

**Prefatory Note**

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

Please note that some material may have been redacted from this document if that material was received on a confidential basis. Redacted material is indicated by occasional gaps in the text or by gray boxes around non-text content. All redacted passages are exempt from disclosure under applicable provisions of the Freedom of Information Act.

Class II FOMC – Restricted (FR)

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# Report to the FOMC on Economic Conditions and Monetary Policy



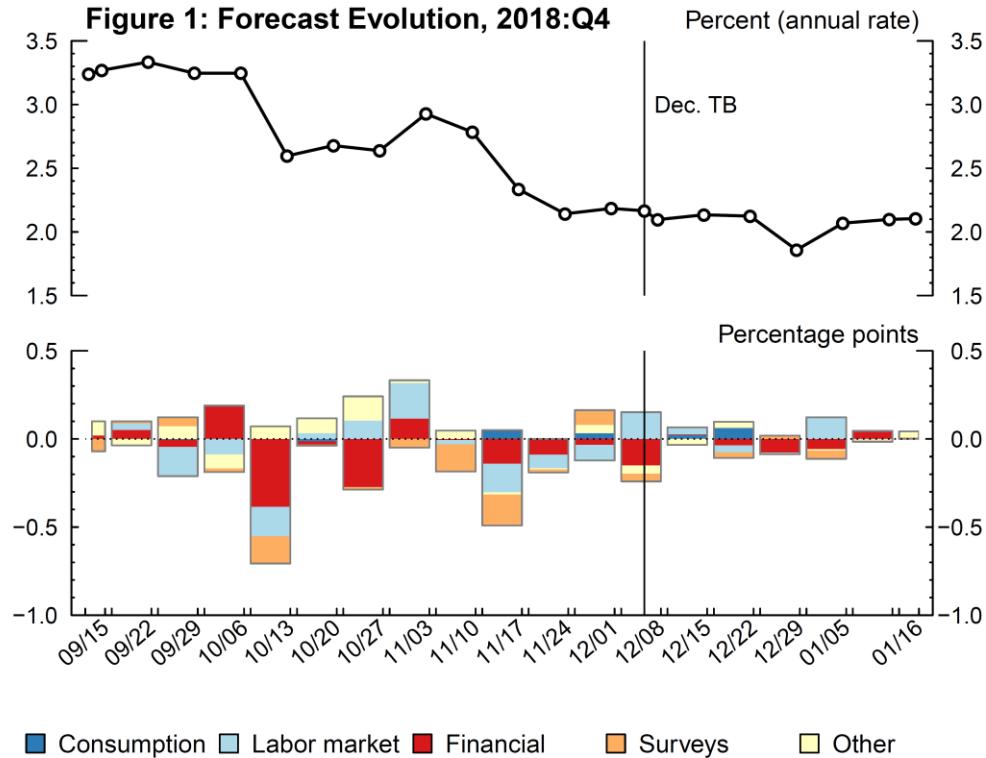
## Book A Economic and Financial Conditions: Outlook, Risks, and Policy Strategies

January 18, 2019

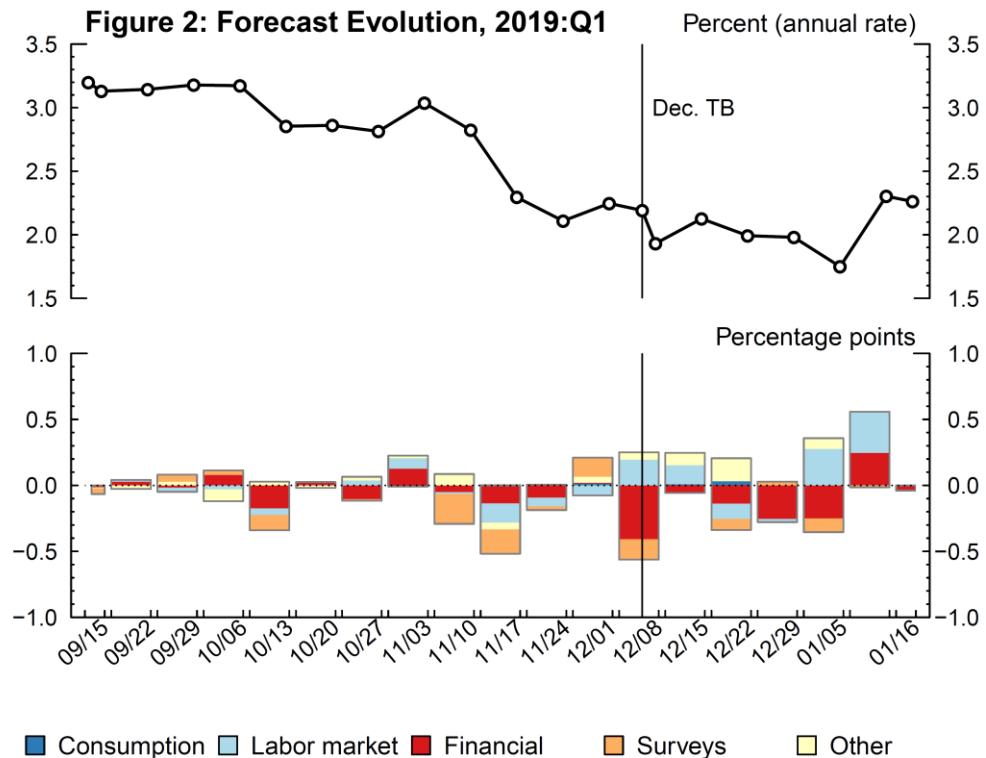
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Prepared for the Federal Open Market Committee  
by the staff of the Board of Governors of the Federal Reserve System

**Figure 1: Forecast Evolution, 2018:Q4**

Source: Staff calculations.

**Figure 2: Forecast Evolution, 2019:Q1**

Source: Staff calculations.

## Comparing the Staff Projection with Other Forecasts

The staff's projection for real GDP growth in 2019 is close to the Blue Chip consensus forecast and below the median projection from the Survey of Professional Forecasters, although the latter dates from mid-November. The staff's GDP forecast is  $\frac{1}{4}$  percentage point higher than the Blue Chip consensus forecast in 2020. The staff's unemployment rate forecast is below the Blue Chip in both 2019 and 2020. The staff's projection for CPI inflation is below the Blue Chip in 2019 but above it in 2020.

### Comparison of Tealbook and Outside Forecasts

|  | 2018 | 2019 | 2020 |
|--|------|------|------|
| <b>GDP (Q4/Q4 percent change)</b>                      |      |      |      |
| January Tealbook                                       | 3.1  | 2.2  | 1.9  |
| Blue Chip (01/10/19)                                   | 3.1  | 2.2  | 1.6  |
| SPF median (11/13/18)                                  | 3.1  | 2.4  | n.a. |
| <b>Unemployment rate (Q4 level)</b>                    |      |      |      |
| January Tealbook                                       | 3.8  | 3.5  | 3.5  |
| Blue Chip (01/10/19)                                   | 3.8  | 3.6  | 3.8  |
| SPF median (11/13/18)                                  | 3.7  | 3.6  | n.a. |
| <b>CPI inflation (Q4/Q4 percent change)</b>            |      |      |      |
| January Tealbook                                       | 2.2  | 2.0  | 2.3  |
| Blue Chip (01/10/19)                                   | 2.2  | 2.1  | 2.2  |
| SPF median (11/13/18)                                  | 2.4  | 2.3  | 2.3  |
| <b>PCE price inflation (Q4/Q4 percent change)</b>      |      |      |      |
| January Tealbook                                       | 1.8  | 1.8  | 1.9  |
| SPF median (11/13/18)                                  | 2.1  | 2.1  | 2.1  |
| <b>Core PCE price inflation (Q4/Q4 percent change)</b> |      |      |      |
| January Tealbook                                       | 1.8  | 2.0  | 2.0  |
| SPF median (11/13/18)                                  | 2.0  | 2.1  | 2.1  |

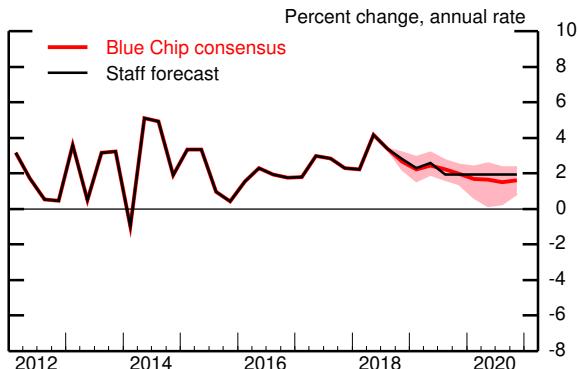
Note: SPF is the Survey of Professional Forecasters, CPI is the consumer price index, and PCE is personal consumption expenditures. Blue Chip does not provide results for overall and core PCE price inflation. The Blue Chip consensus forecast includes input from about 50 panelists, and the SPF about 40.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

n.a. Not available.

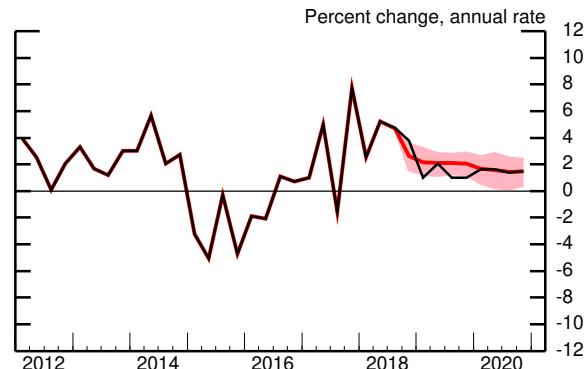
Source: Blue Chip Economic Indicators; Federal Reserve Bank of Philadelphia.

## Tealbook Forecast Compared with Blue Chip

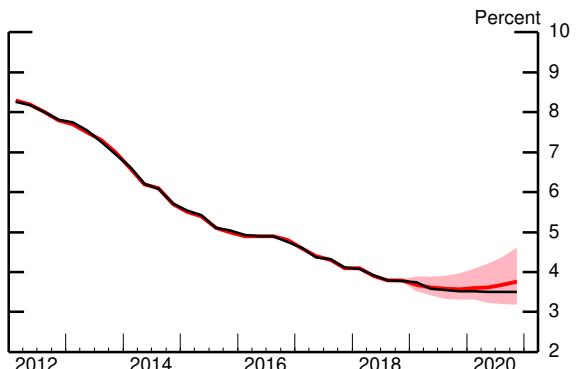
Real GDP



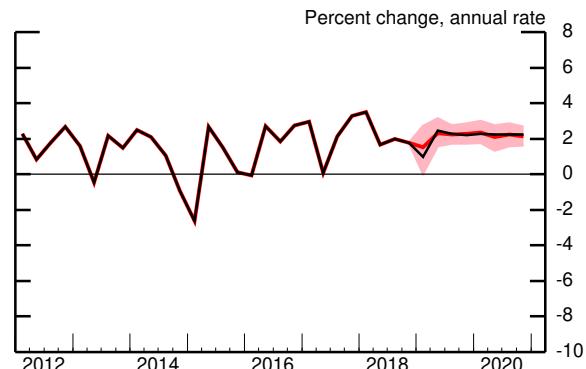
Industrial Production



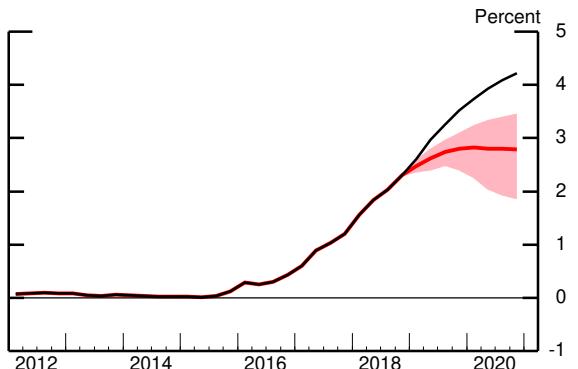
Unemployment Rate



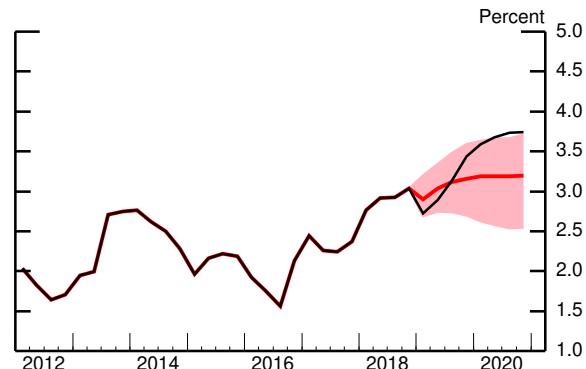
Consumer Price Index



Treasury Bill Rate



10-Year Treasury Yield

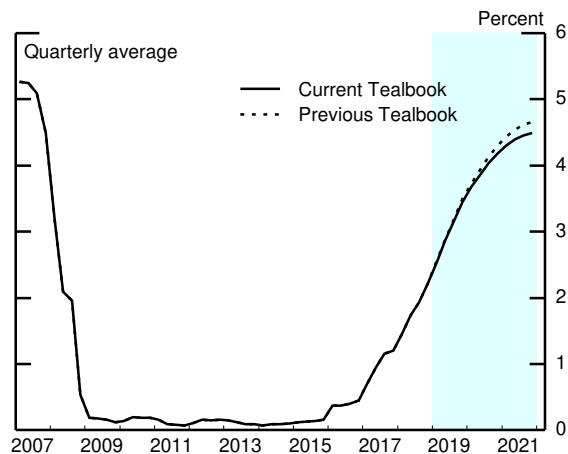


Note: The yield is for on-the-run Treasury securities. Over the forecast period, the staff's projected yield is assumed to be 15 basis points below the off-the-run yield.

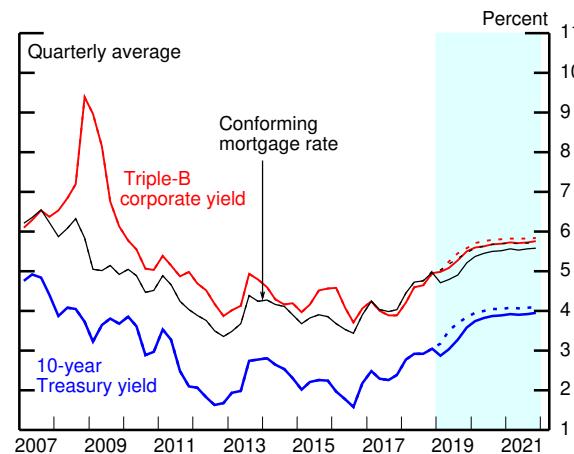
Note: The shaded area represents the area between the Blue Chip top 10 and bottom 10 averages.

## Key Background Factors underlying the Baseline Staff Projection

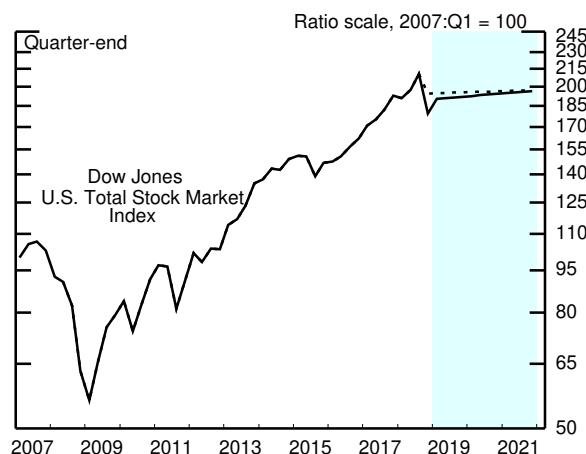
Federal Funds Rate



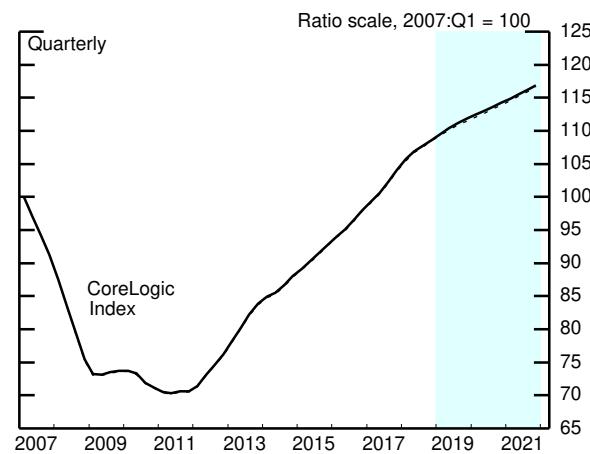
Long-Term Interest Rates



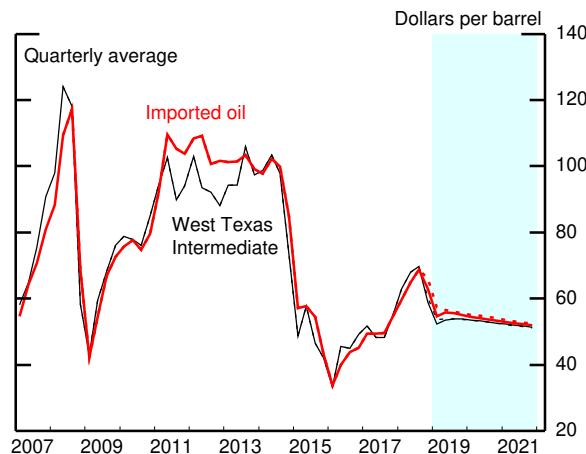
Equity Prices



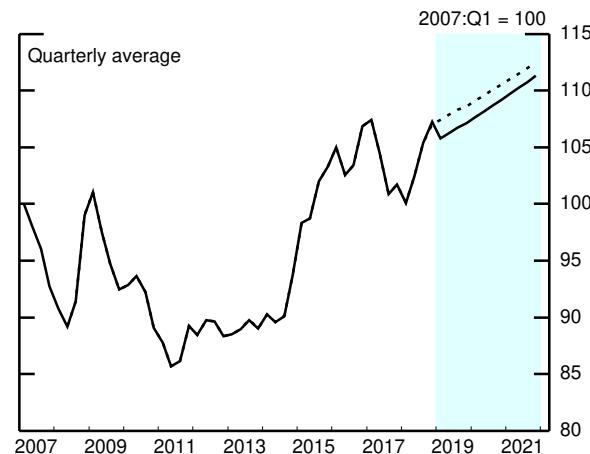
House Prices



Crude Oil Prices



Broad Real Dollar



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

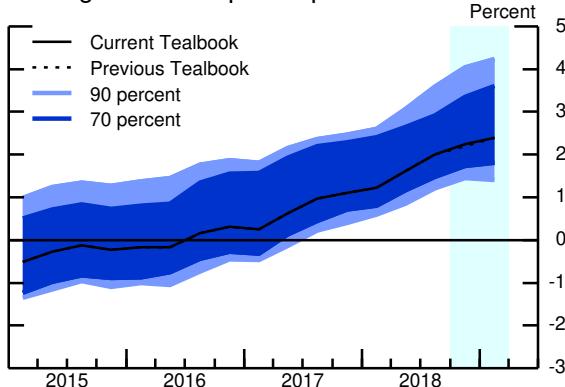
(Percent change at annual rate from final quarter of preceding period except as noted)

| Measure                       | 2016 | 2017 | 2018 | 2018 Q3 | 2018 Q4 | 2019 Q1 |
|-------------------------------|------|------|------|---------|---------|---------|
| <b>Output gap<sup>1</sup></b> | .3   | 1.1  | 2.2  | 2.0     | 2.2     | 2.4     |
| Previous Tealbook             | .3   | 1.1  | 2.2  | 2.0     | 2.2     | 2.4     |
| Real GDP                      | 1.9  | 2.5  | 3.1  | 3.4     | 2.8     | 2.3     |
| Previous Tealbook             | 1.9  | 2.5  | 3.0  | 3.5     | 2.3     | 2.6     |
| Measurement error in GDP      | -.3  | .0   | .2   | .0      | .1      | -.1     |
| Previous Tealbook             | -.3  | .0   | .2   | .2      | -.3     | .0      |
| Potential output              | 1.6  | 1.7  | 1.8  | 1.8     | 1.8     | 1.8     |
| Previous Tealbook             | 1.6  | 1.7  | 1.8  | 1.8     | 1.8     | 1.8     |

Note: The output gap is the percent difference between actual and potential output; a negative number indicates that the economy is operating below potential. The change in the output gap is equal to real GDP growth less the contribution of measurement error less the growth rate of potential output. For quarterly figures, the growth rates are at an annual rate, and this calculation needs to be multiplied by 1/4 to obtain the quarterly change in the output gap.

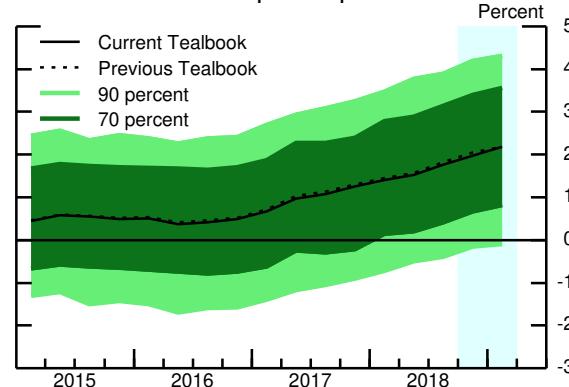
1. Percent, average for the final quarter in the period.

### Judgmental Output Gap



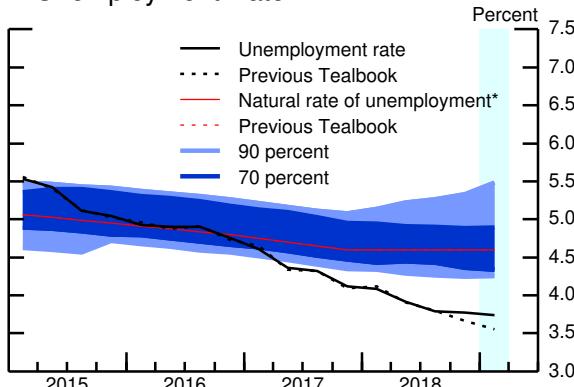
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.  
Source: Various macroeconomic data; staff assumptions.

### Model-Based Output Gap



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

### Unemployment Rate



Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the natural rate.  
\*Staff estimate including the effect of extended and emergency unemployment insurance benefits.  
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

### Core PCE Price Inflation



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

## Summary of the Near-Term Outlook for GDP

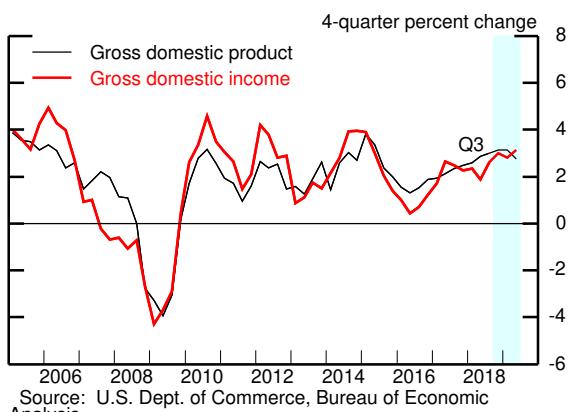
(Percent change at annual rate except as noted)

| Measure                                    | 2018:Q3           |                  | 2018:Q4           |                  | 2019:Q1           |                  |
|--|-------------------|------------------|-------------------|------------------|-------------------|------------------|
|  | Previous Tealbook | Current Tealbook | Previous Tealbook | Current Tealbook | Previous Tealbook | Current Tealbook |
| <b>Real GDP</b>                            | <b>3.5</b>        | <b>3.4</b>       | <b>2.3</b>        | <b>2.8</b>       | <b>2.6</b>        | <b>2.3</b>       |
| Private domestic final purchases           | 3.2               | 3.0              | 2.9               | 4.0              | 2.6               | 2.3              |
| Personal consumption expenditures          | 3.7               | 3.5              | 3.0               | 3.8              | 2.5               | 2.4              |
| Residential investment                     | -2.9              | -3.6             | -5.4              | -4.4             | -2.6              | -3.4             |
| Nonres. private fixed investment           | 2.1               | 2.5              | 5.1               | 7.1              | 4.8               | 3.2              |
| Government purchases                       | 2.5               | 2.6              | 1.5               | 1.7              | 1.9               | .4               |
| <i>Contributions to change in real GDP</i> |                   |                  |                   |                  |                   |                  |
| Inventory investment <sup>1</sup>          | 2.3               | 2.3              | -.6               | -.7              | .0                | .1               |
| Net exports <sup>1</sup>                   | -1.9              | -2.0             | .1                | -.2              | .0                | .1               |

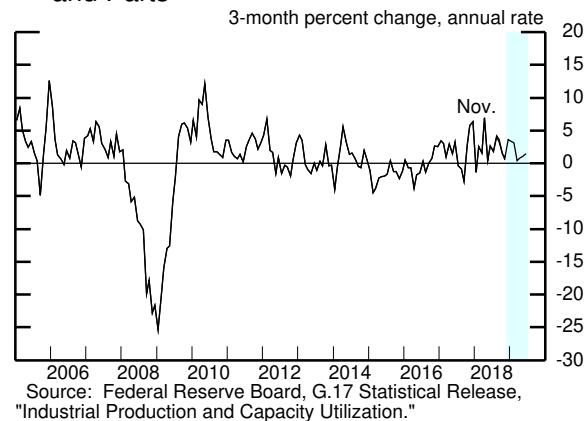
1. Percentage points.

### Recent Nonfinancial Developments (1)

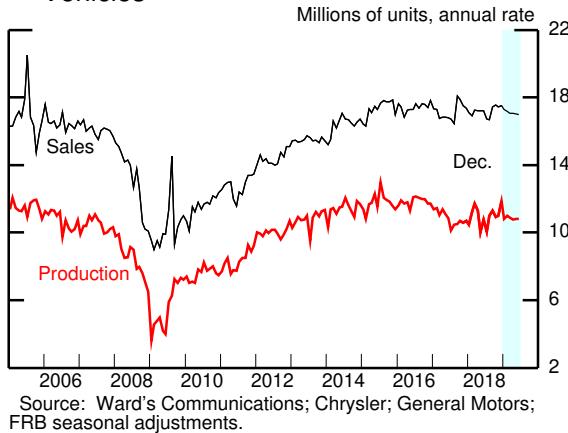
Real GDP and GDI



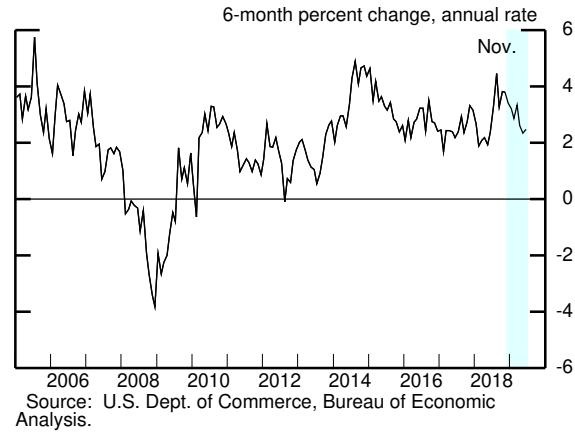
Manufacturing IP ex. Motor Vehicles and Parts



Sales and Production of Light Motor Vehicles

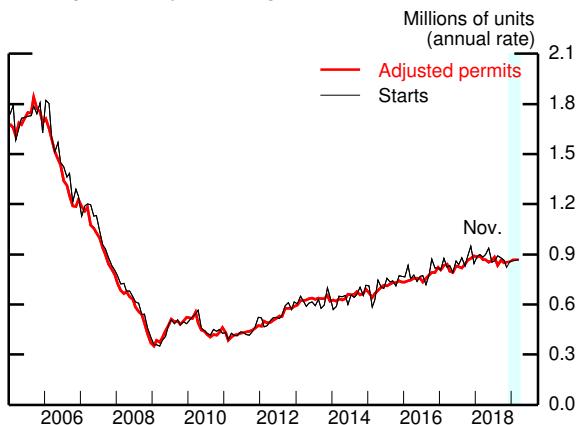


Real PCE Growth



## Recent Nonfinancial Developments (2)

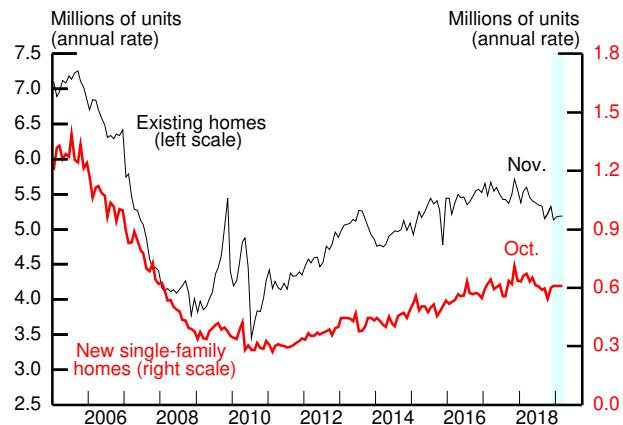
### Single-Family Housing Starts and Permits



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

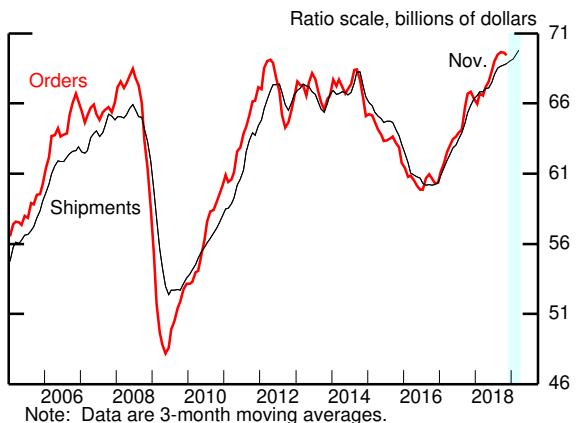
Source: U.S. Census Bureau.

### Home Sales



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

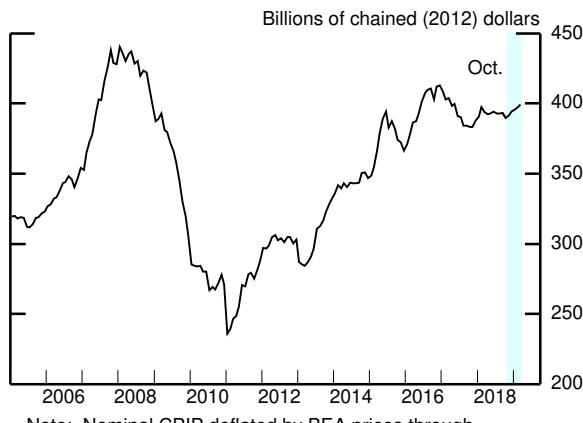
### Nondefense Capital Goods ex. Aircraft



Note: Data are 3-month moving averages.

Source: U.S. Census Bureau.

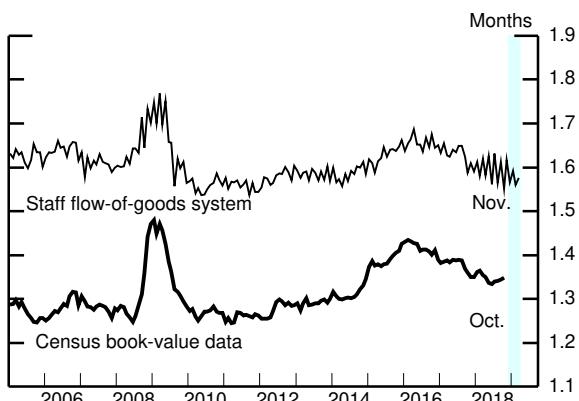
### Nonresidential Construction Put in Place



Note: Nominal CPIP deflated by BEA prices through 2018:Q3 and by the staff's estimated deflator thereafter.

Source: U.S. Census Bureau.

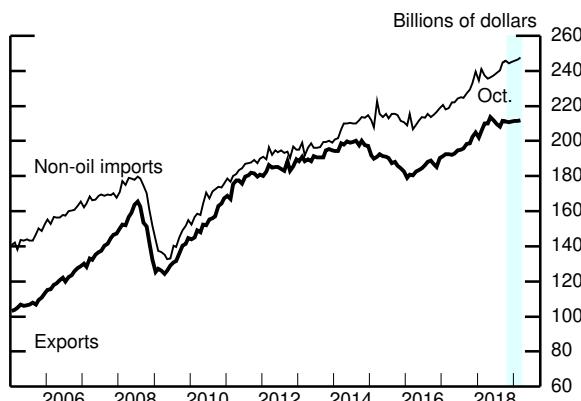
### Inventory Ratios



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

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

### Exports and Non-oil Imports



Note: Forecasts are linear interpolations of quarterly values.

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

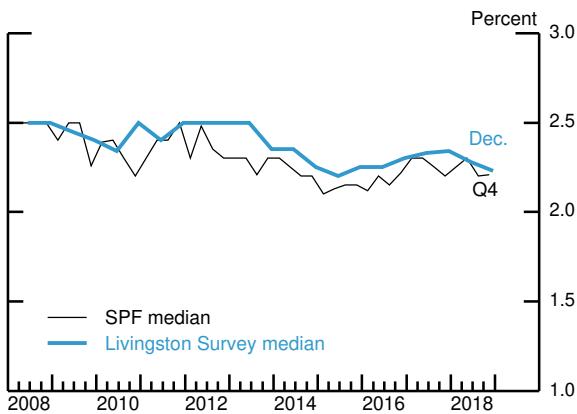
**Federal Reserve System Nowcasts of 2018:Q4 Real GDP Growth**  
 (Percent change at annual rate from previous quarter)

| Federal Reserve Entity                          | Type of model  | Nowcast as of Jan. 16, 2019 |
|---|--|-----------------------------|
| Federal Reserve Bank                            |  |                             |
| Boston  | • Mixed-frequency BVAR   | 0.9                         |
| New York  | • Factor-augmented autoregressive model combination<br>• Factor-augmented autoregressive model combination, financial factors only<br>• Dynamic factor model | 3.3<br>2.0<br>2.5           |
| Cleveland                                       | • Bayesian regressions with stochastic volatility<br>• Tracking model  | 2.3<br>1.3                  |
| Atlanta   | • Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)         | 2.8                         |
| Chicago   | • Dynamic factor models<br>• Bayesian VARs   | 2.2<br>2.6                  |
| St. Louis                                       | • Dynamic factor models<br>• News index model<br>• Let-the-data-decide regressions   | 2.0<br>2.8<br>2.1           |
| Kansas City                                     | • Accounting-based tracking estimate   | 1.9                         |
| Board of Governors                              | • Tealbook estimate (judgmental)<br>• Monthly dynamic factor models (DFM-45)<br>• Mixed-frequency dynamic factor model (DFM-BM) <sup>1</sup>                 | 2.8<br>2.9<br>2.1           |
| Memo: Median of Federal Reserve System nowcasts |  | 2.3                         |

<sup>1</sup> Our standard DFM-BM has been modified to include the VIX, corporate bond spreads, and the slope of the yield curve on government securities.

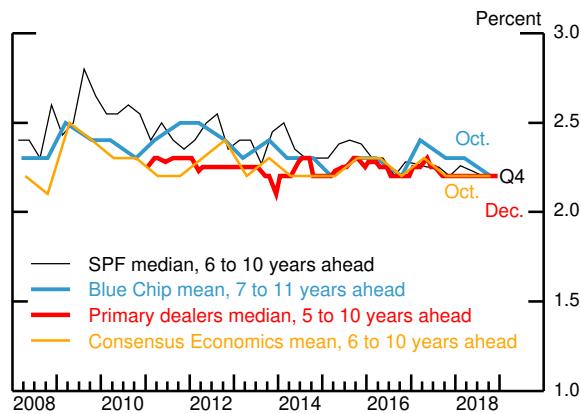
## Survey Measures of Longer-Term Inflation Expectations

CPI Next 10 Years



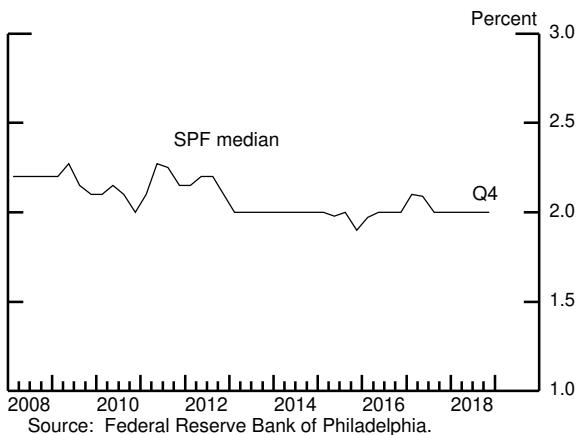
Note: SPF is Survey of Professional Forecasters.  
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations



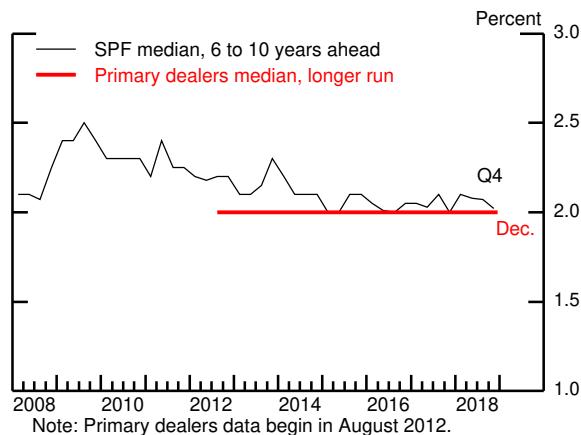
Source: Federal Reserve Bank of Philadelphia; Blue Chip Economic Indicators; Federal Reserve Bank of New York; Consensus Economics.

PCE Next 10 Years



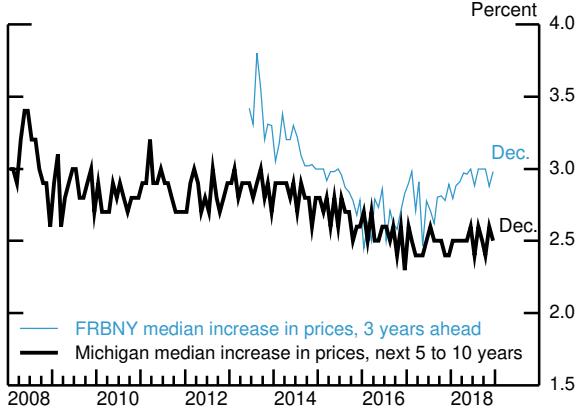
Source: Federal Reserve Bank of Philadelphia.

PCE Forward Expectations



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

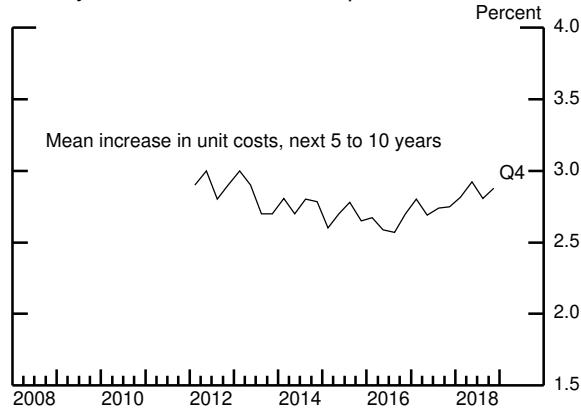
Surveys of Consumers



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

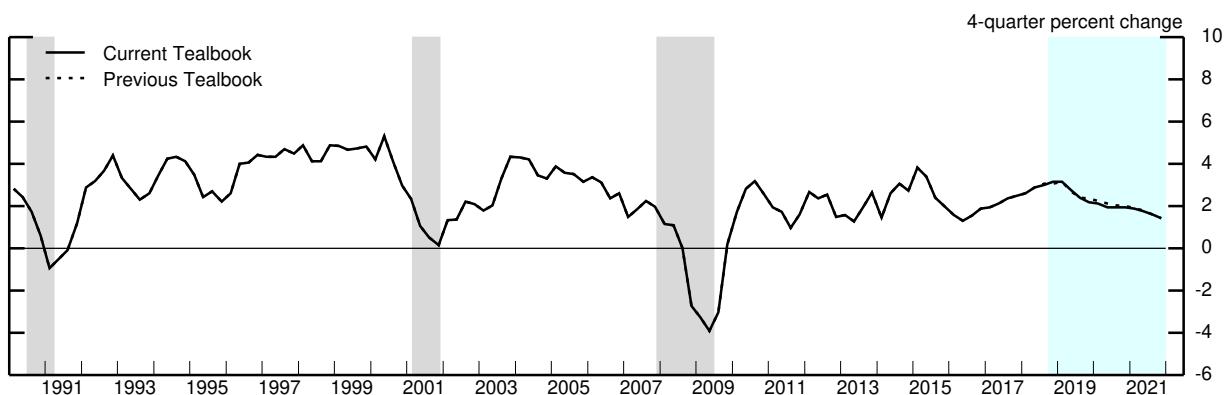


Note: Survey of businesses in the Sixth Federal Reserve District. Data begin in February 2012.  
Source: Federal Reserve Bank of Atlanta.

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

| Measure  | 2018       | 2018 H2    | 2019 H1    | 2019       | 2020       | 2021       |
|--|------------|------------|------------|------------|------------|------------|
| <b>Real GDP</b>  | <b>3.1</b> | <b>3.1</b> | <b>2.4</b> | <b>2.2</b> | <b>1.9</b> | <b>1.4</b> |
| Previous Tealbook  | 3.0        | 2.9        | 2.5        | 2.4        | 2.0        | 1.4        |
| Final sales  | 3.0        | 2.2        | 2.3        | 2.3        | 1.9        | 1.5        |
| Previous Tealbook  | 2.8        | 2.0        | 2.5        | 2.3        | 2.0        | 1.6        |
| Personal consumption expenditures                          | 2.9        | 3.7        | 2.5        | 2.4        | 2.2        | 1.9        |
| Previous Tealbook  | 2.8        | 3.4        | 2.5        | 2.5        | 2.3        | 1.9        |
| Residential investment                                     | -3.2       | -4.0       | -1.1       | .7         | -.6        | -.4        |
| Previous Tealbook  | -3.3       | -4.2       | -.8        | .0         | .2         | .2         |
| Nonresidential structures                                  | 5.9        | -1.8       | 2.8        | 1.9        | -.8        | -2.0       |
| Previous Tealbook  | 5.6        | -2.3       | 2.8        | 2.4        | -.7        | -1.7       |
| Equipment and intangibles                                  | 7.9        | 6.8        | 3.3        | 2.8        | 2.2        | 1.6        |
| Previous Tealbook  | 7.2        | 5.4        | 4.9        | 3.9        | 2.2        | 1.6        |
| Federal purchases  | 3.2        | 3.3        | 3.3        | 3.4        | 2.9        | .9         |
| Previous Tealbook  | 3.2        | 3.2        | 3.0        | 3.2        | 2.9        | 1.0        |
| State and local purchases                                  | 1.4        | 1.4        | 1.2        | 1.2        | 1.0        | 1.0        |
| Previous Tealbook  | 1.3        | 1.3        | 1.2        | 1.2        | 1.0        | 1.0        |
| Exports  | 2.3        | -1.6       | 2.4        | 2.3        | 3.0        | 3.1        |
| Previous Tealbook  | 3.2        | .2         | 2.3        | 2.3        | 3.0        | 3.2        |
| Imports  | 3.5        | 5.9        | 2.4        | 2.5        | 2.9        | 2.6        |
| Previous Tealbook  | 3.7        | 6.4        | 2.6        | 3.1        | 3.2        | 2.8        |
| Contributions to change in real GDP<br>(percentage points) |            |            |            |            |            |            |
| Inventory change   | .2         | .8         | .1         | -.1        | .1         | -.1        |
| Previous Tealbook  | .2         | .9         | .0         | .0         | .0         | -.2        |
| Net exports  | -.3        | -1.1       | -.1        | -.1        | -.1        | .0         |
| Previous Tealbook  | -.2        | -.9        | -.1        | -.2        | -.1        | .0         |

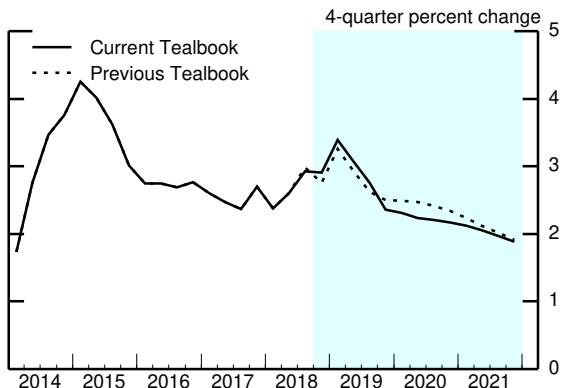
## Real GDP



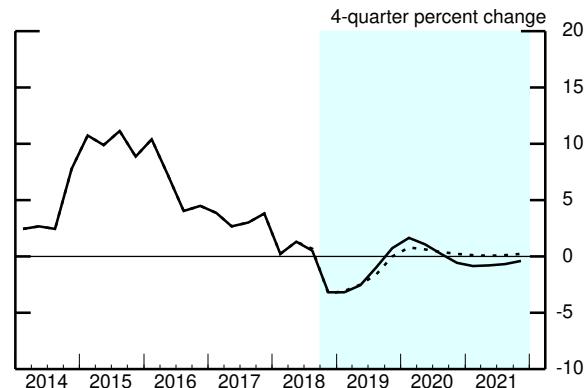
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.  
 Source: U.S. Department of Commerce, Bureau of Economic Analysis.

