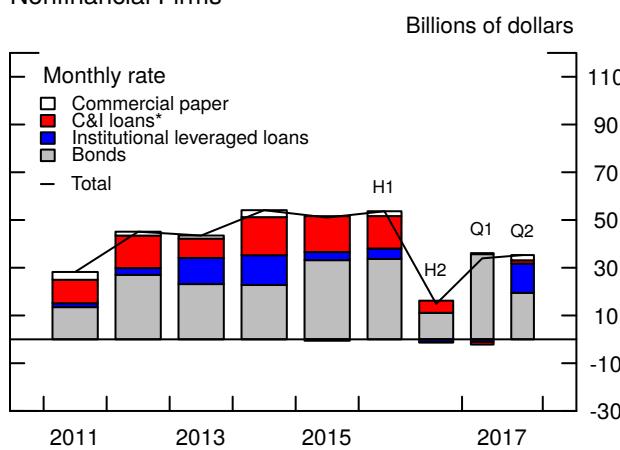
Source: iMoneynet.

**Business Finance****Gross Issuance of Nonfinancial Corporate Bonds**

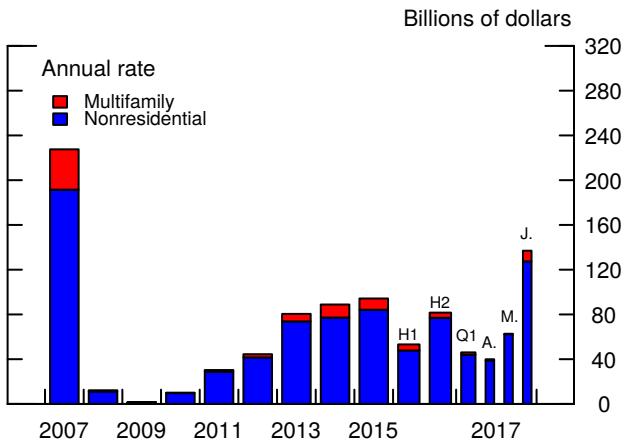
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.  
Source: Mergent Fixed Income Securities Database.

**Institutional Leveraged Loan Issuance, by Purpose**

Source: Thomson Reuters LPC LoanConnector.

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

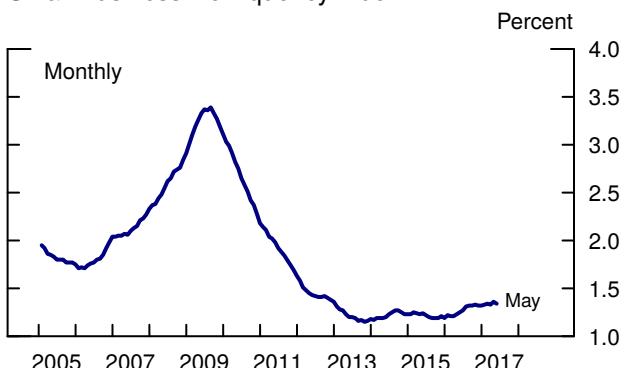
Note: C&I is commercial and industrial.  
\* Period-end basis, seasonally adjusted.  
Source: Depository Trust & Clearing Corporation; Mergent Fixed Income Securities Database; Federal Reserve Board; Thomson Reuters LPC.

**CMBS Issuance**

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

**Percent of Small Firms Reporting Credit Was Somewhat or Very Easy to Obtain over the Previous 12 Months**

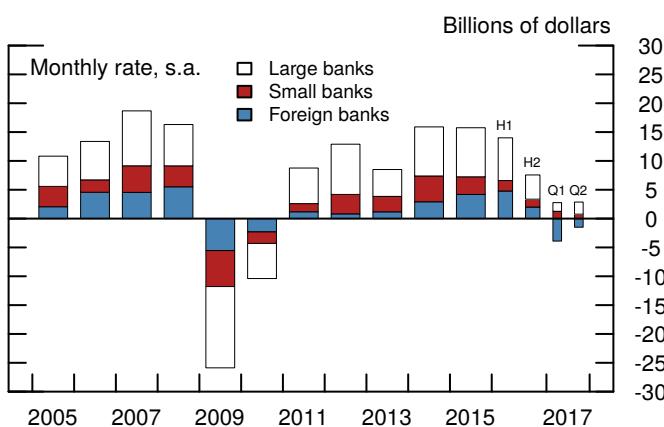
Note: Data not seasonally adjusted.  
Source: Wells Fargo/Gallup Small Business Index.

**Small Business Delinquency Index**

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

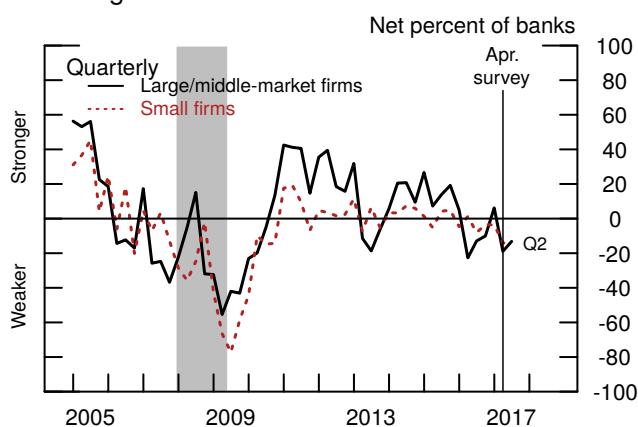
## Bank Lending Conditions

### Commercial and Industrial Loans



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; staff calculations.

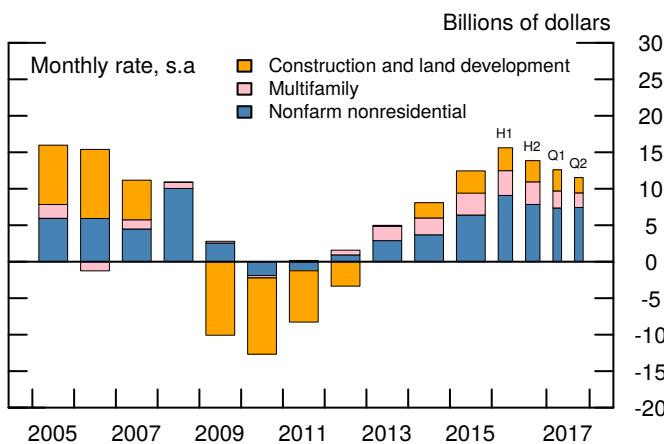
### Change in Demand for C&I Loans



Note: Banks' responses are weighted by their sizes in the relevant loan categories. The shaded bar indicates a period of business recession as defined by the National Bureau of Economic Research.

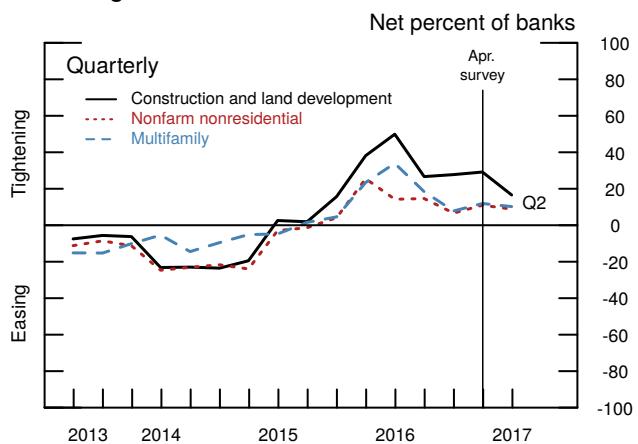
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

### Commercial Real Estate Loans



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; staff calculations.

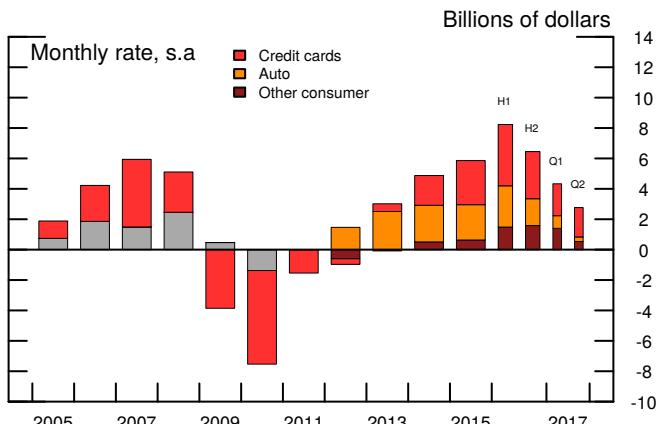
### Changes in Standards for CRE Loans



Note: Banks' responses are weighted by their sizes in the relevant loan categories.

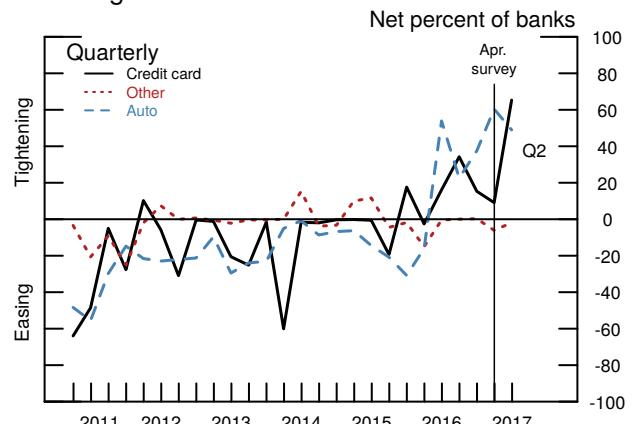
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

### Consumer Loans



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; staff calculations.

### Changes in Standards for Consumer Loans



Note: Banks' responses are weighted by their sizes in the relevant loan categories.

Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

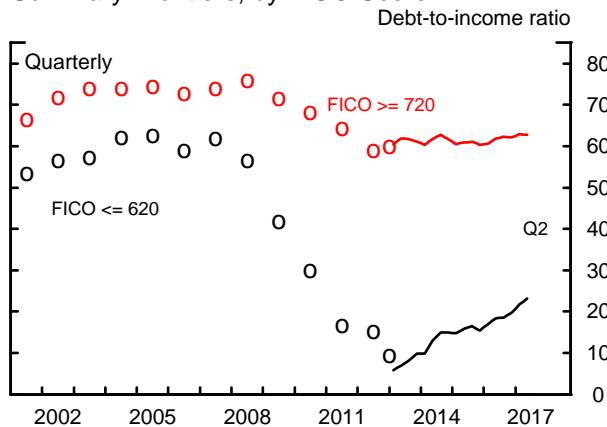
## Household Finance

### Mortgage Rate and MBS Yield



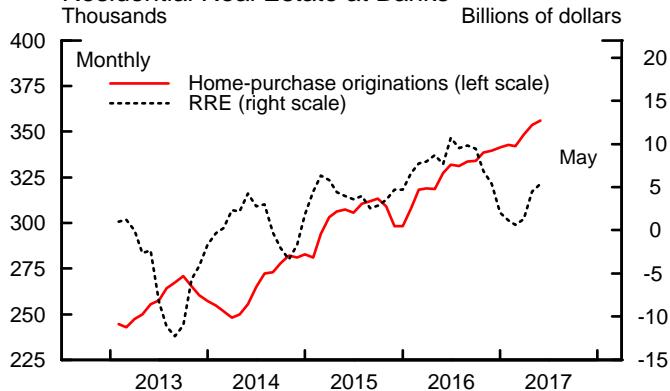
Note: The MBS yield is the Fannie Mae 30-year current-coupon rate.  
Source: For MBS yield, Barclays; for mortgage rate, Loansifter.

### Summary Frontiers, by FICO Score



Note: Summary frontier is a weighted average of the individual frontiers associated with each loan-to-value ratio, property location, and FICO group.  
Source: For frontiers shown with circles, McDash and CoreLogic; for frontiers shown with solid lines, Optimal Blue.

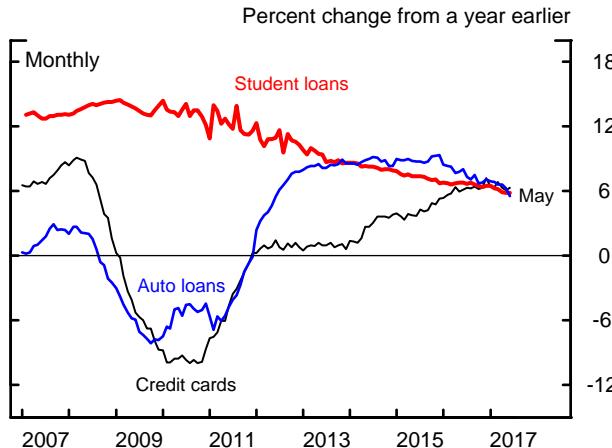
### Mortgage Originations and Change in Residential Real Estate at Banks



Note: Both series show a 3-month moving average and are seasonally adjusted by Federal Reserve Board staff.

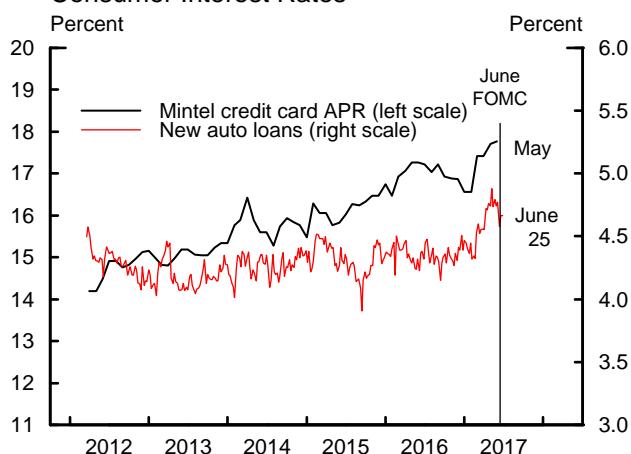
Source: For originations prior to 2016, data reported under the Home Mortgage Disclosure Act of 1975; for originations in 2016 and 2017, staff estimates; for residential real estate (RRE), Federal Reserve Board, Form FR 2644.

### Consumer Credit



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

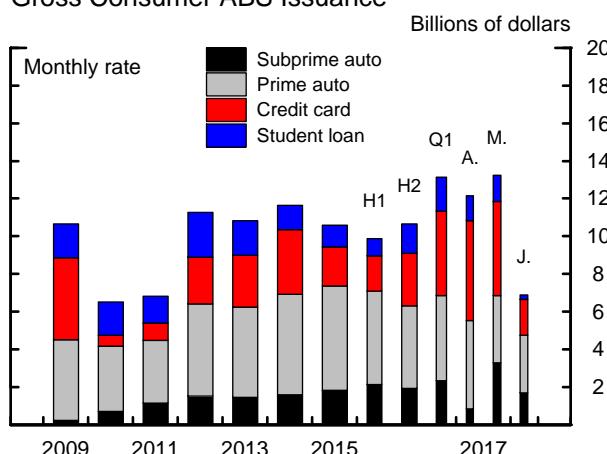
### Consumer Interest Rates



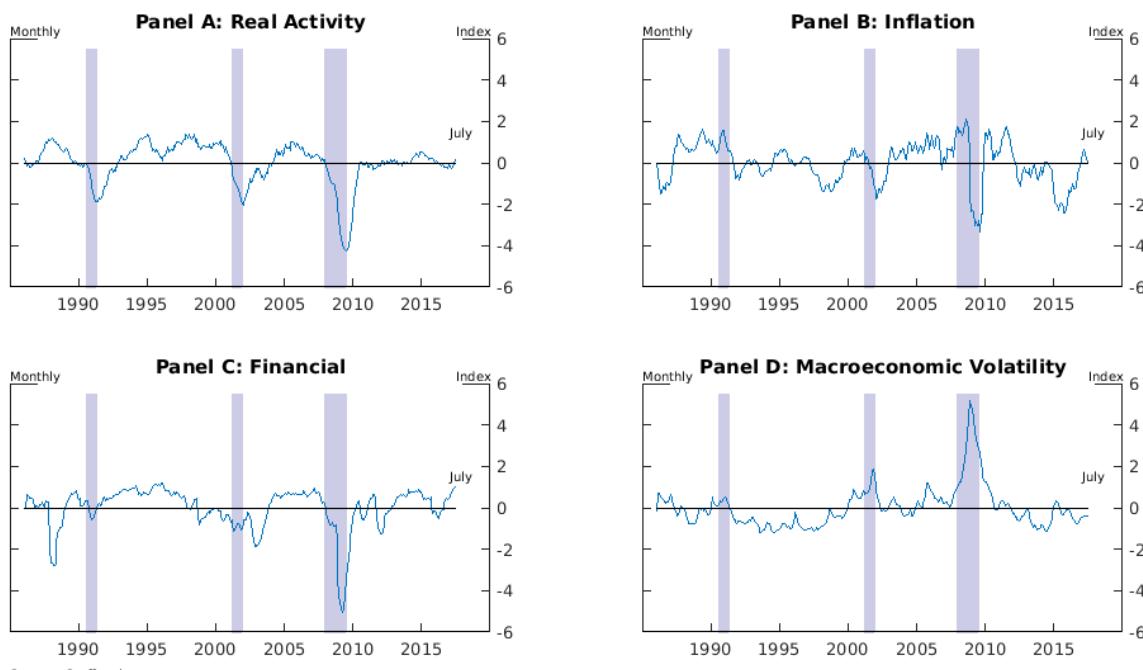
Note: Series are seasonally adjusted. For credit cards, the data are monthly; for auto loans, the data are weekly. APR is annual percentage rate.