## Components of Final Demand

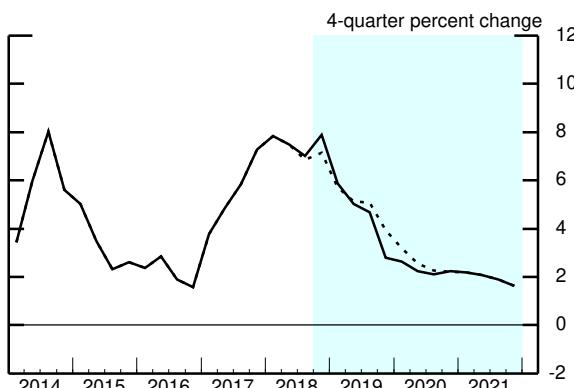
**Personal Consumption Expenditures**



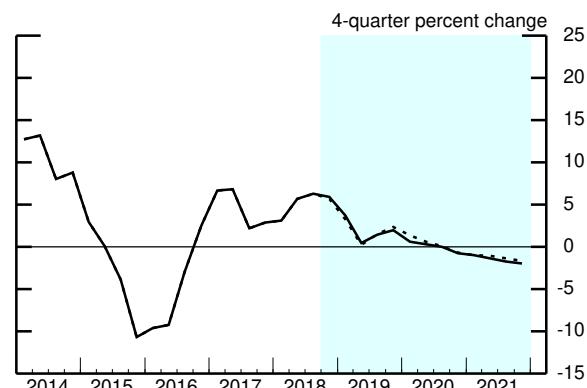
**Residential Investment**



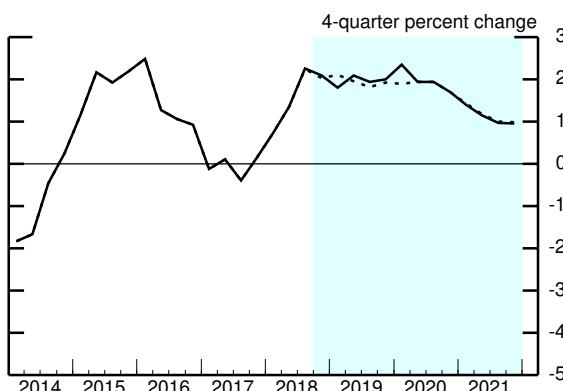
**Equipment and Intangibles**



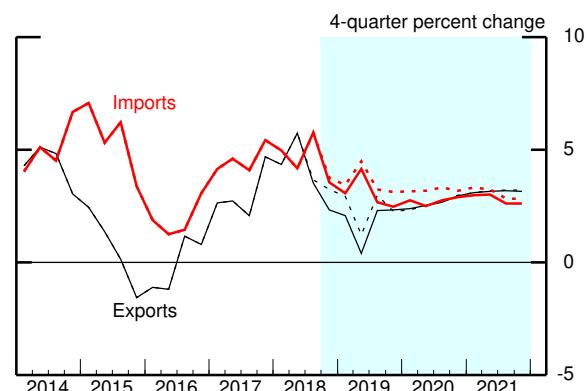
**Nonresidential Structures**



**Government Consumption and Investment**

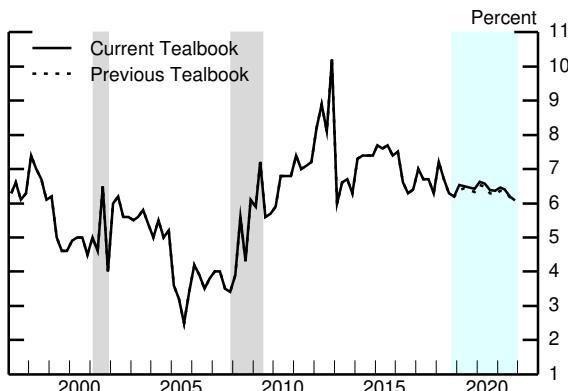


**Exports and Imports**

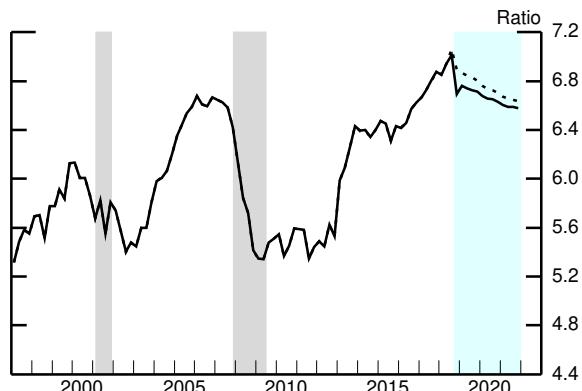


Source: U.S. Department of Commerce, Bureau of Economic Analysis.

## Aspects of the Medium-Term Projection

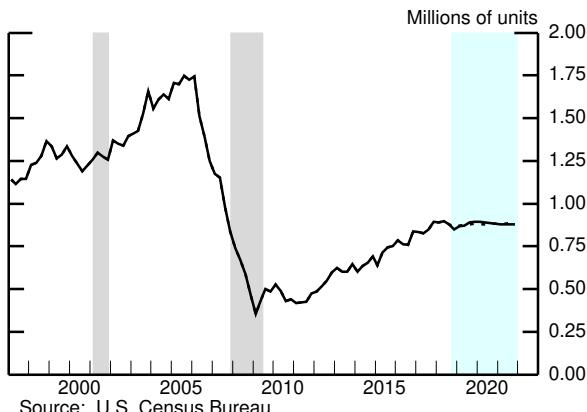
**Personal Saving Rate**

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

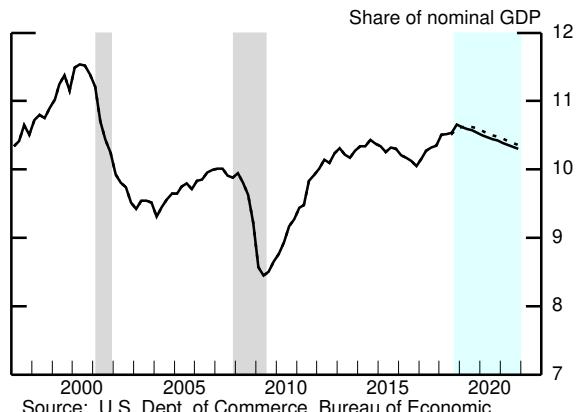
**Wealth-to-Income Ratio**

Note: Ratio of household net worth to disposable personal income.

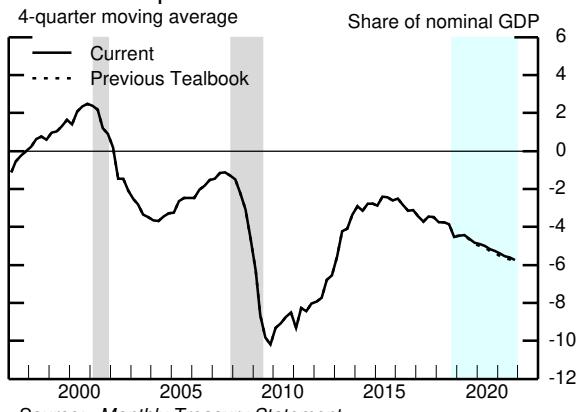
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

**Single-Family Housing Starts**

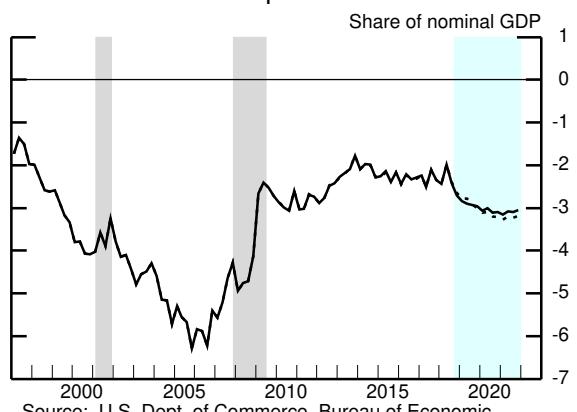
Source: U.S. Census Bureau.

**Equipment and Intangibles Spending**

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

**Federal Surplus/Deficit**

Source: Monthly Treasury Statement.

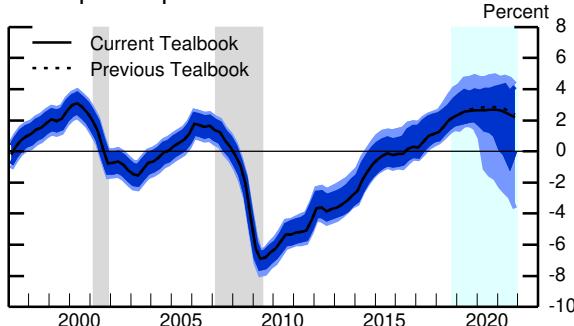
**Current Account Surplus/Deficit**

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

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

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

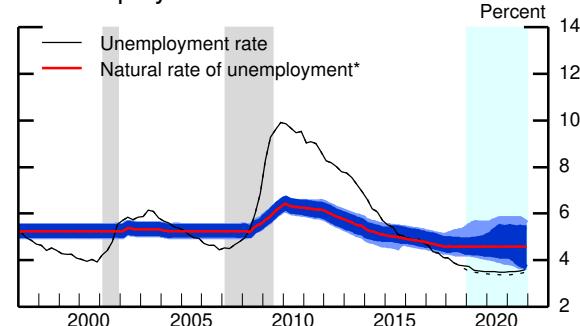
### Output Gap



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

Source: Various macroeconomic data; staff assumptions.

### Unemployment Rate

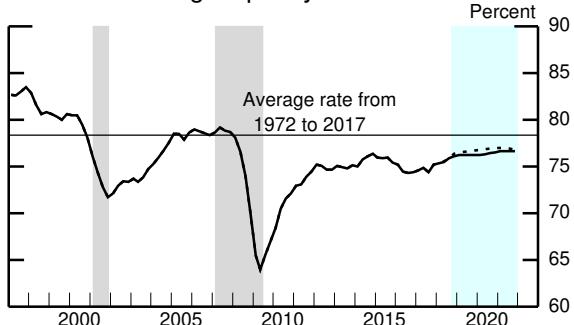


Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the natural rate.

\*Staff estimate including the effect of extended and emergency unemployment insurance benefits.

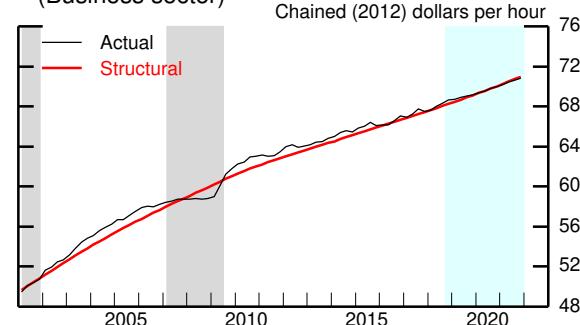
Source: Various macroeconomic data; staff assumptions.

### Manufacturing Capacity Utilization Rate



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

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



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

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

### Decomposition of Potential Output (Percent change, Q4 to Q4, except as noted)

| Measure                                    | 1974-95 | 1996-2000 | 2001-07 | 2008-10 | 2011-16 | 2017 | 2018 | 2019 | 2020 | 2021 |
|--|---------|-----------|---------|---------|---------|------|------|------|------|------|
| Potential output                           | 3.1     | 3.6       | 2.7     | 1.9     | 1.4     | 1.7  | 1.8  | 1.8  | 1.9  | 1.9  |
| Previous Tealbook                          | 3.1     | 3.6       | 2.7     | 1.9     | 1.4     | 1.7  | 1.8  | 1.8  | 1.9  | 1.9  |
| <i>Selected contributions</i> <sup>1</sup> |         |           |         |         |         |      |      |      |      |      |
| Structural labor productivity <sup>2</sup> | 1.7     | 2.9       | 2.7     | 1.8     | 1.2     | 1.2  | 1.2  | 1.3  | 1.3  | 1.4  |
| Previous Tealbook                          | 1.7     | 2.9       | 2.7     | 1.8     | 1.2     | 1.2  | 1.2  | 1.3  | 1.3  | 1.4  |
| Capital deepening                          | .7      | 1.4       | 1.0     | .5      | .8      | .6   | .7   | .7   | .7   | .6   |
| Multifactor productivity                   | .8      | 1.1       | 1.4     | 1.1     | .2      | .3   | .3   | .3   | .5   | .6   |
| Structural hours                           | 1.5     | 1.3       | .8      | .4      | .4      | .3   | .8   | .6   | .6   | .5   |
| Previous Tealbook                          | 1.5     | 1.3       | .8      | .4      | .4      | .3   | .7   | .6   | .6   | .5   |
| Labor force participation                  | .4      | -.1       | -.2     | -.5     | -.5     | -.3  | -.2  | -.2  | -.2  | -.2  |
| Previous Tealbook                          | .4      | -.1       | -.2     | -.5     | -.5     | -.3  | -.2  | -.2  | -.2  | -.2  |
| Memo:                                      |         |           |         |         |         |      |      |      |      |      |
| Output gap <sup>3</sup>                    | -1.2    | 2.5       | .3      | -5.3    | .3      | 1.1  | 2.2  | 2.6  | 2.7  | 2.2  |
| Previous Tealbook                          | -1.2    | 2.5       | .3      | -5.3    | .3      | 1.1  | 2.2  | 2.8  | 2.9  | 2.4  |

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

1. Percentage points.

2. Total business sector.

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

## The Outlook for the Labor Market

| Measure  | 2018         | 2018 H2      | 2019 H1      | 2019         | 2020         | 2021         |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| Nonfarm payroll employment <sup>1</sup><br>Previous Tealbook     | 220<br>204   | 222<br>191   | 192<br>179   | 171<br>167   | 120<br>128   | 70<br>87     |
| Private employment <sup>1</sup><br>Previous Tealbook             | 214<br>200   | 213<br>185   | 180<br>168   | 160<br>156   | 110<br>118   | 60<br>77     |
| Labor force participation rate <sup>2</sup><br>Previous Tealbook | 63.0<br>62.9 | 63.0<br>62.9 | 63.0<br>62.9 | 63.0<br>62.9 | 62.8<br>62.8 | 62.6<br>62.6 |
| Civilian unemployment rate <sup>2</sup><br>Previous Tealbook     | 3.8<br>3.7   | 3.8<br>3.7   | 3.6<br>3.5   | 3.5<br>3.4   | 3.5<br>3.4   | 3.6<br>3.5   |
| Employment to population ratio <sup>2</sup><br>Previous Tealbook | 60.6<br>60.6 | 60.6<br>60.6 | 60.7<br>60.7 | 60.7<br>60.8 | 60.6<br>60.7 | 60.4<br>60.4 |

1. Thousands, average monthly changes.

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

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

## Inflation Projections

| Measure   | 2018       | 2018 H2    | 2019 H1      | 2019         | 2020       | 2021       |
|---|------------|------------|--------------|--------------|------------|------------|
| <i>Percent change at annual rate from final quarter of preceding period</i> |            |            |              |              |            |            |
| PCE chain-weighted price index<br>Previous Tealbook                         | 1.8<br>1.8 | 1.5<br>1.4 | 1.7<br>1.8   | 1.8<br>1.8   | 1.9<br>2.0 | 2.0<br>2.0 |
| Food and beverages<br>Previous Tealbook                                     | .5<br>.5   | .4<br>.3   | 2.2<br>2.2   | 2.3<br>2.3   | 2.3<br>2.3 | 2.3<br>2.3 |
| Energy<br>Previous Tealbook   | 4.2<br>4.0 | 1.8<br>1.5 | -8.5<br>-7.0 | -4.1<br>-3.5 | -.1<br>-.2 | .5<br>.5   |
| Excluding food and energy<br>Previous Tealbook                              | 1.8<br>1.8 | 1.5<br>1.5 | 2.2<br>2.2   | 2.0<br>2.0   | 2.0<br>2.0 | 2.0<br>2.0 |
| Prices of core goods imports <sup>1</sup><br>Previous Tealbook              | .5<br>.7   | -.7<br>-.1 | .9<br>.6     | .9<br>.8     | .9<br>1.0  | .8<br>.9   |
| <i>12-month percent change</i>  |            |            |              |              |            |            |
| PCE chain-weighted price index<br>Previous Tealbook                         | 1.7<br>1.7 | 1.5<br>1.6 | 1.5<br>1.6   | 1.7<br>1.7   | 1.6<br>... | 1.6<br>... |
| Excluding food and energy<br>Previous Tealbook                              | 1.9<br>1.9 | 1.9<br>1.9 | 1.9<br>1.9   | 1.9<br>1.9   | 1.9<br>... | 1.8<br>... |

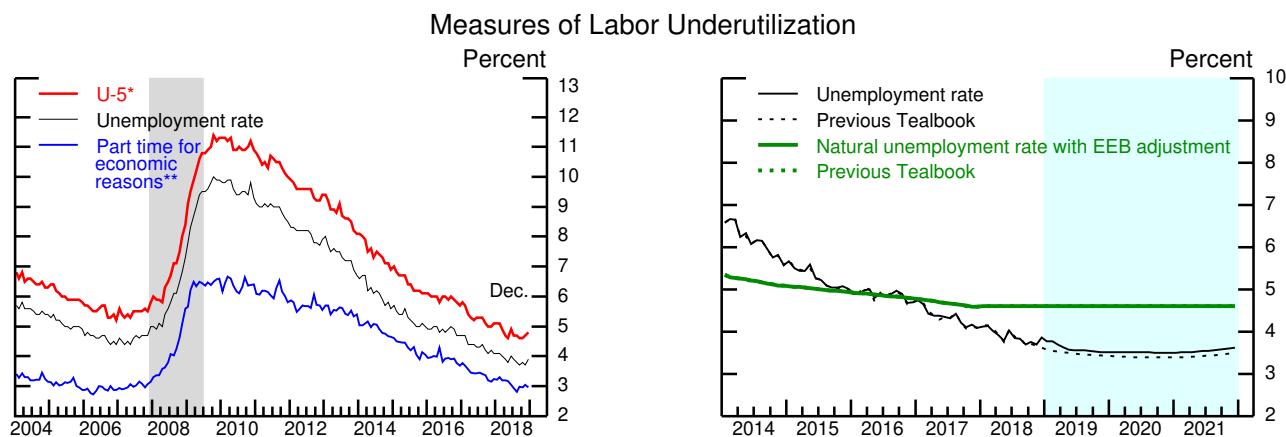
... Not applicable.

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

2. Staff forecast.

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

## Labor Market Developments and Outlook (1)

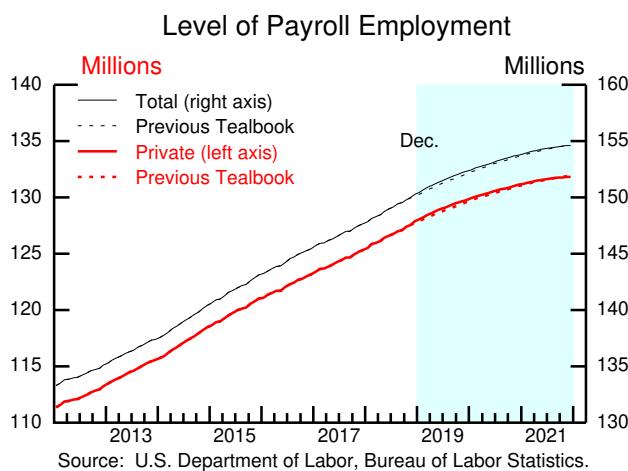


\* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.

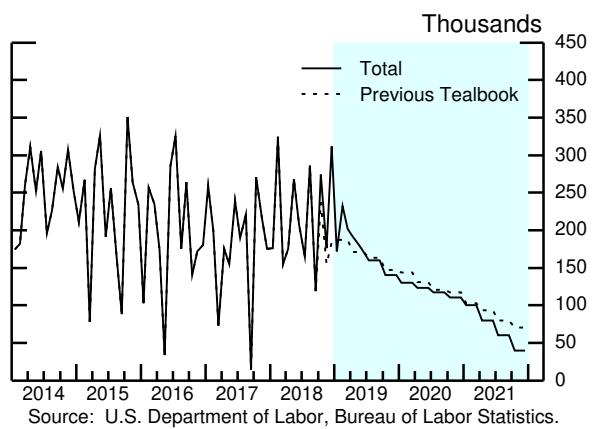
\*\* Percent of Current Population Survey employment.

EEB Extended and emergency unemployment benefits.

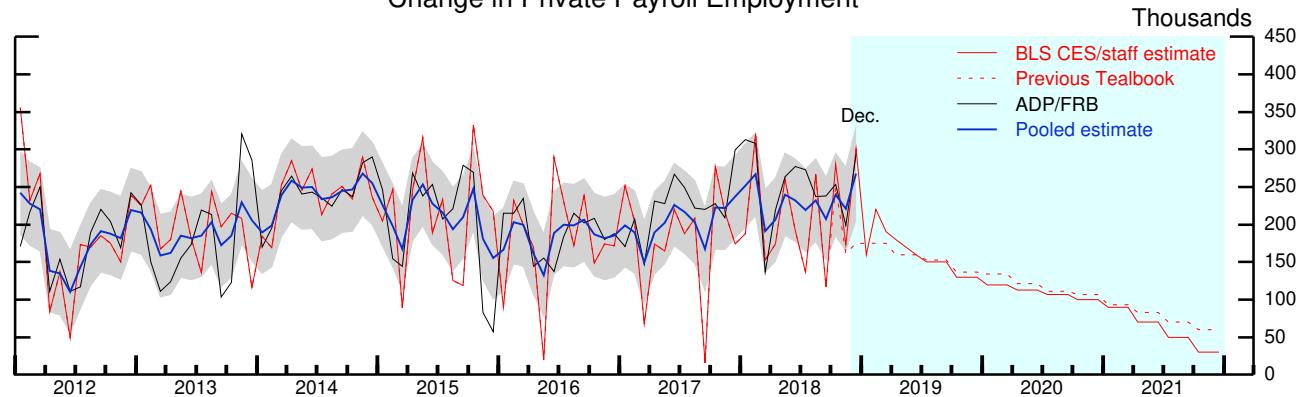
Source: U.S. Department of Labor, Bureau of Labor Statistics.



### Change in Total Payroll Employment



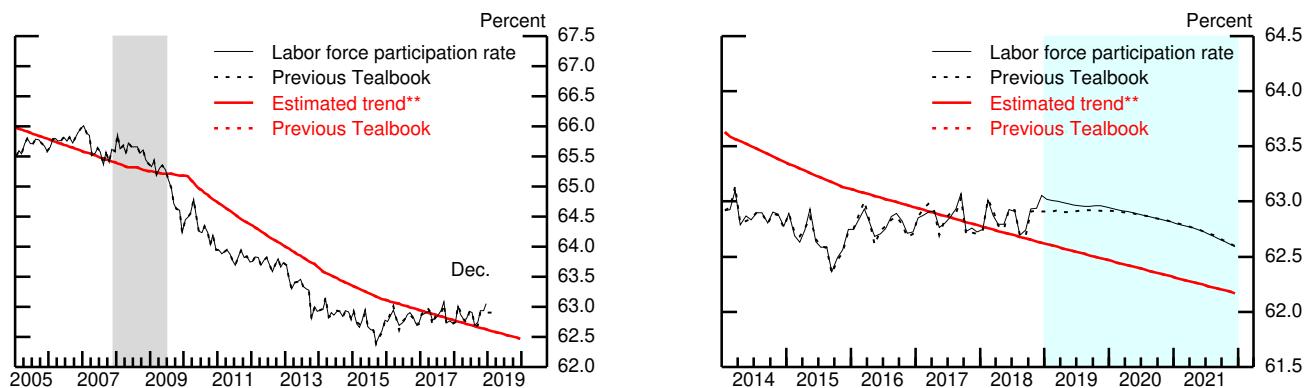
### Change in Private Payroll Employment



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

## Labor Market Developments and Outlook (2)

### Labor Force Participation Rate\*

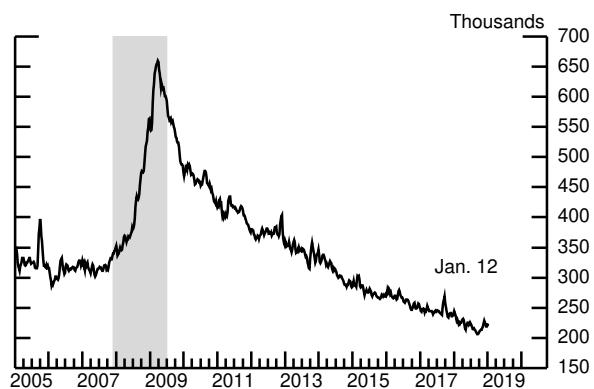


\* Published data adjusted by staff to account for changes in population weights.

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

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

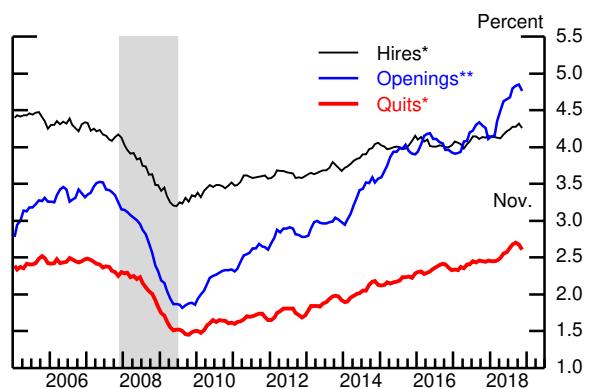
### Initial Unemployment Insurance Claims\*



\* 4-week moving average.

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

### Hires, Quits, and Job Openings

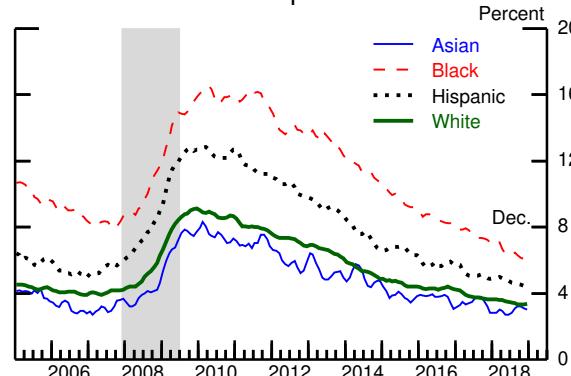


\* Percent of private nonfarm payroll employment, 3-month moving average.

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

Source: Job Openings and Labor Turnover Survey.

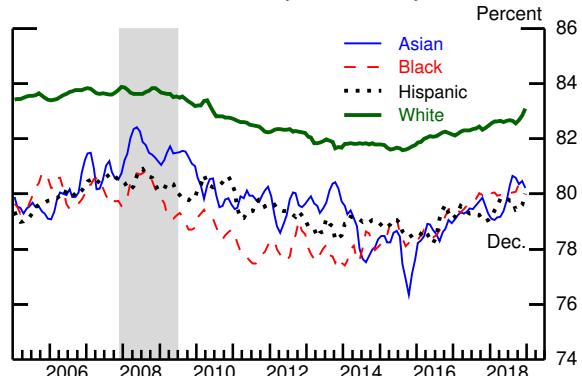
### Unemployment Rate by Racial/Ethnic Group



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

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

### Labor Force Participation Rate by Racial/Ethnic Group, 25 to 54 years old



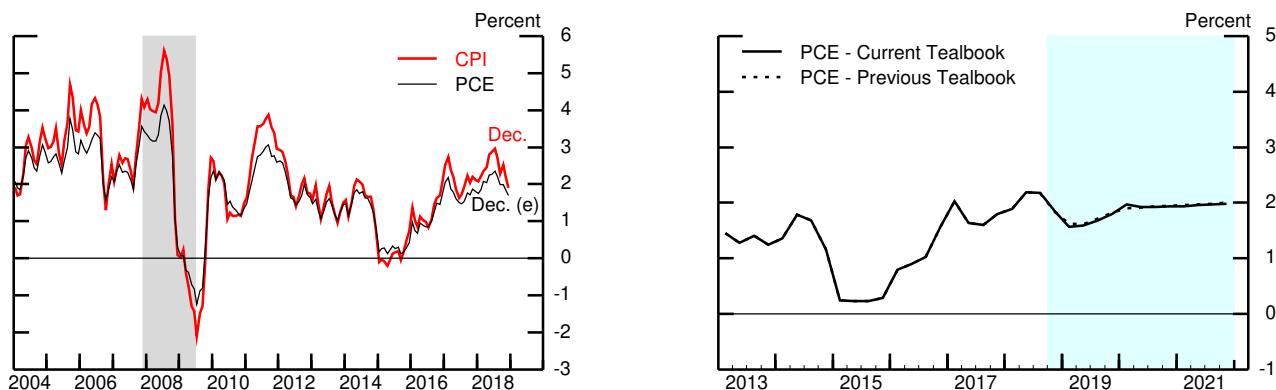
Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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

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

## Inflation Developments and Outlook (1)

(Percent change from year-earlier period)

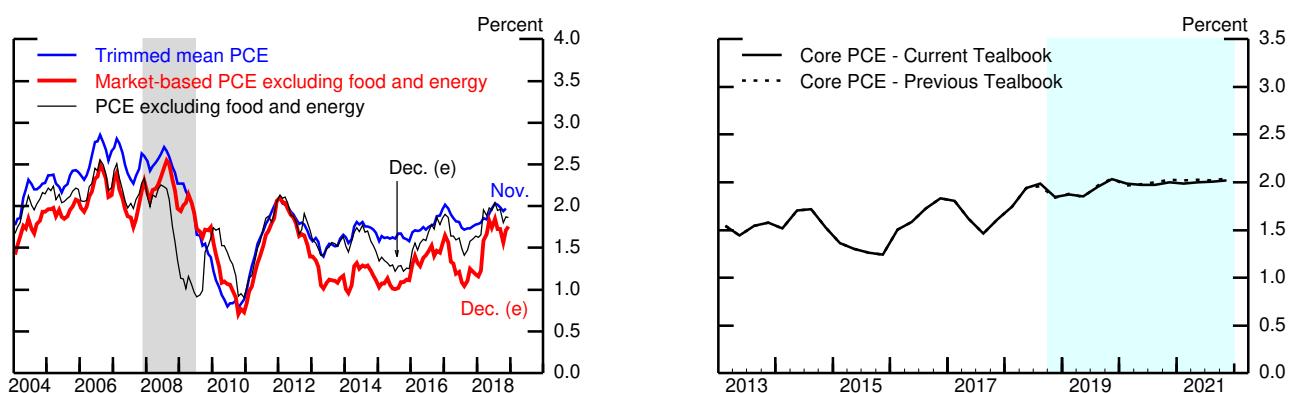
### Headline Consumer Price Inflation



Note: PCE prices from October to December 2018 are staff estimates (e).

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

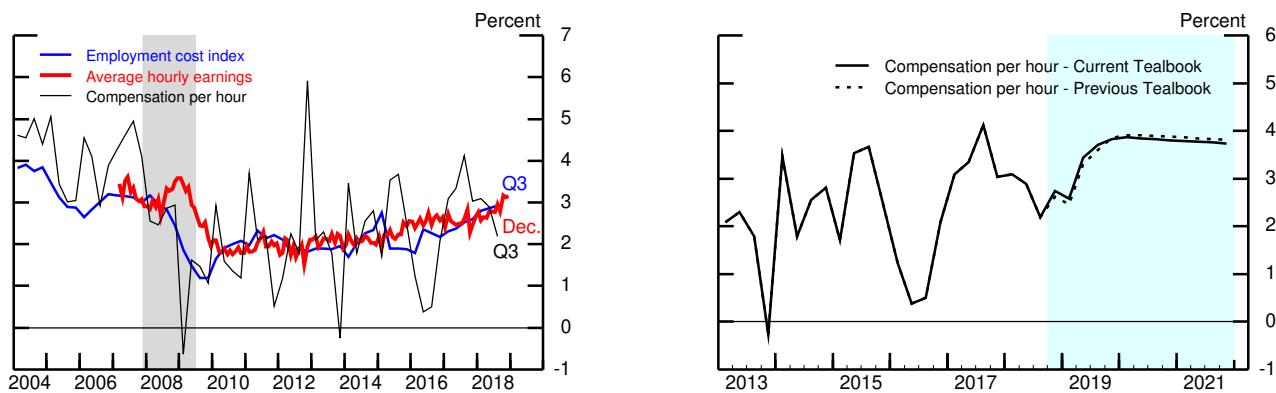
### Measures of Underlying PCE Price Inflation



Note: Core PCE prices from October to December 2018 are staff estimates (e).

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

### Labor Cost Growth



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

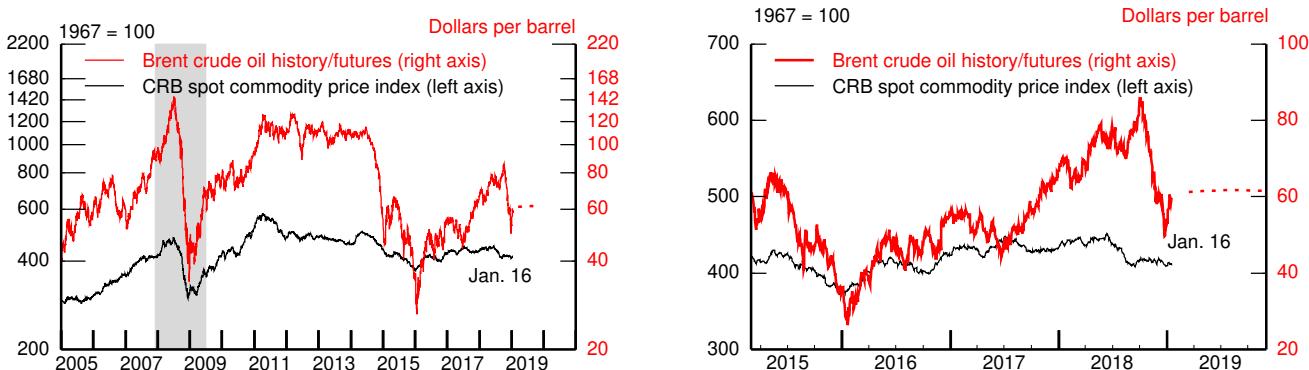
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

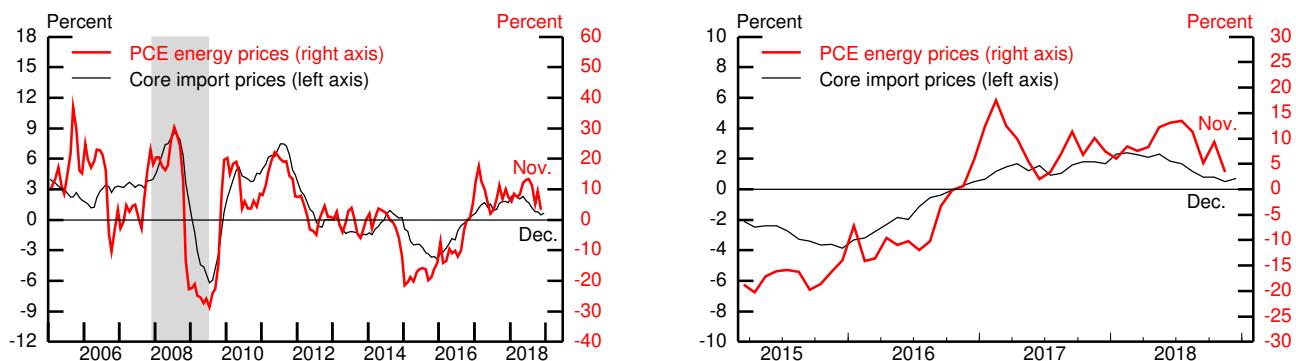
## Inflation Developments and Outlook (2)

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

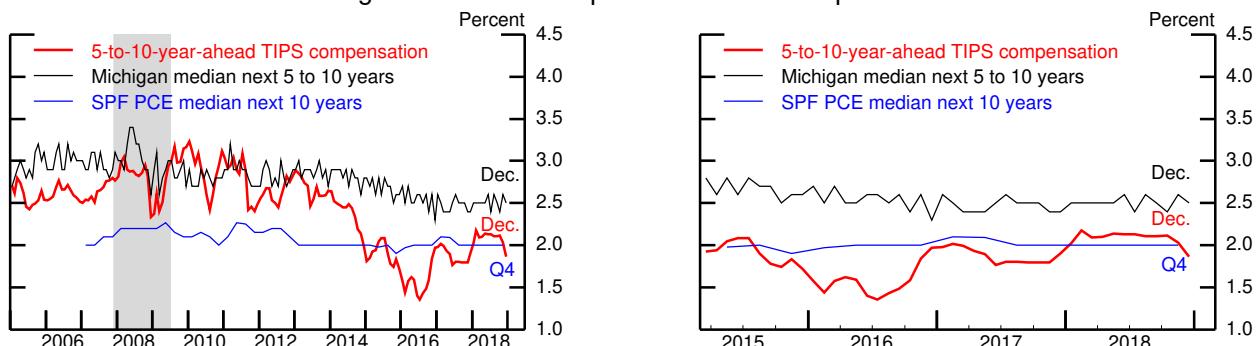
### Commodity and Oil Price Levels



### Energy and Import Price Inflation



### Long-Term Inflation Expectations and Compensation



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

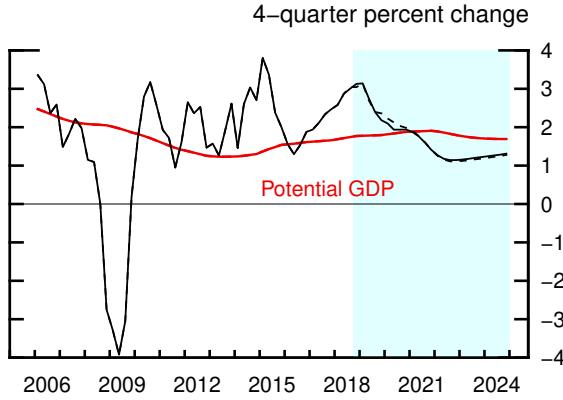
**The Long-Term Outlook**

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

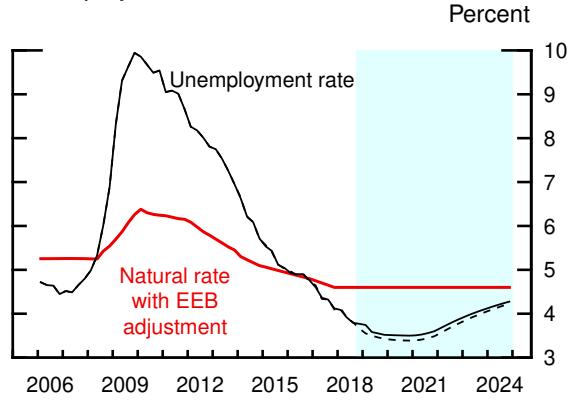
| Measure  | 2018         | 2019         | 2020         | 2021         | 2022         | 2023         | 2024         | Longer run   |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Real GDP<br>Previous Tealbook                                | 3.1<br>3.0   | 2.2<br>2.4   | 1.9<br>2.0   | 1.4<br>1.4   | 1.1<br>1.1   | 1.2<br>1.2   | 1.3<br>1.3   | 1.7<br>1.7   |
| Civilian unemployment rate <sup>1</sup><br>Previous Tealbook | 3.8<br>3.7   | 3.5<br>3.4   | 3.5<br>3.4   | 3.6<br>3.5   | 3.9<br>3.8   | 4.1<br>4.0   | 4.3<br>4.2   | 4.6<br>4.6   |
| PCE prices, total<br>Previous Tealbook                       | 1.8<br>1.8   | 1.8<br>1.8   | 1.9<br>2.0   | 2.0<br>2.0   | 2.0<br>2.0   | 2.1<br>2.1   | 2.1<br>2.1   | 2.0<br>2.0   |
| Core PCE prices<br>Previous Tealbook                         | 1.8<br>1.8   | 2.0<br>2.0   | 2.0<br>2.0   | 2.0<br>2.0   | 2.0<br>2.1   | 2.1<br>2.1   | 2.1<br>2.1   | 2.0<br>2.0   |
| Federal funds rate <sup>1</sup><br>Previous Tealbook         | 2.22<br>2.22 | 3.44<br>3.49 | 4.18<br>4.30 | 4.49<br>4.66 | 4.36<br>4.55 | 4.07<br>4.24 | 3.72<br>3.87 | 2.50<br>2.50 |
| 10-year Treasury yield <sup>1</sup><br>Previous Tealbook     | 3.0<br>3.1   | 3.6<br>3.8   | 3.9<br>4.1   | 4.0<br>4.1   | 3.9<br>4.0   | 3.7<br>3.8   | 3.6<br>3.7   | 3.4<br>3.4   |

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

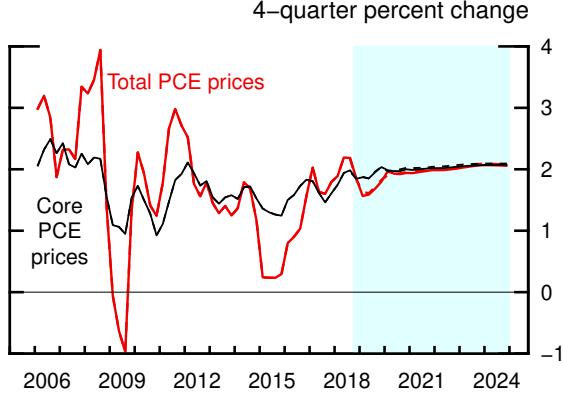
Real GDP



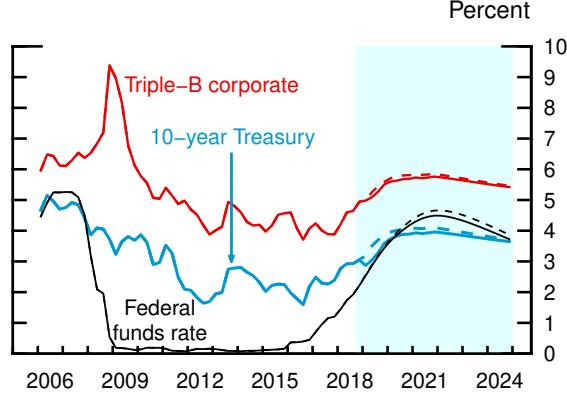
Unemployment Rate



PCE Prices



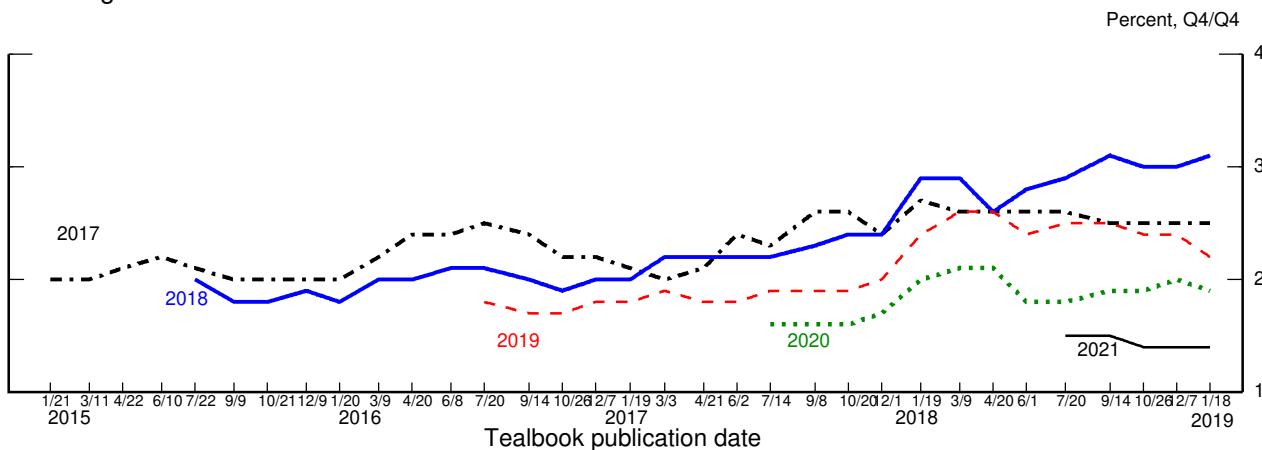
Interest Rates



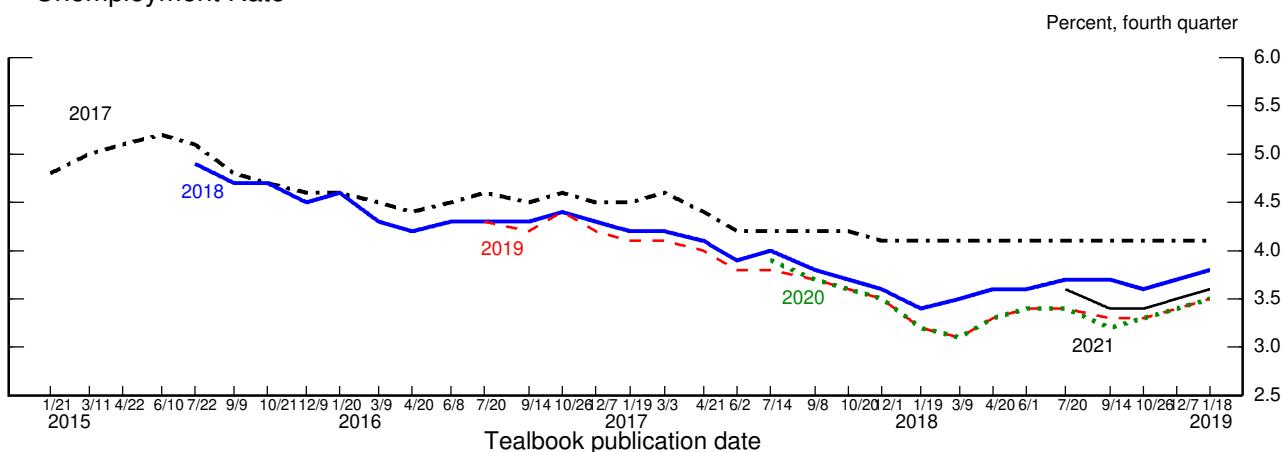
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

## Evolution of the Staff Forecast

Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy

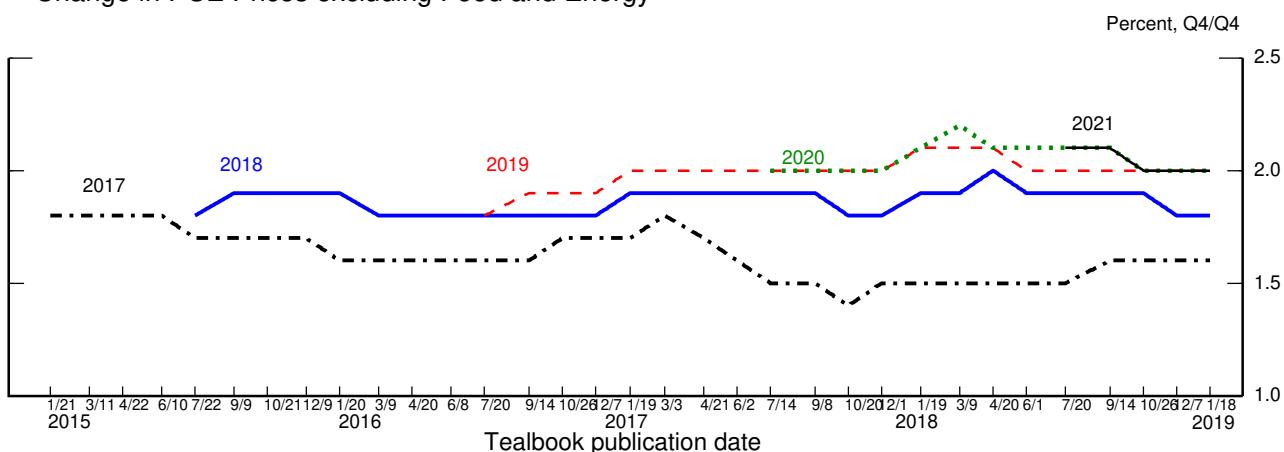


Table 1: Trade Policy Developments

|                              | United States  |             |                                    | China          |             |   |
|------------------------------|----------------|-------------|------------------------------------|----------------|-------------|---|
|                              | Effective date | Tariff rise | Imports from China affected (ppt.) | Effective date | Tariff rise | Imports from U.S. affected (\$ in billions) |
| <b>A. Implemented (2018)</b> |                |             |                                    |                |             |   |
| 1 Solar & wash. mach.        | 1/22           | 28          | 1.4                                | -              | -           | -   |
| 2 Steel and aluminum         | 3/23           | 25; 10      | 3.2                                | 4/2            | 15-25       | 3   |
| 3 Sec. 301: \$50 bn (part 1) | 7/6            | 25          | 34                                 | 7/6            | 25          | 34  |
| 3 Sec. 301: \$50 bn (part 2) | 8/23           | 25          | 16                                 | 8/23           | 25          | 16  |
| 4 Sec. 301: \$180 bn         | 9/24           | 10          | 180                                | 9/24           | 5-10        | 60  |
| <b>Total (1-4)</b>           |                | <b>13.4</b> | <b>234.6</b>                       |                | <b>15.5</b> | <b>113</b>                                  |
| <b>B. Proposed (2019)</b>    |                |             |                                    |                |             |   |
| 5 Sec. 301: \$180 bn         | 3/2            | 15          | 180                                | 3/2            | 10-15       | 60  |
| 6 Remaining \$275 bn         | TBD            | 10          | 275                                | TBD            | 10          | 17  |
| <b>Total (1-6)</b>           |                | <b>15.3</b> | <b>509.6</b>                       |                | <b>18.4</b> | <b>130</b>                                  |

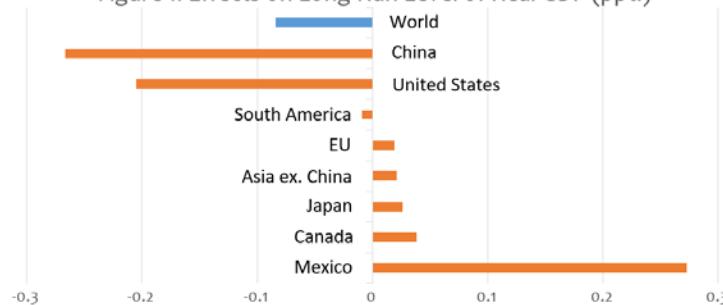
Note: The tariff increases are denoted in percentage points (ppt).

Source: Staff calculations.

Figure 1 shows the estimated effect of the totality of tariffs shown in table 1 (lines 1–6) on real GDP in the world, China, the United States, and other countries or regions. Our estimates suggest that a permanent increase in tariffs would reduce the long-run level of real world GDP by about 0.1 percentage point as global productivity declines. For China and the United States, the tariffs reduce the long-run level of real GDP by a modest 0.27 percentage point and 0.2 percentage point, respectively. Generally, we find negligible spillover effects to other countries. For most countries, the positive spillover effect of U.S. import diversion is diminished by the negative spillover effect from lower Chinese demand. However, Mexico gains as U.S. import demand is diverted from China, thereby pushing resources into the relatively more-productive sectors.

All told, the model suggests a limited long-run imprint from an increase in trade barriers between the United States and China. As such, this analysis suggests that the current heightened concerns regarding the potential economic effects of a trade war are likely related to fears of temporary disruptions (for example, confidence effects, supply chain disruptions, financial market volatility) or other long-run factors that are not captured in our model, such as reduced innovation from less competition or technology effects. As such, we view these estimates as a likely lower bound.<sup>3</sup>

Figure 1: Effects on Long-Run Level of Real GDP (ppt.)



Note: The effects on long-run GDP are denoted in percentage points (ppt).

Source: Staff calculations.

<sup>3</sup> The small long-run effect of tariffs discussed here contrasts with the large negative estimated effects of Brexit on long-run GDP in the United Kingdom, which are between 5 and 10 percent of GDP. The larger estimated effect of Brexit can largely be attributed to the greater importance of the EU for U.K. trade and to increased nontariff barriers as a result of leaving the EU.

## The Foreign GDP Outlook

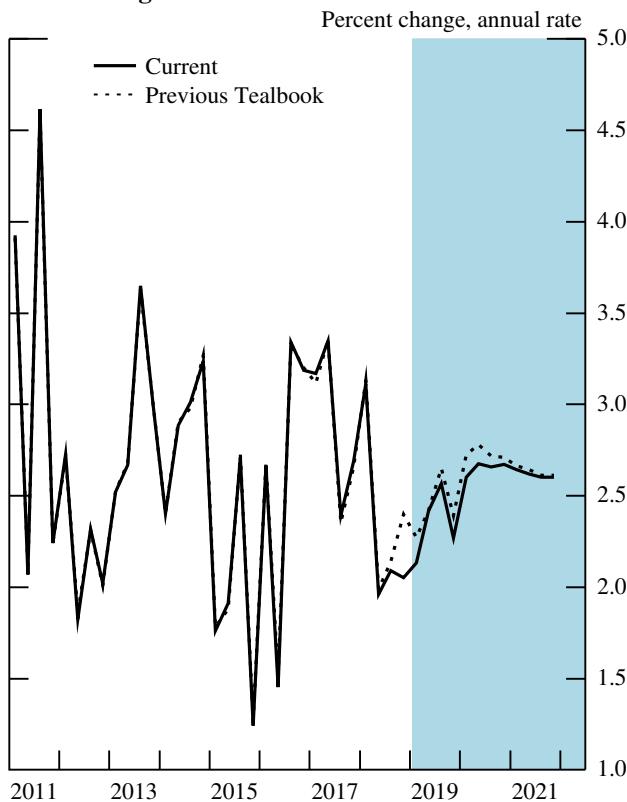
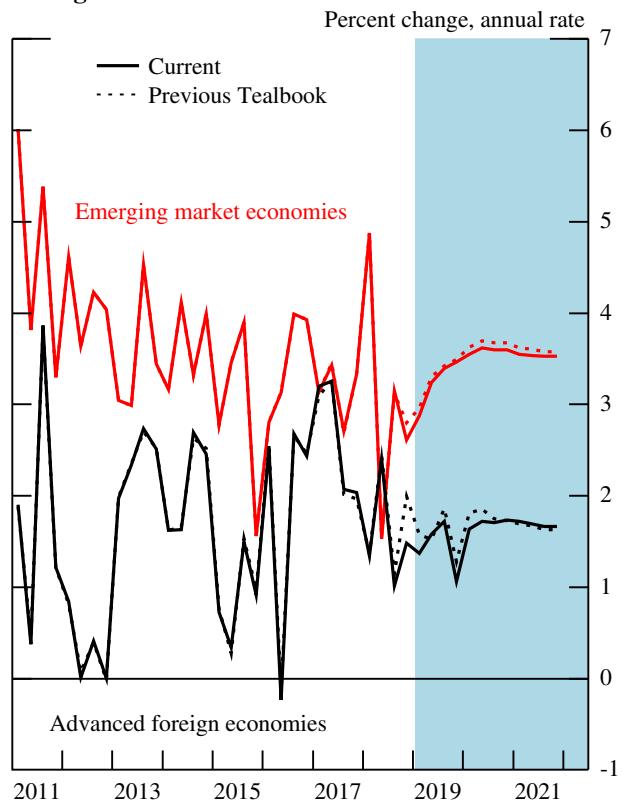
Real GDP\*

Percent change, annual rate

|                               | 2018 |      |     | 2019 |     |     | 2020 | 2021 |
|-------------------------------|------|------|-----|------|-----|-----|------|------|
|                               | H1   | Q3   | Q4  | Q1   | Q2  | H2  |      |      |
| 1. Total Foreign              | 2.5  | 2.1  | 2.1 | 2.1  | 2.4 | 2.4 | 2.7  | 2.6  |
| Previous Tealbook             | 2.6  | 2.1  | 2.4 | 2.3  | 2.4 | 2.5 | 2.7  | 2.6  |
| 2. Advanced Foreign Economies | 1.9  | 1.0  | 1.5 | 1.4  | 1.6 | 1.4 | 1.7  | 1.7  |
| Previous Tealbook             | 1.9  | 1.1  | 2.0 | 1.6  | 1.5 | 1.6 | 1.8  | 1.7  |
| 3. Canada                     | 2.3  | 2.0  | 1.8 | 1.0  | 2.0 | 1.7 | 1.9  | 1.7  |
| 4. Euro Area                  | 1.6  | .6   | .8  | 1.8  | 1.2 | 1.2 | 1.5  | 1.7  |
| 5. Japan                      | .7   | -2.5 | 2.3 | 1.0  | .8  | -.5 | .9   | .8   |
| 6. United Kingdom             | 1.0  | 2.5  | 1.1 | 1.1  | 1.5 | 1.9 | 1.9  | 1.7  |
| 7. Emerging Market Economies  | 3.2  | 3.2  | 2.6 | 2.9  | 3.2 | 3.4 | 3.6  | 3.5  |
| Previous Tealbook             | 3.2  | 3.1  | 2.8 | 3.0  | 3.3 | 3.5 | 3.7  | 3.6  |
| 8. China                      | 6.8  | 5.9  | 5.8 | 5.9  | 6.2 | 6.3 | 5.9  | 5.7  |
| 9. Emerging Asia ex. China    | 4.1  | 2.4  | 3.3 | 3.3  | 3.3 | 3.4 | 3.4  | 3.3  |
| 10. Mexico                    | 1.9  | 3.4  | 1.5 | 1.5  | 2.0 | 2.4 | 2.8  | 2.9  |
| 11. Brazil                    | .7   | 3.1  | .8  | 2.2  | 2.5 | 2.7 | 2.8  | 2.8  |

\* 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

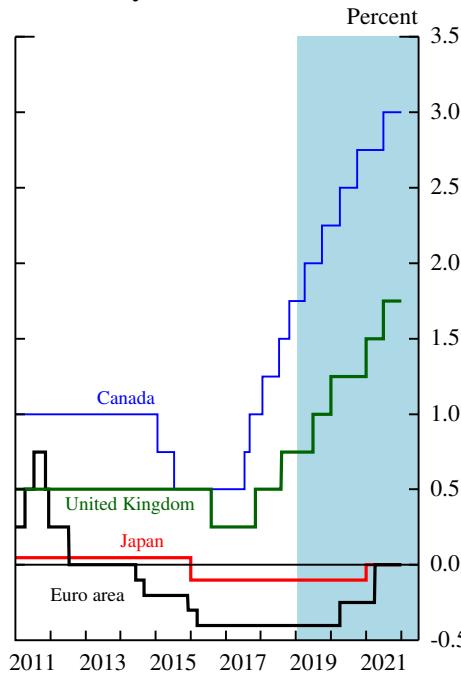
|  | 2018 |     |     | 2019 |     |     | 2020 | 2021 |
|--|------|-----|-----|------|-----|-----|------|------|
|  | H1   | Q3  | Q4  | Q1   | Q2  | H2  |      |      |
| 1. Total Foreign<br>Previous Tealbook              | 2.2  | 3.7 | 2.2 | 2.0  | 2.3 | 2.5 | 2.3  | 2.3  |
|  | 2.2  | 3.7 | 2.8 | 2.0  | 2.3 | 2.5 | 2.4  | 2.4  |
| 2. Advanced Foreign Economies<br>Previous Tealbook | 1.8  | 2.5 | .9  | 1.0  | 1.3 | 1.9 | 1.5  | 1.6  |
|  | 1.8  | 2.5 | 1.6 | .7   | 1.3 | 2.0 | 1.6  | 1.7  |
| 3. Canada  | 2.3  | 2.6 | 1.0 | 2.0  | 2.0 | 2.0 | 2.0  | 2.0  |
| 4. Euro Area                                       | 2.1  | 2.6 | .9  | .7   | 1.0 | 1.2 | 1.3  | 1.4  |
| 5. Japan   | .1   | 2.7 | .4  | -.3  | .6  | 3.6 | .9   | 1.1  |
| 6. United Kingdom                                  | 2.2  | 2.9 | 1.9 | 1.4  | 2.0 | 2.3 | 2.3  | 2.2  |
| 7. Emerging Market Economies<br>Previous Tealbook  | 2.4  | 4.6 | 3.2 | 2.7  | 3.0 | 2.9 | 2.9  | 2.9  |
|  | 2.4  | 4.6 | 3.7 | 3.0  | 3.0 | 2.9 | 2.9  | 2.9  |
| 8. China   | 1.1  | 4.1 | 2.4 | 1.6  | 2.1 | 2.1 | 2.5  | 2.5  |
| 9. Emerging Asia ex. China                         | 1.8  | 1.6 | 1.3 | 1.3  | 2.6 | 2.7 | 2.8  | 2.8  |
| 10. Mexico   | 3.9  | 6.8 | 4.6 | 4.3  | 3.5 | 3.3 | 3.2  | 3.2  |
| 11. Brazil   | 3.7  | 6.6 | 2.6 | 3.1  | 4.3 | 4.3 | 4.3  | 4.3  |

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

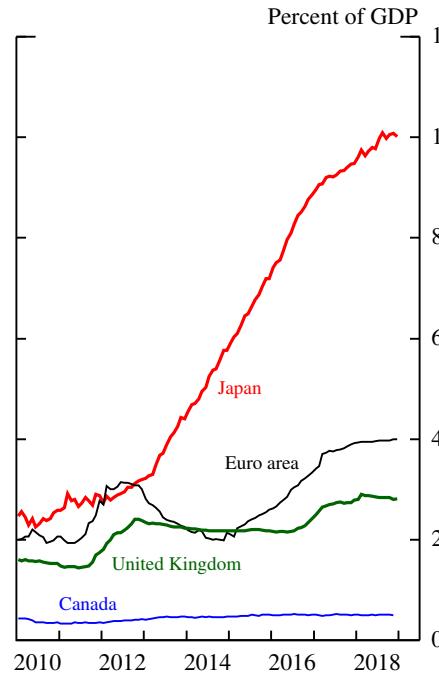
Int'l Econ Devel &amp; Outlook

## Foreign Monetary Policy

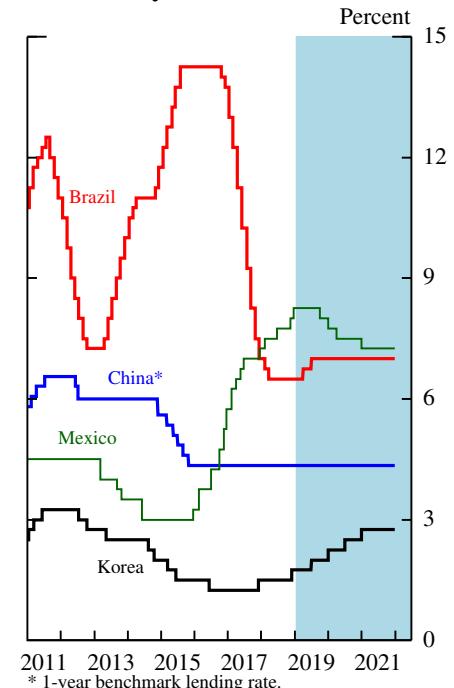
### AFE Policy Rates



### AFE Central Bank Balance Sheets

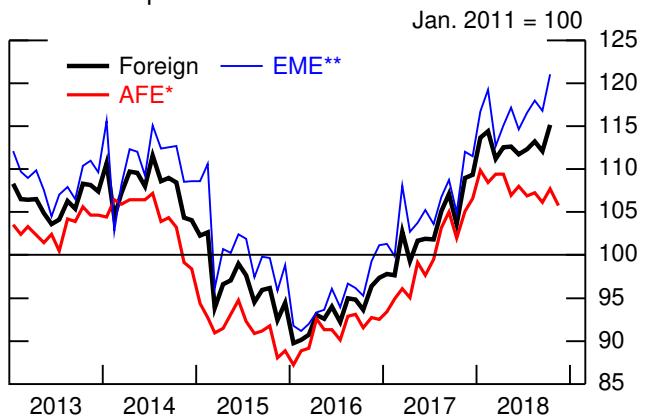
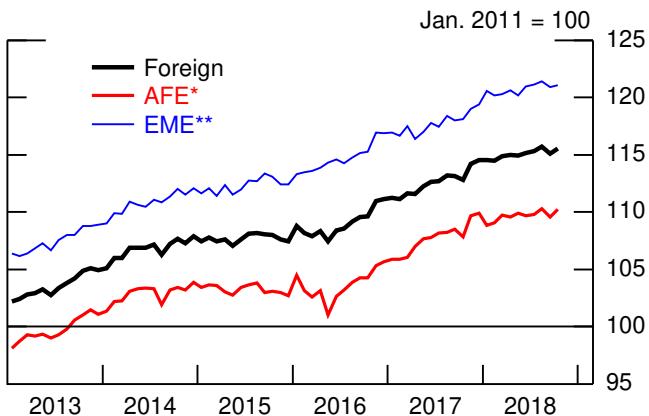
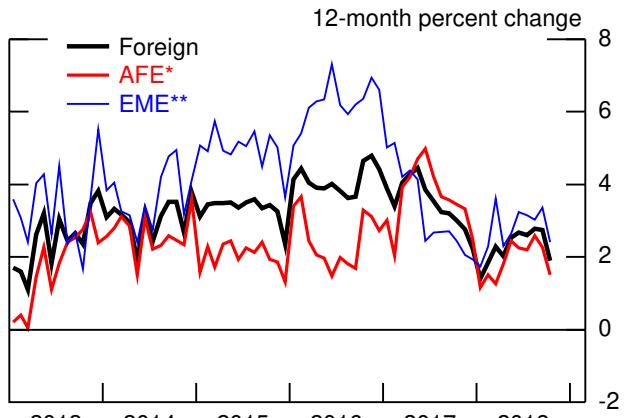
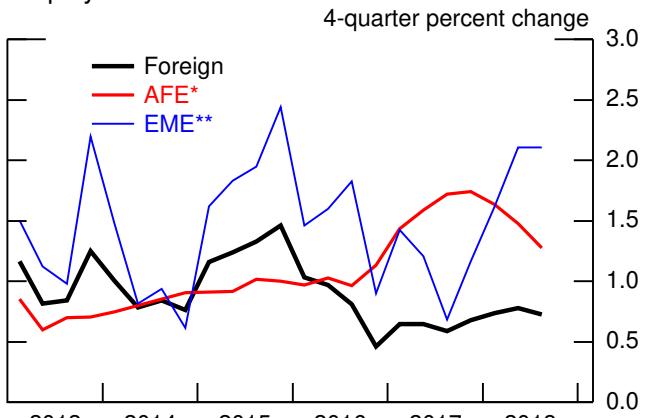
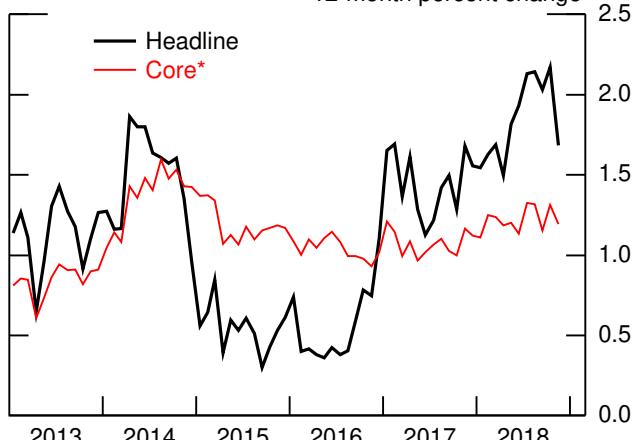
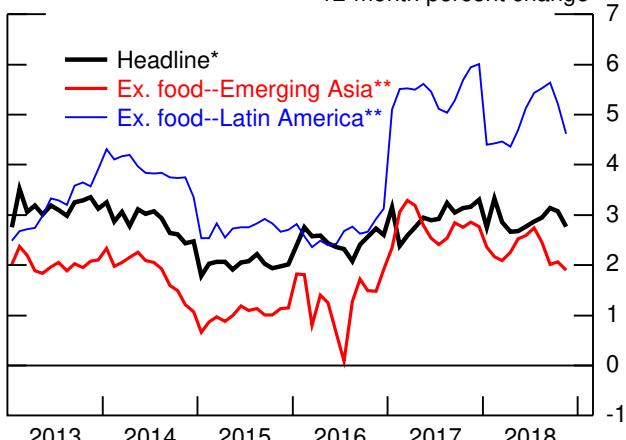


### EME Policy Rates



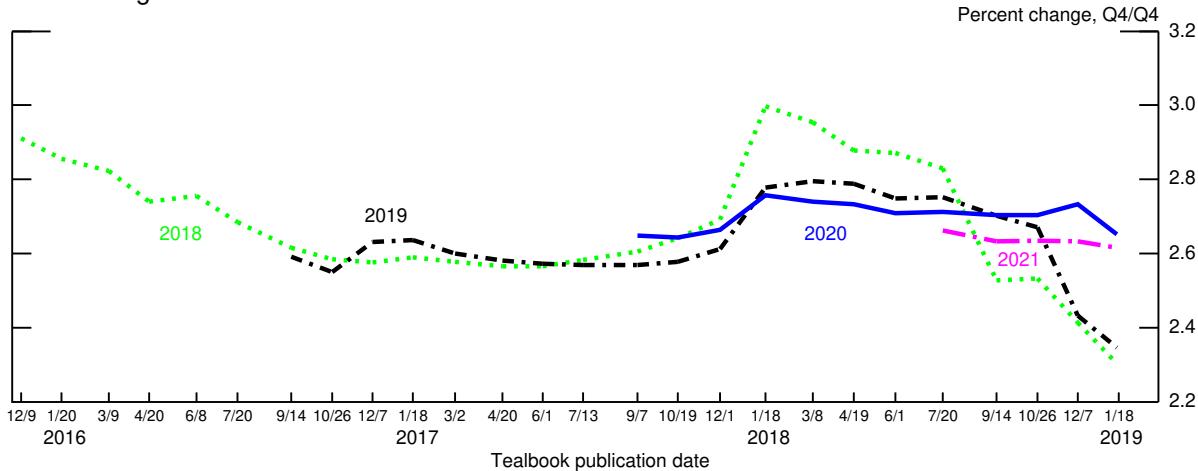
## Recent Foreign Indicators

Int'l Econ Devel &amp; Outlook

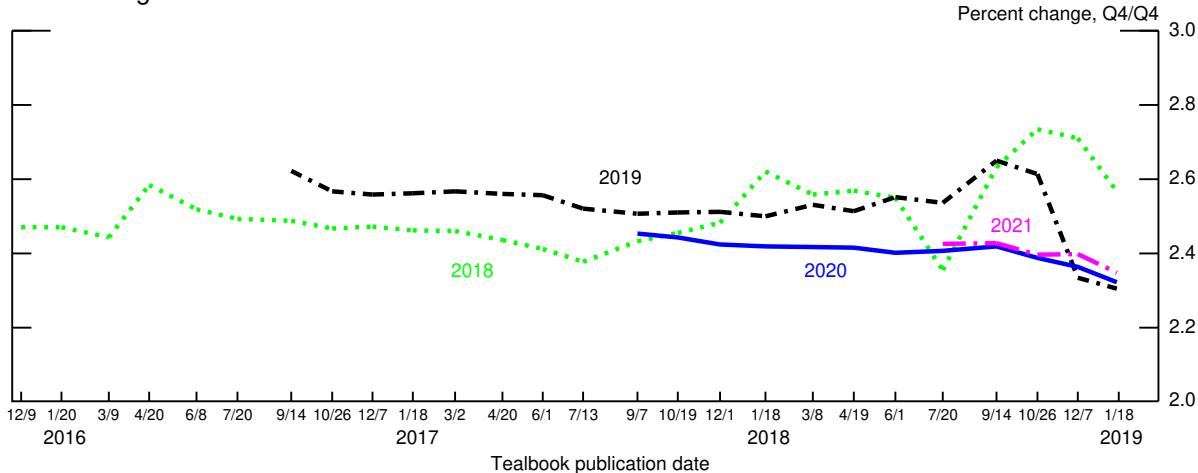
**Nominal Exports****Industrial Production****Retail Sales****Employment****Consumer Prices: Advanced Foreign Economies****Consumer Prices: Emerging Market Economies**

**Evolution of Staff's International Forecast**

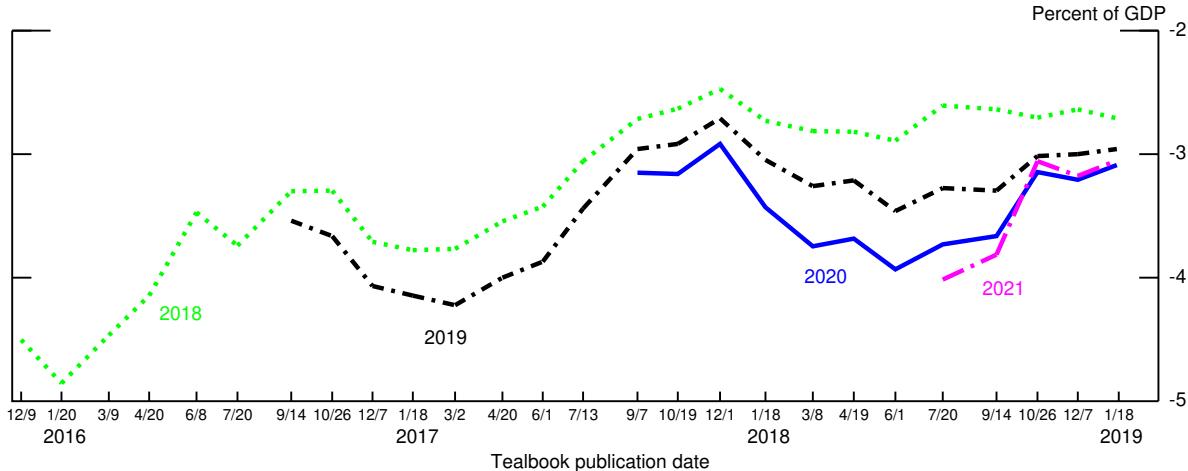
Total Foreign GDP



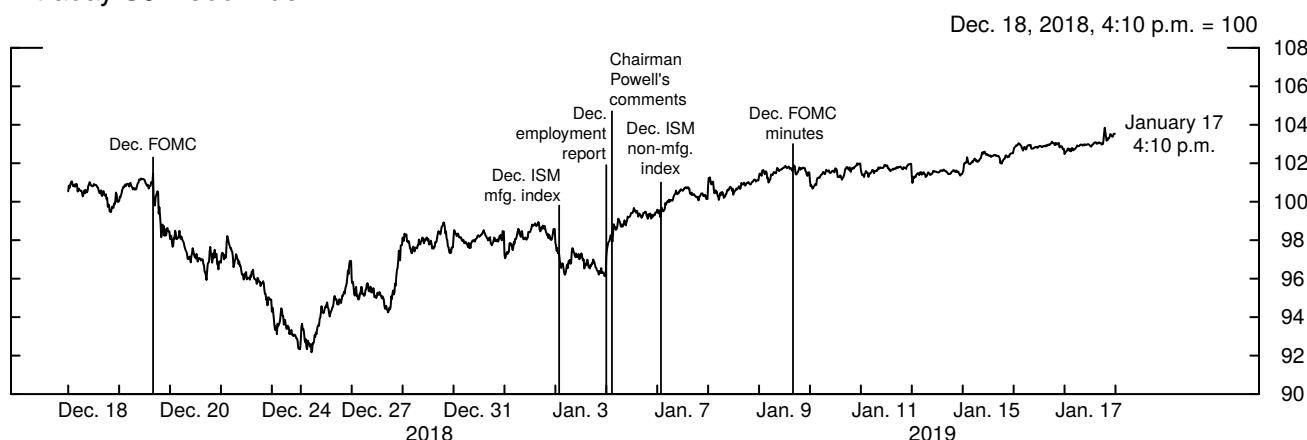
Total Foreign CPI



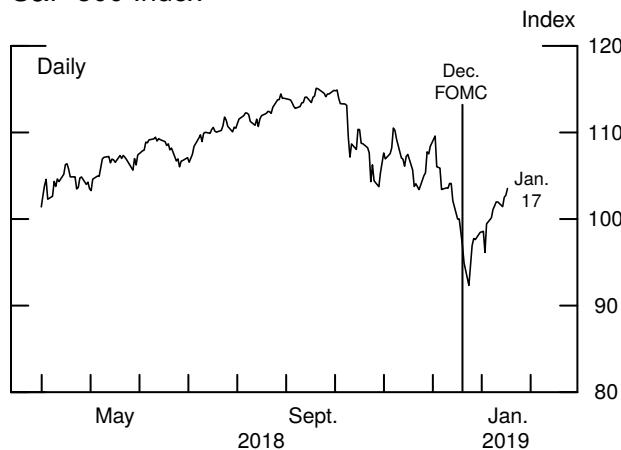
U.S. Current Account Balance



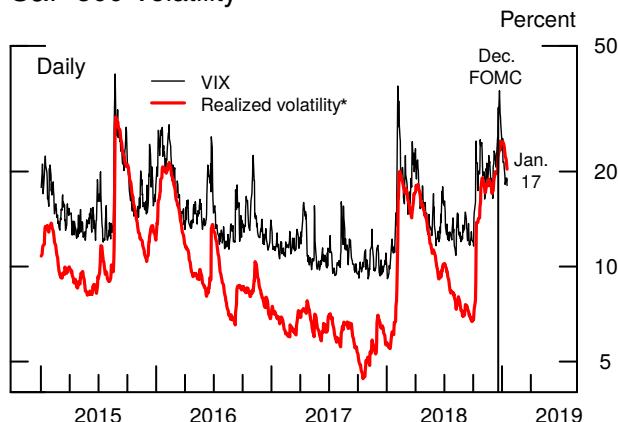
Int'l Econ Devel &amp; Outlook

**Corporate Asset Market Developments****Intraday S&P 500 Index**

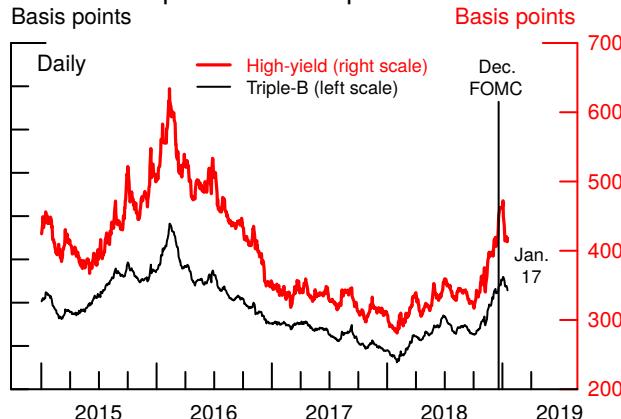
Note: Data are for 2018 and 2019; data are spaced at 5-minute intervals from 9:30 a.m. to 4:10 p.m.  
Source: Bloomberg.

**S&P 500 Index**

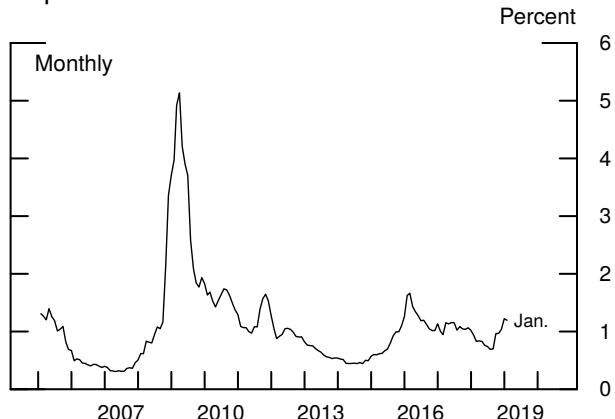
Source: Bloomberg.

**S&P 500 Volatility**

\* 5-minute returns used in exponentially weighted moving average with 75 percent of weight distributed over the most recent 20 days.  
Source: Bloomberg.

**10-Year Corporate Bond Spreads**

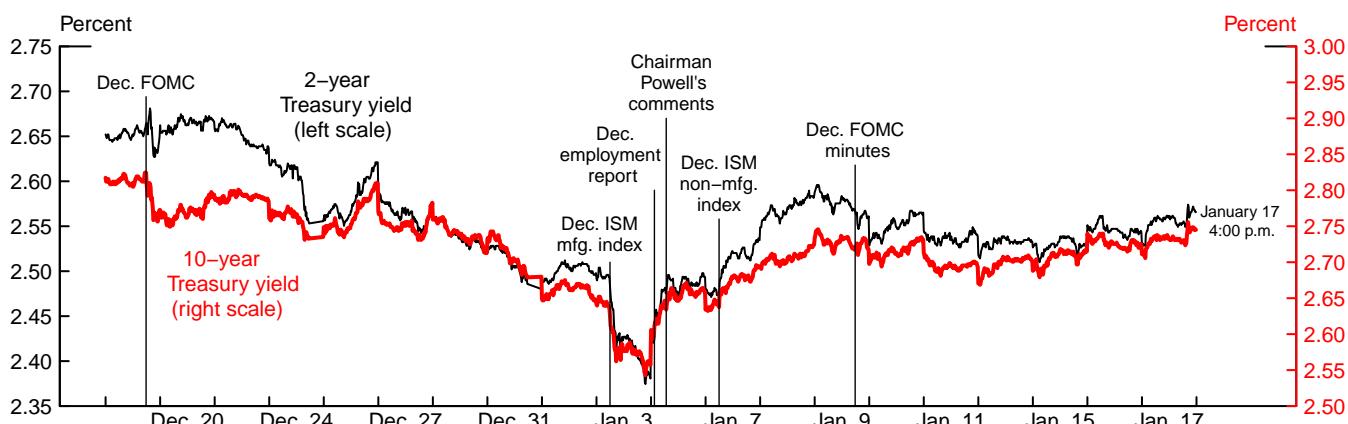
Note: Spreads over 10-year Treasury yield.  
Source: Merrill Lynch; Federal Reserve Bank of New York; Board staff calculations.

**Expected Nonfinancial Year-Ahead Defaults**

Note: Firm-level estimates of default weighted by firm liabilities as a percent of total liabilities, excluding defaulted firms. The January value is the monthly average to date.  
Source: Moody's KMV; Board staff calculations.

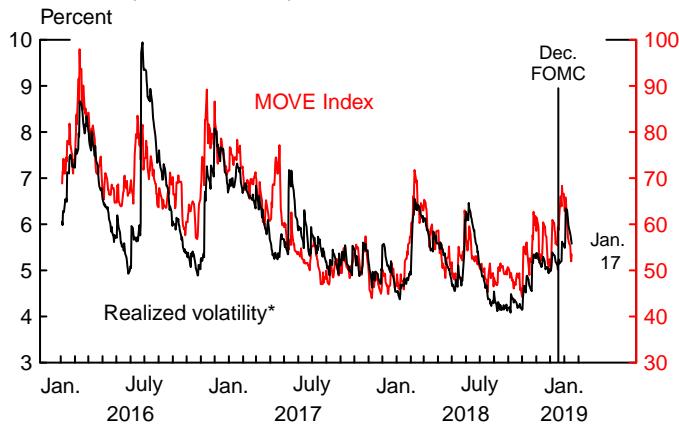
## Policy Expectations and Treasury Yields

### Selected Interest Rates



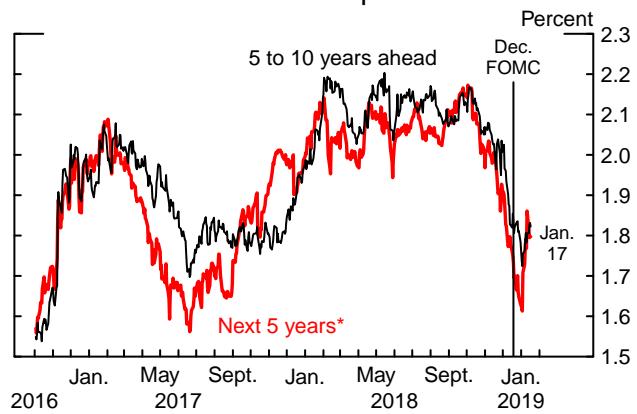
Note: 5-minute intervals, 8:00 a.m. to 4:00 p.m. Data shown are for 2018 and 2019.  
Source: Bloomberg.

### Volatility of Treasury Yields



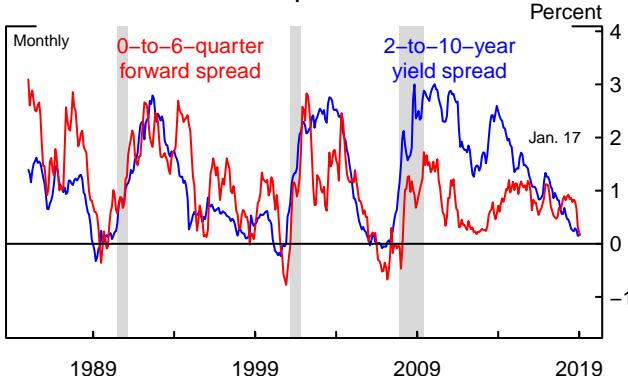
\* 5-minute returns used in exponentially weighted moving average with 75 percent of weight distributed over the most recent 20 days.  
Source: Bloomberg; Board staff calculations.