Source: For credit cards, Mintel; for auto loans, PIN.

### Gross Consumer ABS Issuance



Source: Inside MBS & ABS; Merrill Lynch; Bloomberg.

**Figure 2: Indexes**

Source: Staff estimates.

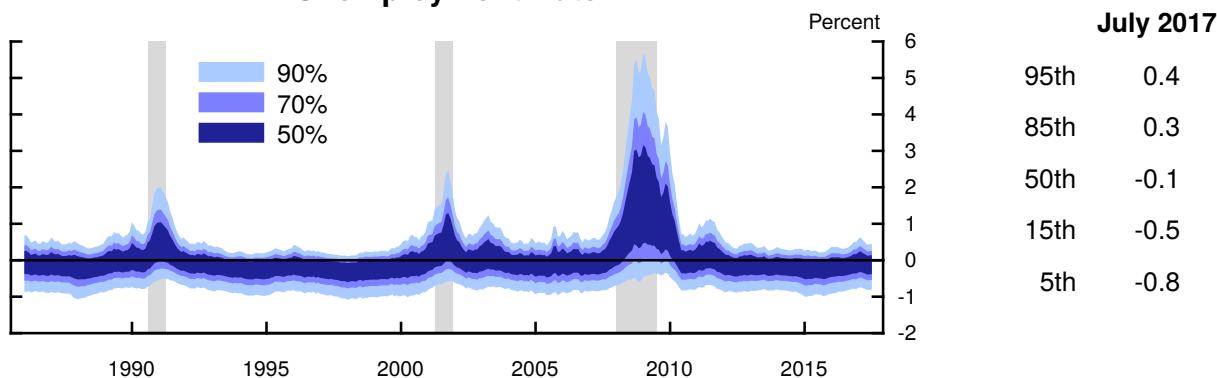
upside risk to the forecast for headline CPI inflation tends to be elevated. Panel C shows an index of financial market indicators. When this indicator is low (in periods of elevated financial stress), downside risks to the GDP growth forecast and upside risks to the unemployment rate forecast tend to be exacerbated. Panel D shows an indicator of macroeconomic uncertainty. This index gauges the average month-to-month volatility of more than 100 macroeconomic series. We found that when this index is elevated, the confidence intervals for all three macroeconomic forecasts are wider, with upside risks to the staff's inflation and unemployment rate forecasts and downside risks to the staff's forecast for GDP growth being especially affected.<sup>3</sup>

The exhibit "Time-Varying Macroeconomic Risk" presents time-series estimates of risks to the staff baseline economic forecasts that were generated using our new framework. As shown in the top panel, upside risk to the forecast for the unemployment rate is estimated to vary substantially over time, from about  $\frac{1}{2}$  percentage point during quiescent periods to more than 2 percentage points during periods of turbulence. In contrast, downside risk to the unemployment rate forecast appears to be relatively stable over time. As shown in the middle panel, upside risk for the staff's GDP growth forecast is estimated to fluctuate moderately around 2 percentage points. However, downside risk tends to occasionally surge, with the lower edge of the interval plunging from typical levels of around negative 2 percentage points to around negative 4 percentage points or lower at certain times. The bottom panel shows the distribution of staff forecast errors for inflation. Upside risk for inflation is estimated to vary more strongly over time than downside risk, with upside risk increasing primarily during periods of heightened macroeconomic volatility.

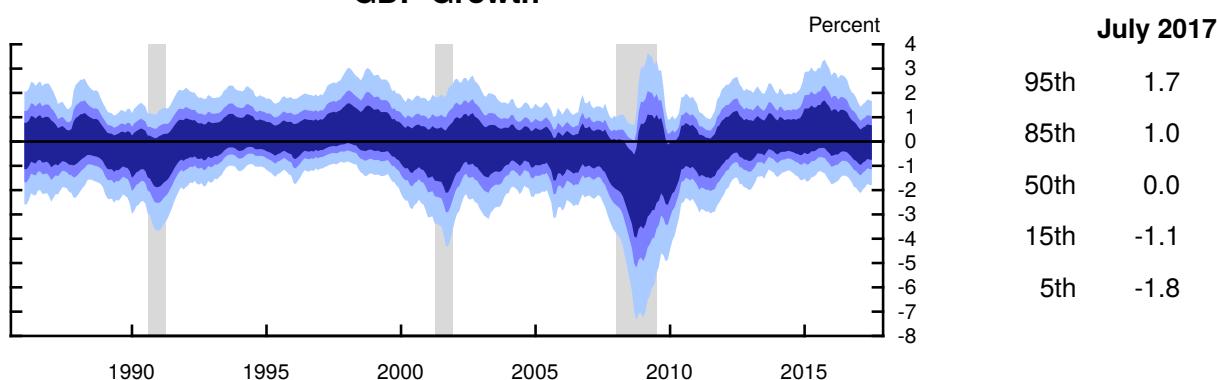
<sup>3</sup> Other instruments that we tested but found to have less explanatory power included measures of economic policy uncertainty and survey-based measures of expected future economic activity.

## Time-Varying Macroeconomic Risk

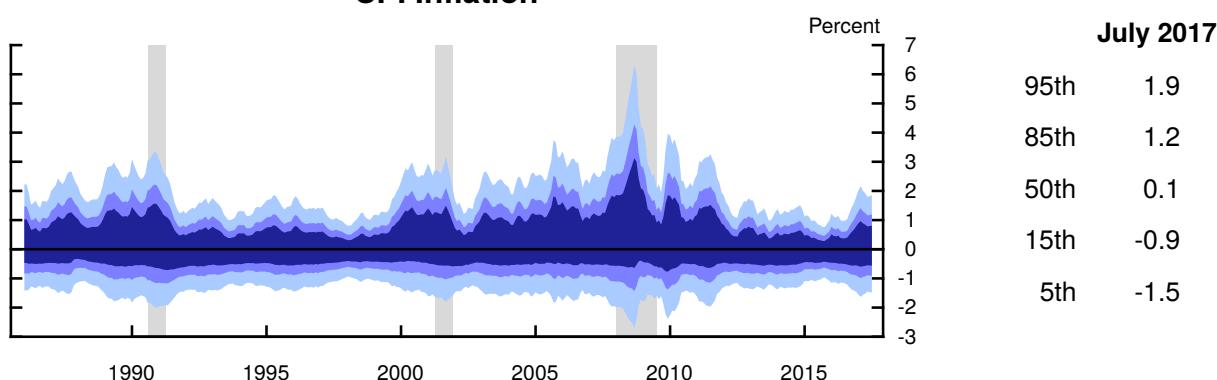
### Unemployment Rate



### GDP Growth

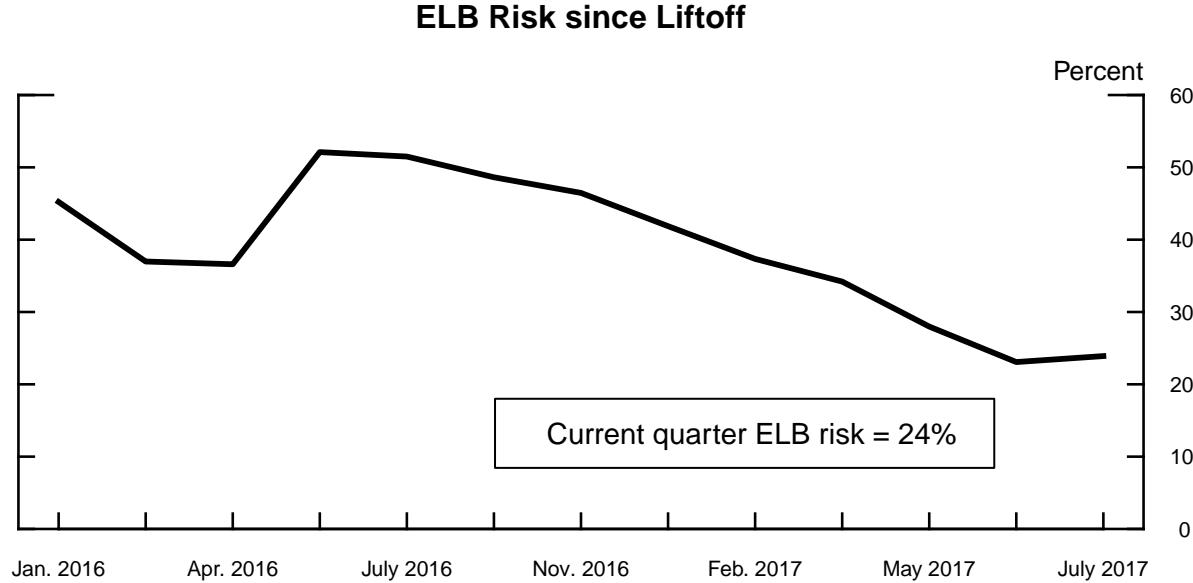


### CPI Inflation

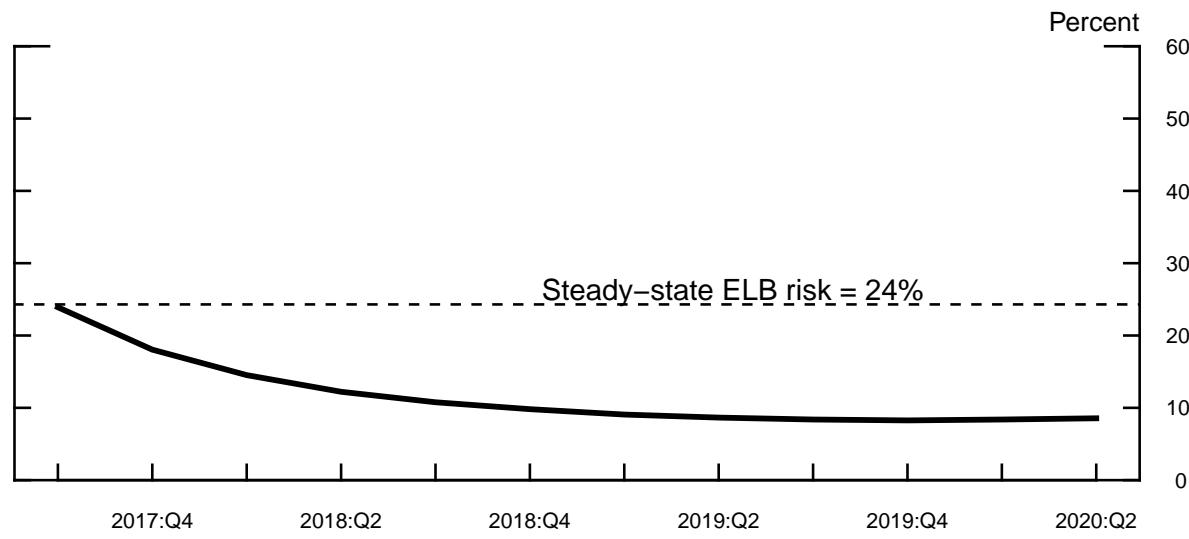


Note: The exhibit shows estimates of quantiles of the predicted distribution of errors for four-quarter-ahead staff forecasts. The estimates are conditioned on indicators of real activity, inflation, financial market strain, and the volatility of high-frequency macroeconomic indicators. The tables show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

## 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.

**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	2.7	2.2	1.9	1.6	1.2
Steeper Phillips curve	1.9	2.8	2.1	1.8	1.4	1.1
Lower inflation expectations	1.9	2.7	2.2	1.9	1.6	1.3
Lower natural rate, misperception	1.9	2.8	2.2	1.8	1.5	1.3
Market correction	1.9	2.3	1.4	1.8	1.8	1.6
Stronger foreign growth and tighter policy	1.9	2.9	2.6	2.1	1.4	1.1
China-driven EME turbulence	1.9	2.4	1.1	1.5	1.8	1.5
<i>Unemployment rate<sup>1</sup></i>						
Extended Tealbook baseline	4.4	4.2	4.0	3.8	3.9	4.4
Steeper Phillips curve	4.4	4.2	4.0	3.9	4.1	4.7
Lower inflation expectations	4.4	4.3	4.0	3.9	3.9	4.3
Lower natural rate, misperception	4.4	4.1	3.7	3.5	3.4	3.8
Market correction	4.4	4.3	4.4	4.3	4.3	4.4
Stronger foreign growth and tighter policy	4.4	4.2	3.8	3.5	3.5	4.1
China-driven EME turbulence	4.4	4.3	4.4	4.5	4.6	4.8
<i>Total PCE prices</i>						
Extended Tealbook baseline	1.3	1.5	1.9	2.0	2.0	2.1
Steeper Phillips curve	1.3	1.6	2.2	2.5	2.8	3.1
Lower inflation expectations	1.3	1.3	1.6	1.7	1.8	1.9
Lower natural rate, misperception	1.3	1.5	1.9	1.9	2.0	2.0
Market correction	1.3	1.5	1.9	2.0	2.0	2.1
Stronger foreign growth and tighter policy	1.3	1.9	2.5	2.2	2.1	2.2
China-driven EME turbulence	1.3	.9	1.2	1.7	1.9	2.1
<i>Core PCE prices</i>						
Extended Tealbook baseline	1.4	1.6	1.9	2.0	2.0	2.1
Steeper Phillips curve	1.4	1.7	2.2	2.5	2.8	3.1
Lower inflation expectations	1.4	1.4	1.6	1.7	1.8	1.9
Lower natural rate, misperception	1.4	1.6	1.9	1.9	1.9	2.0
Market correction	1.4	1.6	1.9	1.9	2.0	2.0
Stronger foreign growth and tighter policy	1.4	1.8	2.3	2.2	2.1	2.2
China-driven EME turbulence	1.4	1.2	1.3	1.7	1.9	2.0
<i>Federal funds rate<sup>1</sup></i>						
Extended Tealbook baseline	1.0	1.4	2.5	3.3	3.8	3.8
Steeper Phillips curve	1.0	1.4	2.7	3.7	4.3	4.6
Lower inflation expectations	1.0	1.4	2.3	3.0	3.5	3.6
Lower natural rate, misperception	1.0	1.5	2.7	3.5	3.8	3.5
Market correction	1.0	1.4	2.1	2.7	3.1	3.4
Stronger foreign growth and tighter policy	1.0	1.5	2.8	3.7	4.1	4.0
China-driven EME turbulence	1.0	1.3	2.1	2.5	2.9	3.2

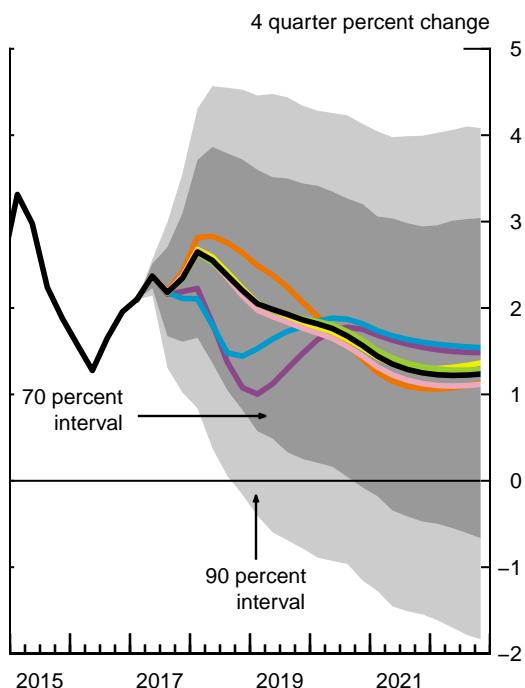
1. Percent, average for the final quarter of the period.