### TIPS-Based Inflation Compensation



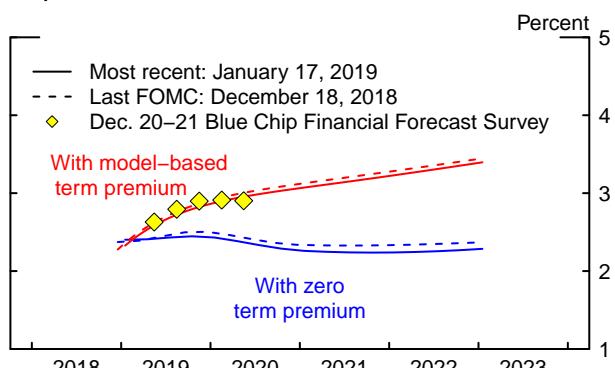
Note: Estimates based on smoothed nominal and inflation-indexed Treasury yield curves.  
\* Adjusted for lagged indexation of Treasury Inflation-Protected Securities (carry effect).  
Source: Federal Reserve Bank of New York; Board staff calculations.

### Long-Term Yield Spread and Near-Term Forward Spread



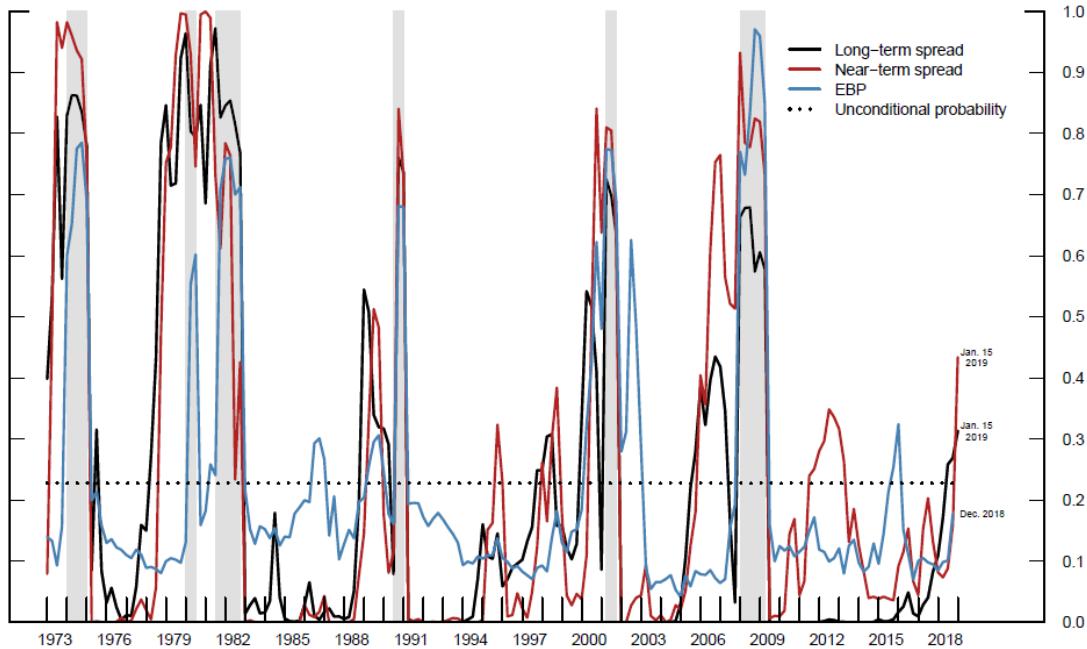
Note: The 0-to-6-quarter forward spread is the difference between the 3-month yield and the implied forward rate between 6 and 7 quarters ahead based on a smoothed Treasury yield curve. Data through December 2018 are monthly averages. Data for January 2019 based on values for January 17. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.  
Source: Federal Reserve Bank of New York; Board staff calculations.

### Implied Federal Funds Rate



Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points. Model-based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premium. The Blue Chip path is the average of respondents' expectations for the federal funds rate in the survey taken December 20 and 21.  
Source: Bloomberg; Wolters Kluwer Legal and Regulatory Solutions U.S., Blue Chip Financial Forecasts; Board staff calculations.

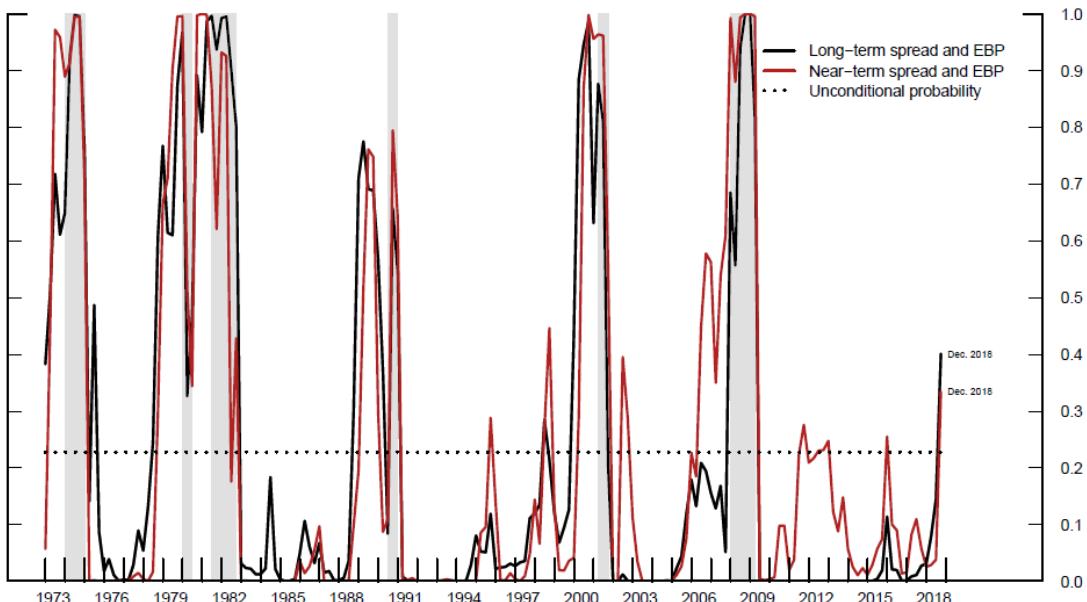
Figure 1: Conditional Probability of Recession Over the Next 4 Quarters



Note: These lines depict the conditional probability of transitioning into or remaining in a recession at some point over the next 4 quarters as estimated by three probit models, using as independent variables the long-term spread, the near-term spread, and EBP. The long-term spread is the difference between the 10-year and 2-year Treasury yield. The near-term spread is the difference between 5-quarter-ahead and 1-quarter-ahead forward Treasury rates. EBP is the excess bond premium of Gilchrist and Zakrajsek (2012). The dotted black line denotes the unconditional probability of being in a recession at some point in the next 4 quarters. The conditional probabilities are estimated using average quarterly values from 1973:Q1 to 2018:Q4. For estimating the models using the term spreads as independent variables, the observations occurring at the effective lower bound are excluded from the sample. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.

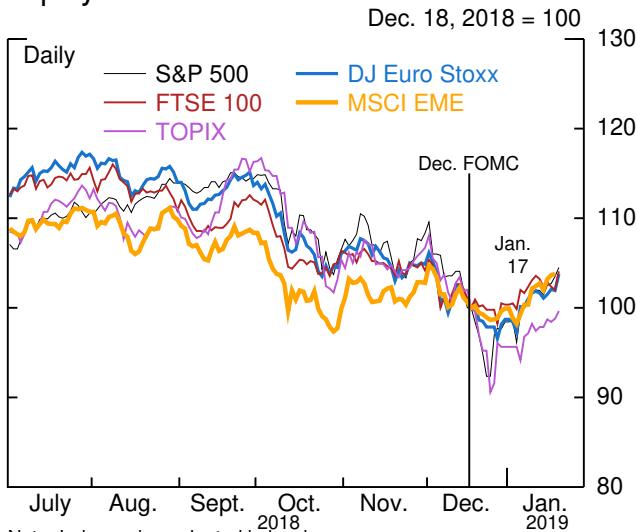
Source: Federal Reserve staff estimates.

Figure 2: Conditional Probability of Recession Over the Next 4 Quarters

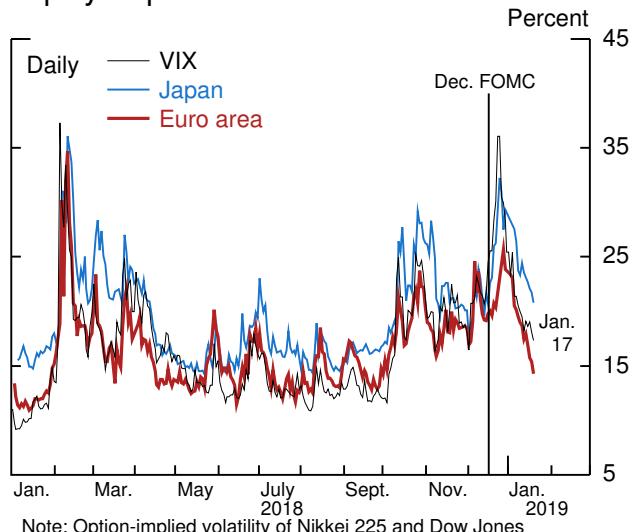


Note: This chart depicts the conditional probability of transitioning into or remaining in a recession at some point over the next 4 quarters as estimated by probit models using two sets of independent variables: the long-term spread and EBP, and the near-term spread and EBP. The long-term spread is the difference between the 10-year and 2-year Treasury yield. The near-term spread is the difference between 5-quarter-ahead and 1-quarter-ahead forward Treasury rates. EBP is the excess bond premium of Gilchrist and Zakrajsek (2012). The dotted black line denotes the unconditional probability of being in a recession at some point in the next 4 quarters. The conditional probability is estimated using average quarterly values from 1973:Q1 to 2018:Q3 and December 2018 data. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.

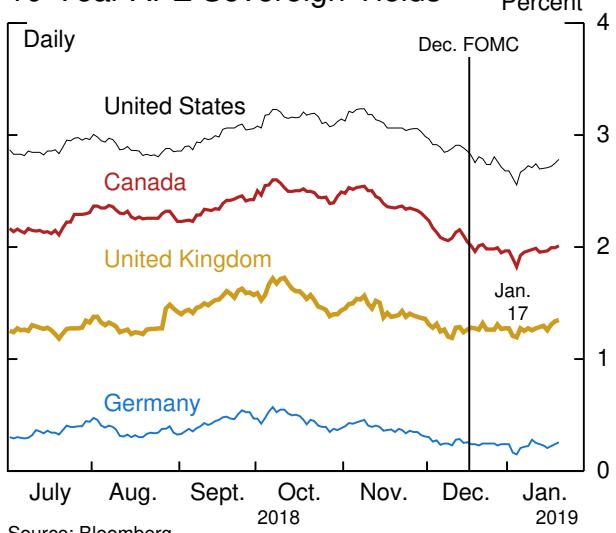
Source: Federal Reserve staff estimates.

**Equity Indexes**

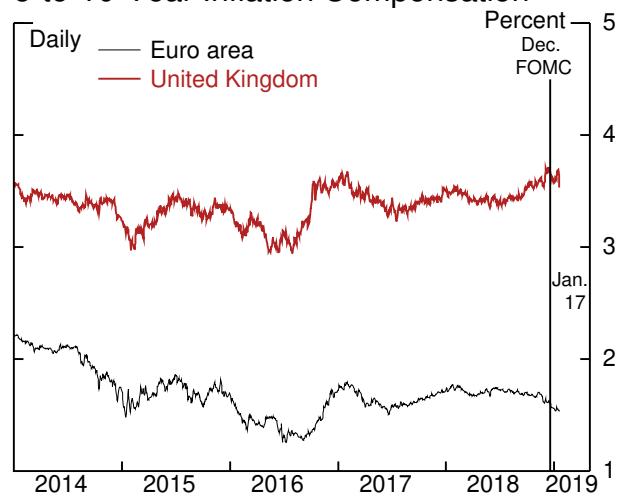
Note: Indexes denominated in local currency.  
Source: Bloomberg.

**Equity-Implied Volatilities**

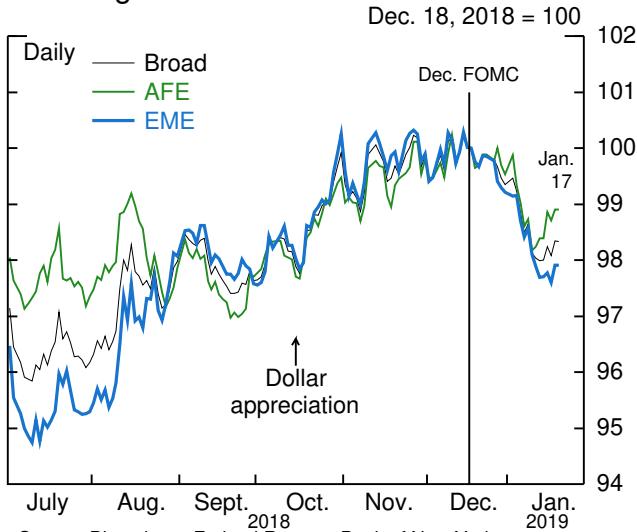
Note: Option-implied volatility of Nikkei 225 and Dow Jones Euro STOXX 50 are shown for Japan and euro area, respectively.  
Source: Bloomberg.

**10-Year AFE Sovereign Yields**

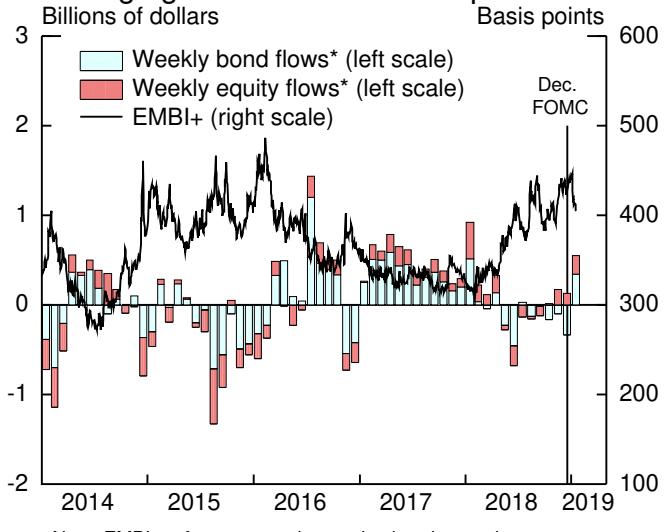
Source: Bloomberg.

**5-to-10-Year Inflation Compensation**

Note: U.K. inflation compensation refers to the Retail Price Index, which partly accounts for the higher level of the series relative to the euro area.  
Source: Bloomberg.

**Exchange rates**

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

**Emerging Market Flows and Spreads**

Note: EMBI+ refers to emerging market bond spreads to Treasury securities.

\* Average weekly flow by month.

Source: Emerging Portfolio Fund Research. Excludes intra-China flows.

## The Decline in Longer-Horizon Inflation Compensation

Yields on longer-term nominal Treasury securities have declined appreciably since the September 2018 FOMC, with most of the decline in nominal yields attributable to a decline in inflation compensation as yields on Treasury Inflation-Protected Securities (TIPS) have been relatively little changed over this period. In particular, 5-to-10-year-forward inflation compensation fell from an annual rate of around 2.1 percent in late September to 1.8 percent in mid-January (the red line in figure 1).

Although the decline in inflation compensation could indicate that market participants' inflation expectations have moved lower, it also may reflect reductions in the inflation risk premium and in "other" risk premiums. Other risk premiums tend to fall with the relative illiquidity of TIPS as well as with increased investor demand for nominal relative to inflation-indexed securities—for example, when investors pile into nominal Treasury securities during times of market stress. According to the staff's term structure models, 5-to-10-year inflation expectations have remained little changed since September 2018. Instead, a reduction in the inflation risk premium and in other risk premiums accounts for most of the decline in longer-horizon inflation compensation over this period.

Information about longer-run inflation expectations can be also obtained from survey forecasts. As shown in figure 1, measures of inflation expectations 5 to 10 years ahead based on the Desk's Survey of Primary Dealers, the Blue Chip Financial Forecasts survey, and the Survey of Professional Forecasters were little changed, on net, over the past few months. Similarly, the probability distribution of longer-run inflation from the Desk's surveys has also remained relatively stable (not shown). In particular, survey respondents have not materially changed the odds that they attach to either low or high inflation outcomes.

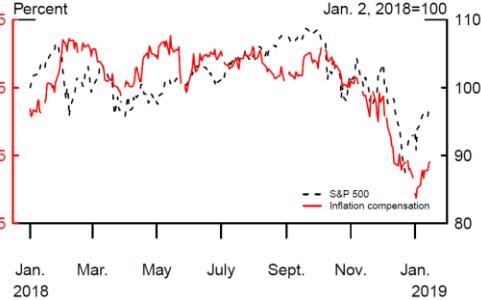
Some additional support for the decline in risk premiums can be found in the strong co-movement of inflation compensation with equity prices since last September, as both declined sharply throughout the last quarter of 2018 (figure 2). The recent episode of deteriorating risk sentiment that pushed equity prices down likely weighed on inflation compensation through two channels. First, increased perceptions of downside risks to the growth outlook coupled with a lack of upward inflationary pressures may have led investors to become more concerned about scenarios in which both growth and inflation are low, leading to a decline in the inflation risk premium. Second, safe-haven flows into

**Figure 1: Inflation Compensation and Survey Measures of Longer-Term Inflation Expectations**



Note: Blue Chip figures are from Blue Chip Financial Forecasts.  
Source: Blue Chip; Federal Reserve Bank of New York.

**Figure 2: 5-to-10-Year Inflation Compensation and the S&P 500 Index**

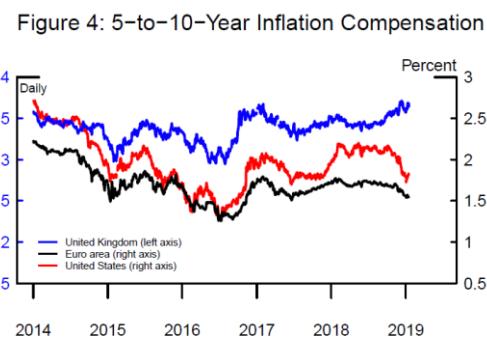
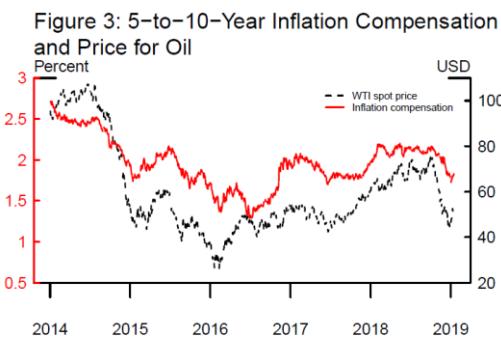


Source: Barclays and Bloomberg.

nominal Treasury securities likely pushed down nominal Treasury yields and inflation compensation through a decline in other risk premiums.<sup>1</sup>

The current episode differs a bit from the declines in inflation compensation in the second half of 2014, when declines in inflation expectations seemed to play somewhat more of a role. In both the current and the 2014 episode, market participants associated the decline in inflation compensation with a plunge in oil prices (figure 3). Although it remains unclear what specific mechanism links long-horizon inflation compensation with oil prices, market participants noted that in both episodes the oil price declines could be partly signaling weaker global demand and weaker risk sentiment, and these factors might also be showing through to lower inflation risk and other risk premiums.<sup>2</sup> However, the most recent episode has not witnessed a global drop in inflation compensation, while disinflationary pressures from abroad likely weighed on domestic inflation expectations in the 2014 episode as the fall in U.S. inflation compensation mirrored the declines in euro-area and U.K. inflation compensation (figure 4). Consistent with these observations, the staff's term structure model attributed about half of the decline in longer-horizon inflation compensation during the second-half of 2014 to lower inflation expectations and inflation risk premium, while during the most recent episode the model estimates suggest that inflation expectations remained little changed.

On balance, the staff's term structure model, the evidence from surveys of investors, professional forecasters, and economists, and the shifts in investor risk sentiment over the past months suggest that lower inflation risk premiums and other risk premiums—rather than declines in inflation expectations—account for a bulk of the decline in longer-horizon inflation compensation since last September. However, deducing sources of changes in inflation compensation is sensitive to modeling assumptions, and one cannot rule out that inflation expectations among market participants have edged down some over the past few months.

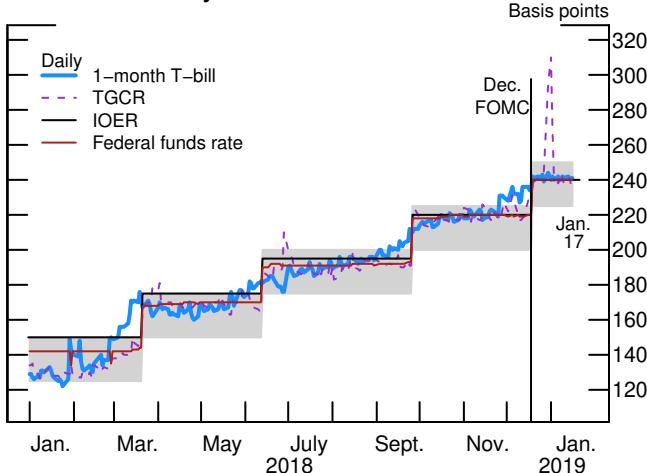


<sup>1</sup> For a discussion of the inflation risk premium and other risk premiums, see, for example, Andrew Chen, Eric Engstrom, and Olesya Grishchenko (2016), “Has the Inflation Risk Premium Fallen? Is it Now Negative?” FEDS Notes (Washington: Board of Governors of the Reserve System, April 4), <https://www.federalreserve.gov/econresdata/notes/feds-notes/2016/has-the-inflation-risk-premium-fallen-is-it-now-negative-20160404.html>; and Stefania D'Amico, Don Kim, and Min Wei (2018), “Tips from TIPS: The Informational Content of Treasury Inflation-Protected Security Prices,” *Journal of Financial and Quantitative Analysis*, vol. 53 (February), pp. 395–436.

<sup>2</sup> In both the 2014 and the current episode, market participants attributed a substantial part of oil price declines to supply factors.

## Short-Term Funding Markets

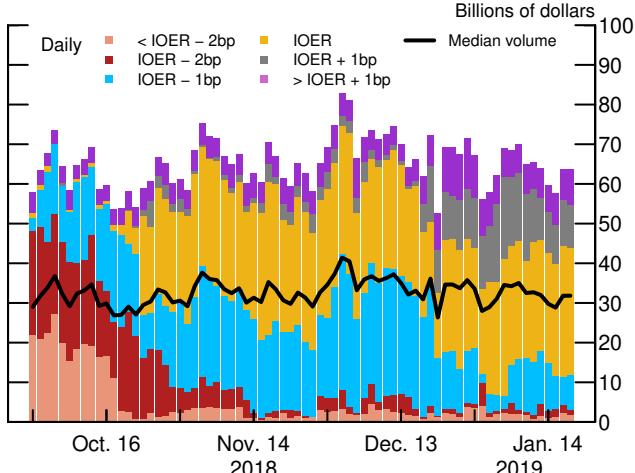
### Selected Money Market Rates



Note: Federal funds rate is a weighted median. Shaded area is the target range for the federal funds rate. IOER is interest on excess reserves. TGCR is triparty general collateral rate.

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

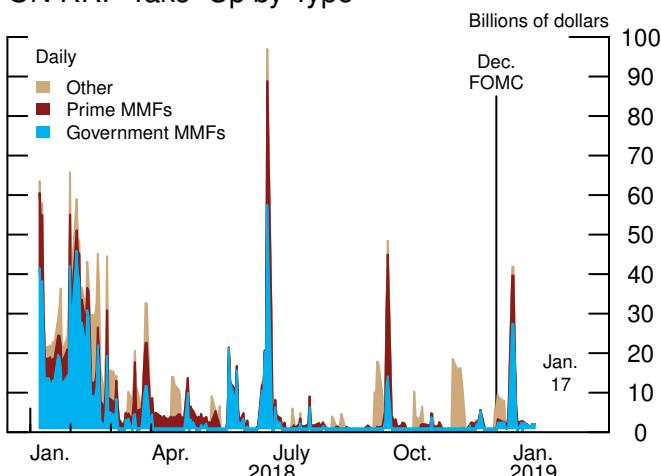
### Distribution of Fed Funds Rate across Trades



Note: IOER is interest on excess reserves.

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

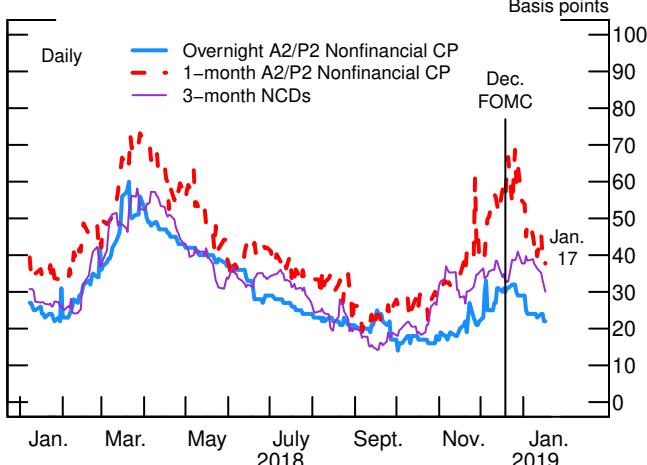
### ON RRP Take-Up by Type



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

Source: Federal Reserve Bank of New York.

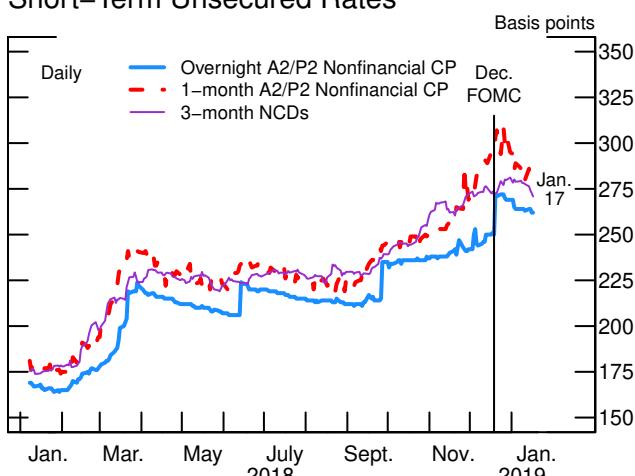
### Short-Term Unsecured Rates



Note: Overnight spreads are to the effective federal funds rate while 1-month and 3-month spreads are to overnight index swap rates. NCD (negotiable certificate of deposit) spreads are computed as a 5-day moving average. CP is commercial paper.

Source: Depository Trust & Clearing Corporation.

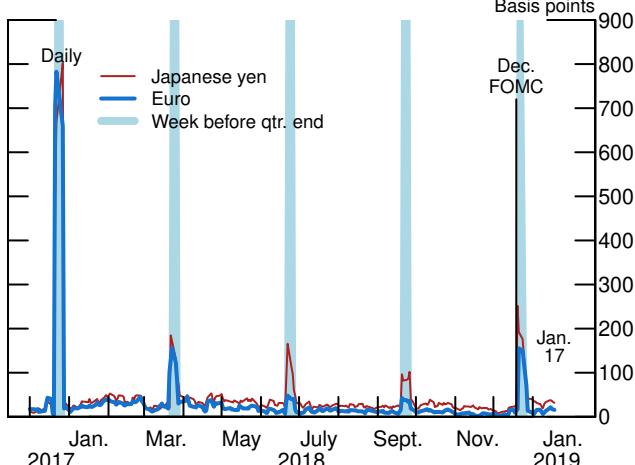
### Short-Term Unsecured Rates



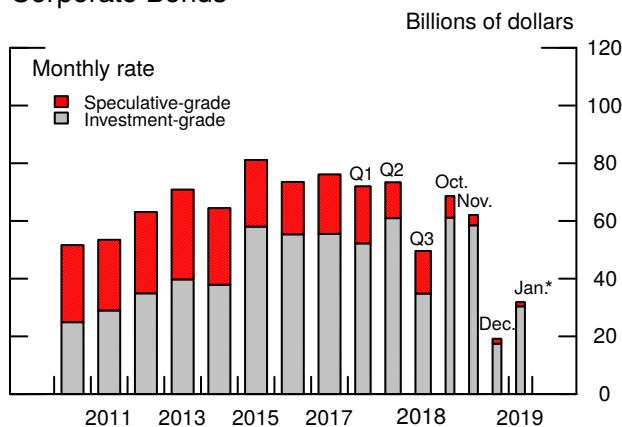
Note: NCD (negotiable certificate of deposit) yields are computed as a 5-day moving average. CP is commercial paper.

Source: Depository Trust & Clearing Corporation.

### One-Week FX Swap Bases

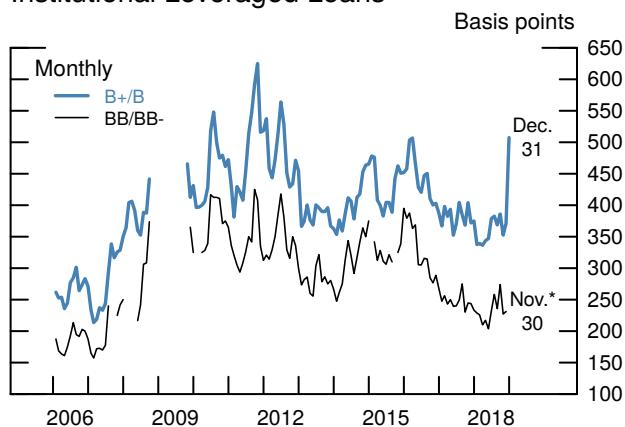


Source: Bloomberg; Board staff calculations.

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

Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.  
\*January data reflect preliminary data on issuance through January 16.

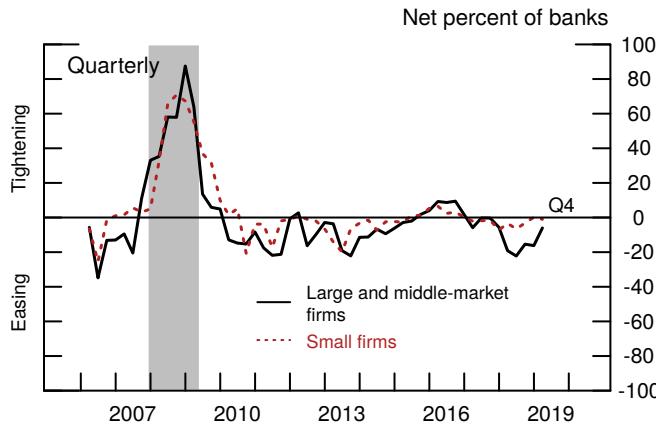
Source: Mergent Fixed Income Securities Database.

**Average Spreads of New-Issue Institutional Leveraged Loans**

Note: Breaks in the series represent periods with no issuance. Spreads are calculated against 3-month LIBOR. The spreads do not include up-front fees.

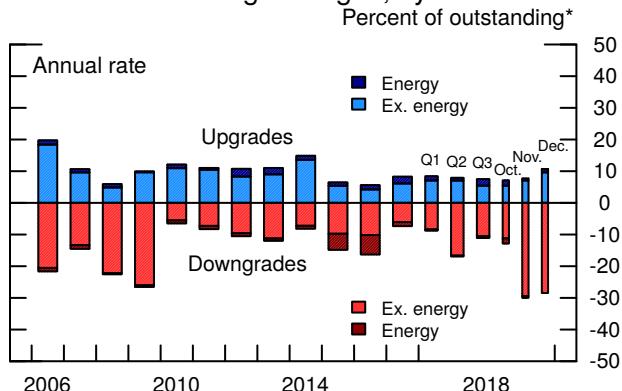
\* The BB/BB- series ends in November because of a lack of loan issuance in December.

Source: S&P LCD.

**Standards for C&I Loans**

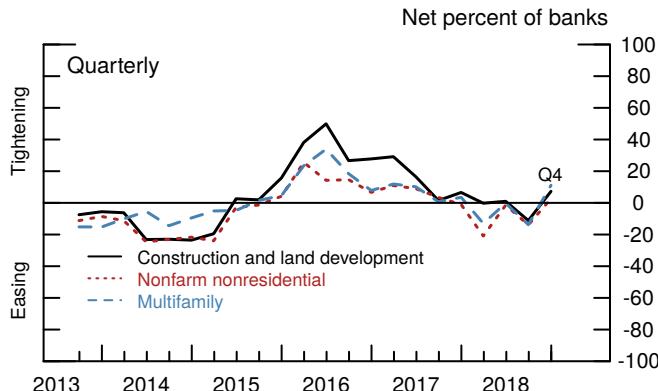
Note: C&I is commercial and industrial. Banks' responses are weighted by the outstanding amount of C&I loans on their balance sheets at the end of the previous quarter. The shaded bar indicates a period of business recession as defined by the National Bureau of Economic Research.

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

**Nonfinancial Rating Changes, by Sector**

\* Computed as a percent of nonfinancial bonds outstanding.

Source: Board staff calculations using Moody's ratings from Mergent Fixed Income Securities Database.

**Standards for CRE Loans**

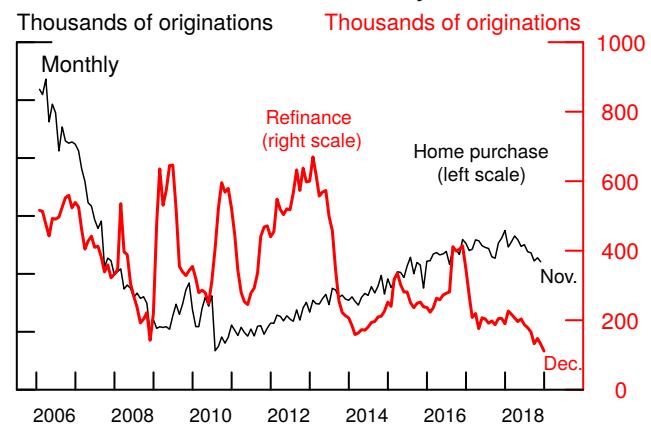
Note: CRE is commercial real estate. Banks' responses are weighted by the outstanding amount of CRE loans on their balance sheets at the end of the previous quarter.

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

**Household Finance****Mortgage Rate and MBS Yield**

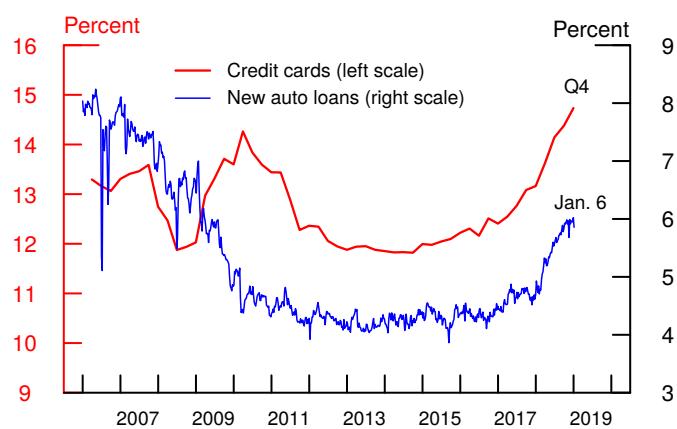
Note: The mortgage-backed securities (MBS) yield is the Fannie Mae 30-year current-coupon rate.

Source: For mortgage rate through 2010, Freddie Mac; after 2010, Loansifter; for MBS yield, Barclays.

**Purchase and Refinance Activity**

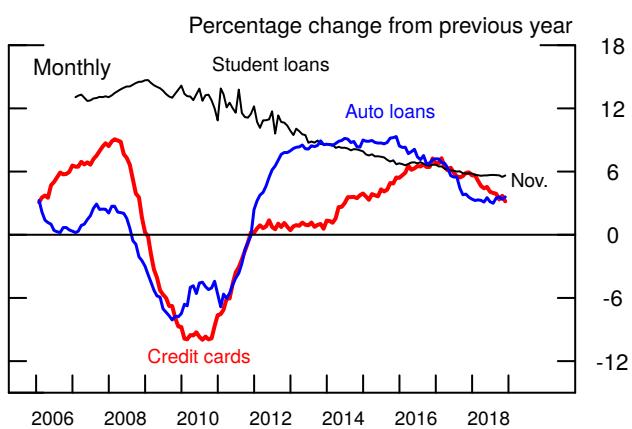
Note: The data are seasonally adjusted by Federal Reserve Board staff.

Source: For values through 2017, data reported under the Home Mortgage Disclosure Act of 1975; for values in 2018, staff estimates.

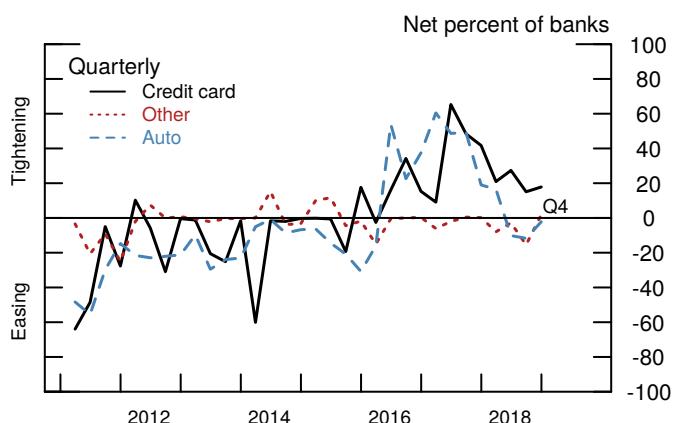
**Consumer Interest Rates**

Note: Credit card data reflect rates at commercial banks on all credit card plans; data are reported quarterly and not seasonally adjusted. Auto loans data are reported weekly and seasonally adjusted.

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

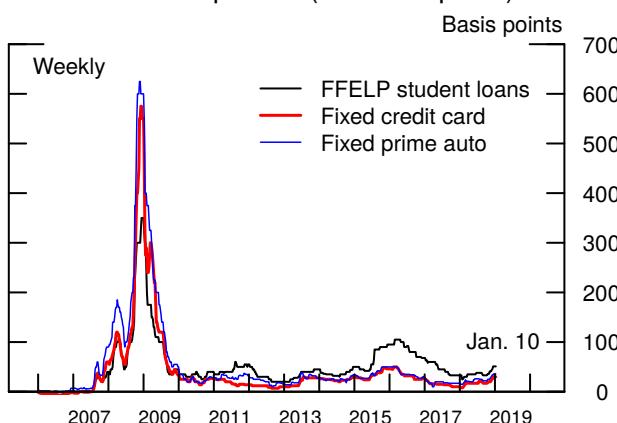
**Consumer Credit**

Source: Federal Reserve Board.

**Standards for Consumer Loans**

Note: Banks' responses are weighted by the outstanding amount of the relevant loan categories on their balance sheets at the end of the previous quarter.

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

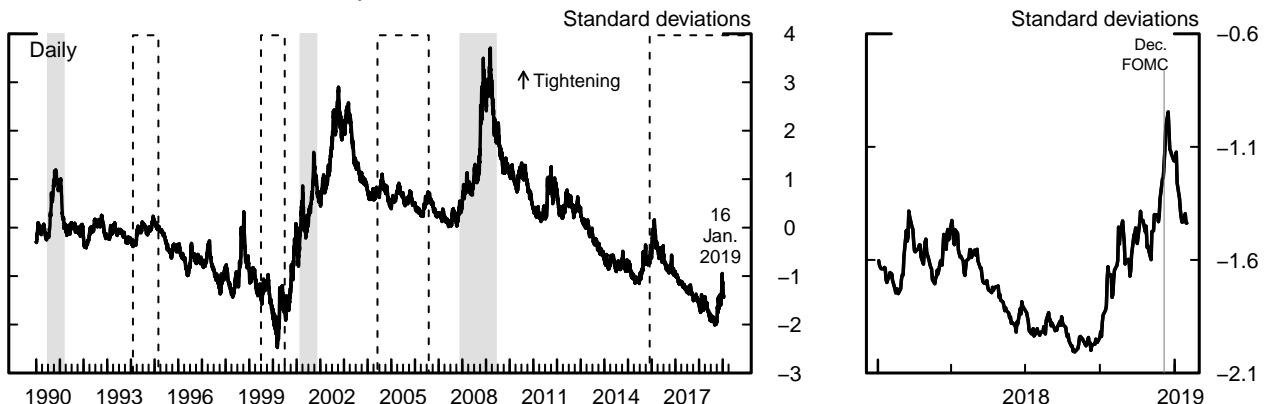
**Selected ABS Spreads (3-Year Triple-A)**

Note: Spreads are to swap rate for credit card and auto asset-backed securities (ABS) and to 3-month LIBOR for student loans. Student loans are from the Federal Family Education Loan Program.

Source: J.P. Morgan.

## Selected Financial Conditions Indexes

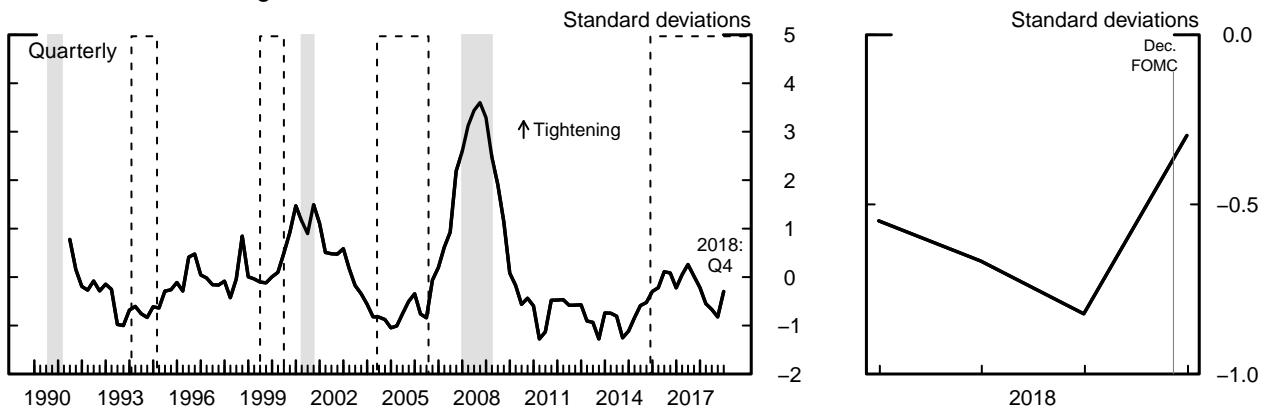
Staff FCI for Nonfinancial Corporations



Note: The index is the deviation from the long-run relation between the systematic components of the cumulative log returns of 2 portfolios of firms with credit ratings above and just below investment grade. The systematic components are derived from the 5-factor Fama–French asset pricing model, augmented with the momentum and quality minus junk factors.

Source: CRSP; Yahoo Finance; Moody's Bond Ratings; Ken French website; AQR Capital Management website.

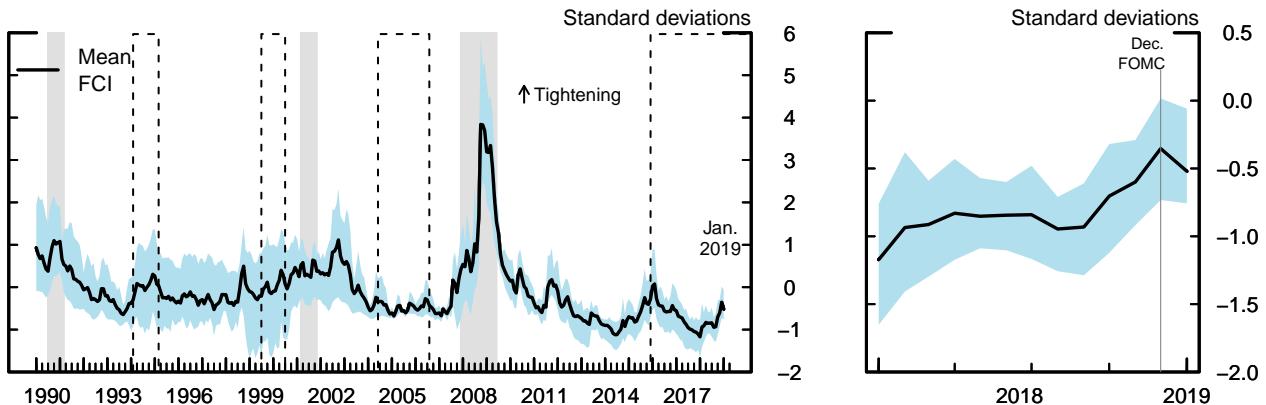
SLOOS Bank Lending Standards Index



Note: The index is a weighted average of the net percentage of domestic banks tightening standards for 11 loan categories, with weights given by the size of each loan category on banks' balance sheets.

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

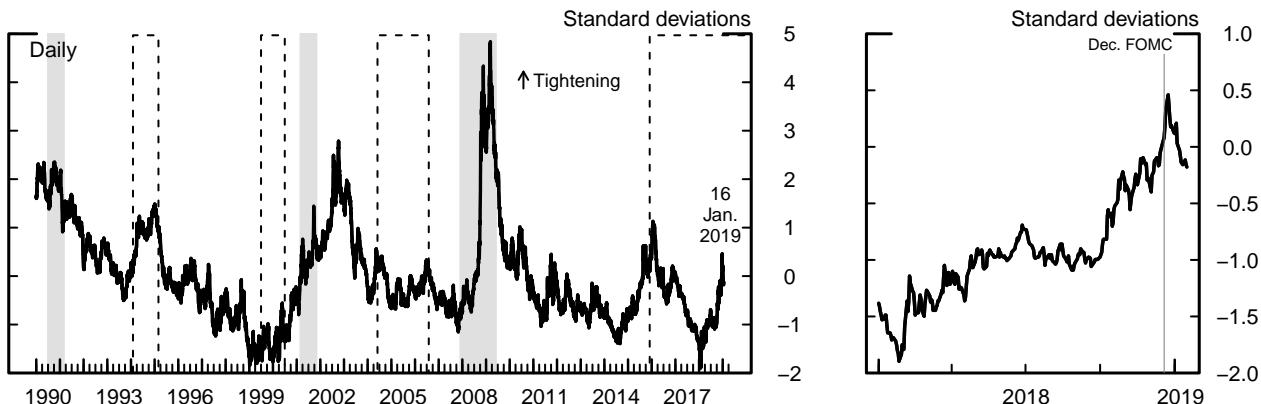
Mean and Range of External FCIs



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

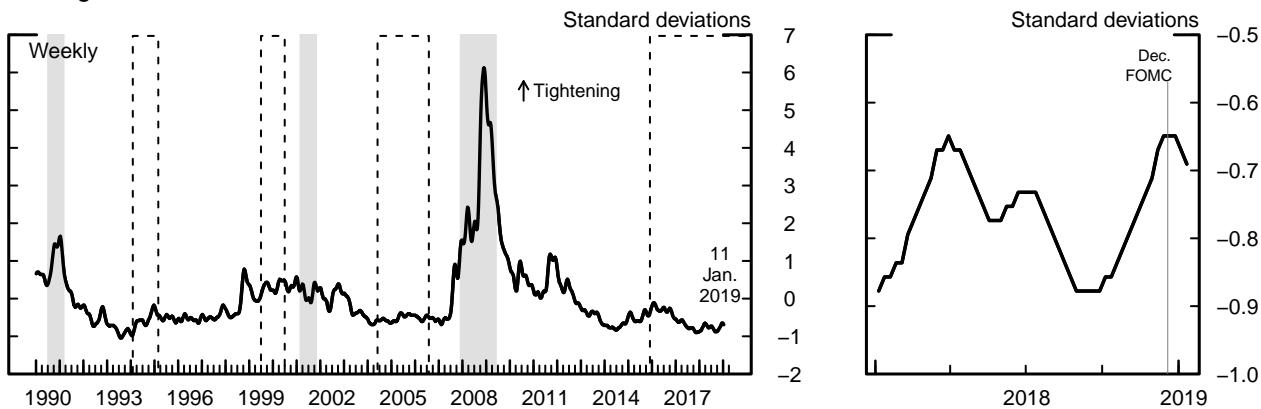
Source: Bloomberg; Federal Reserve Banks of Chicago, St. Louis, and Kansas City.

**For all panels: Indexes are standardized. Values above (below) zero represent tighter (easier) than average financial conditions. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. The dashed boxes denote monetary policy tightening cycles.**

**Selected Financial Conditions Indexes****Goldman Sachs FCI**

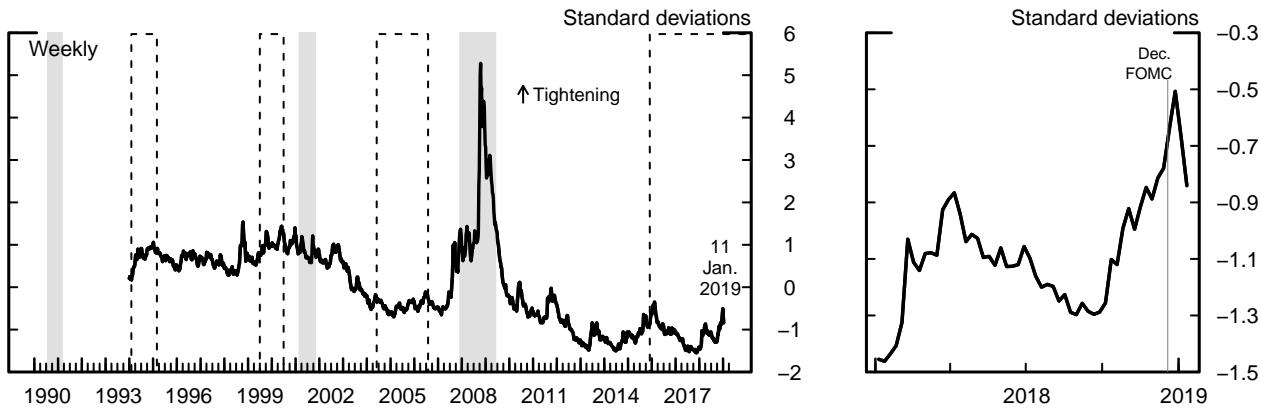
Note: The index is a weighted average of 5 financial variables: the federal funds rate, the 10-year Treasury yield, the triple-B yield spreads to Treasury, the S&P price-to-earnings ratio, the broad value of the U.S. dollar. Weights are pinned down by the contribution of each financial variable on real gross domestic product growth over the following year using a vector auto-regression model.

Source: Bloomberg.

**Chicago Fed NFCI**

Note: The index is based on 100 financial variables related to money markets (28 indicators), debt and equity markets (27 indicators), and the banking system (45 indicators). The index is weekly and is derived using a dynamic factor model.

Source: Federal Reserve Bank of Chicago.

**St. Louis Fed Financial Stress Index**

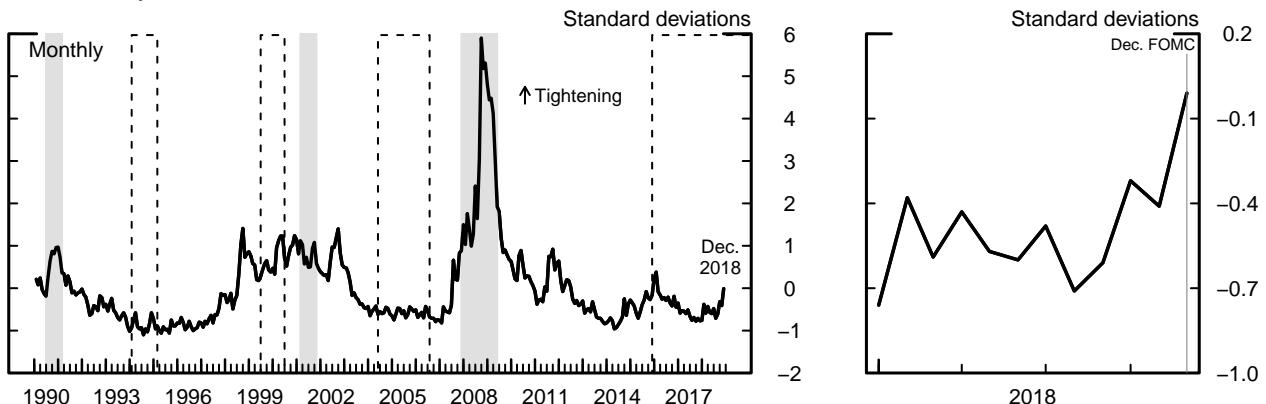
Note: The index is the principal component of 18 variables including short- and long-term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, breakeven inflation rate, and the S&P 500 index.

Source: Federal Reserve Bank of St. Louis.

**For all panels: Indexes are standardized. Values above (below) zero represent tighter (easier) than average financial conditions. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. The dashed boxes denote monetary policy tightening cycles.**

## Selected Financial Conditions Indexes

### Kansas City Fed Financial Stress Index



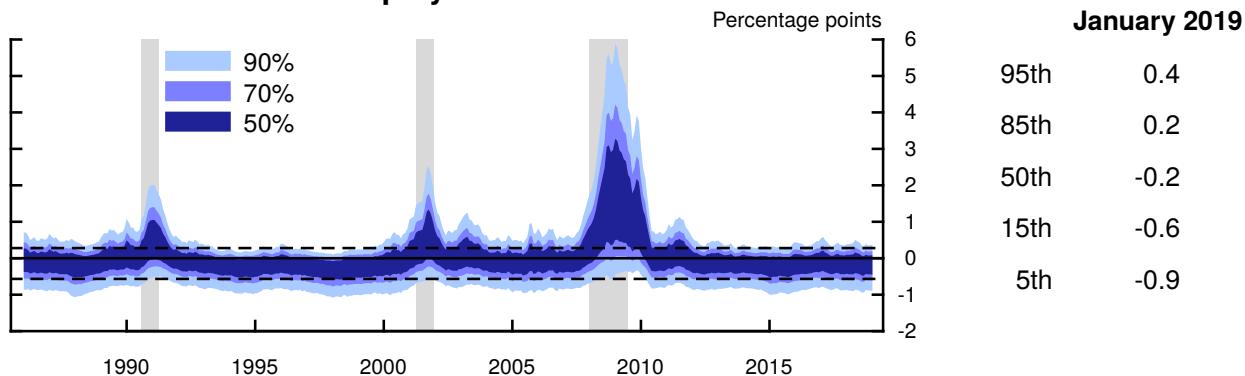
Note: The index is the principal component of 11 financial variables including short- and long-term interest rates, corporate and consumer yield spreads, the VIX, and the volatility of bank stock prices.

Source: Federal Reserve Bank of Kansas City.

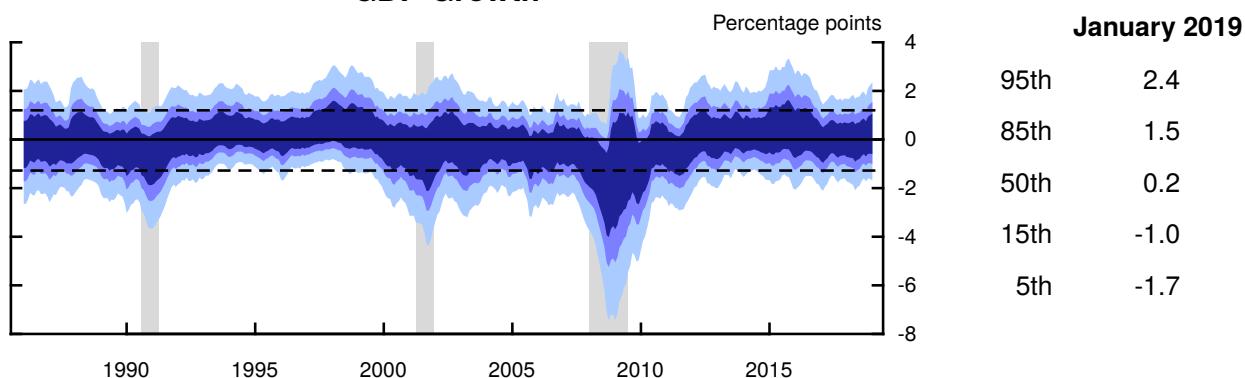
**For all panels: Indexes are standardized. Values above (below) zero represent tighter (easier) than average financial conditions. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. The dashed boxes denote monetary policy tightening cycles.**

## Time-Varying Macroeconomic Risk

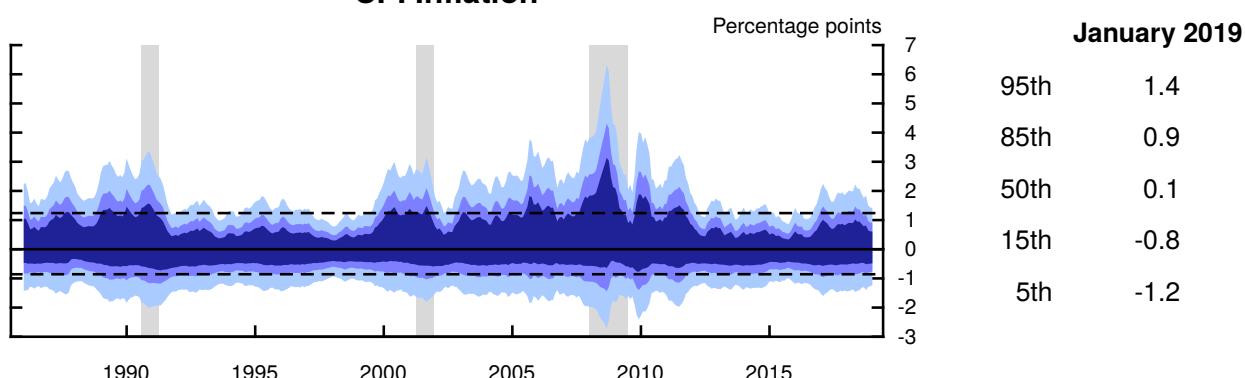
### Unemployment Rate



### GDP Growth



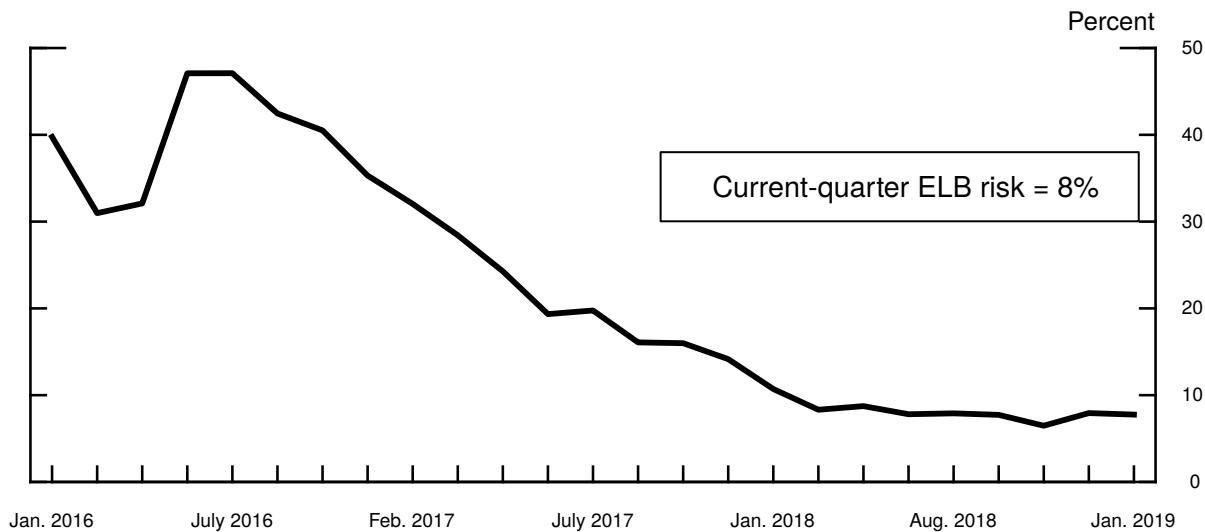
### CPI Inflation



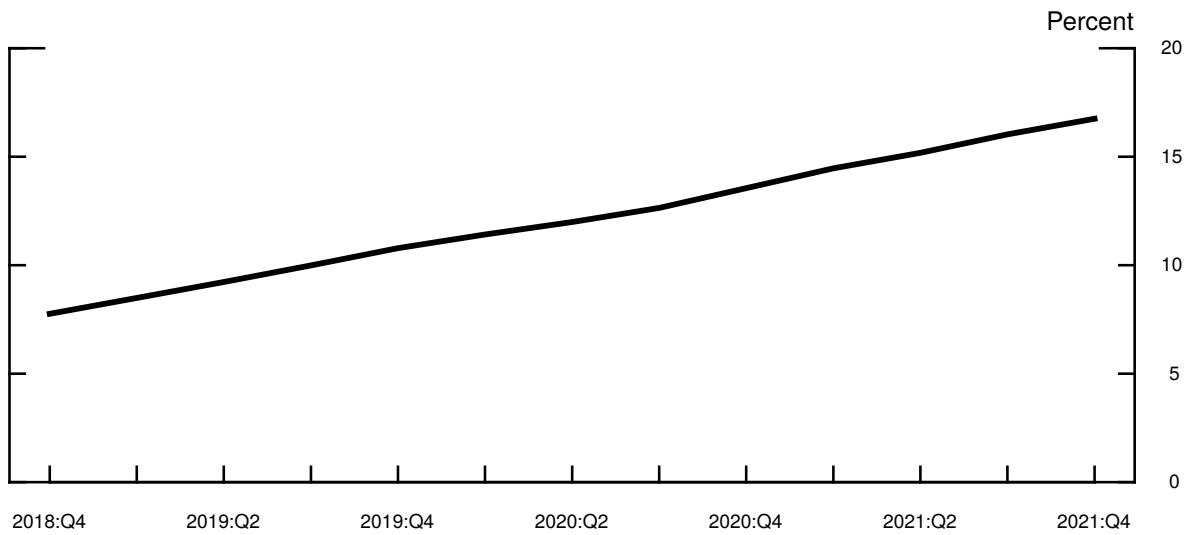
Note: The exhibit shows estimates of quantiles of the distribution of errors for four-quarter-ahead staff forecasts. The estimates are conditioned on indicators of real activity, inflation, financial market strain, and the volatility of high-frequency macroeconomic indicators. The tables show selected quantiles of the predictive distributions for the respective variables as of the current Tealbook. Dashed lines denote the median 15<sup>th</sup> and 85<sup>th</sup> percentiles. Gray shaded bars indicate recession periods as defined by the National Bureau of Economic Research.

## Effective Lower Bound Risk Estimate

### ELB Risk since Liftoff



### ELB Risk over the Projection Period



Note: The figures show the probability that the federal funds rate reaches the effective lower bound (ELB) over the next 3 years starting in the given quarter. Details behind the computation of the ELB risk measure are provided in the box "A Guidepost for Dropping the Effective Lower Bound Risk from the Assessment of Risks" in the Risks and Uncertainty section of the April 2017 Tealbook A. The lower panel computes ELB risk over a forward-looking moving 3-year window using stochastic simulations in FRB/US beginning in the current quarter. The simulations are computed around the Tealbook baseline.

### Alternative Scenarios

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

| Measure and scenario                            | 2018 |      |      |      |      |         |
|---|------|------|------|------|------|---------|
|   | H2   | 2019 | 2020 | 2021 | 2022 | 2023-24 |
| <i>Real GDP</i>                                 |      |      |      |      |      |         |
| Tealbook baseline and extension                 | 3.1  | 2.2  | 1.9  | 1.4  | 1.1  | 1.3     |
| Recession with resilient institutions           | 3.1  | .7   | 1.1  | 1.6  | 1.2  | 1.3     |
| Recession with vulnerable institutions          | 3.1  | -.8  | 1.6  | 1.8  | 1.1  | 1.2     |
| Stronger aggregate demand                       | 3.1  | 3.0  | 2.1  | 1.4  | 1.1  | 1.1     |
| Stronger aggregate supply                       | 3.1  | 2.3  | 2.3  | 1.7  | 1.3  | 1.3     |
| Supply constraints                              | 3.1  | 2.2  | 1.8  | 1.3  | 1.1  | 1.2     |
| China slowdown                                  | 3.1  | 1.8  | 1.5  | 1.5  | 1.4  | 1.4     |
| China slowdown with global financial spillovers | 3.1  | 1.3  | .3   | 1.0  | 1.4  | 1.7     |
| <i>Unemployment rate<sup>1</sup></i>            |      |      |      |      |      |         |
| Tealbook baseline and extension                 | 3.8  | 3.5  | 3.5  | 3.6  | 3.9  | 4.3     |
| Recession with resilient institutions           | 3.8  | 4.2  | 5.5  | 4.5  | 4.2  | 4.4     |
| Recession with vulnerable institutions          | 3.8  | 4.9  | 6.5  | 5.0  | 4.7  | 4.9     |
| Stronger aggregate demand                       | 3.8  | 3.1  | 3.0  | 3.2  | 3.5  | 4.0     |
| Stronger aggregate supply                       | 3.8  | 3.5  | 3.4  | 3.5  | 3.8  | 4.2     |
| Supply constraints                              | 3.8  | 3.6  | 3.7  | 3.8  | 4.0  | 4.4     |
| China slowdown                                  | 3.8  | 3.6  | 3.8  | 4.0  | 4.2  | 4.5     |
| China slowdown with global financial spillovers | 3.8  | 3.8  | 4.4  | 4.8  | 5.0  | 5.0     |
| <i>Total PCE prices</i>                         |      |      |      |      |      |         |
| Tealbook baseline and extension                 | 1.5  | 1.8  | 1.9  | 2.0  | 2.0  | 2.1     |
| Recession with resilient institutions           | 1.5  | 1.7  | 1.8  | 2.0  | 2.0  | 2.1     |
| Recession with vulnerable institutions          | 1.5  | 1.6  | 1.8  | 1.9  | 1.8  | 1.9     |
| Stronger aggregate demand                       | 1.5  | 1.9  | 2.0  | 2.1  | 2.1  | 2.1     |
| Stronger aggregate supply                       | 1.5  | 1.6  | 1.5  | 1.7  | 1.8  | 1.9     |
| Supply constraints                              | 1.5  | 2.3  | 2.4  | 2.4  | 2.2  | 2.1     |
| China slowdown                                  | 1.5  | 1.3  | 1.5  | 1.9  | 2.0  | 2.0     |
| China slowdown with global financial spillovers | 1.5  | 1.0  | 1.0  | 1.6  | 1.9  | 2.1     |
| <i>Core PCE prices</i>                          |      |      |      |      |      |         |
| Tealbook baseline and extension                 | 1.5  | 2.0  | 2.0  | 2.0  | 2.0  | 2.1     |
| Recession with resilient institutions           | 1.5  | 2.0  | 1.9  | 2.0  | 2.0  | 2.1     |
| Recession with vulnerable institutions          | 1.5  | 1.9  | 1.8  | 1.9  | 1.9  | 1.9     |
| Stronger aggregate demand                       | 1.5  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1     |
| Stronger aggregate supply                       | 1.5  | 1.8  | 1.6  | 1.7  | 1.8  | 1.9     |
| Supply constraints                              | 1.5  | 2.5  | 2.5  | 2.4  | 2.2  | 2.1     |
| China slowdown                                  | 1.5  | 1.8  | 1.6  | 1.9  | 1.9  | 2.0     |
| China slowdown with global financial spillovers | 1.5  | 1.5  | 1.2  | 1.6  | 1.8  | 2.0     |
| <i>Federal funds rate<sup>1</sup></i>           |      |      |      |      |      |         |
| Tealbook baseline and extension                 | 2.2  | 3.4  | 4.2  | 4.5  | 4.4  | 3.7     |
| Recession with resilient institutions           | 2.2  | 3.3  | 2.1  | 2.2  | 2.7  | 3.1     |
| Recession with vulnerable institutions          | 2.2  | 2.8  | .5   | .7   | 1.4  | 1.8     |
| Stronger aggregate demand                       | 2.2  | 3.8  | 4.9  | 5.3  | 5.2  | 4.4     |
| Stronger aggregate supply                       | 2.2  | 3.3  | 3.9  | 4.1  | 4.1  | 3.6     |
| Supply constraints                              | 2.2  | 3.5  | 4.4  | 4.7  | 4.6  | 3.9     |
| China slowdown                                  | 2.2  | 3.2  | 3.5  | 3.8  | 3.7  | 3.3     |
| China slowdown with global financial spillovers | 2.2  | 3.1  | 2.9  | 2.8  | 2.7  | 2.8     |

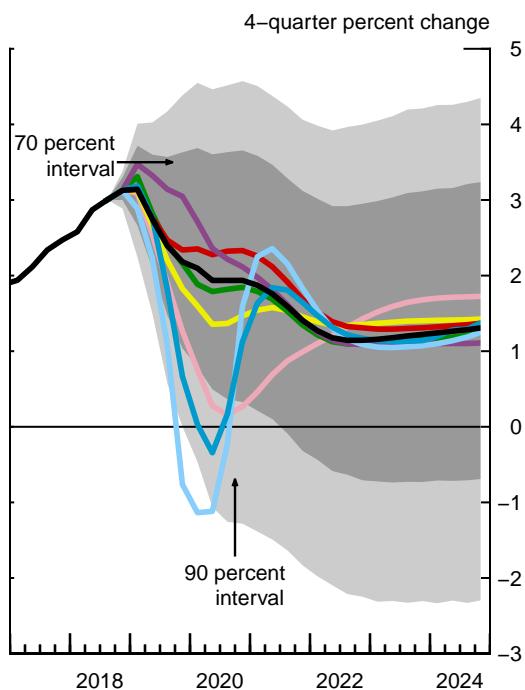
1. Percent, average for the final quarter of the period.

## Forecast Confidence Intervals and Alternative Scenarios

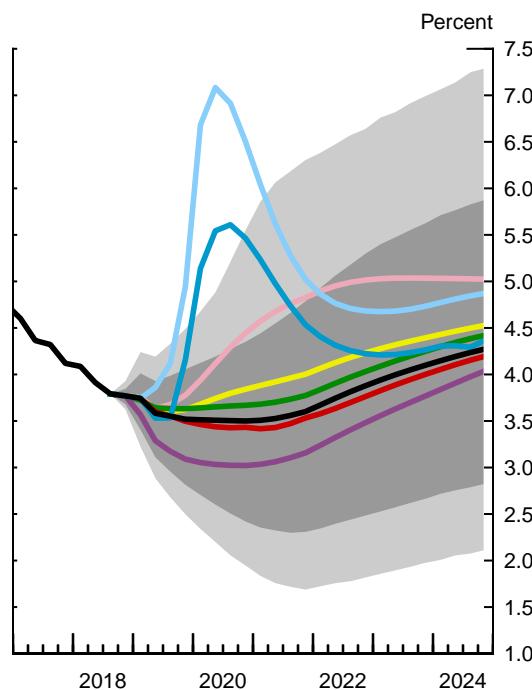
Confidence Intervals Based on FRB/US Stochastic Simulations

- Tealbook baseline and extension
- Recessions with resilient institutions
- Recessions with vulnerable institutions
- Stronger aggregate demand
- Stronger aggregate supply
- Supply constraints
- China slowdown
- China slowdown with global financial spillovers

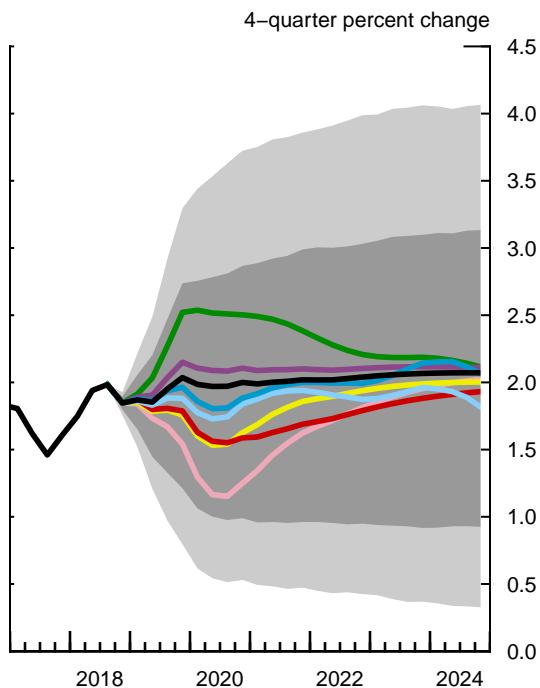
Real GDP



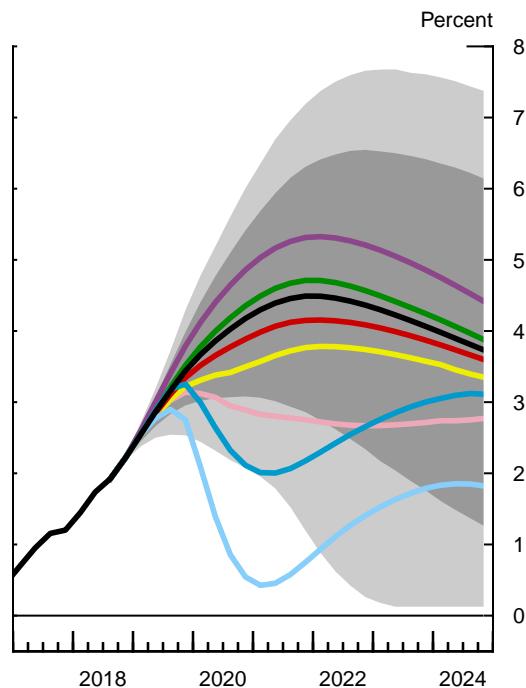
Unemployment Rate



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**

Risks &amp; Uncertainty

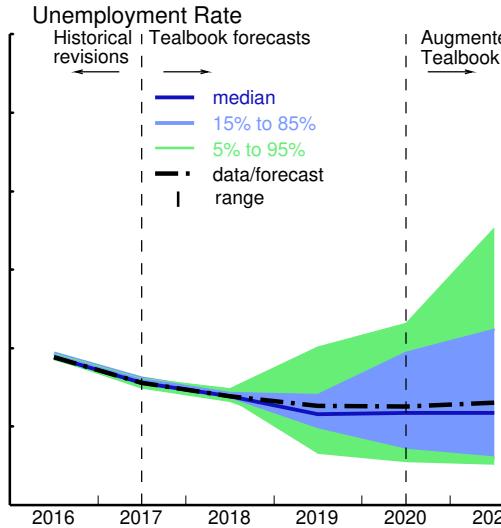
| Measure   | 2018    | 2019    | 2020    | 2021    | 2022    | 2023    | 2024    |
|---|---------|---------|---------|---------|---------|---------|---------|
| <i>Real GDP</i><br>(percent change, Q4 to Q4)                                       |         |         |         |         |         |         |         |
| Projection  | 3.1     | 2.2     | 1.9     | 1.4     | 1.1     | 1.2     | 1.3     |
| Confidence interval   |         |         |         |         |         |         |         |
| Tealbook forecast errors  | 2.6–3.9 | .8–3.9  | -.1–3.5 | -.9–2.9 | ...     | ...     | ...     |
| FRB/US stochastic simulations   | 3.0–3.3 | 1.0–3.6 | .3–3.7  | -.3–3.1 | -.7–3.0 | -.7–3.1 | -.7–3.2 |
| <i>Civilian unemployment rate</i><br>(percent, Q4)                                  |         |         |         |         |         |         |         |
| Projection  | 3.8     | 3.5     | 3.5     | 3.6     | 3.9     | 4.1     | 4.3     |
| Confidence interval   |         |         |         |         |         |         |         |
| Tealbook forecast errors  | 3.7–3.9 | 2.9–3.8 | 2.4–4.9 | 2.2–5.5 | ...     | ...     | ...     |
| FRB/US stochastic simulations   | 3.7–3.8 | 2.8–4.1 | 2.4–4.4 | 2.3–4.8 | 2.5–5.3 | 2.7–5.6 | 2.8–5.9 |
| <i>PCE prices, total</i><br>(percent change, Q4 to Q4)                              |         |         |         |         |         |         |         |
| Projection  | 1.8     | 1.8     | 1.9     | 2.0     | 2.0     | 2.1     | 2.1     |
| Confidence interval   |         |         |         |         |         |         |         |
| Tealbook forecast errors  | 1.8–2.2 | 1.3–3.2 | 1.2–3.5 | 1.3–3.4 | ...     | ...     | ...     |
| FRB/US stochastic simulations   | 1.8–1.9 | .9–2.6  | .8–2.9  | .8–3.1  | .8–3.1  | .8–3.2  | .8–3.2  |
| <i>PCE prices excluding</i><br><i>food and energy</i><br>(percent change, Q4 to Q4) |         |         |         |         |         |         |         |
| Projection  | 1.8     | 2.0     | 2.0     | 2.0     | 2.0     | 2.1     | 2.1     |
| Confidence interval   |         |         |         |         |         |         |         |
| Tealbook forecast errors  | 1.7–2.3 | 1.8–2.6 | 1.5–2.8 | ...     | ...     | ...     | ...     |
| FRB/US stochastic simulations   | 1.8–1.9 | 1.2–2.7 | 1.0–2.9 | 1.0–3.0 | .9–3.0  | .9–3.1  | .9–3.1  |
| <i>Federal funds rate</i><br>(percent, Q4)  |         |         |         |         |         |         |         |
| Projection  | 2.2     | 3.4     | 4.2     | 4.5     | 4.4     | 4.1     | 3.7     |
| Confidence interval   |         |         |         |         |         |         |         |
| FRB/US stochastic simulations   | 2.2–2.2 | 3.0–4.0 | 3.1–5.4 | 2.9–6.3 | 2.3–6.5 | 1.8–6.4 | 1.2–6.1 |

Note: Shocks underlying FRB/US stochastic simulations are randomly drawn from the 1969–2017 set of model equation residuals. Intervals derived from Tealbook forecast errors are based on projections made from 1980 to 2017 for real GDP and unemployment and from 1998 to 2017 for PCE prices. The intervals for real GDP, unemployment, and total PCE prices are extended into 2021 using information from the Blue Chip survey and forecasts from the CBO and CEA.

... Not applicable.

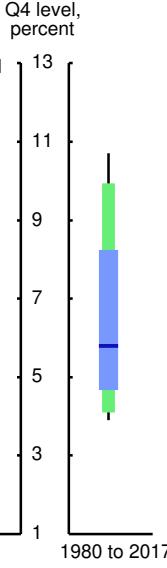
## Prediction Intervals Derived from Historical Tealbook Forecast Errors

### Forecast Error Percentiles



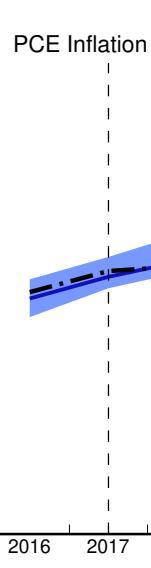
### Historical Distributions

Q4 level, percent

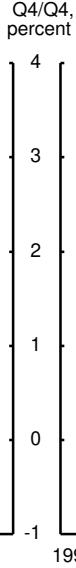


### PCE Inflation

Q4 level, percent

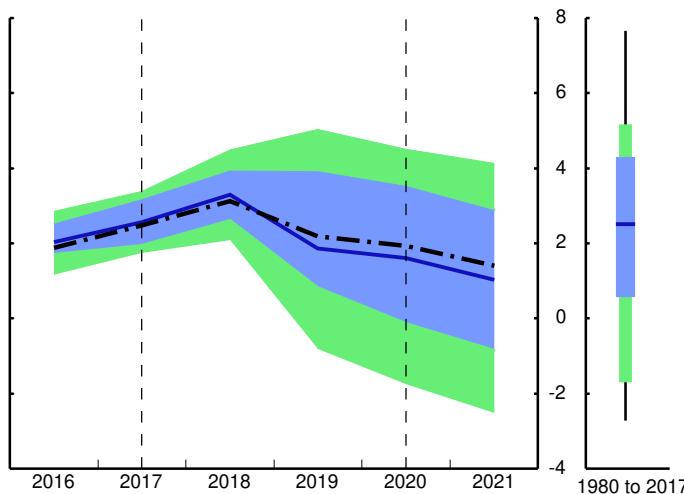


Q4/Q4, percent



Risks & Uncertainty

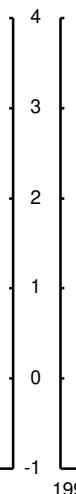
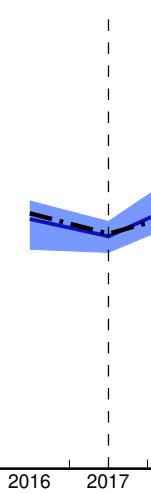
### Real GDP Growth



Q4/Q4, percent

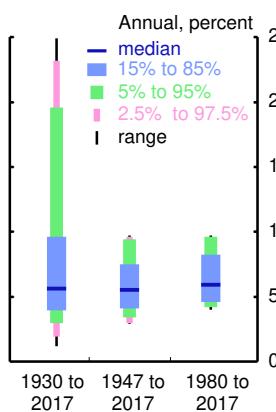
### Core PCE Inflation

Q4/Q4, percent

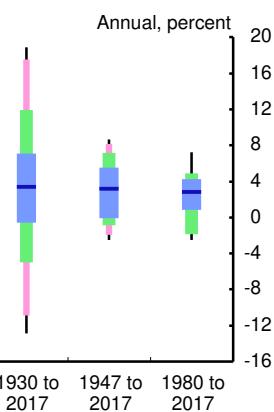


### Historical Distributions

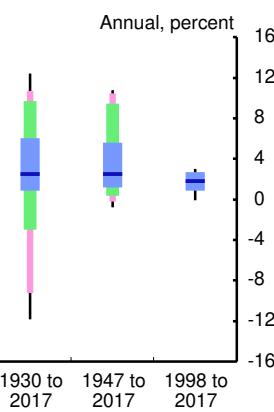
#### Unemployment Rate



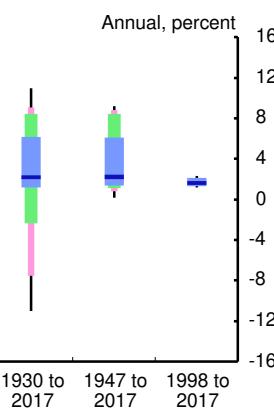
#### Real GDP Growth



#### 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 2021.

## Assessment of Key Macroeconomic Risks

### Probability of Inflation Events

(4 quarters ahead)

| Probability that the 4-quarter change in total PCE prices will be . . . | Staff | FRB/US | EDO | BVAR |
|---|-------|--------|-----|------|
| <i>Greater than 3 percent</i>   |       |        |     |      |
| Current Tealbook  | .08   | .05    | .03 | .05  |
| Previous Tealbook   | .08   | .05    | .04 | .05  |
| <i>Less than 1 percent</i>  |       |        |     |      |
| Current Tealbook  | .17   | .22    | .09 | .19  |
| Previous Tealbook   | .16   | .22    | .09 | .20  |

### 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                                  | .02   | .17    | .20 | .03  |
| Previous Tealbook                                 | .02   | .18    | .22 | .03  |
| <i>Decrease by 1 percentage point</i>             |       |        |     |      |
| Current Tealbook                                  | .12   | .00    | .03 | .07  |
| Previous Tealbook                                 | .12   | .00    | .01 | .10  |

### Probability of Near-Term Recession

| Probability that real GDP declines in the next two quarters | Staff | FRB/US | EDO | BVAR | Factor Model |
|---|-------|--------|-----|------|--------------|
| Current Tealbook  | .01   | .03    | .05 | .02  | .03          |
| Previous Tealbook   | .01   | .02    | .06 | .02  | .00          |

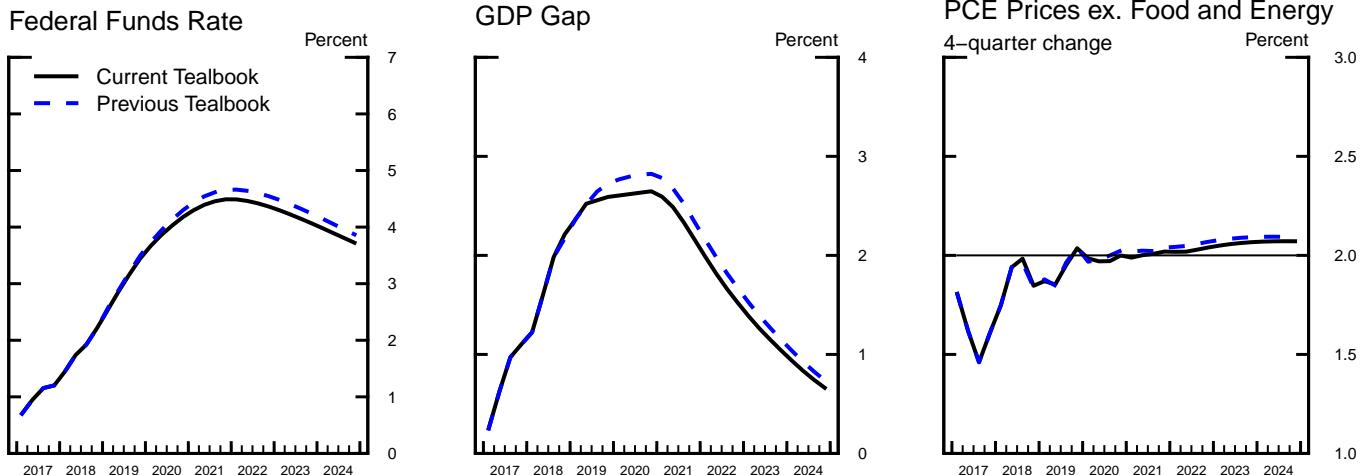
Note: "Staff" represents stochastic simulations in FRB/US around the staff baseline; baselines for FRB/US, BVAR, EDO, and the factor model are generated by those models themselves, up to the current-quarter estimate. Data for the current quarter are taken from the staff estimate for the second Tealbook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

## Policy Rules and the Staff Projection

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

|                                     | (Percent)   | <u>2019:Q1</u> | <u>2019:Q2</u> |
|-------------------------------------|-------------|----------------|----------------|
| Taylor (1999) rule                  | <b>4.64</b> | <b>4.78</b>    |                |
| <i>Previous Tealbook</i>            | 4.66        | 4.76           |                |
| Taylor (1993) rule                  | <b>3.46</b> | <b>3.52</b>    |                |
| <i>Previous Tealbook</i>            | 3.47        | 3.50           |                |
| First-difference rule               | <b>2.41</b> | <b>2.52</b>    |                |
| <i>Previous Tealbook projection</i> | 2.50        | 2.68           |                |
| Flexible price-level targeting rule | <b>2.00</b> | <b>1.84</b>    |                |
| <i>Previous Tealbook projection</i> | 2.03        | 1.87           |                |
| <i>Addendum:</i>                    |             |                |                |
| Tealbook baseline                   | <b>2.54</b> | <b>2.86</b>    |                |

### Key Elements of the Staff Projection



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

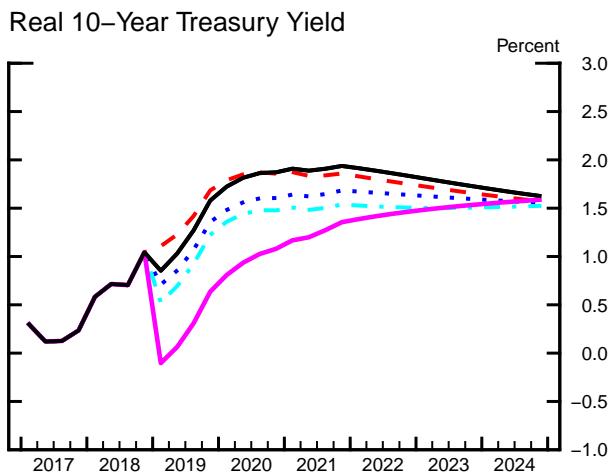
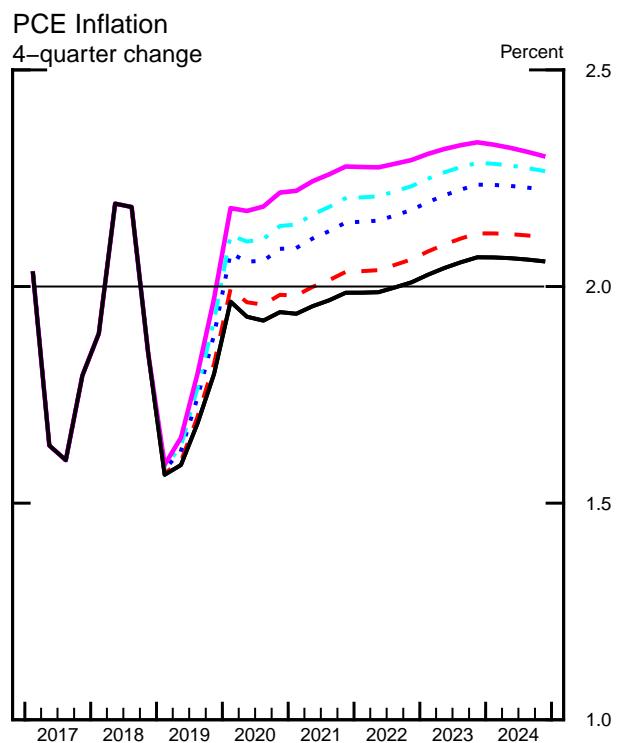
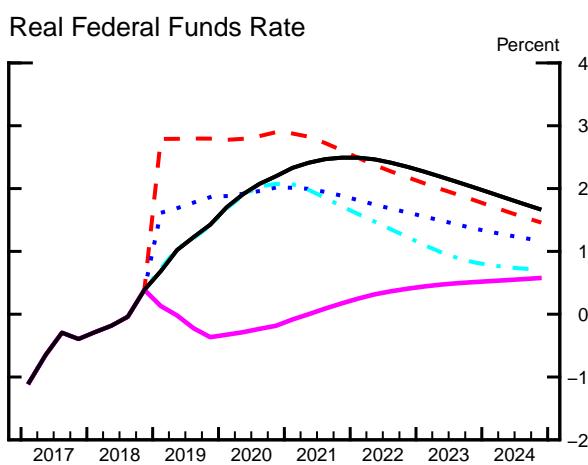
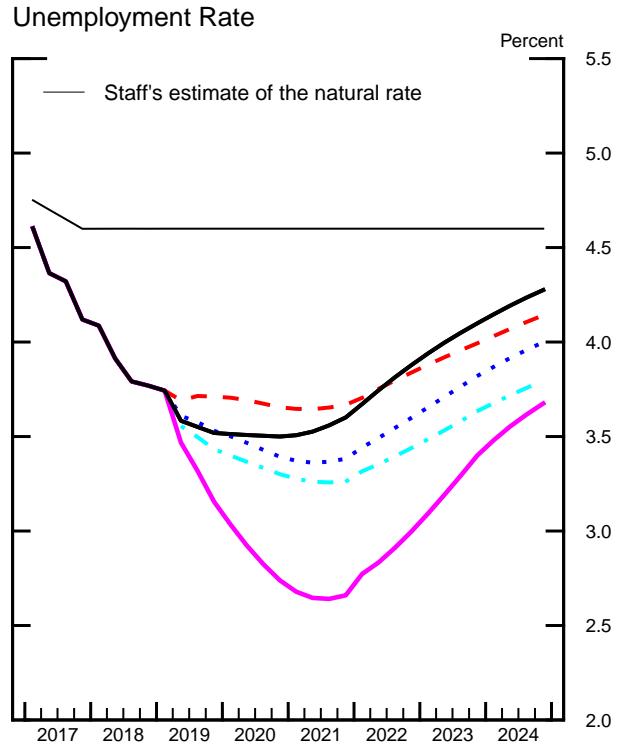
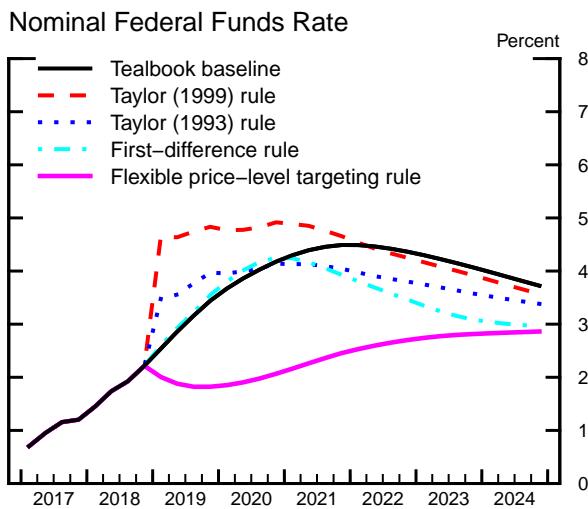
|   | (Percent) | Current Value | Current-Quarter Estimate Based on Previous Tealbook | Previous Tealbook |
|---|-----------|---------------|---|-------------------|
| Tealbook baseline                         |           |               |   |                   |
| FRB/US $r^*$                              | 3.03      |               | 3.21  | 3.13              |
| Average projected real federal funds rate | 1.83      |               | 1.91  | 1.72              |
| SEP-consistent baseline                   |           |               |   |                   |
| FRB/US $r^*$                              | 1.68      |               |   |                   |
| Average projected real federal funds rate | .97       |               |   |                   |

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

2. The "FRB/US  $r^*$ " is the level of the real federal funds rate that, if maintained over a 12-quarter period (beginning in the current quarter) in the FRB/US model, sets the output gap equal to zero in the final quarter of that period given either the Tealbook or SEP-consistent projection. The SEP-consistent baseline corresponds to the December 2018 median SEP responses. The "Average projected real federal funds rate" is calculated under the Tealbook and SEP-consistent baseline projections over the same 12-quarter period as FRB/US  $r^*$ .