## Forecast Confidence Intervals and Alternative Scenarios

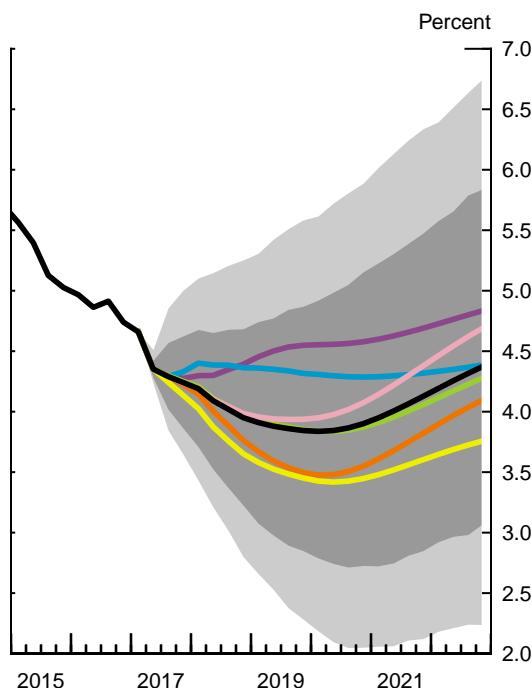
Confidence Intervals Based on FRB/US Stochastic Simulations

- Extended Tealbook baseline
- Lower natural rate, misperception
- Stronger foreign growth and tighter policy
- Steeper Phillips curve
- Market correction
- China–driven EME turbulence
- Lower inflation expectations

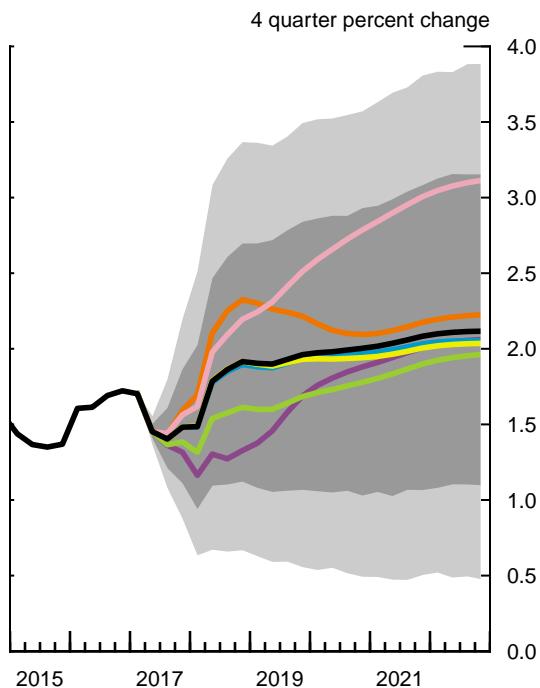
Real GDP



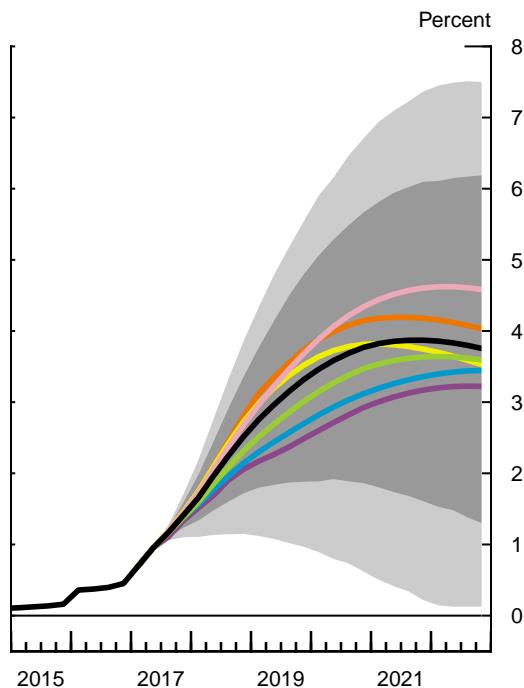
Unemployment Rate



PCE Prices excluding Food and Energy



Federal Funds Rate



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

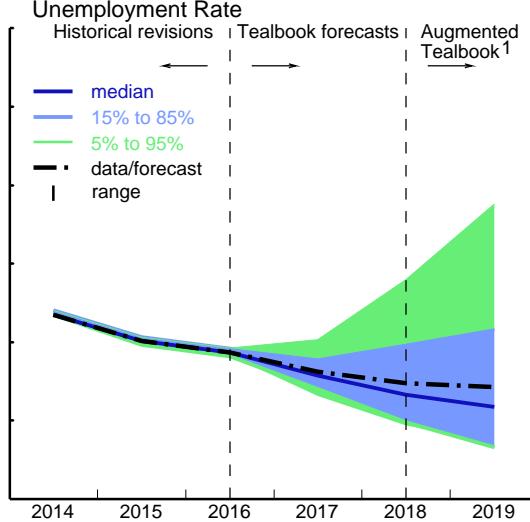
Measure	2017	2018	2019	2020	2021	2022
<i>Real GDP</i> <i>(percent change, Q4 to Q4)</i>						
Projection	2.3	2.2	1.9	1.6	1.2	1.2
Confidence interval						
Tealbook forecast errors	1.4–3.9	.4–3.8	-.4–3.6	...	...	...
FRB/US stochastic simulations	1.6–3.1	.8–3.7	.3–3.4	-.1–3.2	-.5–2.9	-.7–3.0
<i>Civilian unemployment rate</i> <i>(percent, Q4)</i>						
Projection	4.2	4.0	3.8	3.9	4.1	4.4
Confidence interval						
Tealbook forecast errors	3.8–4.6	3.0–5.0	2.3–5.3	...	...	...
FRB/US stochastic simulations	3.9–4.6	3.2–4.7	2.8–4.9	2.7–5.2	2.8–5.5	3.1–5.8
<i>PCE prices, total</i> <i>(percent change, Q4 to Q4)</i>						
Projection	1.4	1.9	2.0	2.0	2.1	2.1
Confidence interval						
Tealbook forecast errors	.8–1.7	.9–3.5	.7–3.5	...	...	...
FRB/US stochastic simulations	.9–1.8	1.0–2.8	1.0–2.9	.9–3.0	1.0–3.2	1.0–3.3
<i>PCE prices excluding food and energy</i> <i>(percent change, Q4 to Q4)</i>						
Projection	1.5	1.9	2.0	2.0	2.1	2.1
Confidence interval						
Tealbook forecast errors	1.2–1.7	1.4–2.6	...	...	...	...
FRB/US stochastic simulations	1.1–1.9	1.1–2.7	1.1–2.8	1.0–2.9	1.1–3.1	1.1–3.2
<i>Federal funds rate</i> <i>(percent, Q4)</i>						
Projection	1.4	2.5	3.3	3.8	3.9	3.8
Confidence interval						
FRB/US stochastic simulations	1.2–1.6	1.7–3.4	1.9–4.8	1.9–5.7	1.6–6.1	1.3–6.2

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.

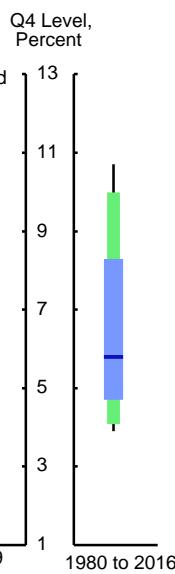
... Not applicable.

## Prediction Intervals Derived from Historical Tealbook Forecast Errors

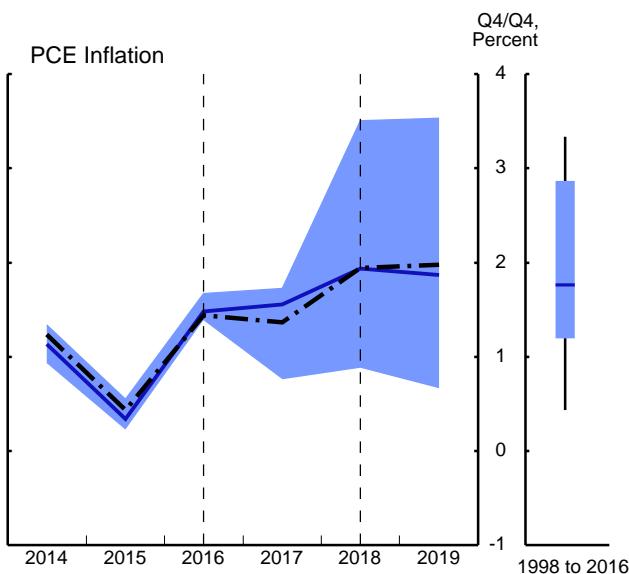
### Forecast Error Percentiles



### Historical Distributions

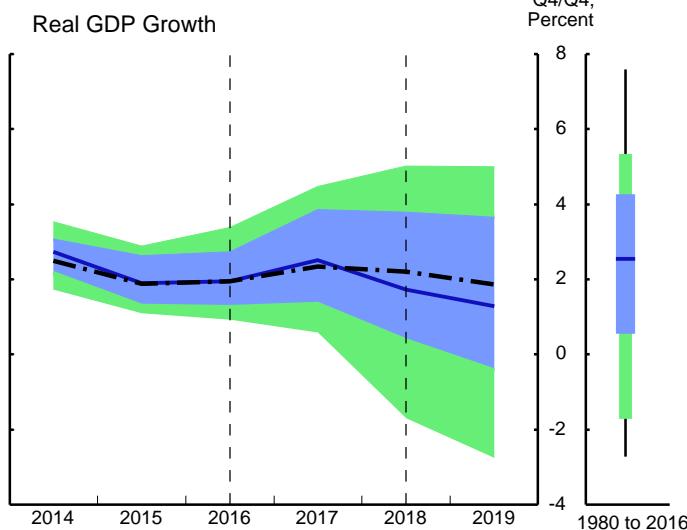


### PCE Inflation

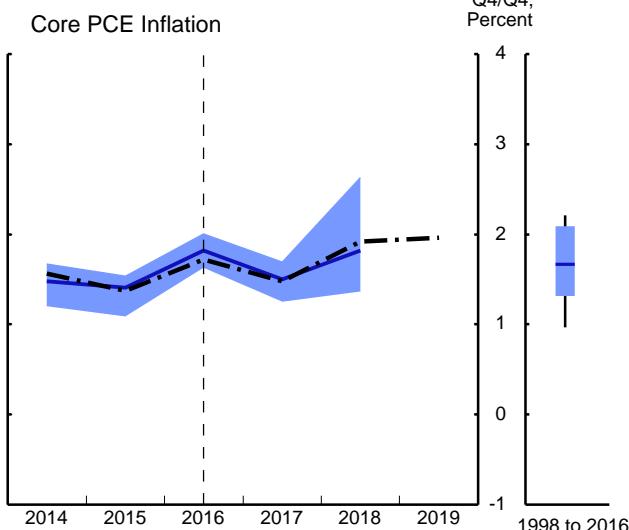


Risks & Uncertainty

### Real GDP Growth

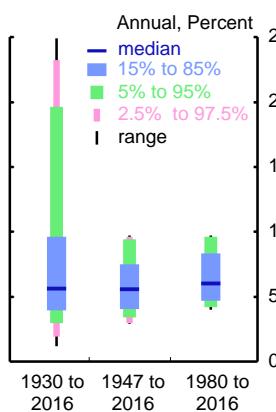


### Core PCE Inflation

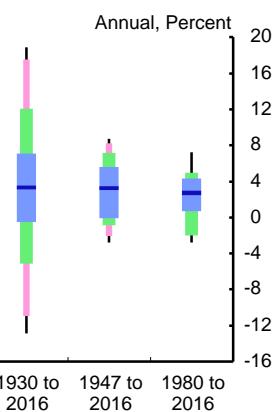


### Historical Distributions

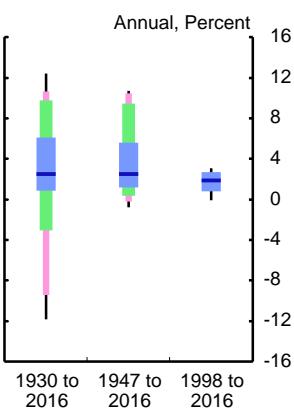
#### Unemployment Rate



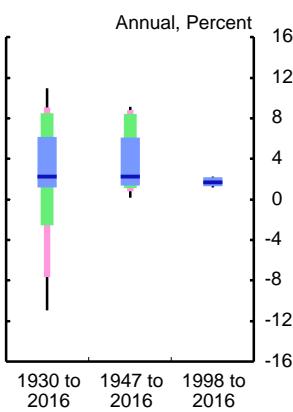
#### Real GDP Growth



#### 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.

## 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	.06	.04	.01	.02
Previous Tealbook	.07	.07	.04	.03
<i>Less than 1 percent</i>				
Current Tealbook	.16	.25	.17	.30
Previous Tealbook	.15	.14	.07	.25

### 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	.02	.13	.01
Previous Tealbook	.03	.03	.12	.01
<i>Decrease by 1 percentage point</i>				
Current Tealbook	.08	.12	.09	.26
Previous Tealbook	.08	.08	.10	.26

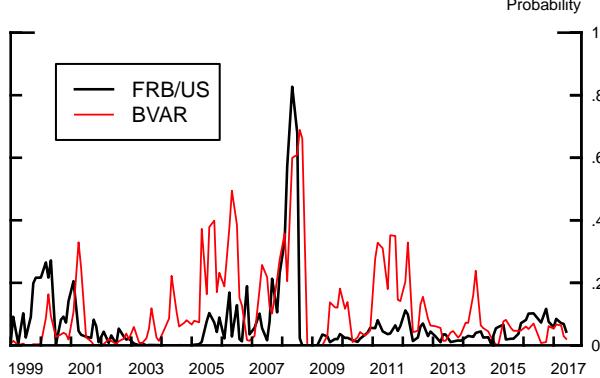
### Probability of Near-Term Recession

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	.01	.01	.03	.04	.00

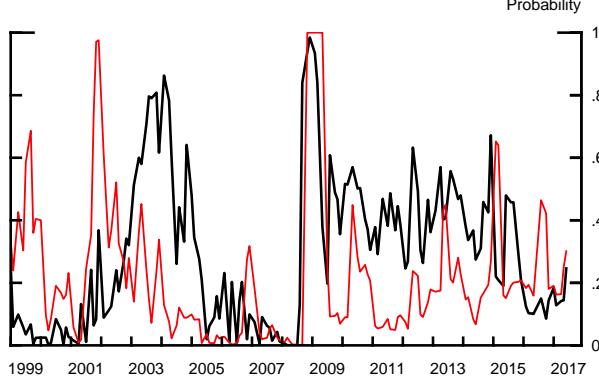
Note: "Staff" represents stochastic simulations in FRB/US around the staff baseline; baselines for FRB/US, BVAR, EDO, and the factor model are generated by those models themselves, up to the current-quarter estimate. Data for the current quarter are taken from the staff estimate for the second Tealbook 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)

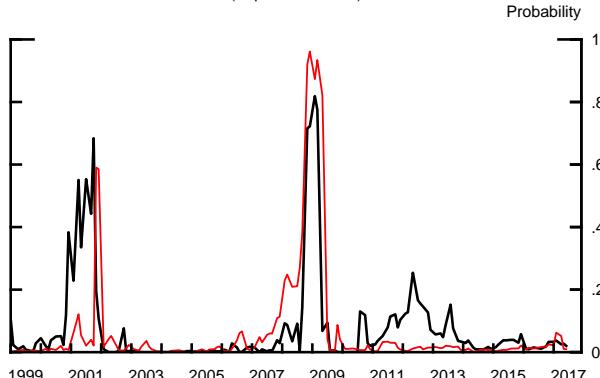
Probability that Total PCE Inflation Is above 3 Percent  
(4 quarters ahead)



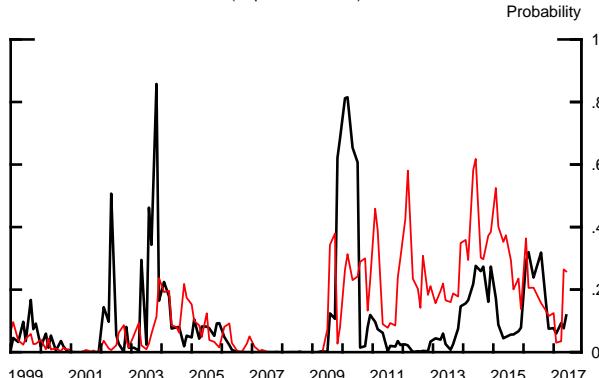
Probability that Total PCE Inflation Is below 1 Percent  
(4 quarters ahead)



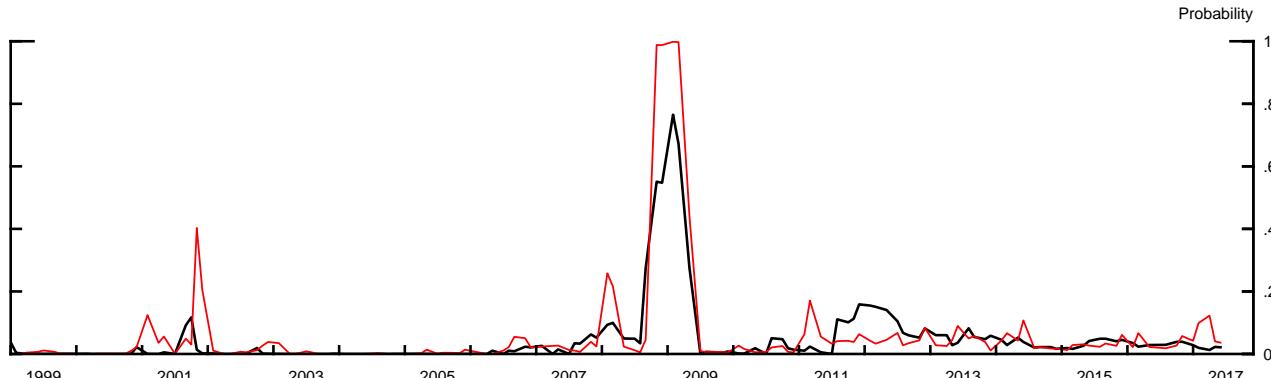
Probability that the Unemployment Rate Increases 1 ppt  
(4 quarters ahead)



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



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

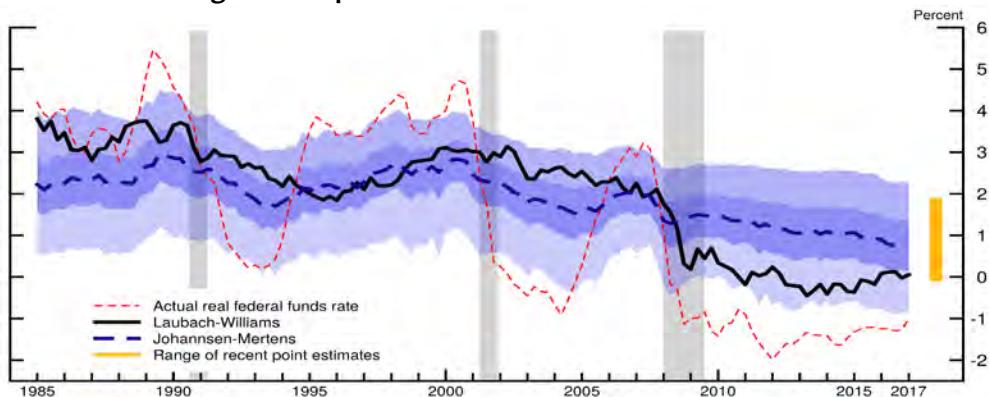


Note: See notes on facing page. Recession and inflation probabilities for FRB/US and the BVAR are real-time estimates. See Robert J. Tetlow and Brian Ironside (2007), "Real-Time Model Uncertainty in the United States: The Fed, 1996–2003," *Journal of Money, Credit and Banking*, vol. 39 (October), pp.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

continue to be a source of downward pressure on rates for some time. Christensen and Rudebusch (2017) provide an alternative perspective by inferring the longer-run equilibrium interest rate mainly from financial market data. Their point estimate is also near zero, and they too predict that the rate is “more likely than not” to remain low in the near term (p. 4).<sup>3</sup> Furthermore, “model free” measures, such as the Treasury Inflation-Protected Securities five-year, five-year-forward rate, remain low, though its movements could reflect changes in term premiums.

In addition to the estimates discussed previously, we summarize, with the yellow bar in the figure, a range of point estimates of the longer-run equilibrium rate from a collection of empirical studies. The range of point estimates spans from almost 0 to 1¼ percent. Taken together, these studies indicate that the staff’s current assumption for the longer-run equilibrium rate is well within the range of empirical estimates, especially given that each of these estimates is subject to considerable uncertainty. As the figure illustrates, the uncertainty bands around the longer-run equilibrium real rate in the Johannsen-Mertens model are large. Therefore, each study taken individually is only modestly informative about plausible values of the longer-run equilibrium rate, but the concordance of estimates using different data and modeling assumptions is somewhat reassuring.

#### Estimates of the Longer-Run Equilibrium Real Rate



Note: Shaded regions are the 50 percent and 90 percent uncertainty bands from the Johannsen-Mertens model. The yellow bar displays a range of recent point estimates from the studies cited herein in addition to estimates from Holston, Laubach, and Williams (2016) and Lewis and Vazquez-Grande (2017). The realized real federal funds rate is measured as the nominal federal funds rate less the four-quarter change in core PCE prices. Shaded vertical bars are NBER recession dates.

Source: Johannsen and Mertens (2015; see box note 2); Laubach and Williams (2016; see box note 2); Kathryn Holston, Thomas Laubach, and John C. Williams (2016), “Measuring the Natural Rate of Interest: International Trends and Determinants,” Working Paper Series 2016-11 (San Francisco: Federal Reserve Bank of San Francisco, December), <http://www.frbsf.org/economic-research/publications/working-papers/wp2016-11.pdf>; Kurt Lewis and Francisco Vazquez-Grande (2017), “Measuring the Natural Rate of Interest: Alternative Specifications,” Finance and Economics Discussion Series 2017-059 (Washington: Board of Governors of the Federal Reserve System, May), <https://doi.org/10.17016/FEDS.2017.059>.

<sup>3</sup> See Etienne Gagnon, Benjamin K. Johannsen, and David Lopez-Salido (2016), “Understanding the New Normal: The Role of Demographics,” Finance and Economics Discussion Series 2016-080 (Washington: Board of Governors of the Federal Reserve System, October), <http://dx.doi.org/10.17016/FEDS.2016.080>; and Jens H.E. Christensen and Glenn D. Rudebusch (2017), “New Evidence for a Lower New Normal in Interest Rates,” FRBSF Economic Letter 2017-17 (San Francisco: Federal Reserve Bank of San Francisco, June), [www.frbsf.org/economic-research/files/el2017-17.pdf](http://www.frbsf.org/economic-research/files/el2017-17.pdf).

## Policy Rules and the Staff Projection

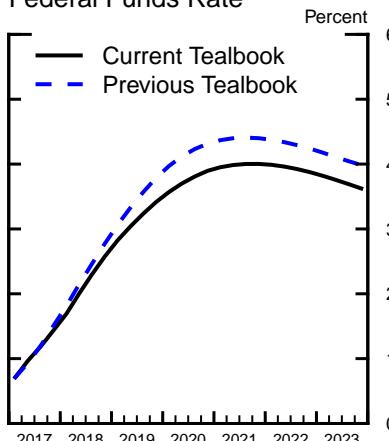
### Near-Term Prescriptions of Selected Simple Policy Rules<sup>1</sup>

(Percent)

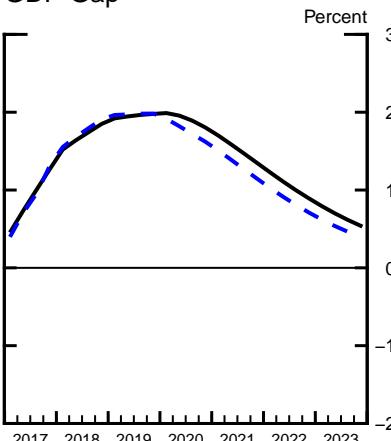
	<u>2017:Q3</u>	<u>2017:Q4</u>
Taylor (1993) rule	<b>2.11</b>	<b>2.35</b>
<i>Previous Tealbook</i>	2.82	3.11
Taylor (1999) rule	<b>2.60</b>	<b>2.96</b>
<i>Previous Tealbook</i>	3.28	3.74
First-difference rule	<b>1.27</b>	<b>1.56</b>
<i>Previous Tealbook projection</i>	1.33	1.65
Nominal income targeting rule	<b>0.83</b>	<b>0.76</b>
<i>Previous Tealbook projection</i>	0.95	1.01
<i>Addendum:</i>		
Tealbook baseline	<b>1.17</b>	<b>1.41</b>

### Key Elements of the Staff Projection

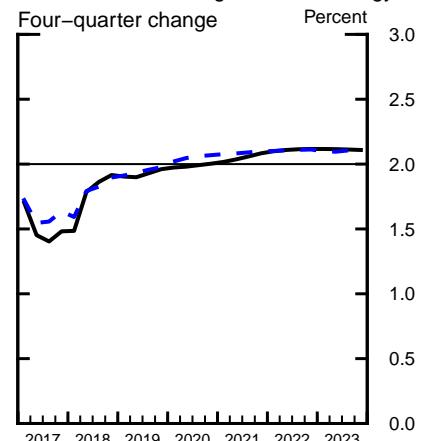
#### Federal Funds Rate



#### GDP Gap



#### PCE Prices Excluding Food and Energy



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

(Percent)

	Current Tealbook	Current-Quarter Estimate Based on Previous Tealbook	Previous Tealbook
--	---------------------	--	----------------------

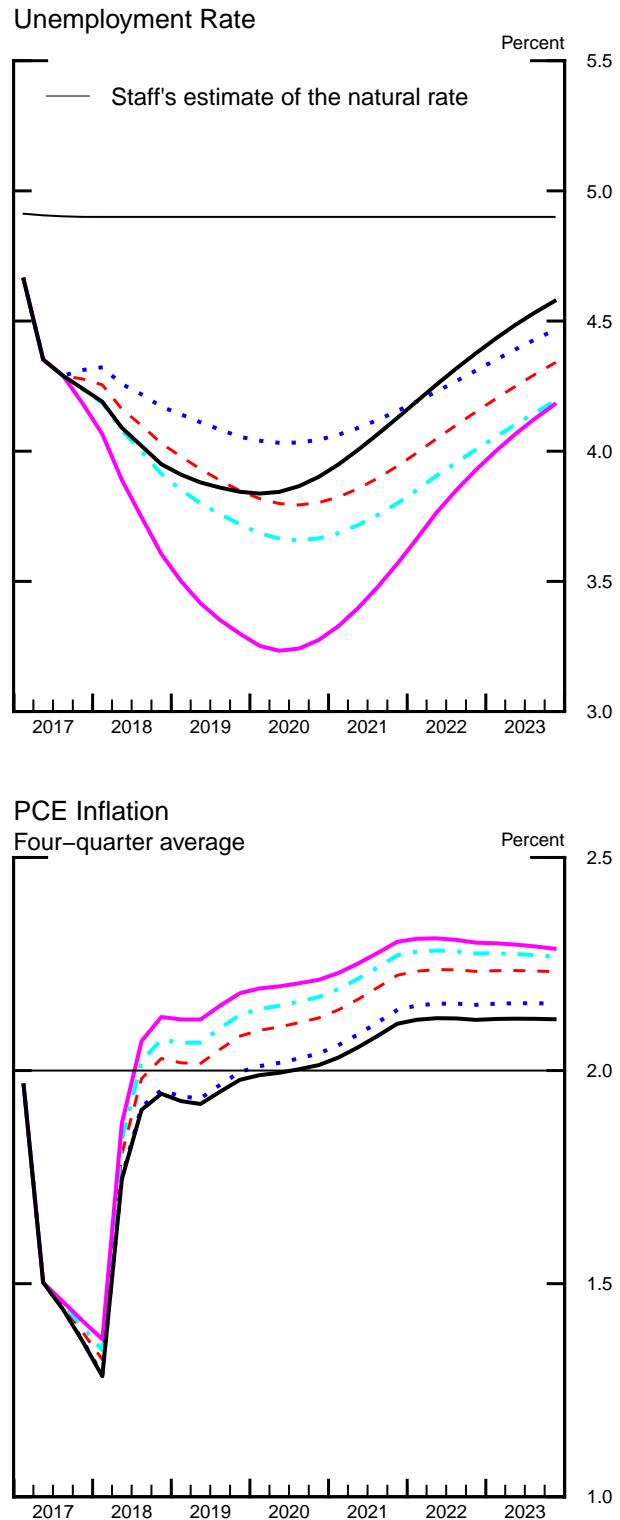
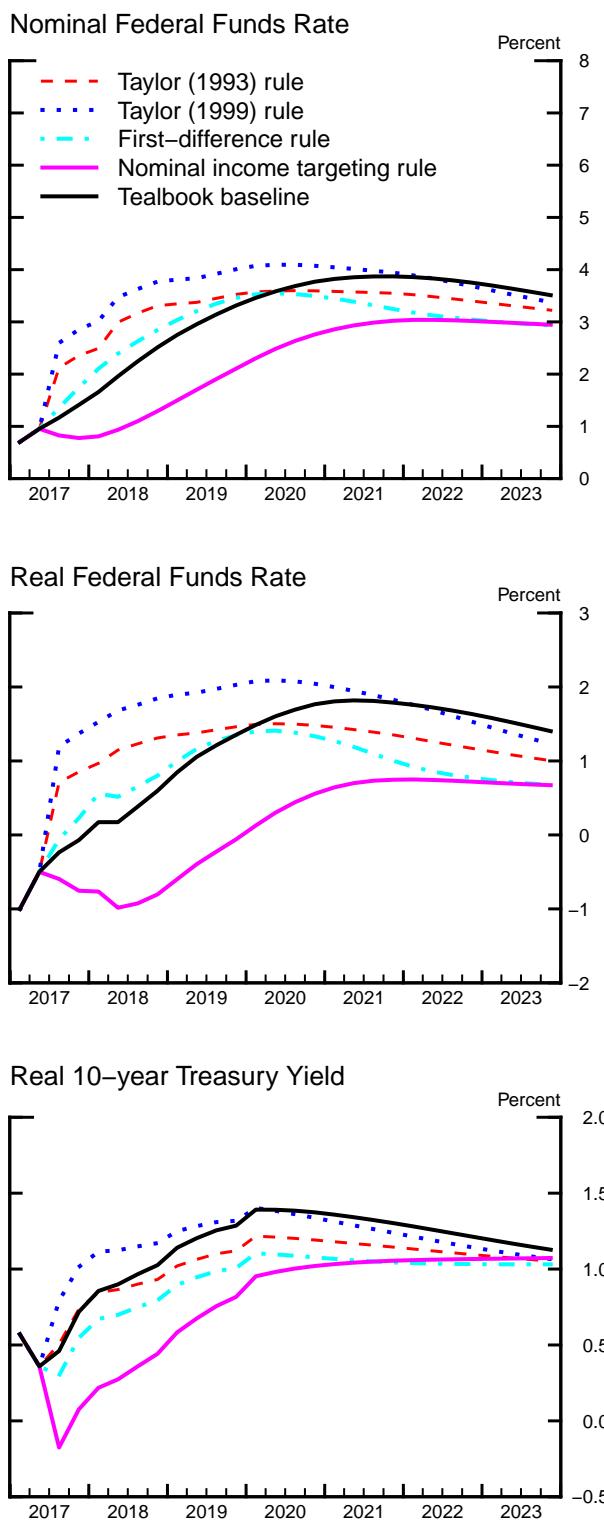
Tealbook-consistent FRB/US $r^*$	2.16	2.21	2.05
Average projected real federal funds rate	0.73	0.90	0.69

1. Where applicable, the intercepts of rules conditional on the current and previous Tealbook projections are 0.5 percent and 1 percent, respectively. 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

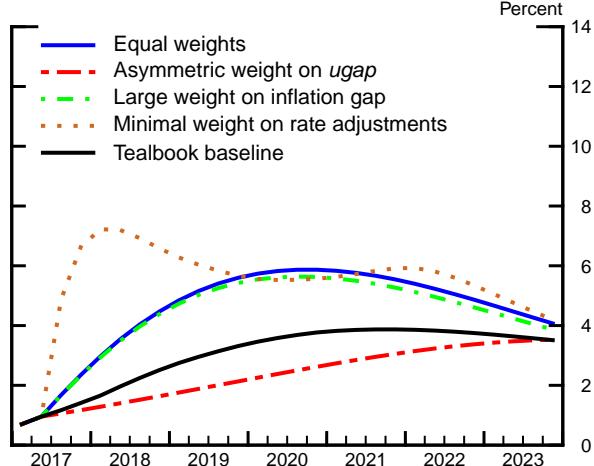
## Monetary Policy Strategies



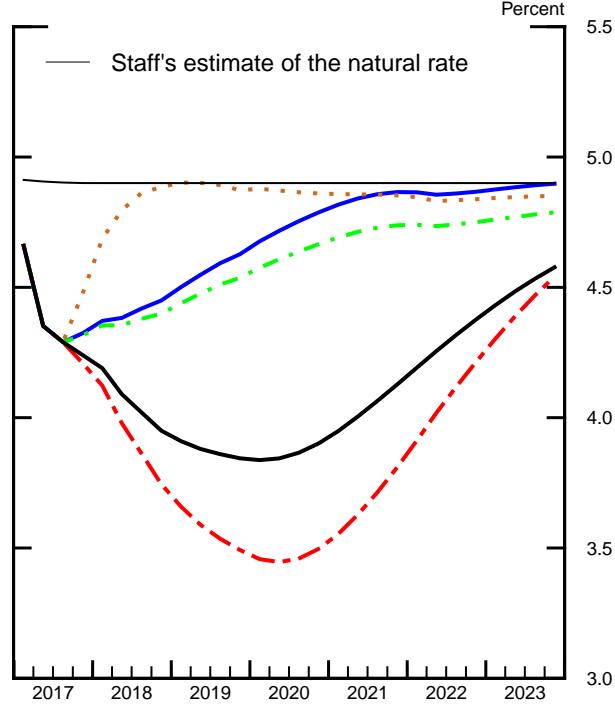
Note: The policy rule simulations in this exhibit are based on rules that respond to core inflation rather than to headline inflation. This choice of rule specification was made in light of a tendency for current and near-term core inflation rates to outperform headline inflation rates as predictors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

## Optimal Control Simulations under Commitment

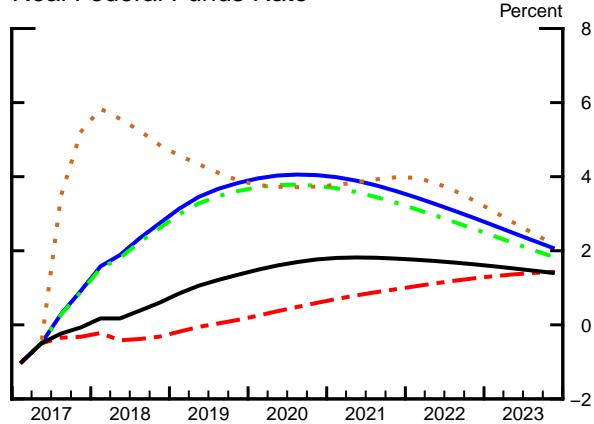
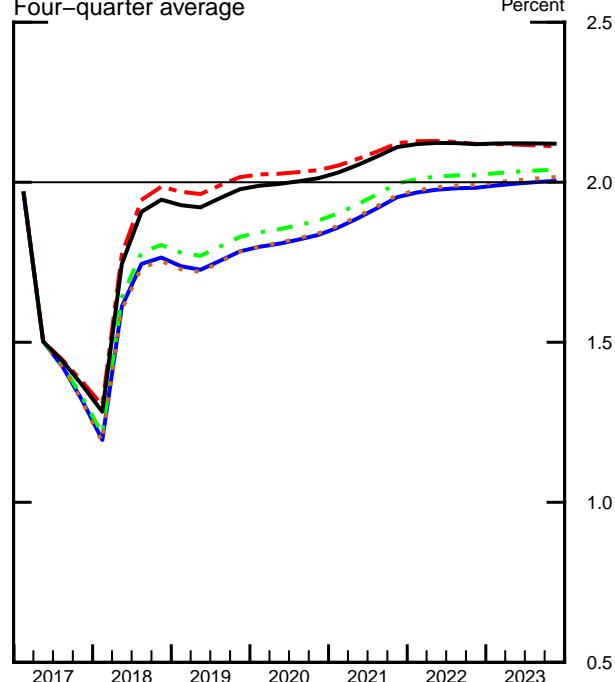
Nominal Federal Funds Rate



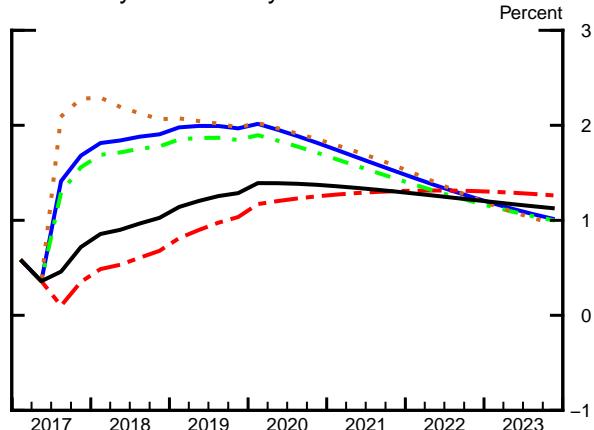
Unemployment Rate



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.