## Simple Policy Rule Simulations

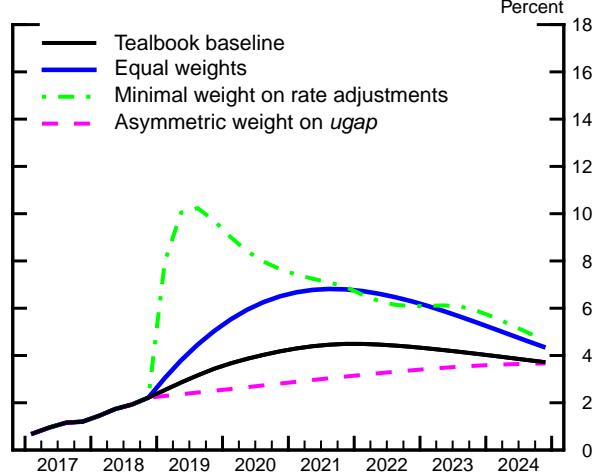
## Monetary Policy Strategies



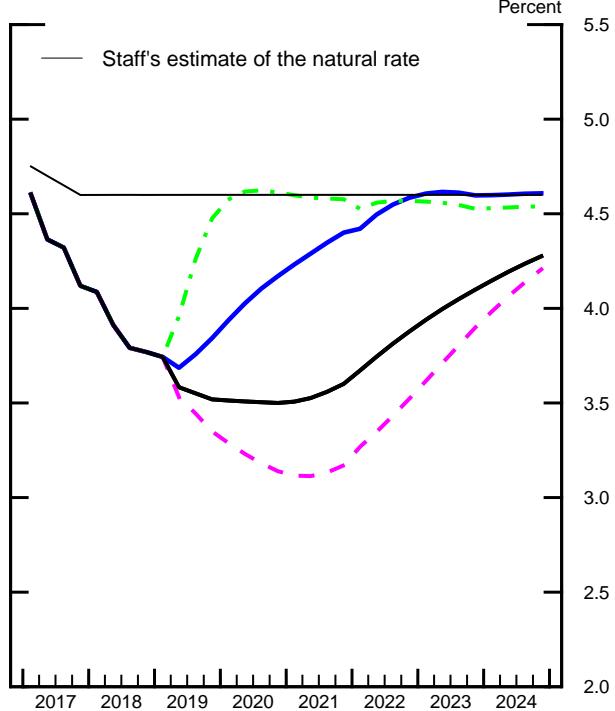
Note: The policy rule simulations in this exhibit are based on rules that respond to core inflation rather than to headline inflation. This choice of rule specification was made in light of a tendency for current and near-term core inflation rates to outperform headline inflation rates as predictors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

## Optimal Control Simulations under Commitment

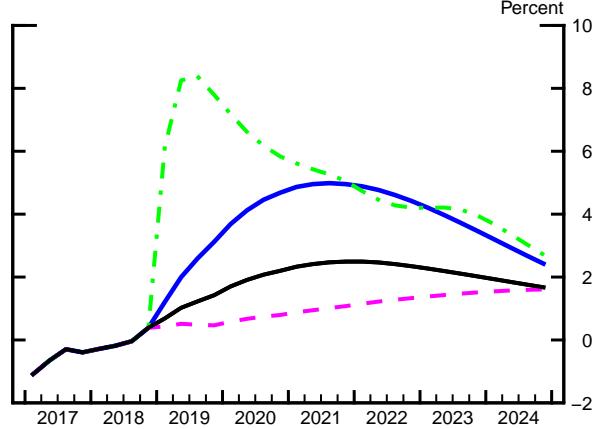
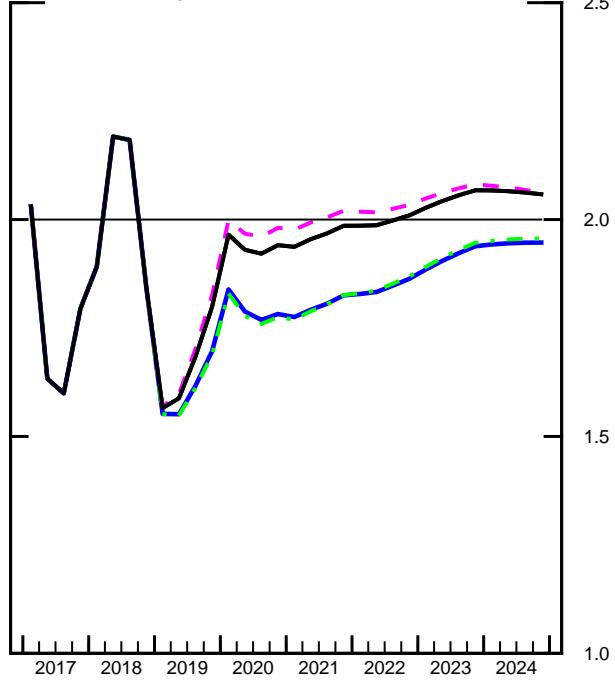
Nominal Federal Funds Rate



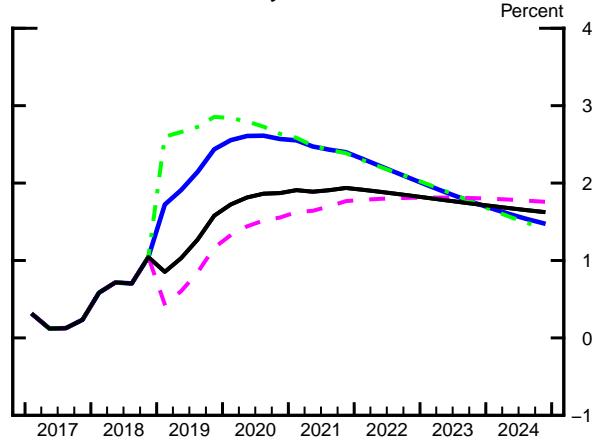
Unemployment Rate



Real Federal Funds Rate

PCE Inflation  
4-quarter change

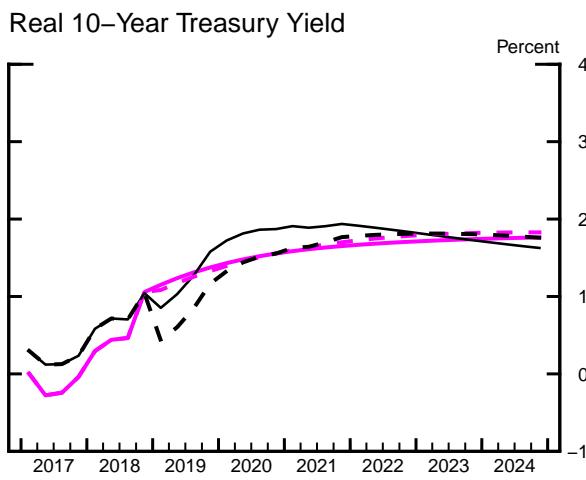
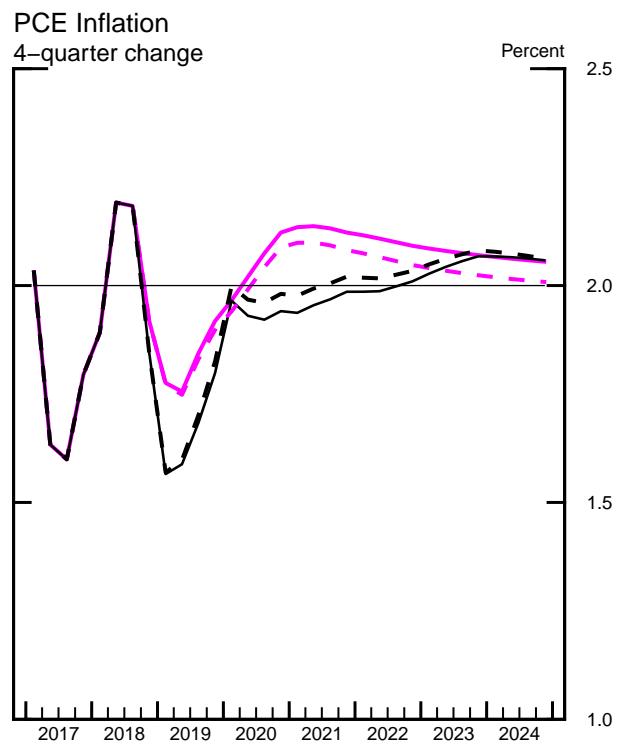
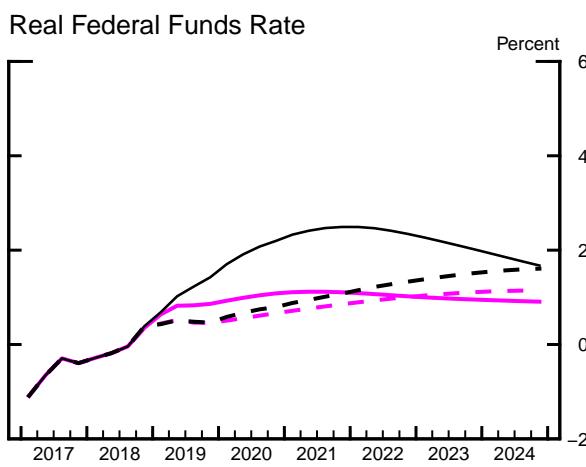
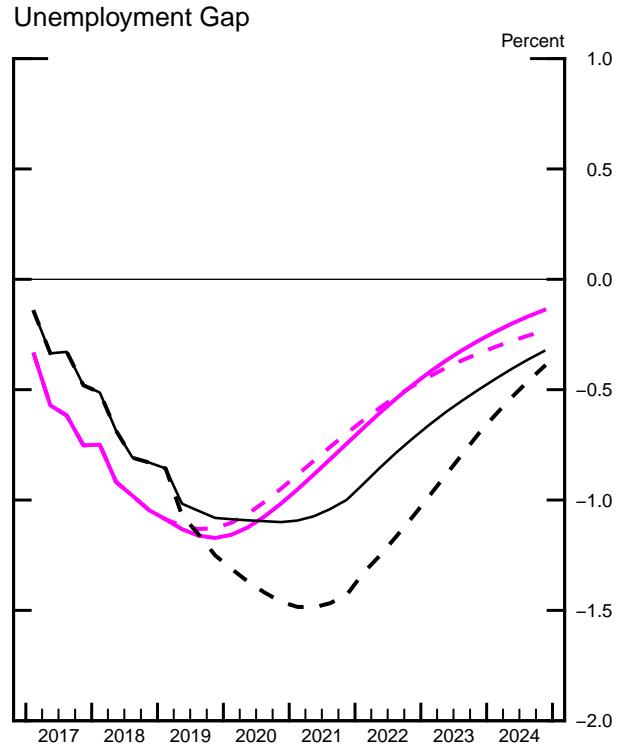
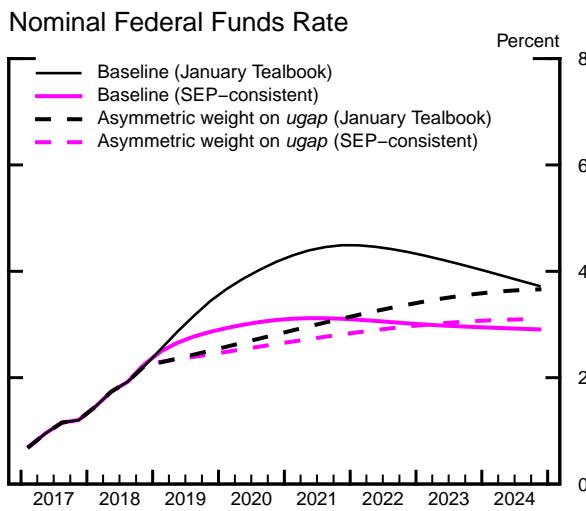
Real 10-Year Treasury Yield



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 4-quarter headline PCE inflation from the Committee's 2 percent objective, of squared deviations of the unemployment rate from the staff's estimate of the natural rate, and of squared changes in the federal funds rate. The weights vary across simulations. See the appendix for technical details and the box "Optimal Control and the Loss Function" in the June 2016 Tealbook B for a motivation.

## Optimal Control Using a Projection Consistent with the SEP

## Monetary Policy Strategies



Note: The SEP-consistent projection is constructed to match the median responses to the December 2018 Summary of Economic Projections. All simulations are performed in the FRB/US model.

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

| Outcome and strategy                          | 2018 |      |      |      |      |      |      |
|---|------|------|------|------|------|------|------|
|   | H2   | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| <i>Nominal federal funds rate<sup>1</sup></i> |      |      |      |      |      |      |      |
| Taylor (1999)                                 | 2.2  | 4.8  | 4.9  | 4.7  | 4.2  | 3.9  | 3.6  |
| Taylor (1993)                                 | 2.2  | 4.0  | 4.1  | 4.0  | 3.8  | 3.6  | 3.4  |
| First-difference                              | 2.2  | 3.5  | 4.2  | 3.9  | 3.5  | 3.1  | 3.0  |
| Flexible price-level targeting                | 2.2  | 1.8  | 2.1  | 2.5  | 2.7  | 2.8  | 2.9  |
| Extended Tealbook baseline                    | 2.2  | 3.4  | 4.2  | 4.5  | 4.4  | 4.1  | 3.7  |
| <i>Real GDP</i>                               |      |      |      |      |      |      |      |
| Taylor (1999)                                 | 3.1  | 1.8  | 2.0  | 1.6  | 1.3  | 1.3  | 1.4  |
| Taylor (1993)                                 | 3.1  | 2.2  | 2.2  | 1.6  | 1.3  | 1.2  | 1.3  |
| First-difference                              | 3.1  | 2.4  | 2.2  | 1.7  | 1.4  | 1.3  | 1.4  |
| Flexible price-level targeting                | 3.1  | 3.0  | 2.8  | 1.8  | 1.1  | .9   | 1.2  |
| Extended Tealbook baseline                    | 3.1  | 2.2  | 1.9  | 1.4  | 1.1  | 1.2  | 1.3  |
| <i>Unemployment rate<sup>1</sup></i>          |      |      |      |      |      |      |      |
| Taylor (1999)                                 | 3.8  | 3.7  | 3.7  | 3.7  | 3.8  | 4.0  | 4.1  |
| Taylor (1993)                                 | 3.8  | 3.5  | 3.4  | 3.4  | 3.6  | 3.8  | 4.0  |
| First-difference                              | 3.8  | 3.4  | 3.3  | 3.3  | 3.4  | 3.6  | 3.8  |
| Flexible price-level targeting                | 3.8  | 3.2  | 2.7  | 2.7  | 3.0  | 3.4  | 3.7  |
| Extended Tealbook baseline                    | 3.8  | 3.5  | 3.5  | 3.6  | 3.9  | 4.1  | 4.3  |
| <i>Total PCE prices</i>                       |      |      |      |      |      |      |      |
| Taylor (1999)                                 | 1.5  | 1.8  | 2.0  | 2.0  | 2.1  | 2.1  | 2.1  |
| Taylor (1993)                                 | 1.5  | 1.9  | 2.1  | 2.1  | 2.2  | 2.2  | 2.2  |
| First-difference                              | 1.5  | 1.9  | 2.1  | 2.2  | 2.2  | 2.3  | 2.3  |
| Flexible price-level targeting                | 1.5  | 2.0  | 2.2  | 2.3  | 2.3  | 2.3  | 2.3  |
| Extended Tealbook baseline                    | 1.5  | 1.8  | 1.9  | 2.0  | 2.0  | 2.1  | 2.1  |
| <i>Core PCE prices</i>                        |      |      |      |      |      |      |      |
| Taylor (1999)                                 | 1.5  | 2.1  | 2.0  | 2.1  | 2.1  | 2.1  | 2.1  |
| Taylor (1993)                                 | 1.5  | 2.1  | 2.1  | 2.2  | 2.2  | 2.2  | 2.2  |
| First-difference                              | 1.5  | 2.2  | 2.2  | 2.2  | 2.3  | 2.3  | 2.3  |
| Flexible price-level targeting                | 1.5  | 2.2  | 2.3  | 2.3  | 2.3  | 2.3  | 2.3  |
| Extended Tealbook baseline                    | 1.5  | 2.0  | 2.0  | 2.0  | 2.0  | 2.1  | 2.1  |

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

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

| Outcome and strategy                          | 2019 |     |     |     | 2020 |     |     |     |
|---|------|-----|-----|-----|------|-----|-----|-----|
|   | Q1   | Q2  | Q3  | Q4  | Q1   | Q2  | Q3  | Q4  |
| <i>Nominal federal funds rate<sup>1</sup></i> |      |     |     |     |      |     |     |     |
| Taylor (1999)                                 | 4.6  | 4.6 | 4.7 | 4.8 | 4.8  | 4.8 | 4.8 | 4.9 |
| Taylor (1993)                                 | 3.5  | 3.6 | 3.8 | 4.0 | 4.0  | 4.0 | 4.0 | 4.1 |
| First-difference                              | 2.6  | 2.9 | 3.2 | 3.5 | 3.8  | 4.0 | 4.2 | 4.2 |
| Flexible price-level targeting                | 2.0  | 1.9 | 1.8 | 1.8 | 1.9  | 1.9 | 2.0 | 2.1 |
| Extended Tealbook baseline                    | 2.5  | 2.9 | 3.2 | 3.4 | 3.7  | 3.9 | 4.0 | 4.2 |
| <i>Real GDP</i>                               |      |     |     |     |      |     |     |     |
| Taylor (1999)                                 | 3.1  | 2.6 | 2.2 | 1.8 | 1.7  | 1.7 | 1.8 | 2.0 |
| Taylor (1993)                                 | 3.1  | 2.7 | 2.4 | 2.2 | 2.2  | 2.1 | 2.1 | 2.2 |
| First-difference                              | 3.1  | 2.8 | 2.5 | 2.4 | 2.4  | 2.2 | 2.2 | 2.2 |
| Flexible price-level targeting                | 3.1  | 3.0 | 2.9 | 3.0 | 3.2  | 3.0 | 2.9 | 2.8 |
| Extended Tealbook baseline                    | 3.1  | 2.7 | 2.4 | 2.2 | 2.1  | 1.9 | 1.9 | 1.9 |
| <i>Unemployment rate<sup>1</sup></i>          |      |     |     |     |      |     |     |     |
| Taylor (1999)                                 | 3.7  | 3.7 | 3.7 | 3.7 | 3.7  | 3.7 | 3.7 | 3.7 |
| Taylor (1993)                                 | 3.7  | 3.6 | 3.6 | 3.5 | 3.5  | 3.5 | 3.4 | 3.4 |
| First-difference                              | 3.7  | 3.6 | 3.5 | 3.4 | 3.4  | 3.4 | 3.3 | 3.3 |
| Flexible price-level targeting                | 3.7  | 3.5 | 3.3 | 3.2 | 3.0  | 2.9 | 2.8 | 2.7 |
| Extended Tealbook baseline                    | 3.7  | 3.6 | 3.6 | 3.5 | 3.5  | 3.5 | 3.5 | 3.5 |
| <i>Total PCE prices</i>                       |      |     |     |     |      |     |     |     |
| Taylor (1999)                                 | 1.6  | 1.6 | 1.7 | 1.8 | 2.0  | 2.0 | 2.0 | 2.0 |
| Taylor (1993)                                 | 1.6  | 1.6 | 1.7 | 1.9 | 2.1  | 2.1 | 2.1 | 2.1 |
| First-difference                              | 1.6  | 1.6 | 1.8 | 1.9 | 2.1  | 2.1 | 2.1 | 2.1 |
| Flexible price-level targeting                | 1.6  | 1.7 | 1.8 | 2.0 | 2.2  | 2.2 | 2.2 | 2.2 |
| Extended Tealbook baseline                    | 1.6  | 1.6 | 1.7 | 1.8 | 2.0  | 1.9 | 1.9 | 1.9 |
| <i>Core PCE prices</i>                        |      |     |     |     |      |     |     |     |
| Taylor (1999)                                 | 1.9  | 1.9 | 2.0 | 2.1 | 2.0  | 2.0 | 2.0 | 2.0 |
| Taylor (1993)                                 | 1.9  | 1.9 | 2.0 | 2.1 | 2.1  | 2.1 | 2.1 | 2.1 |
| First-difference                              | 1.9  | 1.9 | 2.0 | 2.2 | 2.1  | 2.1 | 2.2 | 2.2 |
| Flexible price-level targeting                | 1.9  | 1.9 | 2.1 | 2.2 | 2.2  | 2.2 | 2.2 | 2.3 |
| Extended Tealbook baseline                    | 1.9  | 1.9 | 2.0 | 2.0 | 2.0  | 2.0 | 2.0 | 2.0 |

1. Percent, average for the quarter.

**Outcomes of Optimal Control Simulations under Commitment**

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

| Outcome and strategy                          | 2018 |      |      |      |      |      |      |
|---|------|------|------|------|------|------|------|
|   | H2   | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| <i>Nominal federal funds rate<sup>1</sup></i> |      |      |      |      |      |      |      |
| Equal weights                                 | 2.2  | 5.0  | 6.5  | 6.8  | 6.3  | 5.4  | 4.4  |
| Minimal weight on rate adjustments            | 2.2  | 9.7  | 7.7  | 6.9  | 6.1  | 5.9  | 4.7  |
| Asymmetric weight on ugap                     | 2.2  | 2.5  | 2.8  | 3.1  | 3.4  | 3.6  | 3.7  |
| Extended Tealbook baseline                    | 2.2  | 3.4  | 4.2  | 4.5  | 4.4  | 4.1  | 3.7  |
| <i>Real GDP</i>                               |      |      |      |      |      |      |      |
| Equal weights                                 | 3.1  | 1.5  | 1.2  | 1.1  | 1.3  | 1.7  | 1.6  |
| Minimal weight on rate adjustments            | 3.1  | .4   | 1.3  | 1.6  | 1.7  | 1.8  | 1.5  |
| Asymmetric weight on ugap                     | 3.1  | 2.6  | 2.3  | 1.5  | 1.0  | .9   | 1.1  |
| Extended Tealbook baseline                    | 3.1  | 2.2  | 1.9  | 1.4  | 1.1  | 1.2  | 1.3  |
| <i>Unemployment rate<sup>1</sup></i>          |      |      |      |      |      |      |      |
| Equal weights                                 | 3.8  | 3.8  | 4.2  | 4.4  | 4.6  | 4.6  | 4.6  |
| Minimal weight on rate adjustments            | 3.8  | 4.5  | 4.6  | 4.6  | 4.6  | 4.5  | 4.5  |
| Asymmetric weight on ugap                     | 3.8  | 3.3  | 3.1  | 3.2  | 3.5  | 3.9  | 4.2  |
| Extended Tealbook baseline                    | 3.8  | 3.5  | 3.5  | 3.6  | 3.9  | 4.1  | 4.3  |
| <i>Total PCE prices</i>                       |      |      |      |      |      |      |      |
| Equal weights                                 | 1.5  | 1.7  | 1.8  | 1.8  | 1.9  | 1.9  | 1.9  |
| Minimal weight on rate adjustments            | 1.5  | 1.7  | 1.8  | 1.8  | 1.9  | 1.9  | 2.0  |
| Asymmetric weight on ugap                     | 1.5  | 1.8  | 2.0  | 2.0  | 2.0  | 2.1  | 2.1  |
| Extended Tealbook baseline                    | 1.5  | 1.8  | 1.9  | 2.0  | 2.0  | 2.1  | 2.1  |
| <i>Core PCE prices</i>                        |      |      |      |      |      |      |      |
| Equal weights                                 | 1.5  | 1.9  | 1.8  | 1.9  | 1.9  | 1.9  | 2.0  |
| Minimal weight on rate adjustments            | 1.5  | 1.9  | 1.8  | 1.9  | 1.9  | 1.9  | 2.0  |
| Asymmetric weight on ugap                     | 1.5  | 2.1  | 2.0  | 2.1  | 2.1  | 2.1  | 2.1  |
| Extended Tealbook baseline                    | 1.5  | 2.0  | 2.0  | 2.0  | 2.0  | 2.1  | 2.1  |

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

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

| Outcome and strategy                          | 2019 |      |      |     | 2020 |     |     |     |
|---|------|------|------|-----|------|-----|-----|-----|
|   | Q1   | Q2   | Q3   | Q4  | Q1   | Q2  | Q3  | Q4  |
| <i>Nominal federal funds rate<sup>1</sup></i> |      |      |      |     |      |     |     |     |
| Equal weights                                 | 3.0  | 3.8  | 4.5  | 5.0 | 5.5  | 5.9 | 6.3 | 6.5 |
| Minimal weight on rate adjustments            | 8.0  | 10.1 | 10.2 | 9.7 | 9.0  | 8.4 | 8.0 | 7.7 |
| Asymmetric weight on <i>ugap</i>              | 2.3  | 2.4  | 2.4  | 2.5 | 2.6  | 2.7 | 2.7 | 2.8 |
| Extended Tealbook baseline                    | 2.5  | 2.9  | 3.2  | 3.4 | 3.7  | 3.9 | 4.0 | 4.2 |
| <i>Real GDP</i>                               |      |      |      |     |      |     |     |     |
| Equal weights                                 | 3.1  | 2.5  | 1.9  | 1.5 | 1.2  | 1.0 | 1.1 | 1.2 |
| Minimal weight on rate adjustments            | 3.1  | 2.1  | 1.2  | .4  | -.0  | .3  | .7  | 1.3 |
| Asymmetric weight on <i>ugap</i>              | 3.1  | 2.9  | 2.6  | 2.6 | 2.6  | 2.4 | 2.4 | 2.3 |
| Extended Tealbook baseline                    | 3.1  | 2.7  | 2.4  | 2.2 | 2.1  | 1.9 | 1.9 | 1.9 |
| <i>Unemployment rate<sup>1</sup></i>          |      |      |      |     |      |     |     |     |
| Equal weights                                 | 3.7  | 3.7  | 3.8  | 3.8 | 3.9  | 4.0 | 4.1 | 4.2 |
| Minimal weight on rate adjustments            | 3.7  | 4.0  | 4.3  | 4.5 | 4.6  | 4.6 | 4.6 | 4.6 |
| Asymmetric weight on <i>ugap</i>              | 3.7  | 3.5  | 3.4  | 3.3 | 3.3  | 3.2 | 3.2 | 3.1 |
| Extended Tealbook baseline                    | 3.7  | 3.6  | 3.6  | 3.5 | 3.5  | 3.5 | 3.5 | 3.5 |
| <i>Total PCE prices</i>                       |      |      |      |     |      |     |     |     |
| Equal weights                                 | 1.6  | 1.6  | 1.6  | 1.7 | 1.8  | 1.8 | 1.8 | 1.8 |
| Minimal weight on rate adjustments            | 1.6  | 1.5  | 1.6  | 1.7 | 1.8  | 1.8 | 1.8 | 1.8 |
| Asymmetric weight on <i>ugap</i>              | 1.6  | 1.6  | 1.7  | 1.8 | 2.0  | 2.0 | 2.0 | 2.0 |
| Extended Tealbook baseline                    | 1.6  | 1.6  | 1.7  | 1.8 | 2.0  | 1.9 | 1.9 | 1.9 |
| <i>Core PCE prices</i>                        |      |      |      |     |      |     |     |     |
| Equal weights                                 | 1.9  | 1.8  | 1.9  | 1.9 | 1.9  | 1.8 | 1.8 | 1.8 |
| Minimal weight on rate adjustments            | 1.9  | 1.8  | 1.9  | 1.9 | 1.8  | 1.8 | 1.8 | 1.8 |
| Asymmetric weight on <i>ugap</i>              | 1.9  | 1.9  | 2.0  | 2.1 | 2.0  | 2.0 | 2.0 | 2.0 |
| Extended Tealbook baseline                    | 1.9  | 1.9  | 2.0  | 2.0 | 2.0  | 2.0 | 2.0 | 2.0 |

1. Percent, average for the quarter.

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

| Interval                        | Nominal GDP |          | Real GDP |          | PCE price index |          | Core PCE price index |          | Unemployment rate <sup>1</sup> |          |
|---------------------------------|-------------|----------|----------|----------|-----------------|----------|----------------------|----------|--------------------------------|----------|
|                                 | 12/07/18    | 01/17/19 | 12/07/18 | 01/17/19 | 12/07/18        | 01/17/19 | 12/07/18             | 01/17/19 | 12/07/18                       | 01/17/19 |
| <i>Quarterly</i>                |             |          |          |          |                 |          |                      |          |                                |          |
| 2018:Q1                         | 4.3         | 4.3      | 2.2      | 2.2      | 2.5             | 2.5      | 2.2                  | 2.2      | 4.1                            | 4.1      |
| Q2                              | 7.6         | 7.6      | 4.2      | 4.2      | 2.0             | 2.0      | 2.1                  | 2.1      | 3.9                            | 3.9      |
| Q3                              | 5.0         | 4.9      | 3.5      | 3.4      | 1.5             | 1.6      | 1.5                  | 1.6      | 3.8                            | 3.8      |
| Q4                              | 3.9         | 4.4      | 2.3      | 2.8      | 1.4             | 1.4      | 1.6                  | 1.5      | 3.7                            | 3.8      |
| 2019:Q1                         | 4.6         | 3.9      | 2.6      | 2.3      | 1.7             | 1.3      | 2.3                  | 2.3      | 3.6                            | 3.7      |
| Q2                              | 4.7         | 4.7      | 2.4      | 2.6      | 1.9             | 2.1      | 2.0                  | 2.0      | 3.5                            | 3.6      |
| Q3                              | 4.4         | 4.1      | 2.3      | 1.9      | 1.9             | 2.0      | 2.0                  | 2.0      | 3.5                            | 3.6      |
| Q4                              | 4.1         | 3.9      | 2.1      | 1.9      | 1.8             | 1.8      | 1.9                  | 1.9      | 3.4                            | 3.5      |
| 2020:Q1                         | 4.1         | 4.1      | 2.1      | 1.9      | 2.0             | 2.0      | 2.1                  | 2.1      | 3.4                            | 3.5      |
| Q2                              | 4.2         | 4.2      | 2.0      | 1.9      | 2.0             | 1.9      | 2.0                  | 2.0      | 3.4                            | 3.5      |
| Q3                              | 4.1         | 4.0      | 2.0      | 1.9      | 2.0             | 1.9      | 2.0                  | 2.0      | 3.4                            | 3.5      |
| Q4                              | 3.9         | 3.9      | 1.9      | 1.9      | 1.9             | 1.9      | 2.0                  | 2.0      | 3.4                            | 3.5      |
| <i>Two-quarter<sup>2</sup></i>  |             |          |          |          |                 |          |                      |          |                                |          |
| 2018:Q2                         | 5.9         | 5.9      | 3.2      | 3.2      | 2.2             | 2.2      | 2.1                  | 2.1      | -.2                            | -.2      |
| Q4                              | 4.4         | 4.7      | 2.9      | 3.1      | 1.4             | 1.5      | 1.5                  | 1.5      | -.2                            | -.1      |
| 2019:Q2                         | 4.7         | 4.3      | 2.5      | 2.4      | 1.8             | 1.7      | 2.2                  | 2.2      | -.2                            | -.2      |
| Q4                              | 4.2         | 4.0      | 2.2      | 1.9      | 1.9             | 1.9      | 1.9                  | 1.9      | -.1                            | -.1      |
| 2020:Q2                         | 4.2         | 4.1      | 2.0      | 1.9      | 2.0             | 2.0      | 2.0                  | 2.0      | .0                             | .0       |
| Q4                              | 4.0         | 4.0      | 1.9      | 1.9      | 1.9             | 1.9      | 2.0                  | 2.0      | .0                             | .0       |
| <i>Four-quarter<sup>3</sup></i> |             |          |          |          |                 |          |                      |          |                                |          |
| 2017:Q4                         | 4.5         | 4.5      | 2.5      | 2.5      | 1.8             | 1.8      | 1.6                  | 1.6      | -.6                            | -.7      |
| 2018:Q4                         | 5.2         | 5.3      | 3.0      | 3.1      | 1.8             | 1.8      | 1.8                  | 1.8      | -.4                            | -.3      |
| 2019:Q4                         | 4.4         | 4.1      | 2.4      | 2.2      | 1.8             | 1.8      | 2.0                  | 2.0      | -.3                            | -.3      |
| 2020:Q4                         | 4.1         | 4.1      | 2.0      | 1.9      | 2.0             | 1.9      | 2.0                  | 2.0      | .0                             | .0       |
| 2021:Q4                         | 3.6         | 3.5      | 1.4      | 1.4      | 2.0             | 2.0      | 2.0                  | 2.0      | .1                             | .1       |
| <i>Annual</i>                   |             |          |          |          |                 |          |                      |          |                                |          |
| 2017                            | 4.2         | 4.2      | 2.2      | 2.2      | 1.8             | 1.8      | 1.6                  | 1.6      | 4.4                            | 4.4      |
| 2018                            | 5.2         | 5.2      | 2.9      | 2.9      | 2.0             | 2.0      | 1.9                  | 1.9      | 3.9                            | 3.9      |
| 2019                            | 4.7         | 4.5      | 2.6      | 2.6      | 1.7             | 1.7      | 1.9                  | 1.9      | 3.5                            | 3.6      |
| 2020                            | 4.2         | 4.1      | 2.1      | 2.0      | 1.9             | 1.9      | 2.0                  | 2.0      | 3.4                            | 3.5      |
| 2021                            | 3.8         | 3.8      | 1.7      | 1.7      | 2.0             | 2.0      | 2.0                  | 2.0      | 3.4                            | 3.5      |

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                                     | 2018 |      |      | 2019 |      |      |      | 2020 |       |       |       | 2018 <sup>1</sup> | 2019 <sup>1</sup> | 2020 <sup>1</sup> | 2021 <sup>1</sup> |
|--|------|------|------|------|------|------|------|------|-------|-------|-------|-------------------|-------------------|-------------------|-------------------|
|  | Q2   | Q3   | Q4   | Q1   | Q2   | Q3   | Q4   | Q1   | Q2    | Q3    | Q4    |                   |                   |                   |                   |
| Real GDP                                 | 4.2  | 3.4  | 2.8  | 2.3  | 2.6  | 1.9  | 1.9  | 1.9  | 1.9   | 1.9   | 1.9   | 3.1               | 2.2               | 1.9               | 1.4               |
| <i>Previous Tealbook</i>                 | 4.2  | 3.5  | 2.3  | 2.6  | 2.4  | 2.3  | 2.1  | 2.1  | 2.0   | 2.0   | 1.9   | 3.0               | 2.4               | 2.0               | 1.4               |
| Final sales                              | 5.4  | 1.0  | 3.5  | 2.2  | 2.5  | 2.1  | 2.2  | 2.0  | 2.0   | 1.7   | 1.8   | 3.0               | 2.3               | 1.9               | 1.5               |
| <i>Previous Tealbook</i>                 | 5.4  | 1.2  | 2.8  | 2.6  | 2.4  | 2.2  | 2.2  | 2.2  | 2.0   | 1.8   | 1.9   | 2.8               | 2.3               | 2.0               | 1.6               |
| Priv. dom. final purch.                  | 4.3  | 3.0  | 4.0  | 2.3  | 2.5  | 2.3  | 2.2  | 2.0  | 2.0   | 2.0   | 1.9   | 3.3               | 2.3               | 1.9               | 1.6               |
| <i>Previous Tealbook</i>                 | 4.3  | 3.2  | 2.9  | 2.6  | 2.7  | 2.5  | 2.4  | 2.2  | 2.1   | 2.1   | 2.0   | 3.1               | 2.6               | 2.1               | 1.7               |
| Personal cons. expend.                   | 3.8  | 3.5  | 3.8  | 2.4  | 2.5  | 2.3  | 2.2  | 2.2  | 2.2   | 2.2   | 2.1   | 2.9               | 2.4               | 2.2               | 1.9               |
| <i>Previous Tealbook</i>                 | 3.8  | 3.7  | 3.0  | 2.5  | 2.5  | 2.5  | 2.5  | 2.5  | 2.4   | 2.3   | 2.2   | 2.8               | 2.5               | 2.3               | 1.9               |
| Durables                                 | 8.6  | 3.7  | 7.9  | 5.1  | 2.0  | 1.8  | 1.7  | 1.7  | 1.6   | 1.6   | 1.5   | 4.4               | 2.7               | 1.6               | 1.3               |
| Nondurables                              | 4.0  | 4.6  | 4.8  | 5.1  | 3.0  | 2.4  | 2.3  | 2.3  | 2.3   | 2.3   | 2.2   | 3.4               | 3.2               | 2.3               | 2.0               |
| Services                                 | 3.0  | 3.2  | 2.9  | 1.3  | 2.4  | 2.3  | 2.3  | 2.3  | 2.2   | 2.2   | 2.2   | 2.5               | 2.1               | 2.2               | 1.9               |
| Residential investment                   | -1.3 | -3.6 | -4.4 | -3.4 | 1.4  | 2.9  | 2.2  | .1   | -.8   | -.5   | -1.1  | -3.2              | .7                | -.6               | -.4               |
| <i>Previous Tealbook</i>                 | -1.3 | -2.9 | -5.4 | -2.6 | 1.0  | 1.0  | .8   | .4   | .3    | .2    | .1    | -3.3              | .0                | .2                | .2                |
| Nonres. priv. fixed invest.              | 8.7  | 2.5  | 7.1  | 3.2  | 3.1  | 2.3  | 1.8  | 1.4  | 1.6   | 1.6   | 1.5   | 7.4               | 2.6               | 1.5               | .8                |
| <i>Previous Tealbook</i>                 | 8.7  | 2.1  | 5.1  | 4.8  | 4.0  | 3.1  | 2.5  | 1.5  | 1.4   | 1.7   | 1.6   | 6.8               | 3.6               | 1.5               | .9                |
| Equipment & intangibles                  | 7.1  | 4.4  | 9.4  | 2.8  | 3.7  | 2.9  | 1.8  | 2.1  | 2.2   | 2.3   | 2.3   | 7.9               | 2.8               | 2.2               | 1.6               |
| <i>Previous Tealbook</i>                 | 7.1  | 3.8  | 7.1  | 5.0  | 4.7  | 3.5  | 2.5  | 2.1  | 2.1   | 2.3   | 2.4   | 7.2               | 3.9               | 2.2               | 1.6               |
| Nonres. structures                       | 14.5 | -3.4 | -.2  | 4.6  | 1.0  | .4   | 1.8  | -.9  | -.1   | -.8   | -1.2  | 5.9               | 1.9               | -.8               | -2.0              |
| <i>Previous Tealbook</i>                 | 14.5 | -3.4 | -1.2 | 3.8  | 1.7  | 1.7  | 2.3  | -.3  | -1.3  | -.5   | -.7   | 5.6               | 2.4               | -.7               | -1.7              |
| Net exports <sup>2</sup>                 | -841 | -950 | -961 | -955 | -972 | -984 | -988 | -991 | -996  | -1014 | -1015 | -913              | -975              | -1004             | -1023             |
| <i>Previous Tealbook<sup>2</sup></i>     | -841 | -946 | -946 | -946 | -963 | -983 | -997 | -998 | -1010 | -1032 | -1034 | -909              | -972              | -1018             | -1046             |
| Exports                                  | 9.3  | -4.9 | 1.9  | 2.4  | 2.3  | 2.5  | 2.0  | 2.6  | 2.9   | 3.1   | 3.2   | 2.3               | 2.3               | 3.0               | 3.1               |
| Imports                                  | -.6  | 9.3  | 2.7  | 1.1  | 3.7  | 3.2  | 1.8  | 2.2  | 2.7   | 4.3   | 2.4   | 3.5               | 2.5               | 2.9               | 2.6               |
| Gov't. cons. & invest.                   | 2.5  | 2.6  | 1.7  | .4   | 3.7  | 2.0  | 2.0  | 1.8  | 2.0   | 1.9   | 1.1   | 2.1               | 2.0               | 1.7               | .9                |
| <i>Previous Tealbook</i>                 | 2.5  | 2.5  | 1.5  | 1.9  | 1.9  | 1.9  | 2.0  | 1.7  | 2.1   | 1.9   | 1.1   | 2.0               | 1.9               | 1.7               | 1.0               |
| Federal                                  | 3.7  | 3.5  | 3.2  | -1.0 | 7.8  | 3.3  | 3.5  | 3.0  | 3.8   | 3.5   | 1.2   | 3.2               | 3.4               | 2.9               | .9                |
| Defense                                  | 6.0  | 4.9  | 5.7  | 3.2  | 3.1  | 3.9  | 4.1  | 3.3  | 4.4   | 3.3   | 1.0   | 4.9               | 3.6               | 3.0               | .9                |
| Nonddefense                              | .5   | 1.6  | -.4  | -7.0 | 15.2 | 2.5  | 2.6  | 2.6  | 3.0   | 3.7   | 1.6   | .9                | 3.1               | 2.7               | 1.0               |
| State & local                            | 1.8  | 2.0  | .9   | 1.2  | 1.2  | 1.1  | 1.1  | 1.0  | 1.0   | 1.0   | 1.0   | 1.4               | 1.2               | 1.0               | 1.0               |
| Change in priv. inventories <sup>2</sup> | -37  | 90   | 46   | 52   | 55   | 44   | 32   | 29   | 26    | 37    | 44    | 32                | 46                | 34                | 36                |
| <i>Previous Tealbook<sup>2</sup></i>     | -37  | 89   | 52   | 53   | 56   | 64   | 60   | 51   | 51    | 59    | 58    | 34                | 58                | 55                | 47                |

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

2. Billions of chained (2012) dollars; annual values show annual averages.

**Changes in Real Gross Domestic Product and Related Items**  
 (Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise noted)

| Item   | 2012         | 2013         | 2014         | 2015           | 2016         | 2017         | 2018         | 2019         | 2020           | 2021           |
|--|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|----------------|----------------|
| Real GDP<br><i>Previous Tealbook</i>   | 1.5<br>1.5   | 2.6<br>2.6   | 2.7<br>2.7   | 2.0<br>2.0     | 1.9<br>1.9   | 2.5<br>2.5   | 3.1<br>3.0   | 2.2<br>2.4   | 1.9<br>2.0     | 1.4<br>1.4     |
| Final sales<br><i>Previous Tealbook</i>  | 1.9<br>1.9   | 2.0<br>2.0   | 3.0<br>3.0   | 1.9<br>1.9     | 2.1<br>2.1   | 2.6<br>2.6   | 3.0<br>2.8   | 2.3<br>2.3   | 1.9<br>2.0     | 1.5<br>1.6     |
| Priv. dom. final purch.<br><i>Previous Tealbook</i>                              | 2.6<br>2.6   | 2.6<br>2.6   | 4.3<br>4.3   | 2.7<br>2.7     | 2.7<br>2.7   | 3.3<br>3.3   | 3.3<br>3.1   | 2.3<br>2.6   | 1.9<br>2.1     | 1.6<br>1.7     |
| Personal cons. expend.<br><i>Previous Tealbook</i>                               | 1.6<br>1.6   | 1.9<br>1.9   | 3.8<br>3.8   | 3.0<br>3.0     | 2.8<br>2.8   | 2.7<br>2.7   | 2.9<br>2.8   | 2.4<br>2.5   | 2.2<br>2.3     | 1.9<br>1.9     |
| Durables   | 6.3          | 5.0          | 9.2          | 6.0            | 6.8          | 7.7          | 4.4          | 2.7          | 1.6            | 1.3            |
| Nondurables  | .7           | 2.8          | 3.0          | 3.0            | 2.0          | 3.0          | 3.4          | 3.2          | 2.3            | 2.0            |
| Services   | 1.2          | 1.1          | 3.2          | 2.6            | 2.4          | 1.8          | 2.5          | 2.1          | 2.2            | 1.9            |
| Residential investment<br><i>Previous Tealbook</i>                               | 15.4<br>15.4 | 7.1<br>7.1   | 7.8<br>7.8   | 8.9<br>8.9     | 4.5<br>4.5   | 3.8<br>3.8   | -3.2<br>-3.3 | .7<br>.0     | -.6<br>.2      | -.4<br>.2      |
| Nonres. priv. fixed invest.<br><i>Previous Tealbook</i>                          | 5.6<br>5.6   | 5.4<br>5.4   | 6.4<br>6.4   | -.7<br>-.7     | 1.8<br>1.8   | 6.3<br>6.3   | 7.4<br>6.8   | 2.6<br>3.6   | 1.5<br>1.5     | .8<br>.9       |
| Equipment & intangibles<br><i>Previous Tealbook</i>                              | 6.1<br>6.1   | 5.1<br>5.1   | 5.6<br>5.6   | 2.6<br>2.6     | 1.6<br>1.6   | 7.3<br>7.3   | 7.9<br>7.2   | 2.8<br>3.9   | 2.2<br>2.2     | 1.6<br>1.6     |
| Nonres. structures<br><i>Previous Tealbook</i>                                   | 4.0<br>4.0   | 6.7<br>6.7   | 8.8<br>8.8   | -10.7<br>-10.7 | 2.5<br>2.5   | 2.9<br>2.9   | 5.9<br>5.6   | 1.9<br>2.4   | -.8<br>-.7     | -2.0<br>-1.7   |
| Net exports <sup>1</sup><br><i>Previous Tealbook<sup>1</sup></i>                 | -569<br>-569 | -533<br>-533 | -578<br>-578 | -725<br>-725   | -786<br>-786 | -859<br>-859 | -913<br>-909 | -975<br>-972 | -1004<br>-1018 | -1023<br>-1046 |
| Exports  | 2.1          | 6.0          | 3.0          | -1.6           | .8           | 4.7          | 2.3          | 2.3          | 3.0            | 3.1            |
| Imports  | .6           | 3.0          | 6.7          | 3.4            | 3.1          | 5.4          | 3.5          | 2.5          | 2.9            | 2.6            |
| Gov't. cons. & invest.<br><i>Previous Tealbook</i>                               | -2.1<br>-2.1 | -2.4<br>-2.4 | .2<br>.2     | 2.2<br>2.2     | .9<br>.9     | .1<br>.1     | 2.1<br>2.0   | 2.0<br>1.9   | 1.7<br>1.7     | .9<br>1.0      |
| Federal  | -2.6         | -6.1         | -1.2         | 1.2            | .2           | 1.3          | 3.2          | 3.4          | 2.9            | .9             |
| Defense  | -4.7         | -6.5         | -3.6         | -.2            | -.7          | 1.3          | 4.9          | 3.6          | 3.0            | .9             |
| Nondefense   | 1.2          | -5.5         | 2.7          | 3.4            | 1.5          | 1.3          | .9           | 3.1          | 2.7            | 1.0            |
| State & local  | -1.7         | .2           | 1.1          | 2.8            | 1.4          | -.5          | 1.4          | 1.2          | 1.0            | 1.0            |
| Change in priv. inventories <sup>1</sup><br><i>Previous Tealbook<sup>1</sup></i> | 71<br>71     | 109<br>109   | 87<br>87     | 129<br>129     | 23<br>23     | 23<br>23     | 32<br>34     | 46<br>58     | 34<br>55       | 36<br>47       |

1. Billions of chained (2012) dollars; annual values show annual averages.

# Greensheets

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

| Item  | 2018 |      |     | 2019 |     |     |     | 2020 |     |     |     | 2018 <sup>1</sup> | 2019 <sup>1</sup> | 2020 <sup>1</sup> | 2021 <sup>1</sup> | Class II FOMC - Restricted (FR) |
|---|------|------|-----|------|-----|-----|-----|------|-----|-----|-----|-------------------|-------------------|-------------------|-------------------|---------------------------------|
|   | Q2   | Q3   | Q4  | Q1   | Q2  | Q3  | Q4  | Q1   | Q2  | Q3  | Q4  |                   |                   |                   |                   |                                 |
| Real GDP<br><i>Previous Tealbook</i>                    | 4.2  | 3.4  | 2.8 | 2.3  | 2.6 | 1.9 | 1.9 | 1.9  | 1.9 | 1.9 | 1.9 | 3.1               | 2.2               | 1.9               | 1.4               |                                 |
|   | 4.2  | 3.5  | 2.3 | 2.6  | 2.4 | 2.3 | 2.1 | 2.1  | 2.0 | 2.0 | 1.9 | 3.0               | 2.4               | 2.0               | 1.4               |                                 |
| Final sales<br><i>Previous Tealbook</i>                 | 5.3  | 1.0  | 3.5 | 2.2  | 2.5 | 2.1 | 2.2 | 2.0  | 2.0 | 1.7 | 1.8 | 2.9               | 2.2               | 1.9               | 1.5               |                                 |
|   | 5.3  | 1.2  | 2.8 | 2.6  | 2.3 | 2.2 | 2.2 | 2.2  | 2.0 | 1.8 | 1.9 | 2.8               | 2.3               | 2.0               | 1.6               |                                 |
| Priv. dom. final purch.<br><i>Previous Tealbook</i>     | 3.7  | 2.6  | 3.4 | 2.0  | 2.2 | 2.0 | 1.9 | 1.7  | 1.7 | 1.7 | 1.6 | 2.8               | 2.0               | 1.7               | 1.4               |                                 |
|   | 3.7  | 2.7  | 2.5 | 2.2  | 2.3 | 2.2 | 2.1 | 1.9  | 1.8 | 1.8 | 1.7 | 2.7               | 2.2               | 1.8               | 1.4               |                                 |
| Personal cons. expend.<br><i>Previous Tealbook</i>      | 2.6  | 2.4  | 2.6 | 1.7  | 1.7 | 1.5 | 1.5 | 1.5  | 1.5 | 1.5 | 1.4 | 2.0               | 1.6               | 1.5               | 1.3               |                                 |
|   | 2.6  | 2.5  | 2.0 | 1.7  | 1.7 | 1.7 | 1.7 | 1.7  | 1.6 | 1.6 | 1.5 | 1.9               | 1.7               | 1.6               | 1.3               |                                 |
| Durables  | .6   | .3   | .5  | .4   | .1  | .1  | .1  | .1   | .1  | .1  | .1  | .3                | .2                | .1                | .1                |                                 |
| Nondurables   | .6   | .6   | .7  | .7   | .4  | .3  | .3  | .3   | .3  | .3  | .3  | .5                | .4                | .3                | .3                |                                 |
| Services  | 1.4  | 1.5  | 1.4 | .6   | 1.1 | 1.1 | 1.1 | 1.1  | 1.1 | 1.0 | 1.0 | 1.2               | 1.0               | 1.1               | .9                |                                 |
| Residential investment<br><i>Previous Tealbook</i>      | -.1  | -.1  | -.2 | -.1  | .1  | .1  | .1  | .0   | .0  | .0  | .0  | -.1               | .0                | .0                | .0                |                                 |
|   | -.1  | -.1  | -.2 | -.1  | .0  | .0  | .0  | .0   | .0  | .0  | .0  | -.1               | .0                | .0                | .0                |                                 |
| Nonres. priv. fixed invest.<br><i>Previous Tealbook</i> | 1.2  | .4   | 1.0 | .4   | .4  | .3  | .2  | .2   | .2  | .2  | .2  | 1.0               | .4                | .2                | .1                |                                 |
|   | 1.2  | .3   | .7  | .6   | .5  | .4  | .3  | .2   | .2  | .2  | .2  | .9                | .5                | .2                | .1                |                                 |
| Equipment & intangibles<br><i>Previous Tealbook</i>     | .7   | .5   | 1.0 | .3   | .4  | .3  | .2  | .2   | .2  | .2  | .2  | .8                | .3                | .2                | .2                |                                 |
|   | .7   | .4   | .7  | .5   | .5  | .4  | .3  | .2   | .2  | .2  | .2  | .7                | .4                | .2                | .2                |                                 |
| Nonres. structures<br><i>Previous Tealbook</i>          | .4   | -.1  | .0  | .1   | .0  | .0  | .1  | .0   | .0  | .0  | .0  | .2                | .1                | .0                | -.1               |                                 |
|   | .4   | -.1  | .0  | .1   | .1  | .1  | .1  | .0   | .0  | .0  | .0  | .2                | .1                | .0                | -.1               |                                 |
| Net exports<br><i>Previous Tealbook</i>                 | 1.2  | -2.0 | -.2 | .1   | -.3 | -.2 | .0  | .0   | .0  | -.3 | .0  | -.3               | -.1               | -.1               | .0                |                                 |
|   | 1.2  | -1.9 | .1  | .0   | -.3 | -.3 | -.2 | .0   | -.2 | -.3 | .0  | -.2               | -.2               | -.1               | .0                |                                 |
| Exports   | 1.1  | -.6  | .2  | .3   | .3  | .3  | .2  | .3   | .4  | .4  | .4  | .3                | .3                | .4                | .4                |                                 |
| Imports   | .1   | -1.4 | -.4 | -.2  | -.6 | -.5 | -.3 | -.3  | -.4 | -.6 | -.4 | -.5               | -.4               | -.4               | -.4               |                                 |
| Gov't. cons. & invest.<br><i>Previous Tealbook</i>      | .4   | .4   | .3  | .1   | .6  | .3  | .3  | .3   | .4  | .3  | .2  | .4                | .3                | .3                | .2                |                                 |
|   | .4   | .4   | .3  | .3   | .3  | .3  | .3  | .3   | .4  | .3  | .2  | .3                | .3                | .3                | .2                |                                 |
| Federal   | .2   | .2   | .2  | -.1  | .5  | .2  | .2  | .2   | .2  | .2  | .1  | .2                | .2                | .2                | .1                |                                 |
| Defense   | .2   | .2   | .2  | .1   | .1  | .1  | .2  | .1   | .2  | .1  | .0  | .2                | .1                | .1                | .0                |                                 |
| Nondefense  | .0   | .0   | .0  | -.2  | .4  | .1  | .1  | .1   | .1  | .1  | .0  | .0                | .1                | .1                | .0                |                                 |
| State & local   | .2   | .2   | .1  | .1   | .1  | .1  | .1  | .1   | .1  | .1  | .1  | .2                | .1                | .1                | .1                |                                 |
| Change in priv. inventories<br><i>Previous Tealbook</i> | -1.2 | 2.3  | -.7 | .1   | .1  | -.2 | -.2 | -.1  | -.1 | .2  | .1  | .2                | -.1               | .1                | -.1               |                                 |
|   | -1.2 | 2.3  | -.6 | .0   | .1  | .1  | -.1 | -.2  | -.0 | .1  | .0  | .2                | -.0               | .0                | -.2               |                                 |

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

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

| Item  | 2018         |              |            | 2019           |            |            |            | 2020       |            |            |            | 2018 <sup>1</sup> | 2019 <sup>1</sup> | 2020 <sup>1</sup> | 2021 <sup>1</sup> |
|---|--------------|--------------|------------|----------------|------------|------------|------------|------------|------------|------------|------------|-------------------|-------------------|-------------------|-------------------|
|   | Q2           | Q3           | Q4         | Q1             | Q2         | Q3         | Q4         | Q1         | Q2         | Q3         | Q4         |                   |                   |                   |                   |
| GDP chain-wt. price index<br><i>Previous Tealbook</i>   | 3.0<br>3.0   | 1.8<br>1.7   | 1.8<br>1.8 | 1.6<br>2.0     | 2.0<br>2.2 | 2.1<br>2.1 | 1.9<br>1.9 | 2.1<br>2.0 | 2.2<br>2.2 | 2.1<br>2.1 | 2.0<br>2.0 | 2.2<br>2.1        | 1.9<br>2.0        | 2.1<br>2.1        | 2.1<br>2.1        |
| PCE chain-wt. price index<br><i>Previous Tealbook</i>   | 2.0<br>2.0   | 1.6<br>1.5   | 1.4<br>1.4 | 1.3<br>1.7     | 2.1<br>1.9 | 2.0<br>1.9 | 1.8<br>1.8 | 2.0<br>2.0 | 1.9<br>2.0 | 1.9<br>2.0 | 1.9<br>1.9 | 1.8<br>1.8        | 1.8<br>1.8        | 1.9<br>2.0        | 2.0<br>2.0        |
| Energy<br><i>Previous Tealbook</i>  | .7<br>.7     | 3.3<br>3.4   | .4<br>-.4  | -18.4<br>-12.9 | 2.4<br>-.8 | .7<br>.0   | .4<br>.2   | -.1<br>-.4 | .0<br>-.4  | -.1<br>-.1 | -.1<br>.0  | 4.2<br>4.0        | -4.1<br>-3.5      | -.1<br>-.2        | .5<br>.5          |
| Food<br><i>Previous Tealbook</i>  | 1.2<br>1.2   | .4<br>.4     | .3<br>.2   | 2.1<br>2.1     | 2.2<br>2.3 | 2.4<br>2.4 | 2.4<br>2.4 | 2.3<br>2.3 | 2.3<br>2.3 | 2.3<br>2.3 | 2.3<br>2.3 | .5<br>.5          | 2.3<br>2.3        | 2.3<br>2.3        | 2.3<br>2.3        |
| Ex. food & energy<br><i>Previous Tealbook</i>   | 2.1<br>2.1   | 1.6<br>1.5   | 1.5<br>1.6 | 2.3<br>2.3     | 2.0<br>2.0 | 2.0<br>2.0 | 1.9<br>1.9 | 2.1<br>2.1 | 2.0<br>2.0 | 2.0<br>2.0 | 2.0<br>2.0 | 1.8<br>1.8        | 2.0<br>2.0        | 2.0<br>2.0        | 2.0<br>2.0        |
| Ex. food & energy, market based<br><i>Previous Tealbook</i>                                   | 2.2<br>2.2   | 1.2<br>1.2   | 1.3<br>1.2 | 2.3<br>2.3     | 2.0<br>1.8 | 1.8<br>1.8 | 1.7<br>1.7 | 1.9<br>1.9 | 1.8<br>1.9 | 1.8<br>1.9 | 1.8<br>1.8 | 1.7<br>1.6        | 1.9<br>1.9        | 1.9<br>1.9        | 1.9<br>1.9        |
| CPI<br><i>Previous Tealbook</i>   | 1.7<br>1.7   | 2.0<br>2.0   | 1.8<br>1.8 | 1.0<br>1.6     | 2.5<br>2.2 | 2.3<br>2.2 | 2.2<br>2.2 | 2.3<br>2.3 | 2.3<br>2.3 | 2.3<br>2.3 | 2.3<br>2.3 | 2.2<br>2.2        | 2.0<br>2.0        | 2.3<br>2.3        | 2.3<br>2.4        |
| Ex. food & energy<br><i>Previous Tealbook</i>   | 1.8<br>1.8   | 2.0<br>2.0   | 2.0<br>2.1 | 2.7<br>2.8     | 2.5<br>2.4 | 2.4<br>2.4 | 2.3<br>2.3 | 2.5<br>2.5 | 2.4<br>2.5 | 2.4<br>2.5 | 2.4<br>2.5 | 2.2<br>2.2        | 2.5<br>2.5        | 2.4<br>2.5        | 2.5<br>2.5        |
| ECI, hourly compensation <sup>2</sup><br><i>Previous Tealbook<sup>2</sup></i>                 | 2.4<br>2.4   | 3.0<br>3.0   | 2.6<br>2.6 | 2.8<br>2.8     | 2.8<br>2.8 | 2.8<br>2.8 | 2.9<br>2.9 | 2.8<br>2.9 | 2.8<br>2.9 | 2.8<br>2.9 | 2.8<br>2.9 | 3.0<br>3.0        | 2.9<br>2.9        | 2.8<br>2.9        | 2.8<br>2.9        |
| Business sector   |              |              |            |                |            |            |            |            |            |            |            |                   |                   |                   |                   |
| Output per hour<br><i>Previous Tealbook</i>   | 3.6<br>3.6   | 1.8<br>2.0   | 1.8<br>.9  | .3<br>.7       | 1.2<br>.6  | .8<br>1.1  | .9<br>1.1  | 1.1<br>1.1 | 1.2<br>1.2 | 1.2<br>1.3 | 1.2<br>1.3 | 1.9<br>1.8        | .8<br>.9          | 1.2<br>1.2        | 1.2<br>1.2        |
| Compensation per hour<br><i>Previous Tealbook</i>   | .5<br>.5     | 2.8<br>2.8   | 3.4<br>2.9 | 3.7<br>3.7     | 3.9<br>3.9 | 3.9<br>3.9 | 3.9<br>3.9 | 3.8<br>3.9 | 3.8<br>3.9 | 3.8<br>3.9 | 3.8<br>3.9 | 2.7<br>2.6        | 3.8<br>3.9        | 3.8<br>3.9        | 3.7<br>3.8        |
| Unit labor costs<br><i>Previous Tealbook</i>  | -2.9<br>-2.9 | 1.0<br>.8    | 1.6<br>1.9 | 3.3<br>2.9     | 2.7<br>3.3 | 3.1<br>2.8 | 2.9<br>2.8 | 2.7<br>2.7 | 2.6<br>2.6 | 2.5<br>2.6 | 2.5<br>2.6 | .8<br>.8          | 3.0<br>3.0        | 2.6<br>2.6        | 2.5<br>2.6        |
| Core goods imports chain-wt. price index <sup>3</sup><br><i>Previous Tealbook<sup>3</sup></i> | .6<br>.6     | -1.2<br>-1.2 | -.1<br>1.0 | .4<br>.3       | 1.5<br>.8  | .9<br>.9   | .9<br>1.0  | 1.1<br>1.1 | .9<br>1.1  | .8<br>1.0  | .9<br>1.0  | .5<br>.7          | .9<br>.8          | .9<br>1.0         | .8<br>.9          |

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

2. Private-industry workers.

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

**Greensheets****Changes in Prices and Costs**

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

| Item  | 2012       | 2013         | 2014         | 2015           | 2016         | 2017       | 2018       | 2019         | 2020       | 2021       |
|---|------------|--------------|--------------|----------------|--------------|------------|------------|--------------|------------|------------|
| GDP chain-wt. price index<br><i>Previous Tealbook</i>   | 2.1<br>2.1 | 1.8<br>1.8   | 1.6<br>1.6   | .9<br>.9       | 1.5<br>1.5   | 2.0<br>2.0 | 2.2<br>2.1 | 1.9<br>2.0   | 2.1<br>2.1 | 2.1<br>2.1 |
| PCE chain-wt. price index<br><i>Previous Tealbook</i>   | 1.8<br>1.8 | 1.2<br>1.2   | 1.2<br>1.2   | .3<br>.3       | 1.6<br>1.6   | 1.8<br>1.8 | 1.8<br>1.8 | 1.8<br>1.8   | 1.9<br>2.0 | 2.0<br>2.0 |
| Energy<br><i>Previous Tealbook</i>  | 2.1<br>2.1 | -2.9<br>-2.9 | -6.9<br>-6.9 | -16.4<br>-16.4 | 2.1<br>2.1   | 8.1<br>8.1 | 4.2<br>4.0 | -4.1<br>-3.5 | -.1<br>-.2 | .5<br>.5   |
| Food<br><i>Previous Tealbook</i>  | 1.3<br>1.3 | .7<br>.7     | 2.8<br>2.8   | .3<br>.3       | -1.8<br>-1.8 | .7<br>.7   | .5<br>.5   | 2.3<br>2.3   | 2.3<br>2.3 | 2.3<br>2.3 |
| Ex. food & energy<br><i>Previous Tealbook</i>   | 1.8<br>1.8 | 1.6<br>1.6   | 1.5<br>1.5   | 1.2<br>1.2     | 1.8<br>1.8   | 1.6<br>1.6 | 1.8<br>1.8 | 2.0<br>2.0   | 2.0<br>2.0 | 2.0<br>2.0 |
| Ex. food & energy, market based<br><i>Previous Tealbook</i>                                   | 1.5<br>1.5 | 1.1<br>1.1   | 1.2<br>1.2   | 1.1<br>1.1     | 1.5<br>1.5   | 1.2<br>1.2 | 1.7<br>1.6 | 1.9<br>1.9   | 1.9<br>1.9 | 1.9<br>1.9 |
| CPI<br><i>Previous Tealbook</i>   | 1.9<br>1.9 | 1.2<br>1.2   | 1.2<br>1.2   | .4<br>.4       | 1.8<br>1.8   | 2.1<br>2.1 | 2.2<br>2.2 | 2.0<br>2.0   | 2.3<br>2.3 | 2.3<br>2.4 |
| Ex. food & energy<br><i>Previous Tealbook</i>   | 1.9<br>1.9 | 1.7<br>1.7   | 1.7<br>1.7   | 2.0<br>2.0     | 2.2<br>2.2   | 1.7<br>1.7 | 2.2<br>2.2 | 2.5<br>2.5   | 2.4<br>2.5 | 2.5<br>2.5 |
| ECI, hourly compensation <sup>1</sup><br><i>Previous Tealbook<sup>1</sup></i>                 | 1.8<br>1.8 | 2.0<br>2.0   | 2.3<br>2.3   | 1.9<br>1.9     | 2.2<br>2.2   | 2.6<br>2.6 | 3.0<br>3.0 | 2.9<br>2.9   | 2.8<br>2.9 | 2.8<br>2.9 |
| Business sector   |            |              |              |                |              |            |            |              |            |            |
| Output per hour<br><i>Previous Tealbook</i>   | .2<br>.2   | 1.8<br>1.8   | .1<br>.1     | .7<br>.7       | 1.1<br>1.1   | .8<br>.8   | 1.9<br>1.8 | .8<br>.9     | 1.2<br>1.2 | 1.2<br>1.2 |
| Compensation per hour<br><i>Previous Tealbook</i>   | 5.9<br>5.9 | -.3<br>-.3   | 2.8<br>2.8   | 2.5<br>2.5     | 2.1<br>2.1   | 3.0<br>3.0 | 2.7<br>2.6 | 3.8<br>3.9   | 3.8<br>3.9 | 3.7<br>3.8 |
| Unit labor costs<br><i>Previous Tealbook</i>  | 5.7<br>5.7 | -2.0<br>-2.0 | 2.7<br>2.7   | 1.8<br>1.8     | 1.0<br>1.0   | 2.3<br>2.3 | .8<br>.8   | 3.0<br>3.0   | 2.6<br>2.6 | 2.5<br>2.6 |
| Core goods imports chain-wt. price index <sup>2</sup><br><i>Previous Tealbook<sup>2</sup></i> | -.4<br>-.4 | -2.2<br>-2.2 | -.4<br>-.4   | -4.4<br>-4.4   | -.7<br>-.7   | 1.1<br>1.1 | .5<br>.7   | .9<br>.8     | .9<br>1.0  | .8<br>.9   |

1. Private-industry workers.

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

### Other Macroeconomic Indicators

| Item  | 2018 |      |      | 2019 |      |      |      | 2020 |      |      |      | 2018 <sup>1</sup> | 2019 <sup>1</sup> | 2020 <sup>1</sup> | 2021 <sup>1</sup> | Class II FOMC - Restricted (FR) |
|---|------|------|------|------|------|------|------|------|------|------|------|-------------------|-------------------|-------------------|-------------------|---------------------------------|
|   | Q2   | Q3   | Q4   | Q1   | Q2   | Q3   | Q4   | Q1   | Q2   | Q3   | Q4   |                   |                   |                   |                   |                                 |
| <i>Employment and production</i>              |      |      |      |      |      |      |      |      |      |      |      |                   |                   |                   |                   |                                 |
| Nonfarm payroll employment <sup>2</sup>       | 217  | 190  | 254  | 202  | 181  | 160  | 140  | 130  | 123  | 117  | 110  | 220               | 171               | 120               | 70                |                                 |
| Unemployment rate <sup>3</sup>                | 3.9  | 3.8  | 3.8  | 3.7  | 3.6  | 3.6  | 3.5  | 3.5  | 3.5  | 3.5  | 3.5  | 3.8               | 3.5               | 3.5               | 3.6               |                                 |
| <i>Previous Tealbook<sup>3</sup></i>          | 3.9  | 3.8  | 3.7  | 3.6  | 3.5  | 3.5  | 3.4  | 3.4  | 3.4  | 3.4  | 3.4  | 3.7               | 3.4               | 3.4               | 3.5               |                                 |
| Natural rate of unemployment <sup>3</sup>     | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6               | 4.6               | 4.6               | 4.6               |                                 |
| <i>Previous Tealbook<sup>3</sup></i>          | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6               | 4.6               | 4.6               | 4.6               |                                 |
| Employment-to-Population Ratio <sup>3</sup>   | 60.4 | 60.4 | 60.6 | 60.7 | 60.7 | 60.7 | 60.7 | 60.7 | 60.7 | 60.7 | 60.6 | 60.6              | 60.7              | 60.6              | 60.4              |                                 |
| Employment-to-Population Trend <sup>3</sup>   | 59.8 | 59.8 | 59.8 | 59.7 | 59.7 | 59.6 | 59.6 | 59.6 | 59.5 | 59.5 | 59.5 | 59.8              | 59.6              | 59.5              | 59.3              |                                 |
| Output gap <sup>4</sup>                       | 1.6  | 2.0  | 2.2  | 2.4  | 2.6  | 2.6  | 2.6  | 2.6  | 2.7  | 2.7  | 2.7  | 2.2               | 2.6               | 2.7               | 2.2               |                                 |
| <i>Previous Tealbook<sup>4</sup></i>          | 1.6  | 2.0  | 2.2  | 2.4  | 2.5  | 2.7  | 2.8  | 2.8  | 2.8  | 2.9  | 2.9  | 2.2               | 2.8               | 2.9               | 2.4               |                                 |
| Industrial production <sup>5</sup>            | 5.2  | 4.7  | 3.8  | 1.0  | 2.1  | 1.0  | 1.0  | 1.6  | 1.6  | 1.4  | 1.5  | 4.1               | 1.3               | 1.5               | .8                |                                 |
| <i>Previous Tealbook<sup>5</sup></i>          | 5.3  | 4.7  | 3.8  | 2.2  | 1.9  | 1.4  | 1.4  | 1.5  | 1.1  | 1.0  | .9   | 4.1               | 1.7               | 1.1               | .4                |                                 |
| Manufacturing industr. prod. <sup>5</sup>     | 2.3  | 3.7  | 2.3  | 1.7  | 1.1  | 1.0  | 1.0  | .7   | 1.0  | 1.2  | 1.1  | 2.5               | 1.2               | 1.0               | .5                |                                 |
| <i>Previous Tealbook<sup>5</sup></i>          | 2.3  | 3.5  | 3.8  | 1.6  | 1.3  | 1.3  | 1.3  | 1.0  | 1.0  | 1.0  | .7   | 2.9               | 1.4               | .9                | .2                |                                 |
| Capacity utilization rate - mfg. <sup>3</sup> | 75.5 | 75.9 | 76.1 | 76.2 | 76.2 | 76.3 | 76.2 | 76.3 | 76.3 | 76.4 | 76.5 | 76.1              | 76.2              | 76.5              | 76.6              |                                 |
| <i>Previous Tealbook<sup>3</sup></i>          | 75.5 | 75.9 | 76.3 | 76.5 | 76.6 | 76.6 | 76.7 | 76.8 | 76.9 | 77.0 | 77.0 | 76.3              | 76.7              | 77.0              | 76.8              |                                 |
| Housing starts <sup>6</sup>                   | 1.3  | 1.2  | 1.2  | 1.2  | 1.2  | 1.3  | 1.3  | 1.2  | 1.2  | 1.2  | 1.2  | 1.3               | 1.2               | 1.2               | 1.2               |                                 |
| Light motor vehicle sales <sup>6</sup>        | 17.2 | 16.9 | 17.5 | 17.2 | 17.0 | 16.9 | 16.9 | 16.9 | 16.8 | 16.7 | 16.7 | 17.2              | 17.0              | 16.8              | 16.7              |                                 |
| <i>Income and saving</i>                      |      |      |      |      |      |      |      |      |      |      |      |                   |                   |                   |                   |                                 |
| Nominal GDP <sup>5</sup>                      | 7.6  | 4.9  | 4.4  | 3.9  | 4.7  | 4.1  | 3.9  | 4.1  | 4.2  | 4.0  | 3.9  | 5.3               | 4.1               | 4.1               | 3.5               |                                 |
| Real disposable pers. income <sup>5</sup>     | 1.8  | 2.4  | 3.3  | 4.1  | 2.3  | 2.1  | 2.0  | 3.1  | 2.0  | 1.3  | 2.0  | 3.0               | 2.6               | 2.1               | 1.6               |                                 |
| <i>Previous Tealbook<sup>5</sup></i>          | 1.8  | 2.4  | 2.8  | 3.4  | 2.8  | 2.2  | 2.3  | 3.4  | 2.1  | 1.4  | 2.1  | 2.8               | 2.7               | 2.2               | 1.8               |                                 |
| Personal saving rate <sup>3</sup>             | 6.7  | 6.3  | 6.2  | 6.5  | 6.5  | 6.5  | 6.4  | 6.6  | 6.6  | 6.4  | 6.4  | 6.2               | 6.4               | 6.4               | 6.1               |                                 |
| <i>Previous Tealbook<sup>3</sup></i>          | 6.7  | 6.3  | 6.2  | 6.4  | 6.4  | 6.4  | 6.3  | 6.5  | 6.5  | 6.3  | 6.3  | 6.2               | 6.3               | 6.3               | 6.1               |                                 |
| Corporate profits <sup>7</sup>                | 12.5 | 14.7 | -2.6 | -3.1 | 1.1  | .7   | -2.9 | -.6  | 2.0  | 2.0  | 1.9  | 7.2               | -1.1              | 1.3               | 1.1               |                                 |
| Profit share of GNP <sup>3</sup>              | 10.8 | 11.1 | 10.9 | 10.8 | 10.7 | 10.6 | 10.4 | 10.3 | 10.3 | 10.2 | 10.2 | 10.9              | 10.4              | 10.2              | 10.0              |                                 |
| Gross national saving rate <sup>3</sup>       | 18.5 | 18.7 | 18.4 | 18.5 | 18.3 | 18.3 | 18.2 | 18.1 | 18.1 | 18.0 | 18.0 | 18.4              | 18.2              | 18.0              | 17.8              |                                 |
| Net national saving rate <sup>3</sup>         | 3.3  | 3.5  | 3.4  | 3.4  | 3.1  | 3.0  | 2.9  | 2.7  | 2.6  | 2.5  | 2.5  | 3.4               | 2.9               | 2.5               | 2.1               |                                 |

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

2. Average monthly change, thousands.

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

4. Percent difference between actual and potential output; a negative number indicates that the economy is operating below potential.  
Annual values are for the fourth quarter of the year indicated.

5. Percent change, annual rate.

6. Level, millions; annual values are annual averages.

7. Percent change, annual rate, with inventory valuation and capital consumption adjustments.

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## Greensheets

### Other Macroeconomic Indicators

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

| Item  | 2012 | 2013 | 2014 | 2015  | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|------|------|------|-------|------|------|------|------|------|------|
| <i>Employment and production</i>              |      |      |      |       |      |      |      |      |      |      |
| Nonfarm payroll employment <sup>1</sup>       | 179  | 192  | 250  | 226   | 195  | 182  | 220  | 171  | 120  | 70   |
| Unemployment rate <sup>2</sup>                | 7.8  | 7.0  | 5.7  | 5.0   | 4.8  | 4.1  | 3.8  | 3.5  | 3.5  | 3.6  |
| <i>Previous Tealbook</i> <sup>2</sup>         | 7.8  | 7.0  | 5.7  | 5.0   | 4.7  | 4.1  | 3.7  | 3.4  | 3.4  | 3.5  |
| Natural rate of unemployment <sup>2</sup>     | 5.6  | 5.4  | 5.1  | 4.9   | 4.8  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  |
| <i>Previous Tealbook</i> <sup>2</sup>         | 5.6  | 5.4  | 5.1  | 4.9   | 4.8  | 4.6  | 4.6  | 4.6  | 4.6  | 4.6  |
| Employment-to-Population Ratio <sup>2</sup>   | 58.7 | 58.5 | 59.3 | 59.4  | 59.8 | 60.2 | 60.6 | 60.7 | 60.6 | 60.4 |
| Employment-to-Population Trend <sup>2</sup>   | 60.3 | 60.2 | 60.1 | 60.0  | 59.9 | 59.9 | 59.8 | 59.6 | 59.5 | 59.3 |
| Output gap <sup>3</sup>                       | -3.7 | -2.8 | -.8  | -.2   | .3   | 1.1  | 2.2  | 2.6  | 2.7  | 2.2  |
| <i>Previous Tealbook</i> <sup>3</sup>         | -3.7 | -2.8 | -.8  | -.2   | .3   | 1.1  | 2.2  | 2.8  | 2.9  | 2.4  |
| Industrial production                         | 2.2  | 2.3  | 3.4  | -3.3  | -.5  | 3.0  | 4.1  | 1.3  | 1.5  | .8   |
| <i>Previous Tealbook</i>                      | 2.2  | 2.3  | 3.4  | -3.3  | -.5  | 3.0  | 4.1  | 1.7  | 1.1  | .4   |
| Manufacturing industr. prod.                  | 1.4  | 1.1  | 1.4  | -1.6  | -.1  | 1.9  | 2.5  | 1.2  | 1.0  | .5   |
| <i>Previous Tealbook</i>                      | 1.4  | 1.1  | 1.4  | -1.6  | -.1  | 1.9  | 2.9  | 1.4  | .9   | .2   |
| Capacity utilization rate - mfg. <sup>2</sup> | 74.7 | 75.1 | 76.3 | 75.4  | 74.4 | 75.2 | 76.1 | 76.2 | 76.5 | 76.6 |
| <i>Previous Tealbook</i> <sup>2</sup>         | 74.7 | 75.1 | 76.3 | 75.4  | 74.4 | 75.2 | 76.3 | 76.7 | 77.0 | 76.8 |
| Housing starts <sup>4</sup>                   | .8   | .9   | 1.0  | 1.1   | 1.2  | 1.2  | 1.3  | 1.2  | 1.2  | 1.2  |
| Light motor vehicle sales <sup>4</sup>        | 14.4 | 15.5 | 16.5 | 17.4  | 17.5 | 17.1 | 17.2 | 17.0 | 16.8 | 16.7 |
| <i>Income and saving</i>                      |      |      |      |       |      |      |      |      |      |      |
| Nominal GDP                                   | 3.6  | 4.4  | 4.4  | 2.9   | 3.4  | 4.5  | 5.3  | 4.1  | 4.1  | 3.5  |
| Real disposable pers. income                  | 4.9  | -2.5 | 5.2  | 3.1   | 1.6  | 2.8  | 3.0  | 2.6  | 2.1  | 1.6  |
| <i>Previous Tealbook</i>                      | 4.9  | -2.5 | 5.2  | 3.1   | 1.6  | 2.8  | 2.8  | 2.7  | 2.2  | 1.8  |
| Personal saving rate <sup>2</sup>             | 10.2 | 6.3  | 7.4  | 7.4   | 6.4  | 6.3  | 6.2  | 6.4  | 6.4  | 6.1  |
| <i>Previous Tealbook</i> <sup>2</sup>         | 10.2 | 6.3  | 7.4  | 7.4   | 6.4  | 6.3  | 6.2  | 6.3  | 6.3  | 6.1  |
| Corporate profits <sup>5</sup>                | .7   | 3.9  | 5.9  | -10.7 | 7.6  | 3.3  | 7.2  | -1.1 | 1.3  | 1.1  |
| Profit share of GNP <sup>2</sup>              | 11.9 | 11.8 | 12.0 | 10.4  | 10.8 | 10.7 | 10.9 | 10.4 | 10.2 | 10.0 |
| Gross national saving rate <sup>2</sup>       | 18.8 | 19.2 | 20.2 | 19.4  | 18.3 | 18.3 | 18.4 | 18.2 | 18.0 | 17.8 |
| Net national saving rate <sup>2</sup>         | 3.7  | 4.0  | 5.1  | 4.3   | 3.0  | 3.1  | 3.4  | 2.9  | 2.5  | 2.1  |

1. Average monthly change, thousands.

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

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

Values are for the fourth quarter of the year indicated.