**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	2023
<i>Nominal federal funds rate<sup>1</sup></i>							
Taylor (1993)	2.4	3.3	3.5	3.6	3.5	3.4	3.2
Taylor (1999)	2.9	3.8	4.0	4.1	3.9	3.7	3.4
First-difference	1.7	2.8	3.5	3.5	3.2	3.0	2.9
Nominal income targeting	0.8	1.3	2.1	2.8	3.0	3.0	2.9
Extended Tealbook baseline	1.4	2.5	3.3	3.8	3.9	3.8	3.5
<i>Real GDP</i>							
Taylor (1993)	2.3	2.1	2.0	1.8	1.4	1.3	1.4
Taylor (1999)	2.2	1.9	1.9	1.7	1.4	1.4	1.4
First-difference	2.4	2.3	2.0	1.8	1.4	1.3	1.4
Nominal income targeting	2.5	2.8	2.3	1.7	1.2	1.1	1.4
Extended Tealbook baseline	2.3	2.2	1.9	1.6	1.2	1.2	1.3
<i>Unemployment rate<sup>1</sup></i>							
Taylor (1993)	4.3	4.0	3.8	3.8	3.9	4.2	4.3
Taylor (1999)	4.3	4.2	4.1	4.0	4.2	4.3	4.5
First-difference	4.2	3.9	3.7	3.7	3.8	4.0	4.2
Nominal income targeting	4.2	3.6	3.3	3.3	3.6	3.9	4.2
Extended Tealbook baseline	4.2	4.0	3.8	3.9	4.1	4.4	4.6
<i>Total PCE prices</i>							
Taylor (1993)	1.4	2.0	2.1	2.1	2.2	2.2	2.2
Taylor (1999)	1.4	2.0	2.0	2.0	2.1	2.2	2.2
First-difference	1.4	2.1	2.1	2.2	2.3	2.3	2.3
Nominal income targeting	1.4	2.1	2.2	2.2	2.3	2.3	2.3
Extended Tealbook baseline	1.4	1.9	2.0	2.0	2.1	2.1	2.1
<i>Core PCE prices</i>							
Taylor (1993)	1.5	2.0	2.1	2.1	2.2	2.2	2.2
Taylor (1999)	1.5	1.9	2.0	2.0	2.1	2.2	2.1
First-difference	1.5	2.0	2.1	2.2	2.2	2.3	2.3
Nominal income targeting	1.5	2.1	2.2	2.2	2.3	2.3	2.3
Extended Tealbook baseline	1.5	1.9	2.0	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	1.0	2.1	2.4	2.5	3.0	3.2	3.3
Taylor (1999)	0.7	1.0	2.6	2.9	3.0	3.5	3.6	3.8
First-difference	0.7	1.0	1.4	1.7	2.1	2.4	2.6	2.8
Nominal income targeting	0.7	1.0	0.8	0.8	0.8	0.9	1.1	1.3
Extended Tealbook baseline	0.7	1.0	1.2	1.4	1.7	2.0	2.2	2.5
<i>Real GDP</i>								
Taylor (1993)	2.1	2.4	2.2	2.3	2.6	2.5	2.3	2.1
Taylor (1999)	2.1	2.4	2.2	2.2	2.4	2.3	2.0	1.9
First-difference	2.1	2.4	2.2	2.4	2.7	2.6	2.5	2.3
Nominal income targeting	2.1	2.4	2.2	2.5	2.9	3.0	3.0	2.8
Extended Tealbook baseline	2.1	2.4	2.2	2.3	2.6	2.6	2.4	2.2
<i>Unemployment rate<sup>1</sup></i>								
Taylor (1993)	4.7	4.4	4.3	4.3	4.3	4.2	4.1	4.0
Taylor (1999)	4.7	4.4	4.3	4.3	4.3	4.3	4.2	4.2
First-difference	4.7	4.4	4.3	4.2	4.2	4.1	4.0	3.9
Nominal income targeting	4.7	4.4	4.3	4.2	4.1	3.9	3.7	3.6
Extended Tealbook baseline	4.7	4.4	4.3	4.2	4.2	4.1	4.0	4.0
<i>Total PCE prices</i>								
Taylor (1993)	2.0	1.5	1.4	1.4	1.3	1.8	2.0	2.0
Taylor (1999)	2.0	1.5	1.4	1.4	1.3	1.8	1.9	2.0
First-difference	2.0	1.5	1.5	1.4	1.3	1.8	2.0	2.1
Nominal income targeting	2.0	1.5	1.5	1.4	1.4	1.9	2.1	2.1
Extended Tealbook baseline	2.0	1.5	1.4	1.4	1.3	1.7	1.9	1.9
<i>Core PCE prices</i>								
Taylor (1993)	1.7	1.5	1.4	1.5	1.5	1.8	1.9	2.0
Taylor (1999)	1.7	1.5	1.4	1.5	1.5	1.8	1.9	1.9
First-difference	1.7	1.5	1.4	1.5	1.5	1.9	2.0	2.0
Nominal income targeting	1.7	1.5	1.4	1.5	1.6	1.9	2.0	2.1
Extended Tealbook baseline	1.7	1.5	1.4	1.5	1.5	1.8	1.9	1.9

1. Percent, average for the quarter.

**Outcomes of Optimal Control Simulations under Commitment**

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

Measure and policy	2017	2018	2019	2020	2021	2022	2023
<i>Nominal federal funds rate<sup>1</sup></i>							
Equal weights	2.3	4.5	5.6	5.9	5.5	4.9	4.1
Aymmetric weight on <i>ugap</i>	1.2	1.6	2.1	2.6	3.1	3.4	3.5
Large weight on inflation gap	2.3	4.4	5.4	5.6	5.3	4.6	3.9
Minimal weight on rate adjustments	6.6	6.6	5.7	5.6	5.9	5.3	4.2
Extended Tealbook baseline	1.4	2.5	3.3	3.8	3.9	3.8	3.5
<i>Real GDP</i>							
Equal weights	2.1	1.3	1.3	1.4	1.5	1.6	1.5
Aymmetric weight on <i>ugap</i>	2.4	2.6	2.1	1.6	1.1	1.0	1.2
Large weight on inflation gap	2.2	1.4	1.4	1.5	1.5	1.6	1.5
Minimal weight on rate adjustments	1.9	0.8	1.6	1.8	1.6	1.6	1.5
Extended Tealbook baseline	2.3	2.2	1.9	1.6	1.2	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	4.9
Aymmetric weight on <i>ugap</i>	4.2	3.7	3.5	3.5	3.8	4.2	4.5
Large weight on inflation gap	4.3	4.4	4.5	4.7	4.7	4.8	4.8
Minimal weight on rate adjustments	4.5	4.9	4.9	4.9	4.9	4.8	4.9
Extended Tealbook baseline	4.2	4.0	3.8	3.9	4.1	4.4	4.6
<i>Total PCE prices</i>							
Equal weights	1.3	1.8	1.8	1.8	2.0	2.0	2.0
Aymmetric weight on <i>ugap</i>	1.4	2.0	2.0	2.0	2.1	2.1	2.1
Large weight on inflation gap	1.3	1.8	1.8	1.9	2.0	2.0	2.0
Minimal weight on rate adjustments	1.3	1.8	1.8	1.8	2.0	2.0	2.0
Extended Tealbook baseline	1.4	1.9	2.0	2.0	2.1	2.1	2.1
<i>Core PCE prices</i>							
Equal weights	1.4	1.7	1.8	1.8	1.9	2.0	2.0
Aymmetric weight on <i>ugap</i>	1.5	2.0	2.0	2.0	2.1	2.1	2.1
Large weight on inflation gap	1.4	1.8	1.8	1.9	2.0	2.0	2.0
Minimal weight on rate adjustments	1.4	1.7	1.8	1.8	1.9	2.0	2.0
Extended Tealbook baseline	1.5	1.9	2.0	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	1.0	1.7	2.3	3.0	3.5	4.0	4.5
Asymmetric weight on <i>ugap</i>	0.7	1.0	1.1	1.2	1.3	1.4	1.5	1.6
Large weight on inflation gap	0.7	1.0	1.7	2.3	2.9	3.5	4.0	4.4
Minimal weight on rate adjustments	0.7	1.0	4.9	6.6	7.2	7.2	6.9	6.6
Extended Tealbook baseline	0.7	1.0	1.2	1.4	1.7	2.0	2.2	2.5
<i>Real GDP</i>								
Equal weights	2.1	2.4	2.2	2.1	2.2	1.9	1.5	1.3
Asymmetric weight on <i>ugap</i>	2.1	2.4	2.2	2.4	2.8	2.8	2.7	2.6
Large weight on inflation gap	2.1	2.4	2.2	2.2	2.3	2.0	1.6	1.4
Minimal weight on rate adjustments	2.1	2.4	2.2	1.9	1.8	1.3	0.8	0.8
Extended Tealbook baseline	2.1	2.4	2.2	2.3	2.6	2.6	2.4	2.2
<i>Unemployment rate<sup>1</sup></i>								
Equal weights	4.7	4.4	4.3	4.3	4.4	4.4	4.4	4.4
Asymmetric weight on <i>ugap</i>	4.7	4.4	4.3	4.2	4.1	4.0	3.9	3.7
Large weight on inflation gap	4.7	4.4	4.3	4.3	4.4	4.4	4.4	4.4
Minimal weight on rate adjustments	4.7	4.4	4.3	4.5	4.7	4.8	4.9	4.9
Extended Tealbook baseline	4.7	4.4	4.3	4.2	4.2	4.1	4.0	4.0
<i>Total PCE prices</i>								
Equal weights	2.0	1.5	1.4	1.3	1.2	1.6	1.7	1.8
Asymmetric weight on <i>ugap</i>	2.0	1.5	1.4	1.4	1.3	1.8	1.9	2.0
Large weight on inflation gap	2.0	1.5	1.4	1.3	1.2	1.6	1.8	1.8
Minimal weight on rate adjustments	2.0	1.5	1.4	1.3	1.2	1.6	1.7	1.8
Extended Tealbook baseline	2.0	1.5	1.4	1.4	1.3	1.7	1.9	1.9
<i>Core PCE prices</i>								
Equal weights	1.7	1.5	1.4	1.4	1.4	1.7	1.7	1.7
Asymmetric weight on <i>ugap</i>	1.7	1.5	1.4	1.5	1.5	1.8	1.9	2.0
Large weight on inflation gap	1.7	1.5	1.4	1.4	1.4	1.7	1.7	1.8
Minimal weight on rate adjustments	1.7	1.5	1.4	1.4	1.4	1.6	1.7	1.7
Extended Tealbook baseline	1.7	1.5	1.4	1.5	1.5	1.8	1.9	1.9

1. Percent, average for the quarter.

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

	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate <sup>1</sup>	
Interval	06/02/17	07/13/17	06/02/17	07/13/17	06/02/17	07/13/17	06/02/17	07/13/17	06/02/17	07/13/17
<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	3.5	3.4	1.2	1.4	2.4	2.4	2.1	2.0	4.7	4.7
Q2	3.4	3.0	2.6	2.5	0.4	0.2	1.1	0.8	4.3	4.4
Q3	4.4	4.2	2.7	2.7	1.6	1.2	1.8	1.5	4.3	4.3
Q4	5.0	4.4	3.1	2.7	1.7	1.7	1.6	1.6	4.2	4.2
2018:Q1	4.7	4.9	2.6	2.6	1.9	2.0	1.9	2.0	4.2	4.2
Q2	4.2	4.2	2.1	2.1	1.9	2.0	1.9	2.0	4.1	4.1
Q3	4.1	4.1	2.1	2.0	1.9	1.9	1.9	1.8	4.0	4.0
Q4	4.1	4.0	2.1	2.0	1.9	1.9	1.9	1.8	3.9	4.0
<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	3.4	3.2	1.9	1.9	1.4	1.3	1.6	1.4	-0.4	-0.3
Q4	4.7	4.3	2.9	2.7	1.7	1.5	1.7	1.6	-0.1	-0.2
2018:Q2	4.5	4.6	2.4	2.4	1.9	2.0	1.9	2.0	-0.1	-0.1
Q4	4.1	4.0	2.1	2.0	1.9	1.9	1.9	1.8	-0.2	-0.1
<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	4.0	3.7	2.4	2.3	1.6	1.4	1.6	1.5	-0.5	-0.5
2018:Q4	4.3	4.3	2.2	2.2	1.9	1.9	1.9	1.9	-0.3	-0.2
2019:Q4	4.0	4.0	1.8	1.9	2.0	2.0	2.0	2.0	-0.1	-0.2
<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	3.8	2.2	2.3	1.7	1.6	1.6	1.5	4.4	4.4
2018	4.4	4.3	2.5	2.4	1.7	1.7	1.8	1.8	4.0	4.1
2019	4.0	4.1	1.9	2.0	1.9	1.9	1.9	1.9	3.9	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	1.4	2.5	2.7	2.7	2.6	2.1	2.0	2.0	2.0	2.3	2.2	1.9	1.8
Final sales <i>Previous Tealbook</i>	2.6	3.0	1.1	2.6	2.3	2.5	2.9	2.3	2.1	2.1	2.0	2.0	2.6	2.2	1.9	1.9
Priv. dom. final purch. <i>Previous Tealbook</i>	3.2	2.4	3.4	2.9	2.8	2.7	3.2	3.0	2.7	2.5	2.4	2.5	2.5	2.7	2.7	2.3
Personal cons. expend. <i>Previous Tealbook</i>	4.3	3.0	3.5	1.1	3.1	2.7	2.9	2.9	2.7	2.5	2.4	3.1	2.4	2.6	2.6	2.4
Durables	9.8	11.6	11.4	-1.6	3.0	2.8	3.0	3.3	3.0	2.8	2.7	3.1	2.4	2.9	2.9	2.5
Nondurables	5.7	-5.5	3.3	1.6	6.7	4.8	5.1	5.1	4.7	4.1	3.7	7.9	3.7	4.4	4.4	1.8
Services	3.0	2.7	2.4	1.4	2.2	2.2	2.5	2.5	2.3	2.1	2.1	2.6	2.6	3.0	2.8	2.4
Residential investment <i>Previous Tealbook</i>	-7.7	-4.1	9.6	13.0	-6.4	-5.4	4.0	3.4	3.5	4.6	3.6	1.1	1.0	3.8	5.1	5.1
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	1.0	1.4	.9	10.4	4.1	5.2	4.5	3.7	3.0	2.3	2.0	-1	6.0	2.8	1.4	1.4
Equipment & intangibles <i>Previous Tealbook</i>	1.8	-1.3	1.7	7.2	4.6	4.2	5.0	4.9	2.6	2.1	2.2	-1	6.1	2.9	1.1	1.1
Nonres. structures <i>Previous Tealbook</i>	1.8	-1.3	1.7	7.0	2.6	4.5	5.9	6.0	2.9	2.7	2.9	-6	5.2	3.4	1.9	1.9
Net exports <sup>2</sup> <i>Previous Tealbook</i> <sup>2</sup>	-558	-522	-605	-596	-600	-607	-612	-628	-643	-652	-652	-563	-604	-644	-676	-676
Exports	1.8	10.0	-4.5	7.0	1.0	2.7	3.2	3.4	3.5	3.6	3.5	1.5	3.5	3.5	3.3	3.3
Imports	.2	2.2	9.0	4.0	1.5	3.1	3.1	5.0	4.9	4.1	2.7	2.6	2.9	4.2	4.1	4.1
Gov't. cons. & invest. <i>Previous Tealbook</i>	-1.7	.8	.2	-9	-1	1.8	1.7	.4	.4	.4	.4	.2	.6	.4	.6	.6
Federal	-1.7	.8	.2	-9	.3	1.8	1.7	.4	.5	.5	.5	.2	.7	.5	.6	.6
Defense	-4	2.4	-1.2	-2.0	.4	2.2	2.0	-2	-2	-2	-2	-2.0	.6	-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	.8	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	.3	.3	-2.0	-2.0	-2.0
Change in priv. inventories <sup>2</sup> <i>Previous Tealbook</i> <sup>2</sup>	-9	7	50	3	8	20	12	25	25	26	26	18	22	11	23	15
	-9	7	50	4	20	25	29	25	26	26	26	18	22	20	24	15

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	2.3	2.2	1.9
Final sales <i>Previous Tealbook</i>	2.0	1.5	1.7	2.0	2.7	2.0	2.0	2.6	2.2	1.8
Priv. dom. final purch. <i>Previous Tealbook</i>	3.5	2.6	2.3	2.6	3.8	2.7	2.5	2.5	2.3	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	2.6	2.4
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	3.7	4.4	1.8
Services	3.3	.4	.8	2.6	2.8	2.3	2.6	3.0	2.8	2.4
Residential investment <i>Previous Tealbook</i>	-5.2	6.0	15.7	6.8	6.2	13.1	1.1	1.0	3.8	5.1
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	8.1	9.0	5.2	4.8	5.0	.8	-1	6.0	2.8	1.4
Equipment & intangibles <i>Previous Tealbook</i>	12.0	9.2	5.5	4.5	4.1	3.8	-6	6.1	2.9	1.1
Nonres. structures <i>Previous Tealbook</i>	-4.0	8.0	4.1	5.8	8.0	-8.8	1.9	8.9	.8	-2
Net exports <sup>1</sup> <i>Previous Tealbook</i>	-459	-459	-447	-405	-426	-540	-563	-604	-644	-676
Exports	10.1	4.2	2.2	5.9	3.1	-2.2	1.5	3.5	3.5	3.3
Imports	12.0	3.5	.3	2.5	6.1	2.5	2.6	2.9	4.2	4.1
Gov't. cons. & invest. <i>Previous Tealbook</i>	-1.1	-3.0	-2.2	-2.8	.3	2.2	.2	.6	.4	.6
Federal	-1.1	-3.0	-2.2	-2.8	.3	2.2	.2	.7	.5	.6
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	11	23	15
	58	38	55	79	58	84	22	20	24	15

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

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

July 14, 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	1.9	.5	1.4	1.6	2.2	2.1	2.0	2.0	1.6	1.4	2.1	2.1	
<i>Previous Tealbook</i>	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	
PCE chain-wt. price index	2.0	1.5	2.0	2.4	.2	1.2	1.7	2.0	2.0	1.9	1.9	1.4	1.4	1.9	2.0	
<i>Previous Tealbook</i>	2.0	1.5	2.0	.4	1.6	1.7	1.9	1.9	1.9	1.9	1.9	1.4	1.6	1.9	2.0	
Energy	15.5	2.1	26.3	15.4	-16.0	-6.1	3.4	2.6	2.4	2.0	1.8	.8	-1.5	2.2	1.7	
<i>Previous Tealbook</i>	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	
Food	-1.8	-2.1	-1.2	.4	2.3	1.5	1.9	2.3	2.1	2.1	2.3	-1.7	1.5	2.2	2.3	
<i>Previous Tealbook</i>	-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	
Ex. food & energy	1.8	1.7	1.3	2.0	.8	1.5	1.6	2.0	2.0	1.8	1.8	1.7	1.5	1.9	2.0	
<i>Previous Tealbook</i>	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	
Ex. food & energy, market based	1.6	1.6	1.3	1.9	.3	1.3	1.6	1.9	1.9	1.8	1.8	1.5	1.3	1.8	1.9	
<i>Previous Tealbook</i>	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	
CPI	2.3	1.8	3.0	3.1	-.2	1.4	2.3	2.5	2.5	2.4	2.4	1.8	1.7	2.4	2.4	
<i>Previous Tealbook</i>	2.3	1.8	3.0	3.1	.1	2.0	2.4	2.4	2.3	2.4	2.4	1.8	1.9	2.3	2.4	
Ex. food & energy	2.1	2.1	2.0	2.5	.6	1.9	2.3	2.5	2.5	2.4	2.4	2.2	2.2	1.8	2.5	
<i>Previous Tealbook</i>	2.1	2.1	2.0	2.5	1.0	2.3	2.3	2.4	2.4	2.5	2.5	2.2	2.0	2.4	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	2.2	2.5	2.6	
<i>Previous Tealbook</i>	2.3	1.9	3.2	2.3	2.3	2.4	2.6	2.4	2.4	2.4	2.5	2.2	2.2	2.5	2.6	
Business sector																
Output per hour																
<i>Previous Tealbook</i>	-3	3.7	2.4	-.7	.6	2.3	1.8	1.2	.7	.7	.7	1.2	1.0	.9	.9	
Compensation per hour																
<i>Previous Tealbook</i>	5.7	4.3	-2.1	1.5	1.8	2.9	3.5	3.5	3.5	3.5	3.5	1.6	2.4	3.5	3.5	
Unit labor costs																
<i>Previous Tealbook</i>	6.0	.6	-4.4	2.2	1.2	.6	1.7	2.2	2.7	2.7	2.7	.4	1.4	2.6	2.6	
Core goods imports chain-wt. price index <sup>3</sup>	.5	2.0	-.4	.3	2.0	3.5	2.1	.8	.8	.7	.7	.0	2.0	.7	.7	
<i>Previous Tealbook</i>	.5	2.0	-.4	.6	2.2	2.3	.9	.4	.6	.6	.6	.0	1.5	.6	.6	

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

2. Private-industry workers.

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

## Greensheets

**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	1.4	2.1	2.1
PCE chain-wt. price index <i>Previous Tealbook</i>	1.3	2.7	1.8	1.2	1.2	.4	1.4	1.9	2.0	2.0
Energy <i>Previous Tealbook</i>	6.4	12.0	2.3	-2.5	-6.2	-15.8	.8	-1.5	2.2	1.7
Food <i>Previous Tealbook</i>	1.3	5.1	1.2	.7	2.7	.3	-1.7	1.5	2.2	2.3
Ex. food & energy <i>Previous Tealbook</i>	1.0	1.9	1.8	1.5	1.6	1.4	1.7	1.6	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	1.3	1.8	1.9
CPI <i>Previous Tealbook</i>	1.2	3.3	1.9	1.2	1.2	.4	1.8	1.7	2.4	2.4
Ex. food & energy <i>Previous Tealbook</i>	.6	2.2	1.9	1.7	1.7	2.0	2.2	1.8	2.5	2.5
ECL, hourly compensation <sup>1</sup> <i>Previous Tealbook</i>	2.1	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	2.4	3.5	3.5
Unit labor costs <i>Previous Tealbook</i>	-.4	.6	6.0	-2.0	2.8	2.6	.4	1.4	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	2.0	.7	.7
	2.3	4.3	.1	-1.5	.5	-3.3	.0	1.5	.6	.6

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	194	182	167	169	169	159	187	177	167	122	122	122
Unemployment rate <sup>3</sup>	4.9	4.9	4.7	4.7	4.4	4.3	4.2	4.2	4.1	4.0	4.0	4.7	4.2	4.0	3.8	3.8
<i>Previous Tealbook<sup>3</sup></i>	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
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	60.0	60.0	59.7	59.7	60.0	60.0	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	5	.5	.7	1.0	1.3	1.5	1.7	1.8	1.9	.5	1.3	1.9	2.0
<i>Previous Tealbook<sup>4</sup></i>	-1	.3	.5	.4	.4	.7	1.0	1.3	1.6	1.7	1.8	1.9	.5	1.3	1.9	2.0
Industrial production <sup>5</sup>	-.7	.8	.7	1.5	5.5	2.8	1.9	1.5	.9	.6	1.4	-.1	2.9	1.1	1.0	1.0
<i>Previous Tealbook<sup>5</sup></i>	-.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
Manufacturing industr. prod. <sup>5</sup>	-1.1	-.1	1.6	2.2	1.8	.6	1.5	.8	1.0	1.0	.9	.3	1.5	.9	1.0	1.0
<i>Previous Tealbook<sup>5</sup></i>	-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
Capacity utilization rate - mfg. <sup>3</sup>	75.1	74.9	75.1	75.4	75.6	75.6	75.8	75.9	76.0	76.0	76.1	75.1	75.8	76.1	76.7	76.7
<i>Previous Tealbook<sup>3</sup></i>	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
Housing starts <sup>6</sup>	1.2	1.2	1.2	1.2	1.1	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	16.6	16.7	16.8	16.8	16.8	16.7	16.7	17.5	16.8	16.7	16.6	16.6
<i>Income and saving</i>																
Nominal GDP <sup>5</sup>	3.7	5.0	4.2	3.4	3.0	4.2	4.4	4.9	4.2	4.1	4.0	3.5	3.7	4.3	4.0	4.0
Real disposable pers. income <sup>5</sup>	2.9	2.9	-.3	1.7	4.2	1.4	1.6	4.4	2.2	2.4	2.6	1.9	2.2	2.9	2.2	2.2
<i>Previous Tealbook<sup>5</sup></i>	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
Personal saving rate <sup>3</sup>	5.9	5.9	4.9	5.1	5.3	5.0	4.7	5.1	5.0	5.0	5.0	4.9	4.7	5.0	5.0	5.0
<i>Previous Tealbook<sup>3</sup></i>	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
Corporate profits <sup>7</sup>	-2.4	25.4	2.1	-8.7	6.1	1.9	4.7	9.3	2.5	1.7	.6	9.3	.8	3.5	3.1	3.1
Profit share of GNP <sup>3</sup>	10.8	11.3	11.2	10.9	11.0	10.9	11.0	11.1	11.0	11.0	10.9	11.2	11.0	10.9	10.9	10.9
Gross national saving rate <sup>3</sup>	18.2	18.6	17.7	17.7	17.7	17.7	17.4	17.4	17.3	17.3	17.7	17.4	17.3	17.3	16.9	16.9
Net national saving rate <sup>3</sup>	3.1	3.7	2.8	2.7	2.8	2.8	2.5	2.5	2.5	2.4	2.3	2.8	2.5	2.3	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	177	167	122
Unemployment rate <sup>2</sup>	9.5	8.7	7.8	7.0	5.7	5.0	4.7	4.2	4.0	3.8
<i>Previous Tealbook</i> <sup>2</sup>	9.5	8.7	7.8	7.0	5.7	5.0	4.7	4.2	3.9	3.8
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	60.0	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	1.3	2.0
Industrial production <sup>4</sup>	6.0	2.8	2.3	2.2	3.4	-2.7	-1	2.9	1.1	1.0
<i>Previous Tealbook</i> <sup>4</sup>	6.0	2.8	2.3	2.2	3.4	-2.7	-1	2.9	1.2	1.0
Manufacturing industr. prod. <sup>4</sup>	5.9	2.5	1.7	.9	1.5	-6	.3	1.5	.9	.9
<i>Previous Tealbook</i> <sup>4</sup>	5.9	2.5	1.7	.9	1.5	-6	.3	1.6	1.0	.8
Capacity utilization rate - mfg. <sup>2</sup>	72.3	74.4	74.6	74.7	75.9	75.4	75.1	75.8	76.1	76.7
<i>Previous Tealbook</i> <sup>2</sup>	72.3	74.4	74.6	74.7	75.9	75.4	75.1	75.8	76.2	76.5
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	16.8	16.7	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	3.7	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	2.2	2.9	2.2
<i>Previous Tealbook</i> <sup>4</sup>	2.6	1.7	5.1	-2.8	4.5	3.0	1.9	2.4	3.8	2.3
Personal saving rate <sup>2</sup>	5.5	5.8	9.2	4.7	5.6	6.0	4.9	4.7	5.0	5.0
<i>Previous Tealbook</i> <sup>2</sup>	5.5	5.8	9.2	4.7	5.6	6.0	4.9	5.0	5.8	5.6
Corporate profits <sup>6</sup>	18.0	6.8	.6	4.7	6.6	-11.2	9.3	.8	3.5	3.1
Profit share of GNP <sup>2</sup>	12.0	12.3	12.0	12.0	12.4	10.7	11.2	11.0	10.9	10.9
Gross national saving rate <sup>2</sup>	15.2	16.1	18.0	18.2	19.2	18.8	17.7	17.4	17.3	16.9
Net national saving rate <sup>2</sup>	-.3	.8	2.9	3.1	4.3	3.9	2.8	2.5	2.3	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

July 14, 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	3,305	3,396	3,585	711	993	798	741	732	1,029	803	773	673	1,108	843	810
Outlays	3,853	3,997	4,090	4,395	956	932	984	951	1,049	1,031	966	1,001	1,111	1,021	958	1,110
Surplus/deficit	-585	-692	-694	-810	-245	61	-186	-210	-317	-2	-162	-228	-438	-87	-115	-300
<i>Previous Tealbook</i>	-585	-579	-750	-875	-245	61	-186	-210	-317	92	-145	-213	-445	62	-154	-319
Means of financing:																
Borrowing	1,052	226	1,137	938	251	8	241	259	-68	-2	37	520	503	-39	154	334
Cash decrease	-155	262	-100	-8	20	-50	10	-46	307	-89	90	-39	-35	-17	-9	-4
Other <sup>1</sup>	-313	204	-344	-120	-25	-18	-65	-4	78	94	35	-254	-30	-30	-30	-30
Cash operating balance, end of period	353	91	191	199	314	364	353	399	92	181	91	130	165	183	191	196
<b>NIPA federal sector</b>																
Receipts	3,495	3,548	3,626	3,781	3,442	3,485	3,537	3,528	3,612	3,517	3,534	3,574	3,598	3,646	3,684	3,725
Expenditures	4,124	4,270	4,493	4,786	4,111	4,137	4,189	4,215	4,272	4,297	4,296	4,372	4,479	4,528	4,593	4,656
Consumption expenditures	974	990	1,006	1,017	969	975	985	984	986	991	997	1,002	1,007	1,008	1,009	1,010
Defense	589	586	600	612	587	586	591	586	586	590	594	600	602	604	606	606
Nondefense	386	403	407	405	382	389	394	397	403	406	407	408	407	406	405	404
Other spending	3,150	3,281	3,487	3,769	3,142	3,163	3,204	3,232	3,286	3,306	3,299	3,369	3,472	3,520	3,584	3,646
Current account surplus	-629	-723	-868	-1,005	-668	-652	-652	-688	-660	-780	-762	-798	-881	-882	-910	-931
Current account deficit	266	274	286	295	265	265	267	269	274	278	282	284	287	289	289	292
Gross investment	-623	-723	-879	-1,024	-662	-646	-647	-685	-661	-781	-767	-806	-891	-894	-924	-947
<b>Fiscal indicators</b>																
High-employment (HEB) surplus/deficit <sup>3</sup>	-636.6	-775.5	-993.1	-1,178.1	-670.2	-657.3	-671.4	-722.1	-698.6	-838.4	-842.9	-899.6	-997.5	-1,016.3	-1,058.9	-1,095.1
Change in HEB, percent of potential GDP	.4	.6	1.0	.7	.7	-1	.0	.2	-2	.7	.0	.3	.5	.0	.2	.1
Fiscal impetus (FI), percent of GDP <sup>4</sup>	.2	.1	.3	.2	.5	-1	.3	.2	-2	.0	.4	.3	.4	.2	.2	.2
<i>Previous Tealbook</i>	.2	.2	.4	.3	.5	-1	.3	.2	-1	.2	.4	.4	.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	.0	.1	.1	.1	.4	-.3	.0	.1	.0	.2	.2	.1	.1	.1	.1	.1
Taxes and transfers	.2	.0	.2	.1	.2	.2	.2	.0	.1	.0	.0	.0	.4	.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	2.9	3.2	2.8	2.7	2.7	2.6	2.6	2.6	2.6
<i>Previous Tealbook</i>	2.4	1.3	3.2	2.8	3.2	2.7	2.7	2.6	2.6	2.6	2.6	2.6
Advanced foreign economies	2.3	.3	2.6	2.4	2.6	2.4	2.1	1.9	1.8	1.7	1.7	1.7
Canada	2.8	-1.4	4.2	2.7	3.7	2.7	2.1	2.0	1.7	1.7	1.7	1.7
Japan	2.5	1.6	1.0	1.4	1.0	1.0	1.5	1.3	1.2	1.1	.9	.8
United Kingdom	.6	2.4	2.0	2.7	.9	1.2	1.7	1.7	1.7	1.7	1.7	1.7
Euro area	2.1	1.4	1.8	2.1	2.3	2.7	2.4	2.1	2.0	1.8	1.8	1.8
Germany	2.9	1.9	.7	1.7	2.4	2.7	2.3	2.1	1.7	1.6	1.5	1.5
Emerging market economies	2.4	2.2	3.7	3.3	3.7	3.1	3.2	3.3	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	6.7	6.4	6.2	5.9	5.9	5.8	5.8
Latin America	.6	-.5	3.0	2.0	2.4	1.4	1.9	2.2	2.5	2.5	2.6	2.6
Mexico	1.8	.2	4.4	2.9	2.7	1.5	1.9	2.3	2.6	2.6	2.6	2.6
Brazil	-4.0	-1.3	-2.3	-2.2	4.3	-5	1.4	1.9	2.0	2.0	2.0	2.0
<i>Consumer prices<sup>2</sup></i>												
Total foreign	1.4	2.0	1.7	2.6	3.0	2.6	2.2	2.2	2.3	2.3	2.4	2.4
<i>Previous Tealbook</i>	1.4	2.1	1.7	2.6	3.0	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Advanced foreign economies	-.4	1.1	.9	1.8	2.3	.6	1.1	1.3	1.3	1.4	1.5	1.6
Canada	.5	2.2	1.0	1.7	2.6	1.0	1.5	1.4	1.5	1.6	1.8	1.8
Japan	-.3	-.4	-.5	2.4	-.1	.1	.5	.7	.8	.9	1.0	1.0
United Kingdom	.0	.8	2.1	2.0	3.8	3.3	2.4	2.4	2.4	2.3	2.3	2.3
Euro area	-1.2	1.0	1.3	1.9	2.9	-.1	.9	1.2	1.3	1.4	1.4	1.6
Germany	-1.3	1.1	1.4	3.0	2.1	.4	1.3	1.5	1.7	1.8	1.9	2.0
Emerging market economies	2.6	2.7	2.2	3.1	3.4	3.3	3.0	3.1	3.1	3.0	3.0	3.0
Asia	2.0	2.3	1.2	2.6	.9	1.8	2.3	2.7	2.7	2.7	2.7	2.7
Korea	.5	1.0	.4	4.0	2.9	.4	1.7	2.6	3.0	3.0	3.0	3.0
China	2.5	2.3	1.3	2.6	-.6	2.3	2.4	2.5	2.5	2.5	2.5	2.5
Latin America	4.3	3.9	4.5	4.5	9.8	7.1	4.7	4.1	3.9	3.8	3.7	3.7
Mexico	2.8	2.4	3.6	4.1	9.9	6.9	4.2	3.4	3.2	3.2	3.2	3.2
Brazil	11.8	7.5	6.5	2.6	3.2	2.3	3.1	4.4	4.4	4.3	4.3	4.3

<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

July 14, 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	2.8	2.6	2.6	2.6
Advanced foreign economies	1.8	3	2.4	1.8	1.1	1.9	2.3	1.7	1.6	1.6
Canada	3.1	.7	3.6	2.2	.4	2.0	2.6	1.7	1.8	1.8
Japan	.2	3	2.7	-.3	1.0	1.6	1.5	1.0	.1	.1
United Kingdom	1.3	1.3	2.4	3.5	1.7	1.9	1.4	1.7	1.7	1.7
Euro area	.4	-1.1	.8	1.4	1.9	1.8	2.4	1.9	1.8	1.8
Germany	2.4	.2	1.6	1.6	1.3	1.8	2.4	1.6	1.4	1.4
Emerging market economies	4.7	4.4	3.4	3.3	2.8	2.9	3.3	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	6.7	5.8	5.7	5.7
Latin America	4.1	3.4	1.6	1.9	1.3	1.2	2.0	2.5	2.7	2.7
Mexico	4.2	3.4	1.0	2.7	2.5	2.3	2.1	2.6	2.7	2.7
Brazil		2.7	2.5	-2	-5.7	-2.4	1.8	2.0	2.2	2.2
<i>Consumer prices<sup>2</sup></i>										
Total foreign	3.4	2.3	2.4	2.0	1.4	1.9	2.4	2.4	2.5	2.5
<i>Previous Tealbook</i>	3.4	2.3	2.4	2.0	1.4	1.9	2.5	2.4	2.6	2.6
Advanced foreign economies	2.2	1.3	1.0	1.2	.5	.9	1.3	1.5	1.9	1.9
Canada	2.7	1.0	1.0	2.0	1.3	1.4	1.6	1.7	1.9	1.9
Japan	-.3	-2	1.4	2.6	.2	.3	.3	.9	2.5	2.5
United Kingdom	4.6	2.6	2.1	.9	.1	1.2	3.0	2.3	2.2	2.2
Euro area	2.9	2.3	.8	.2	.2	.7	1.2	1.4	1.7	1.7
Germany	2.6	1.9	1.4	.4	.2	1.0	1.3	1.8	2.1	2.1
Emerging market economies	4.3	3.1	3.4	2.7	2.1	2.7	3.2	3.0	3.0	3.0
Asia	4.4	2.6	3.1	1.8	1.5	2.0	1.9	2.7	2.7	2.7
Korea	3.9	1.7	1.1	1.0	.9	1.5	1.9	3.0	3.0	3.0
China	4.6	2.1	2.9	1.5	1.5	2.2	1.7	2.5	2.5	2.5
Latin America	4.1	4.4	4.1	4.8	3.4	4.3	6.4	3.8	3.5	3.5
Mexico	3.5	4.1	3.6	4.2	2.3	3.2	6.1	3.2	3.2	3.2
Brazil	6.7	5.6	5.8	6.5	10.4	7.1	3.2	4.3	4.3	4.3

<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**

	2016				2017				Projected 2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<i>Billions of dollars, s.a.a.r.</i>												
<b>U.S. current account balance</b>	<b>-476.8</b>	<b>-432.8</b>	<b>-441.1</b>	<b>-456.0</b>	<b>-467.1</b>	<b>-478.1</b>	<b>-505.8</b>	<b>-535.9</b>	<b>-579.3</b>	<b>-580.2</b>	<b>-604.3</b>	<b>-624.3</b>
<i>Previous Tealbook</i>	-531.8	-470.9	-482.7	-456.4	-475.2	-509.6	-542.4	-579.5	-640.4	-647.4	-675.8	-702.0
Current account as percent of GDP	-2.6	-2.3	-2.4	-2.4	-2.5	-2.5	-2.6	-2.7	-2.9	-2.9	-3.0	-3.1
<i>Previous Tealbook</i>	-2.9	-2.6	-2.6	-2.4	-2.5	-2.7	-2.8	-3.0	-3.2	-3.2	-3.3	-3.4
Net goods & services	-504.3	-495.1	-483.6	-536.2	-555.9	-556.3	-566.3	-583.3	-610.6	-606.7	-610.8	-616.5
Investment income, net	165.3	184.5	178.2	219.3	204.2	211.1	199.5	182.4	175.2	159.5	145.5	127.2
Direct, net	233.6	250.0	250.9	300.8	288.2	293.3	294.7	294.4	305.7	309.8	316.1	317.9
Portfolio, net	-68.3	-65.5	-72.8	-81.6	-84.0	-82.2	-95.2	-112.0	-130.5	-150.3	-170.6	-190.7
Other income and transfers, net	-137.8	-122.2	-135.7	-139.1	-115.4	-132.9	-139.0	-135.0	-143.9	-132.9	-139.0	-135.0
<i>Annual Data</i>												
<b>U.S. current account balance</b>	<b>-444.6</b>	<b>-426.2</b>	<b>-349.5</b>	<b>-373.0</b>	<b>-434.6</b>	<b>-451.7</b>	<b>-496.8</b>	<b>-597.0</b>	<b>-604.9</b>	<b>-666.4</b>	<b>-666.4</b>	<b>-694.9</b>
<i>Previous Tealbook</i>	-460.4	-446.5	-366.4	-391.4	-463.1	-485.4	-526.7	-526.7	-526.7	-526.7	-526.7	-589.2
Current account as percent of GDP	-2.9	-2.6	-2.1	-2.1	-2.4	-2.4	-2.6	-2.6	-2.6	-3.0	-3.0	-3.3
<i>Previous Tealbook</i>	-3.0	-2.8	-2.2	-2.2	-2.6	-2.6	-2.6	-2.6	-2.6	-3.3	-3.3	-3.8
Net goods & services	-548.6	-536.8	-461.9	-489.5	-500.4	-504.8	-565.5	-565.5	-565.5	-611.1	-611.1	-642.1
Investment income, net	219.2	216.1	215.4	221.3	192.7	186.8	199.3	199.3	199.3	151.8	151.8	85.0
Direct, net	288.7	285.5	283.3	276.7	266.5	258.8	292.6	292.6	292.6	312.4	312.4	323.5
Portfolio, net	-69.5	-69.4	-67.9	-55.4	-73.8	-72.0	-93.3	-93.3	-93.3	-160.5	-160.5	-238.6
Other income and transfers, net	-115.1	-105.5	-103.1	-104.8	-126.9	-133.7	-130.6	-130.6	-130.6	-137.7	-137.7	-137.7

## Abbreviations

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ABS	asset-backed securities
AFE	advanced foreign economy
AHE	average hourly earnings
BEA	Bureau of Economic Analysis
BOC	Bank of Canada
BOE	Bank of England
BOJ	Bank of Japan
BOM	Bank of Mexico
CCAR	Comprehensive Capital Analysis and Review
CDS	credit default swaps
C&I	commercial and industrial
CMBS	commercial mortgage-backed securities
CPI	consumer price index
CRE	commercial real estate
DFAST	Dodd-Frank Act Stress Test
ECB	European Central Bank
ECI	employment cost index
ELB	effective lower bound
EME	emerging market economy
FHA	Federal Housing Administration
FOMC	Federal Open Market Committee; also, the Committee
GDP	gross domestic product
GSE	government-sponsored enterprise
MBS	mortgage-backed securities
Michigan survey	University of Michigan Surveys of Consumers

MMF	money market fund
NI	nominal income
NIPA	national income and product accounts
ON RRP	overnight reverse repurchase agreement
PCE	personal consumption expenditures
PDFP	private domestic final purchases
PMI	purchasing managers index
PPI	producer price index
repo	repurchase agreement
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SOMA	System Open Market Account
S&P	Standard & Poor's
TIPS	Treasury Inflation-Protected Securities

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

July 20, 2017

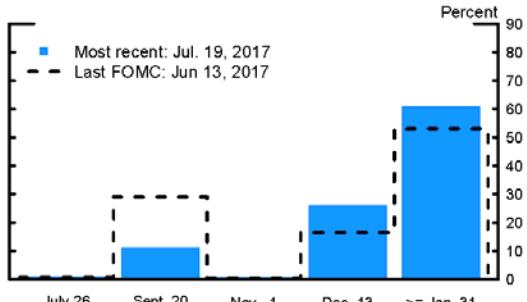
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Prepared for the Federal Open Market Committee  
by the staff of the Board of Governors of the Federal Reserve System

considerably higher than the 10 percent probability implied by market quotes. The median respondent's modal expectation is for three more 25-basis-point rate hikes by the end of 2018, unchanged from the June surveys (not shown).

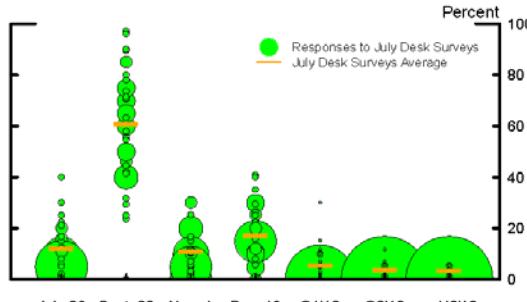
Figure 1: Market-Implied Probability Distribution of the Timing of Next Rate Increase



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 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. The dashed line shows the probability distribution of the next rate hike after the June meeting.

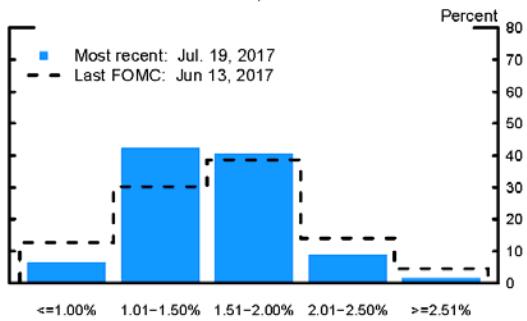
Source: CME Group; Federal Reserve Board staff estimates.

Figure 2: 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.

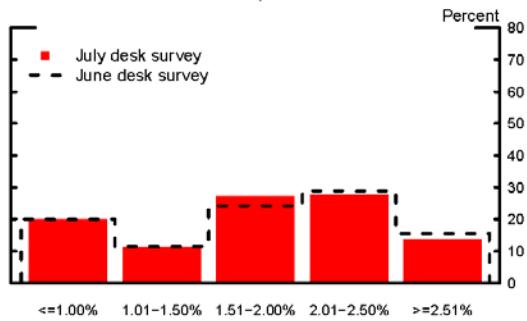
Figure 3: Market-Implied Probability Distribution of the Federal Funds Rate, Year-End 2018



Note: Estimated from Eurodollar futures options, accounting for the differences in the levels and option-implied volatilities of LIBOR and the federal funds rate, but not adjusted for risk premiums.

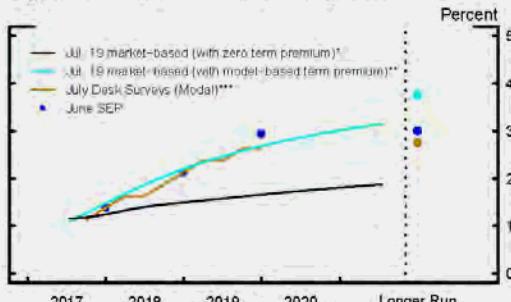
Source: CME Group; Federal Reserve Board staff estimates.

Figure 4: Desk Survey Probability Distribution of the Federal Funds Rate, Year-End 2018



Note: Average unconditional probabilities across primary dealers and market participants for different ranges of the federal funds rate at the end of 2018.  
Source: FRBNY.

Figure 5: Federal Funds Rate Projections

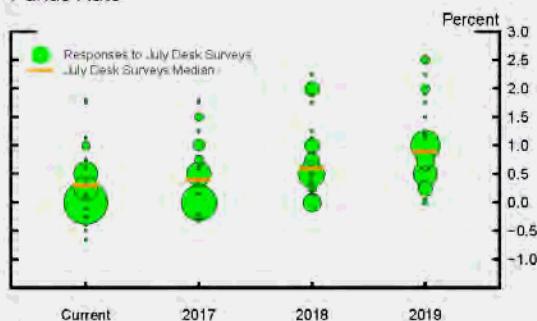


\*Estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points.

\*\*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.

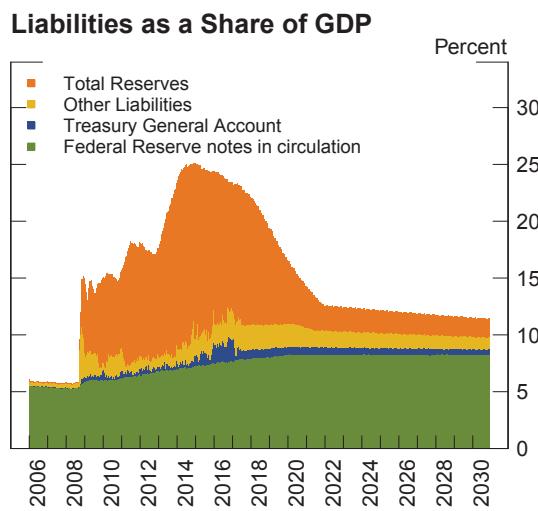
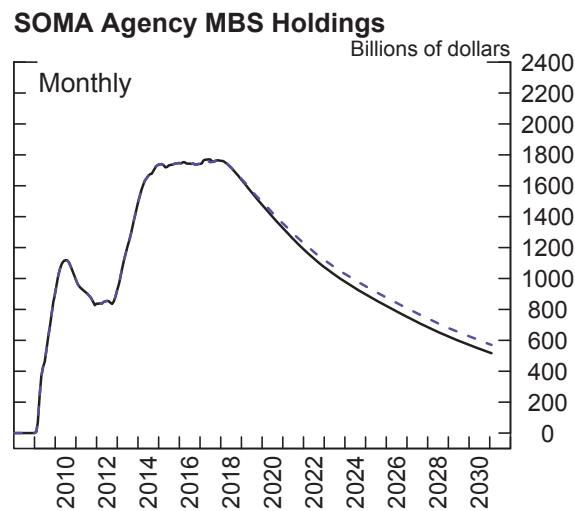
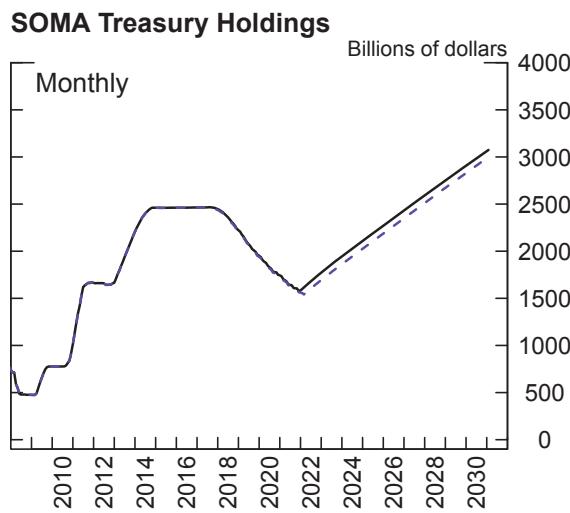
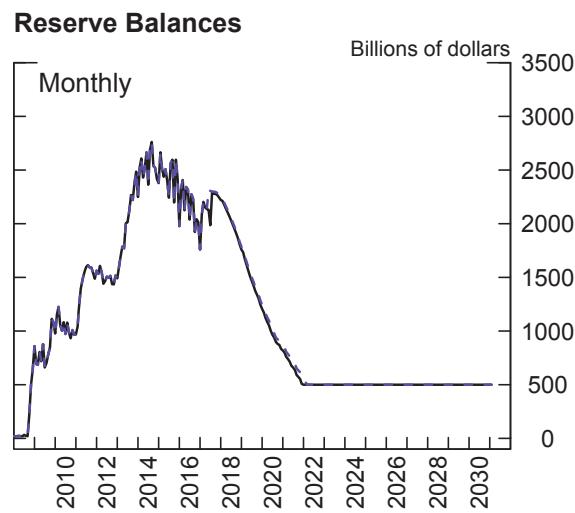
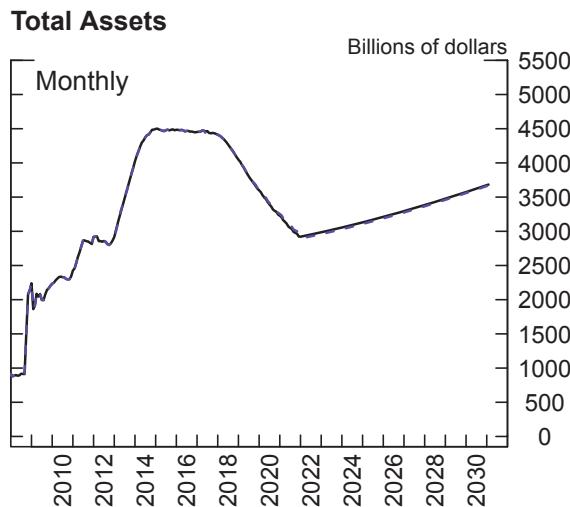
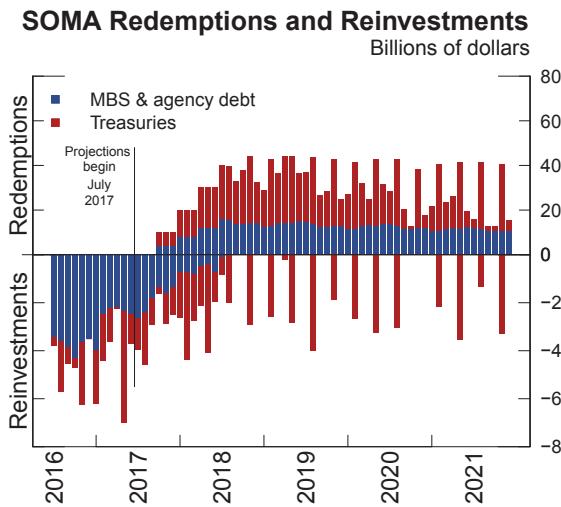
Figure 6: Estimate of the Neutral Real Federal Funds Rate



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

— July Tealbook baseline    - - June Tealbook baseline



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

	Jun 30, 2017	2017	2019	2021	2023	2025	2030
Total assets	4,466	4,413	3,599	2,921	3,055	3,210	3,674
<b>Selected assets</b>							
Loans and other credit extensions*	5	0	0	0	0	0	0
Securities held outright	4,243	4,214	3,430	2,776	2,927	3,095	3,584
U.S. Treasury securities	2,465	2,449	1,952	1,584	1,945	2,270	3,061
Agency debt securities	8	4	2	2	2	2	2
Agency mortgage-backed securities	1,770	1,761	1,476	1,189	979	823	521
Unamortized premiums	166	159	125	99	81	67	40
Unamortized discounts	-15	-14	-11	-9	-7	-6	-4
Total other assets	45	47	47	47	47	47	47
 Total liabilities	 4,425	 4,372	 3,555	 2,873	 3,003	 3,153	 3,603
<b>Selected liabilities</b>							
Federal Reserve notes in circulation	1,515	1,565	1,763	1,888	2,018	2,168	2,618
Reverse repurchase agreements	650	350	350	250	250	250	250
Deposits with Federal Reserve Banks	2,326	2,452	1,436	730	730	730	730
Reserve balances held by depository institutions	1,986	2,221	1,206	500	500	500	500
U.S. Treasury, General Account	181	150	150	150	150	150	150
Other deposits	159	80	80	80	80	80	80
Earnings remittances due to the U.S. Treasury	2	0	0	0	0	0	0
 Total Federal Reserve Bank 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.

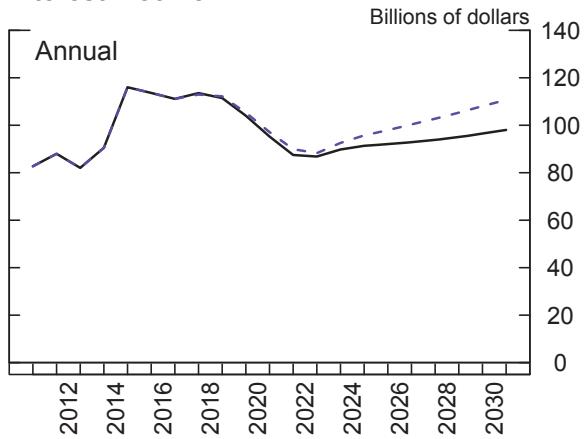
\*Loans and other credit extensions includes primary, secondary, and seasonal credit; central bank liquidity swaps; and net portfolio holdings of Maiden Lane LLC.

\*\*Total capital includes capital paid-in and capital surplus accounts.

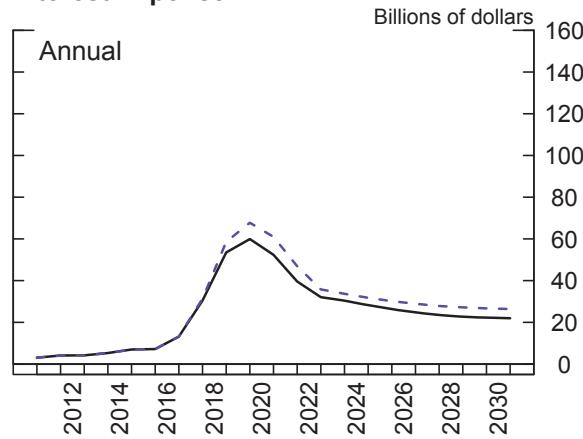
## Income Projections

— July Tealbook baseline    - - June Tealbook baseline

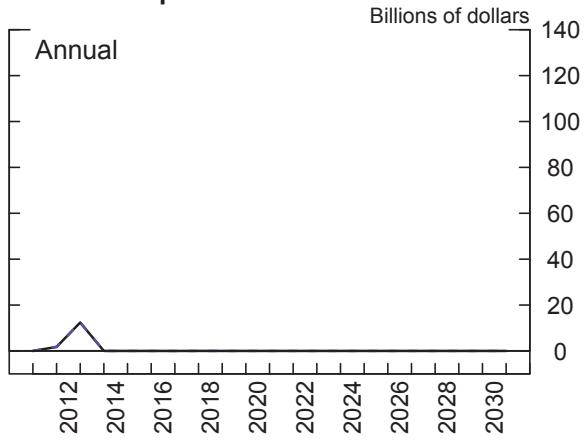
### Interest Income



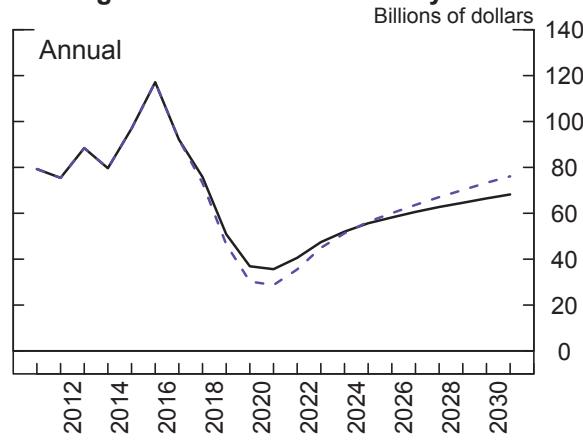
### Interest Expense



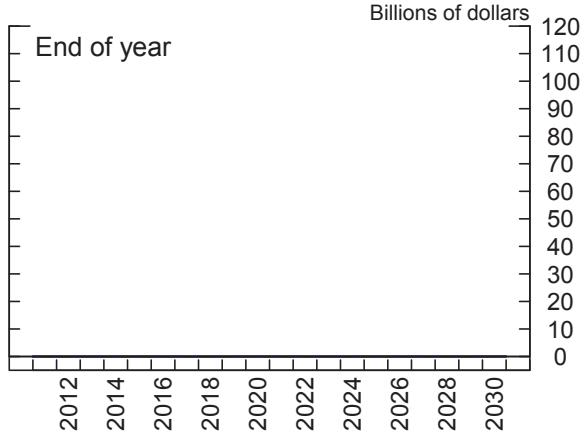
### Realized Capital Gains



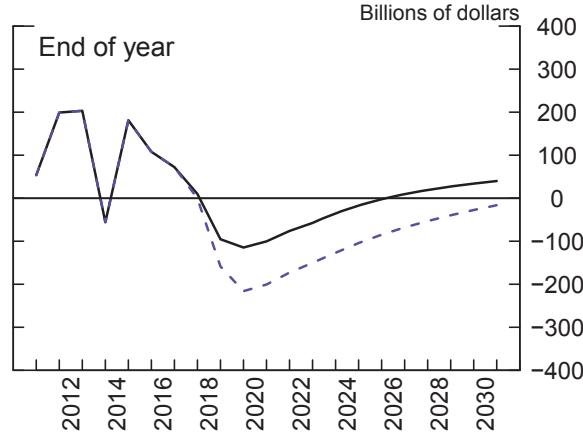
### Earnings Remittances to Treasury



### Deferred Asset



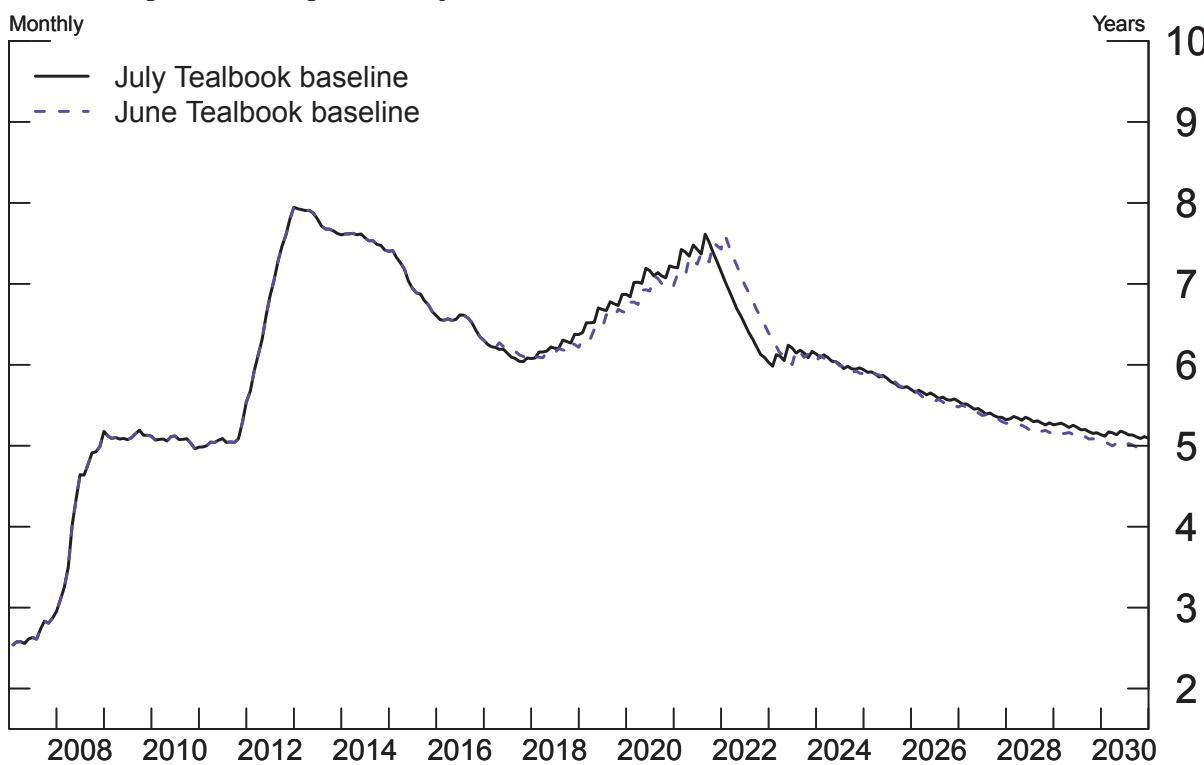
### Memo: Unrealized Gains/Losses



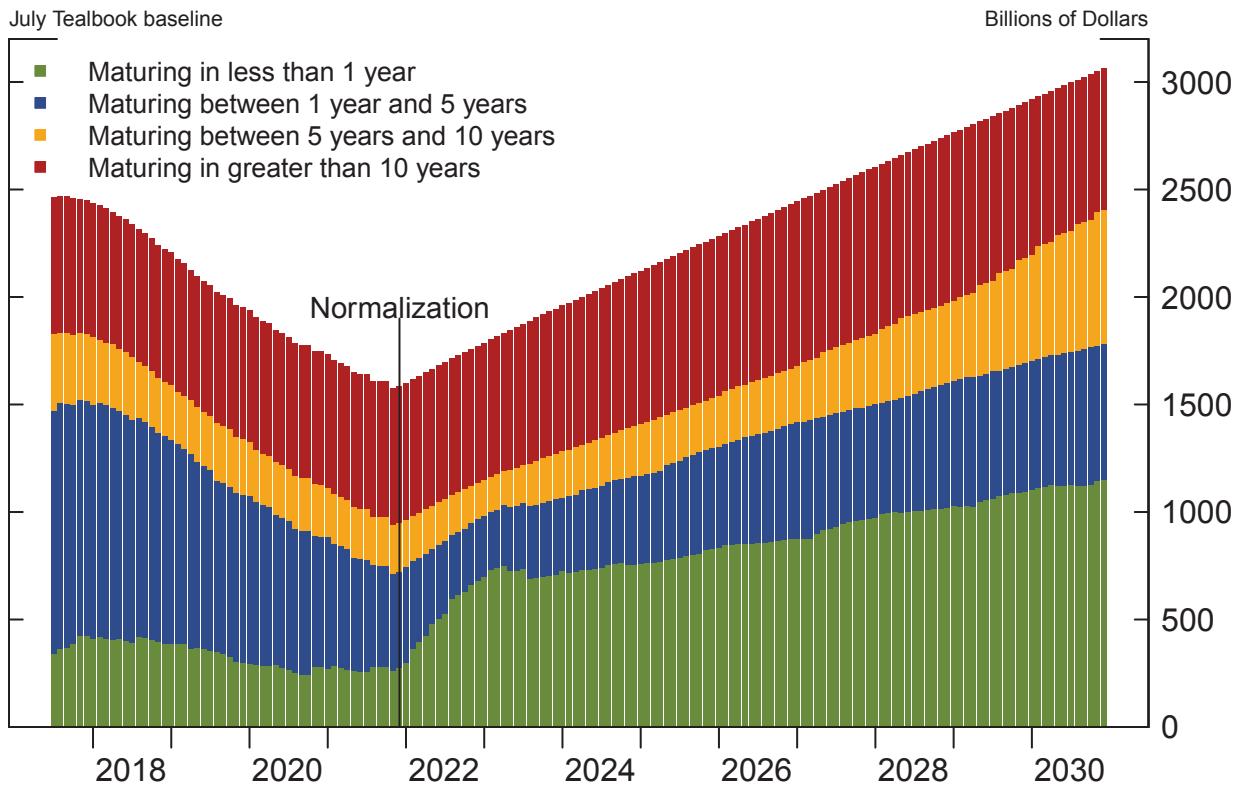
**Projections for the 10-Year Treasury Term Premium Effect  
(Basis Points)**

Date	July Tealbook baseline	June Tealbook baseline
Quarterly Averages		
2017:Q3	-90	-91
Q4	-87	-88
2018:Q4	-74	-75
2019:Q4	-63	-64
2020:Q4	-55	-56
2021:Q4	-49	-49
2022:Q4	-44	-44
2023:Q4	-41	-41
2024:Q4	-38	-37
2025:Q4	-35	-34
2026:Q4	-32	-31
2027:Q4	-30	-29
2028:Q4	-28	-27
2029:Q4	-26	-24
2030:Q4	-24	-23

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



**Maturity Composition of SOMA Treasury Portfolio**



Balance Sheet & Income

## 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