4. Level, millions; values are annual averages.

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

## Staff Projections of Government-Sector Accounts and Related Items

| Item                                      | 2016  | 2017  | 2018  | 2019  | 2020   | 2021   | 2018   |       | 2019  |       |  |  |
|---|-------|-------|-------|-------|--------|--------|--|-------|-------|-------|--|--|
|   |       |       |       |       |        |        | Q3   | Q4    | Q1    | Q2    |  |  |
| <b>Unified federal budget<sup>1</sup></b> |       |       |       |       |        |        | Nominal dollars, billions  |       |       |       |  |  |
| Receipts                                  | 3,268 | 3,316 | 3,329 | 3,435 | 3,586  | 3,712  | 788  | 774   | 713   | 1,109 |  |  |
| Outlays                                   | 3,853 | 3,982 | 4,108 | 4,415 | 4,729  | 4,999  | 960  | 1,146 | 1,088 | 1,120 |  |  |
| Surplus/deficit                           | -585  | -665  | -779  | -980  | -1,143 | -1,287 | -172   | -372  | -374  | -11   |  |  |
| Surplus/deficit                           | -3.2  | -3.5  | -3.8  | -4.6  | -5.2   | -5.6   | -3.4   | -7.3  | -7.2  | -.2   |  |  |
| <i>Previous Tealbook</i>                  | -3.2  | -3.5  | -3.8  | -4.7  | -5.3   | -5.7   | -3.4   | -7.2  | -7.3  | -.3   |  |  |
| Primary surplus/deficit                   | -1.9  | -2.1  | -2.2  | -2.8  | -3.0   | -3.3   | -2.2   | -4.7  | -5.8  | 2.2   |  |  |
| Net interest                              | 1.3   | 1.4   | 1.6   | 1.8   | 2.2    | 2.3    | 1.2  | 2.6   | 1.4   | 2.4   |  |  |
| Cyclically adjusted surplus/deficit       | -3.1  | -3.7  | -4.5  | -5.7  | -6.4   | -6.8   | -4.2   | -8.2  | -8.2  | -1.3  |  |  |
| Federal debt held by public               | 76.4  | 76.1  | 77.8  | 78.8  | 80.9   | 83.7   | 77.8   | 78.9  | 78.6  | 78.8  |  |  |
| <b>Government in the NIPA<sup>2</sup></b> |       |       |       |       |        |        | Real percent change, annual rate                                 |       |       |       |  |  |
| Purchases                                 | .9    | .1    | 2.1   | 2.0   | 1.7    | .9     | 2.6  | 1.7   | .4    | 3.7   |  |  |
| Consumption                               | .9    | -.1   | 1.6   | 1.4   | 1.2    | .6     | 2.3  | .8    | -.5   | 3.4   |  |  |
| Investment                                | .7    | 1.4   | 4.1   | 4.3   | 3.4    | 2.0    | 4.0  | 5.9   | 4.2   | 4.5   |  |  |
| State and local construction              | 1.8   | -2.9  | 4.2   | 2.5   | 1.0    | 1.0    | 4.6  | 3.0   | 3.0   | 3.0   |  |  |
| Real disposable personal income           | 1.6   | 2.8   | 2.9   | 2.6   | 2.1    | 1.6    | 2.3  | 3.3   | 4.1   | 2.3   |  |  |
| Contribution from transfers <sup>3</sup>  | .3    | .2    | .5    | .8    | .5     | .6     | .5   | .5    | 2.0   | .5    |  |  |
| Contribution from taxes <sup>3</sup>      | -.1   | -.6   | -.1   | -.7   | -.5    | -.6    | -.7  | -.6   | -.6   | -.6   |  |  |
| <b>Government employment</b>              |       |       |       |       |        |        | Average net change in monthly payrolls, thousands                |       |       |       |  |  |
| Federal                                   | 3     | -1    | 1     | 2     | 1      | 1      | 1  | 2     | 3     | 2     |  |  |
| State and local                           | 14    | 3     | 5     | 9     | 9      | 9      | 15   | 1     | 9     | 9     |  |  |
| <b>Fiscal indicators<sup>2</sup></b>      |       |       |       |       |        |        | Percentage point contribution to change in real GDP, annual rate |       |       |       |  |  |
| Fiscal effect (FE) <sup>4</sup>           | .4    | .1    | .5    | .8    | .6     | .4     | .7   | .6    | .7    | 1.2   |  |  |
| Discretionary policy actions (FI)         | .3    | .2    | .7    | .6    | .5     | .2     | .8   | .6    | .4    | .9    |  |  |
| <i>Previous Tealbook</i>                  | .3    | .2    | .7    | .6    | .5     | .2     | .8   | .6    | .7    | .6    |  |  |
| Federal purchases                         | .0    | .1    | .2    | .2    | .2     | .1     | .2   | .2    | -.1   | .5    |  |  |
| State and local purchases                 | .1    | -.1   | .2    | .1    | .1     | .1     | .2   | .1    | .1    | .1    |  |  |
| Taxes and transfers                       | .1    | .1    | .3    | .3    | .2     | .0     | .3   | .3    | .4    | .3    |  |  |
| Cyclical                                  | -.1   | -.1   | -.2   | -.2   | -.1    | .0     | -.2  | -.2   | -.1   | -.2   |  |  |
| Other                                     | .2    | .1    | .0    | .3    | .2     | .2     | .1   | .2    | .4    | .4    |  |  |

1. Annual values stated on a fiscal year basis. Quarterly values not seasonally adjusted.

2. Annual values refer to the change from fourth quarter of previous year to fourth quarter of year indicated.

3. Percentage point contribution to change in real disposable personal income, annual basis.

4. The FE measure captures the total contribution of the government sector to the growth of aggregate demand (excluding any multiplier effects and financial offsets). It equals the sum of the direct contributions to aggregate demand growth from all changes in federal purchases and state and local purchases, plus the estimated contribution to real household consumption and business investment that is induced by changes in transfer and tax policies. FI (fiscal impetus) is the portion of FE attributable to discretionary fiscal policy actions (for example, a legislated change in tax revenues).

## Greensheets

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

| Measure and country                | Projected |      |      |     |      |     |     |      |      |     |     |     |
|------------------------------------|-----------|------|------|-----|------|-----|-----|------|------|-----|-----|-----|
|                                    | 2018      |      |      |     | 2019 |     |     |      | 2020 |     |     |     |
|                                    | Q1        | Q2   | Q3   | Q4  | Q1   | Q2  | Q3  | Q4   | Q1   | Q2  | Q3  | Q4  |
| <b>Real GDP<sup>1</sup></b>        |           |      |      |     |      |     |     |      |      |     |     |     |
| Total foreign                      | 3.1       | 2.0  | 2.1  | 2.1 | 2.1  | 2.4 | 2.6 | 2.3  | 2.6  | 2.7 | 2.7 | 2.7 |
| <i>Previous Tealbook</i>           | 3.1       | 2.0  | 2.1  | 2.4 | 2.3  | 2.4 | 2.7 | 2.4  | 2.7  | 2.8 | 2.7 | 2.7 |
| Advanced foreign economies         | 1.3       | 2.4  | 1.0  | 1.5 | 1.4  | 1.6 | 1.7 | 1.1  | 1.6  | 1.7 | 1.7 | 1.7 |
| Canada                             | 1.7       | 2.9  | 2.0  | 1.8 | 1.0  | 2.0 | 1.7 | 1.7  | 1.9  | 1.9 | 1.8 | 1.8 |
| Japan                              | -1.3      | 2.8  | -2.5 | 2.3 | 1.0  | .8  | 3.2 | -4.0 | .7   | 1.0 | 1.0 | .9  |
| United Kingdom                     | .3        | 1.7  | 2.5  | 1.1 | 1.1  | 1.5 | 1.9 | 1.9  | 1.9  | 1.9 | 1.9 | 1.9 |
| Euro area                          | 1.5       | 1.7  | .6   | .8  | 1.8  | 1.2 | 1.2 | 1.3  | 1.4  | 1.5 | 1.6 | 1.7 |
| Germany                            | 1.5       | 1.8  | -.8  | .7  | 2.0  | 1.5 | 1.4 | 1.4  | 1.4  | 1.4 | 1.4 | 1.4 |
| Emerging market economies          | 4.9       | 1.5  | 3.2  | 2.6 | 2.9  | 3.2 | 3.4 | 3.5  | 3.6  | 3.6 | 3.6 | 3.6 |
| Asia                               | 6.3       | 4.0  | 3.7  | 4.3 | 4.3  | 4.5 | 4.6 | 4.5  | 4.4  | 4.4 | 4.4 | 4.4 |
| Korea                              | 4.1       | 2.4  | 2.3  | 2.4 | 2.4  | 2.5 | 2.5 | 2.5  | 2.5  | 2.5 | 2.5 | 2.5 |
| China                              | 7.2       | 6.5  | 5.9  | 5.8 | 5.9  | 6.2 | 6.4 | 6.3  | 6.0  | 6.0 | 5.9 | 5.9 |
| Latin America                      | 3.5       | -1.0 | 2.7  | 1.0 | 1.5  | 2.1 | 2.4 | 2.5  | 2.8  | 2.9 | 2.9 | 2.9 |
| Mexico                             | 4.3       | -.4  | 3.4  | 1.5 | 1.5  | 2.0 | 2.3 | 2.5  | 2.7  | 2.9 | 2.9 | 2.9 |
| Brazil                             | .6        | .7   | 3.1  | .8  | 2.3  | 2.5 | 2.8 | 2.8  | 2.8  | 2.8 | 2.8 | 2.8 |
| <b>Consumer prices<sup>2</sup></b> |           |      |      |     |      |     |     |      |      |     |     |     |
| Total foreign                      | 2.6       | 1.7  | 3.7  | 2.2 | 2.0  | 2.3 | 2.3 | 2.7  | 2.3  | 2.3 | 2.3 | 2.3 |
| <i>Previous Tealbook</i>           | 2.6       | 1.7  | 3.7  | 2.8 | 2.0  | 2.3 | 2.3 | 2.7  | 2.3  | 2.4 | 2.4 | 2.4 |
| Advanced foreign economies         | 2.6       | 1.0  | 2.5  | .9  | 1.0  | 1.3 | 1.5 | 2.4  | 1.5  | 1.5 | 1.5 | 1.6 |
| Canada                             | 3.6       | 1.1  | 2.6  | 1.0 | 2.0  | 2.0 | 2.0 | 2.0  | 2.0  | 2.0 | 2.0 | 2.0 |
| Japan                              | 2.5       | -2.3 | 2.7  | .4  | -.3  | .6  | .9  | 6.3  | .9   | .9  | 1.0 | 1.0 |
| United Kingdom                     | 2.3       | 2.0  | 2.9  | 1.9 | 1.4  | 2.0 | 2.2 | 2.3  | 2.3  | 2.3 | 2.2 | 2.2 |
| Euro area                          | 2.1       | 2.1  | 2.6  | .9  | .7   | 1.0 | 1.2 | 1.2  | 1.2  | 1.3 | 1.3 | 1.4 |
| Germany                            | 1.3       | 2.5  | 2.4  | 1.6 | 1.5  | 1.6 | 1.9 | 2.1  | 2.2  | 2.2 | 2.1 | 2.1 |
| Emerging market economies          | 2.6       | 2.2  | 4.6  | 3.2 | 2.7  | 3.0 | 2.9 | 2.9  | 2.9  | 2.9 | 2.9 | 2.9 |
| Asia                               | 1.8       | 1.0  | 3.2  | 2.0 | 1.5  | 2.3 | 2.3 | 2.3  | 2.5  | 2.6 | 2.6 | 2.6 |
| Korea                              | 1.6       | 2.2  | 1.9  | 1.5 | -.1  | 1.9 | 1.9 | 1.9  | 2.0  | 2.1 | 2.1 | 2.1 |
| China                              | 1.5       | .7   | 4.1  | 2.4 | 1.6  | 2.1 | 2.1 | 2.1  | 2.4  | 2.5 | 2.5 | 2.5 |
| Latin America                      | 4.8       | 4.9  | 8.1  | 6.1 | 5.3  | 4.5 | 4.3 | 4.2  | 3.7  | 3.6 | 3.5 | 3.5 |
| Mexico                             | 4.1       | 3.8  | 6.8  | 4.6 | 4.3  | 3.5 | 3.3 | 3.3  | 3.2  | 3.2 | 3.2 | 3.2 |
| Brazil                             | 3.1       | 4.3  | 6.6  | 2.6 | 3.1  | 4.3 | 4.3 | 4.3  | 4.3  | 4.3 | 4.3 | 4.3 |

1. Foreign GDP aggregates calculated using shares of U.S. exports.

2. Foreign CPI aggregates calculated using shares of U.S. non-oil imports.

**Foreign Real GDP and Consumer Prices: Selected Countries**  
(Percent change, Q4 to Q4)

| Measure and country                | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Projected |      |      |      |
|------------------------------------|------|------|------|------|------|------|-----------|------|------|------|
|                                    |      |      |      |      |      |      | 2018      | 2019 | 2020 | 2021 |
| <b>Real GDP<sup>1</sup></b>        |      |      |      |      |      |      |           |      |      |      |
| Total foreign                      | 2.2  | 3.0  | 2.9  | 1.9  | 2.7  | 2.9  | 2.3       | 2.3  | 2.7  | 2.6  |
| <i>Previous Tealbook</i>           | 2.2  | 3.0  | 2.9  | 1.9  | 2.7  | 2.9  | 2.4       | 2.4  | 2.7  | 2.6  |
| Advanced foreign economies         | .3   | 2.4  | 2.1  | .9   | 1.8  | 2.6  | 1.6       | 1.4  | 1.7  | 1.7  |
| Canada                             | .7   | 3.4  | 2.8  | -.4  | 1.8  | 2.9  | 2.1       | 1.6  | 1.9  | 1.7  |
| Japan                              | .3   | 2.8  | -.4  | 1.0  | 1.2  | 2.4  | .3        | .2   | .9   | .8   |
| United Kingdom                     | 1.6  | 2.6  | 3.1  | 2.2  | 1.7  | 1.6  | 1.4       | 1.6  | 1.9  | 1.7  |
| Euro area                          | -1.1 | .7   | 1.6  | 2.0  | 2.1  | 2.7  | 1.2       | 1.4  | 1.5  | 1.7  |
| Germany                            | .2   | 1.6  | 2.3  | 1.3  | 1.9  | 2.8  | .8        | 1.6  | 1.4  | 1.5  |
| Emerging market economies          | 4.1  | 3.5  | 3.6  | 2.9  | 3.5  | 3.2  | 3.0       | 3.2  | 3.6  | 3.5  |
| Asia                               | 5.8  | 5.4  | 5.0  | 4.5  | 4.9  | 5.2  | 4.6       | 4.5  | 4.4  | 4.2  |
| Korea                              | 2.1  | 3.5  | 2.8  | 3.2  | 2.6  | 2.8  | 2.8       | 2.5  | 2.5  | 2.3  |
| China                              | 8.0  | 7.6  | 7.1  | 6.8  | 6.8  | 6.8  | 6.3       | 6.2  | 5.9  | 5.7  |
| Latin America                      | 2.9  | 1.7  | 2.5  | 1.6  | 2.2  | 1.5  | 1.5       | 2.1  | 2.9  | 2.9  |
| Mexico                             | 3.0  | 1.2  | 3.4  | 2.8  | 3.3  | 1.5  | 2.2       | 2.1  | 2.8  | 2.9  |
| Brazil                             | 2.2  | 2.6  | -.1  | -5.5 | -1.9 | 2.2  | 1.3       | 2.6  | 2.8  | 2.8  |
| <b>Consumer prices<sup>2</sup></b> |      |      |      |      |      |      |           |      |      |      |
| Total foreign                      | 2.3  | 2.4  | 2.0  | 1.4  | 1.9  | 2.6  | 2.6       | 2.3  | 2.3  | 2.3  |
| <i>Previous Tealbook</i>           | 2.3  | 2.4  | 2.0  | 1.4  | 1.9  | 2.6  | 2.7       | 2.3  | 2.4  | 2.4  |
| Advanced foreign economies         | 1.3  | 1.0  | 1.2  | .4   | .9   | 1.5  | 1.8       | 1.5  | 1.5  | 1.6  |
| Canada                             | 1.0  | 1.0  | 2.0  | 1.3  | 1.4  | 1.8  | 2.1       | 2.0  | 2.0  | 2.0  |
| Japan                              | -.2  | 1.4  | 2.6  | .1   | .3   | .6   | .8        | 1.8  | .9   | 1.1  |
| United Kingdom                     | 2.6  | 2.1  | .9   | .1   | 1.2  | 3.0  | 2.3       | 2.0  | 2.3  | 2.2  |
| Euro area                          | 2.3  | .8   | .1   | .2   | .7   | 1.4  | 1.9       | 1.0  | 1.3  | 1.4  |
| Germany                            | 1.9  | 1.4  | .4   | .2   | 1.0  | 1.6  | 1.9       | 1.8  | 2.1  | 2.0  |
| Emerging market economies          | 3.1  | 3.4  | 2.7  | 2.1  | 2.7  | 3.4  | 3.2       | 2.9  | 2.9  | 2.9  |
| Asia                               | 2.6  | 3.1  | 1.8  | 1.5  | 2.0  | 2.0  | 2.0       | 2.1  | 2.6  | 2.6  |
| Korea                              | 1.7  | 1.1  | 1.0  | .9   | 1.4  | 1.4  | 1.8       | 1.4  | 2.0  | 2.1  |
| China                              | 2.1  | 2.9  | 1.5  | 1.5  | 2.1  | 1.8  | 2.2       | 2.0  | 2.5  | 2.5  |
| Latin America                      | 4.3  | 4.2  | 4.9  | 3.4  | 4.3  | 6.7  | 5.9       | 4.6  | 3.6  | 3.5  |
| Mexico                             | 4.1  | 3.6  | 4.2  | 2.3  | 3.3  | 6.6  | 4.8       | 3.6  | 3.2  | 3.2  |
| Brazil                             | 5.6  | 5.8  | 6.5  | 10.4 | 7.1  | 2.8  | 4.1       | 4.0  | 4.3  | 4.3  |

1. Foreign GDP aggregates calculated using shares of U.S. exports.

2. Foreign CPI aggregates calculated using shares of U.S. non-oil imports.

| U.S. Current Account                 |               |               |               |               |               |               |               |               |               |               |               |               |
|--------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <i>Quarterly Data</i>                |               |               |               |               |               |               |               |               |               |               |               |               |
|                                      | 2018          |               |               |               | 2019          |               |               |               | Projected     |               |               |               |
|                                      | 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>-486.8</b> | <b>-404.9</b> | <b>-499.3</b> | <b>-565.8</b> | <b>-599.4</b> | <b>-619.6</b> | <b>-630.1</b> | <b>-643.6</b> | <b>-672.5</b> | <b>-668.2</b> | <b>-695.5</b> | <b>-699.2</b> |
| <i>Previous Tealbook</i>             | -486.8        | -405.8        | -495.1        | -550.5        | -585.0        | -593.0        | -628.5        | -654.5        | -683.3        | -687.4        | -719.9        | -727.6        |
| Current account as percent of GDP    | -2.4          | -2.0          | -2.4          | -2.7          | -2.8          | -2.9          | -2.9          | -3.0          | -3.1          | -3.0          | -3.1          | -3.1          |
| <i>Previous Tealbook</i>             | -2.4          | -2.0          | -2.4          | -2.6          | -2.8          | -2.8          | -2.9          | -3.0          | -3.1          | -3.1          | -3.2          | -3.2          |
| Net goods & services                 | -616.0        | -538.4        | -634.6        | -634.4        | -619.1        | -628.4        | -632.9        | -634.3        | -640.5        | -631.9        | -643.3        | -642.9        |
| Investment income, net               | 258.2         | 263.2         | 251.6         | 179.7         | 139.8         | 117.9         | 117.9         | 101.8         | 88.1          | 72.7          | 62.9          | 54.8          |
| Direct, net                          | 310.4         | 316.4         | 310.6         | 278.6         | 252.6         | 248.1         | 266.5         | 271.3         | 277.1         | 282.7         | 293.9         | 305.5         |
| Portfolio, net                       | -52.2         | -53.1         | -59.0         | -98.9         | -112.8        | -130.2        | -148.7        | -169.5        | -189.1        | -210.0        | -230.9        | -250.6        |
| Other income and transfers, net      | -129.1        | -129.7        | -116.2        | -111.1        | -120.0        | -109.0        | -115.1        | -111.1        | -120.0        | -109.0        | -115.1        | -111.1        |
| <i>Annual Data</i>                   |               |               |               |               |               |               |               |               |               |               |               |               |
|                                      | 2012          | 2013          | 2014          | 2015          | 2016          | 2017          | 2018          | 2019          | 2020          | 2021          |               | Projected     |
| <i>Billions of dollars</i>           |               |               |               |               |               |               |               |               |               |               |               |               |
| <b>U.S. current account balance</b>  | <b>-426.8</b> | <b>-348.8</b> | <b>-365.2</b> | <b>-407.8</b> | <b>-432.9</b> | <b>-449.1</b> | <b>-489.2</b> | <b>-623.2</b> | <b>-683.8</b> | <b>-716.4</b> |               |               |
| <i>Previous Tealbook</i>             | -426.2        | -349.5        | -365.1        | -409.7        | -434.3        | -449.1        | -484.6        | -615.3        | -704.6        | -747.0        |               |               |
| Current account as percent of GDP    | -2.6          | -2.1          | -2.1          | -2.2          | -2.3          | -2.3          | -2.4          | -2.9          | -3.1          | -3.1          |               |               |
| <i>Previous Tealbook</i>             | -2.6          | -2.1          | -2.1          | -2.2          | -2.3          | -2.3          | -2.4          | -2.9          | -3.2          | -3.2          |               |               |
| Net goods & services                 | -537.4        | -461.1        | -489.6        | -498.5        | -502.0        | -552.3        | -605.8        | -628.7        | -639.6        | -641.6        |               |               |
| Investment income, net               | 216.1         | 215.4         | 229.0         | 214.7         | 205.7         | 235.1         | 238.2         | 119.3         | 69.7          | 39.0          |               |               |
| Direct, net                          | 285.5         | 283.3         | 284.2         | 284.6         | 272.6         | 298.4         | 304.0         | 259.6         | 289.8         | 331.1         |               |               |
| Portfolio, net                       | -69.4         | -67.9         | -55.3         | -70.0         | -66.9         | -63.3         | -65.8         | -140.3        | -220.2        | -292.1        |               |               |
| Other income and transfers, net      | -105.5        | -103.1        | -104.6        | -123.9        | -136.6        | -132.0        | -121.5        | -113.8        | -113.8        | -113.8        |               |               |

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

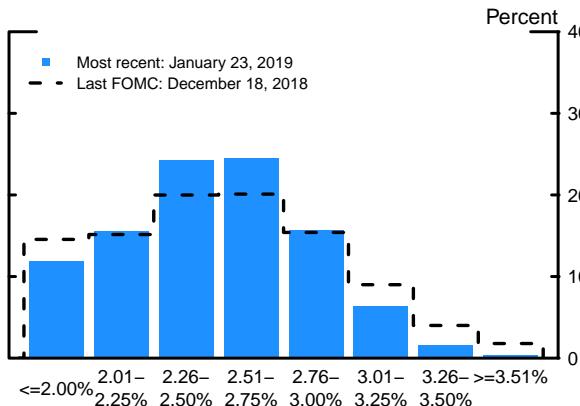
January 24, 2019

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

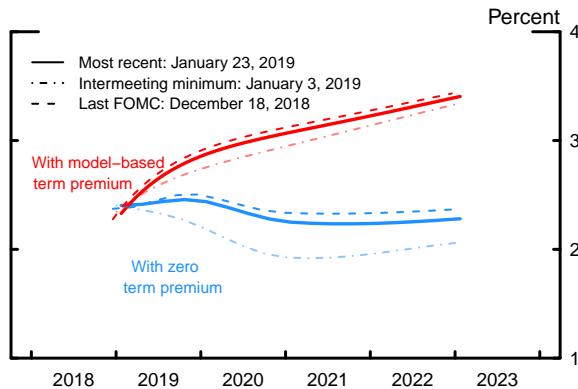
**Figure 1: Market-Implied Probability Distribution of the Federal Funds Rate, Year-End 2019**



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 2: Market-Implied Federal Funds Rate Expectations**

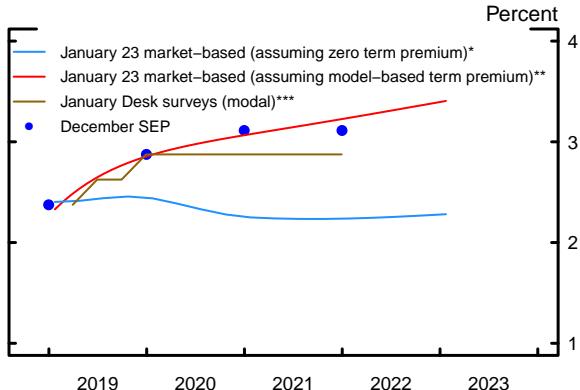


Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points.

Model-based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premium.

Source: Bloomberg; Federal Reserve Board staff estimates.

**Figure 3: Federal Funds Rate Projections**



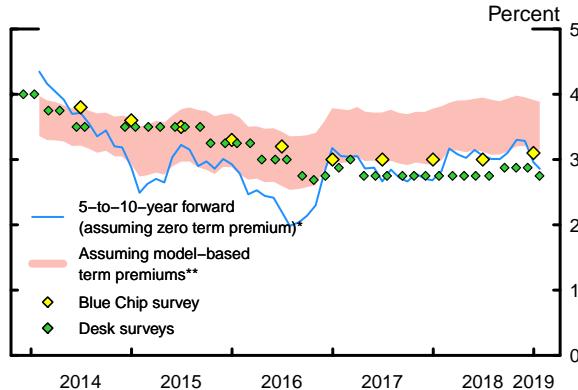
\* Estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points.

\*\* Adjusting for premiums using a term structure model maintained by Board staff.

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

Source: Bloomberg; Federal Reserve Board staff estimates; FRBNY; Summary of Economic Projections.

**Figure 4: Measures of Longer-Run Federal Funds Rate Expectations**

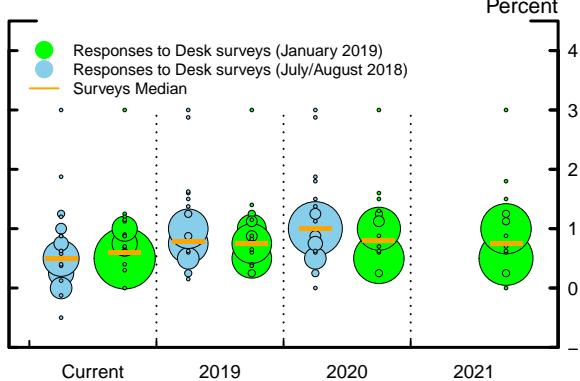


\* Monthly average 5-to-10-year forward rate derived from prices of Treasury securities.

\*\* Monthly average 5-to-10-year forward rate adjusted for three alternative model-based term premium estimates using Kim and Wright (2005), D'Amico, Kim, and Wei (2018), and Priebisch (2017).

Source: Blue Chip; FRBNY; Federal Reserve Board staff estimates.

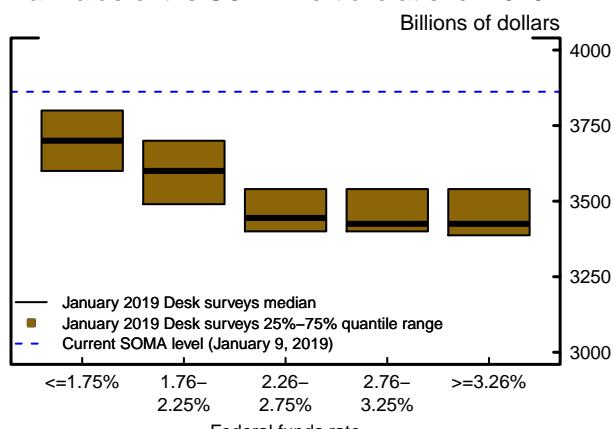
**Figure 5: Desk Survey Estimates of the Neutral Real Federal Funds Rate**



Note: Dots scaled by number of respondents.

Source: FRBNY.

**Figure 6: Desk Survey Projections for the Par Value of the SOMA Portfolio at end-2019**



Note: Projections are shown conditional on different ranges of the target federal funds rate at year-end 2019.

Source: FRBNY.

## Redemptions and Reinvestments of SOMA Principal Payments

**Projections for Treasury Securities  
(Billions of dollars)**

|          | Redemptions |                 | Reinvestments |                 |
|----------|-------------|-----------------|---------------|-----------------|
|          | Period      | Since Oct. 2017 | Period        | Since Oct. 2017 |
| 2019: Q1 | 68.7        | 315.7           | 26.1          | 250.3           |
| 2019: Q2 | 81.5        | 397.2           | 30.5          | 280.8           |
| 2019: Q3 | 64.5        | 461.7           | 39.5          | 320.2           |
| 2019: Q4 | 56.2        | 517.9           | 18.2          | 338.4           |
| 2018     | 229.1       | 247.1           | 197.1         | 224.2           |
| 2019     | 270.8       | 517.9           | 114.2         | 338.4           |
| 2020*    | 47.3        | 565.1           | 23.6          | 362.0           |

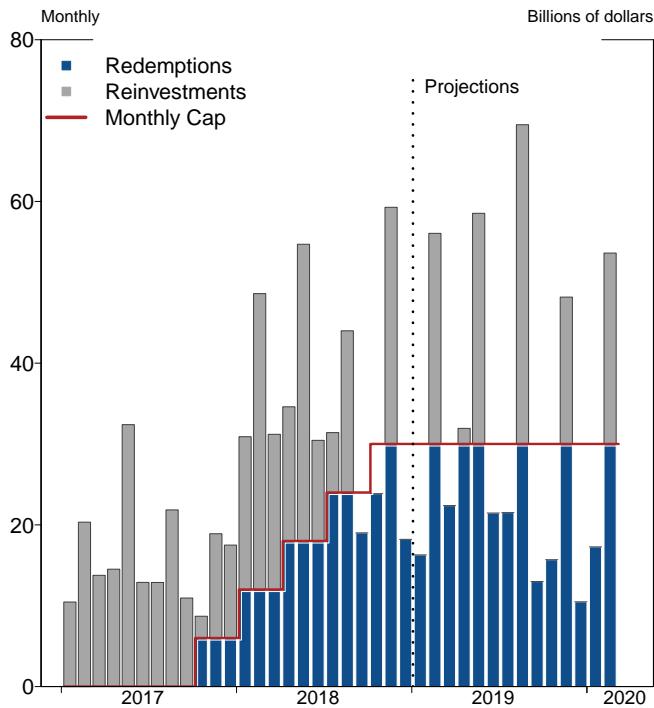
\*Until projected normalization in February 2020.

**Projections for Agency Securities  
(Billions of dollars)**

|          | Redemptions |                 | Reinvestments |                 |
|----------|-------------|-----------------|---------------|-----------------|
|          | Period      | Since Oct. 2017 | Period        | Since Oct. 2017 |
| 2019: Q1 | 45.2        | 218.0           | 0             | 152.3           |
| 2019: Q2 | 48.4        | 266.3           | 0             | 152.3           |
| 2019: Q3 | 48.5        | 314.8           | 0             | 152.3           |
| 2019: Q4 | 38.4        | 353.3           | 0             | 152.3           |
| 2018     | 160.8       | 172.8           | 87.6          | 152.3           |
| 2019     | 180.5       | 353.3           | 0.0           | 152.3           |
| 2020*    | 24.0        | 377.2           | 0.0           | 152.3           |

\*Until projected normalization in February 2020.

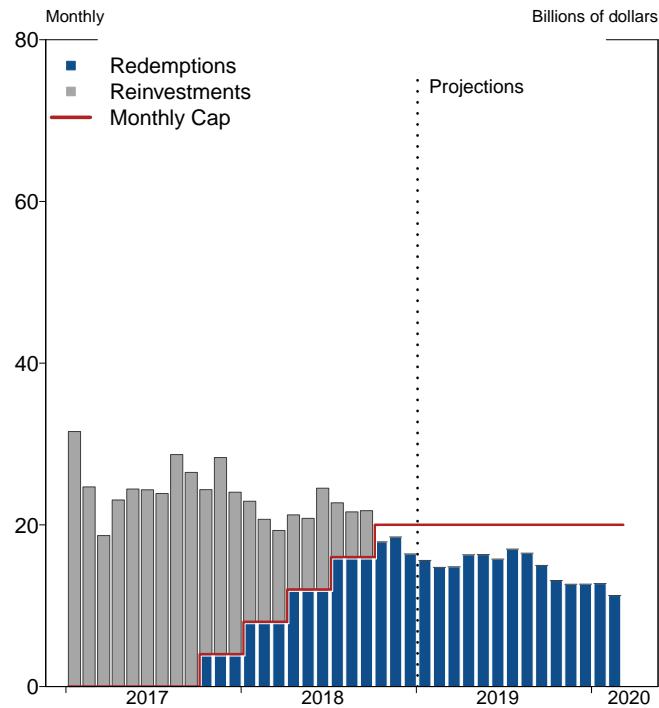
**SOMA Treasury Securities  
Principal Payments**



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

Source: Federal Reserve Board staff calculations

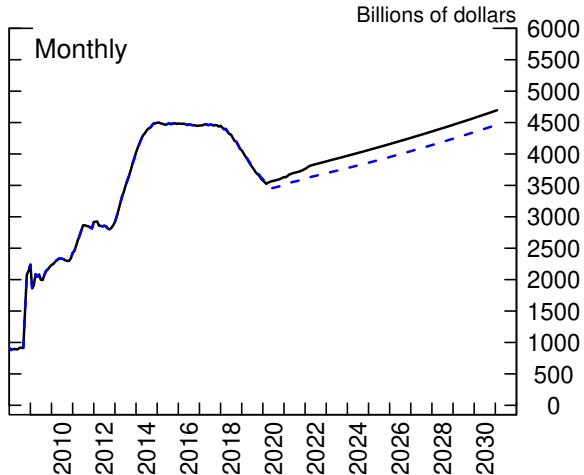
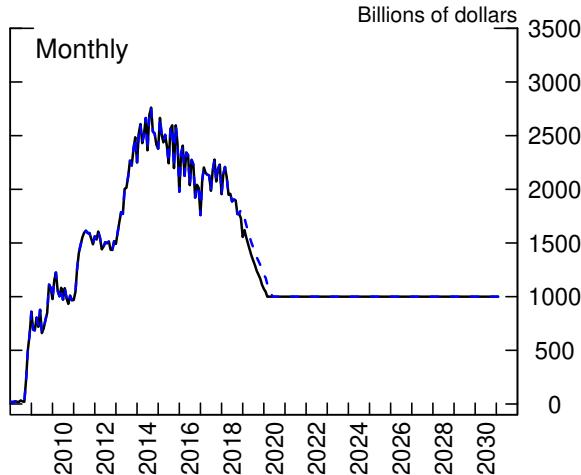
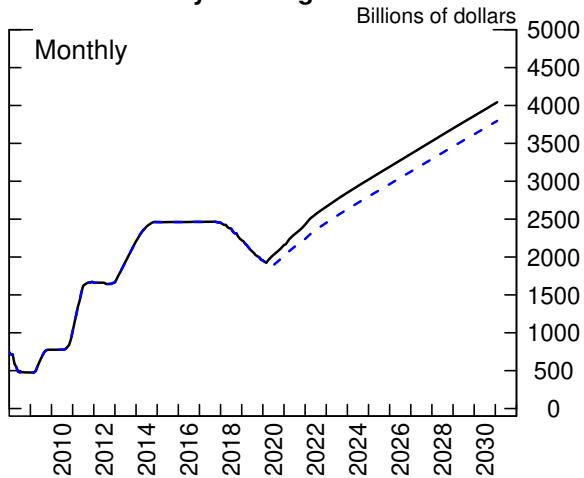
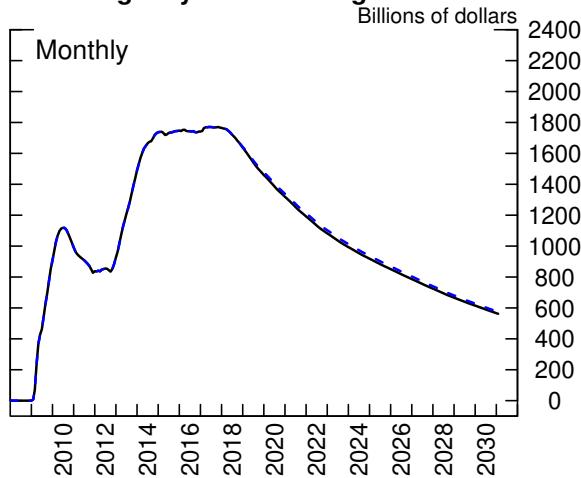
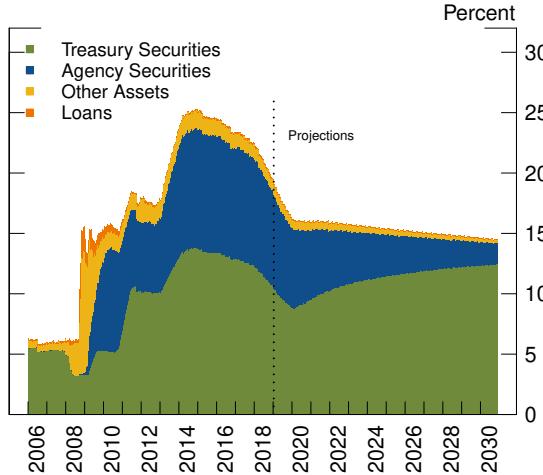
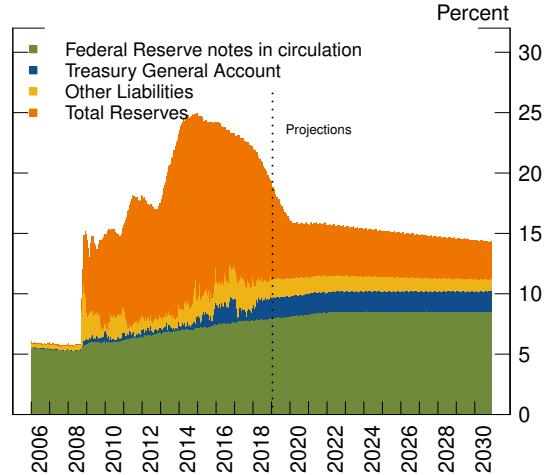
**SOMA Agency Debt and MBS  
Principal Payments**



Note: Projection dependent on future interest rates and housing market developments.

## Total Assets and Selected Balance Sheet Items

— January Tealbook baseline    - - December Tealbook baseline

**Total Assets****Reserve Balances****SOMA Treasury Holdings****SOMA Agency MBS Holdings****Assets as a Share of GDP****Liabilities as a Share of GDP**

**Federal Reserve Balance Sheet**  
**Month-end Projections -- January Tealbook**  
(Billions of dollars)

|  | Historical* |             |             | Projections |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|  | Aug<br>2014 | Sep<br>2017 | Dec<br>2018 | Dec<br>2019 | Dec<br>2020 | Dec<br>2022 | Dec<br>2025 | Dec<br>2030 |
| Total assets                                     | 4,416       | 4,460       | 4,058       | 3,581       | 3,631       | 3,882       | 4,157       | 4,687       |
| <b>Selected assets</b>                           |             |             |             |             |             |             |             |             |
| Loans and other credit extensions**              | 2           | 6           | 4           | 0           | 0           | 0           | 0           | 0           |
| Securities held outright                         | 4,157       | 4,240       | 3,862       | 3,417       | 3,480       | 3,748       | 4,044       | 4,597       |
| U.S. Treasury securities                         | 2,437       | 2,465       | 2,223       | 1,955       | 2,159       | 2,664       | 3,191       | 4,029       |
| Agency debt securities                           | 42          | 7           | 2           | 2           | 2           | 2           | 2           | 2           |
| Agency mortgage-backed securities                | 1,678       | 1,768       | 1,637       | 1,460       | 1,319       | 1,082       | 851         | 566         |
| Unamortized premiums                             | 209         | 162         | 140         | 123         | 109         | 89          | 67          | 41          |
| Unamortized discounts                            | -19         | -14         | -13         | -12         | -10         | -8          | -7          | -5          |
| Total other assets                               | 66          | 66          | 65          | 53          | 53          | 53          | 53          | 53          |
| Total liabilities                                | 4,360       | 4,419       | 4,019       | 3,543       | 3,593       | 3,841       | 4,110       | 4,627       |
| <b>Selected liabilities</b>                      |             |             |             |             |             |             |             |             |
| Federal Reserve notes in circulation             | 1,249       | 1,532       | 1,671       | 1,776       | 1,886       | 2,100       | 2,325       | 2,755       |
| Reverse repurchase agreements                    | 277         | 557         | 304         | 241         | 240         | 240         | 240         | 240         |
| Deposits with Federal Reserve Banks              | 2,825       | 2,323       | 2,036       | 1,520       | 1,462       | 1,496       | 1,541       | 1,627       |
| Reserve balances held by depository institutions | 2,762       | 2,073       | 1,556       | 1,073       | 1000        | 1000        | 1000        | 1000        |
| U.S. Treasury, General Account                   | 49          | 159         | 402         | 372         | 387         | 420         | 465         | 551         |
| Other deposits                                   | 15          | 91          | 78          | 75          | 75          | 75          | 75          | 75          |
| Earnings remittances due to the U.S. Treasury    | 3           | 2           | 2           | 0           | 0           | 0           | 0           | 0           |
| Total Federal Reserve Bank capital***            | 56          | 41          | 39          | 38          | 38          | 41          | 47          | 59          |

Source: Federal Reserve H.4.1 daily data and staff calculations.

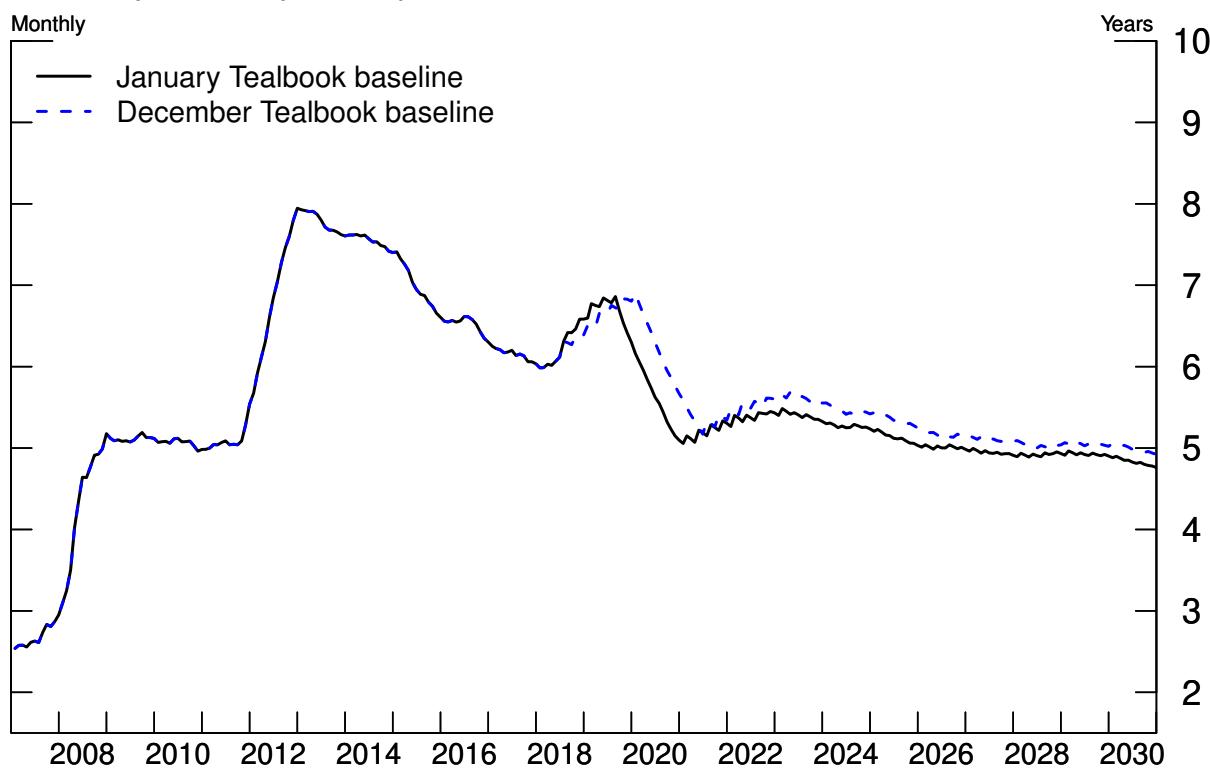
Note: Components may not sum to totals due to rounding.

\*August 2014 corresponds to the peak month-end value of reserve balances; September 2017 corresponds to the last month-end before the initiation of the normalization program; December 2018 is the most recent historical value.

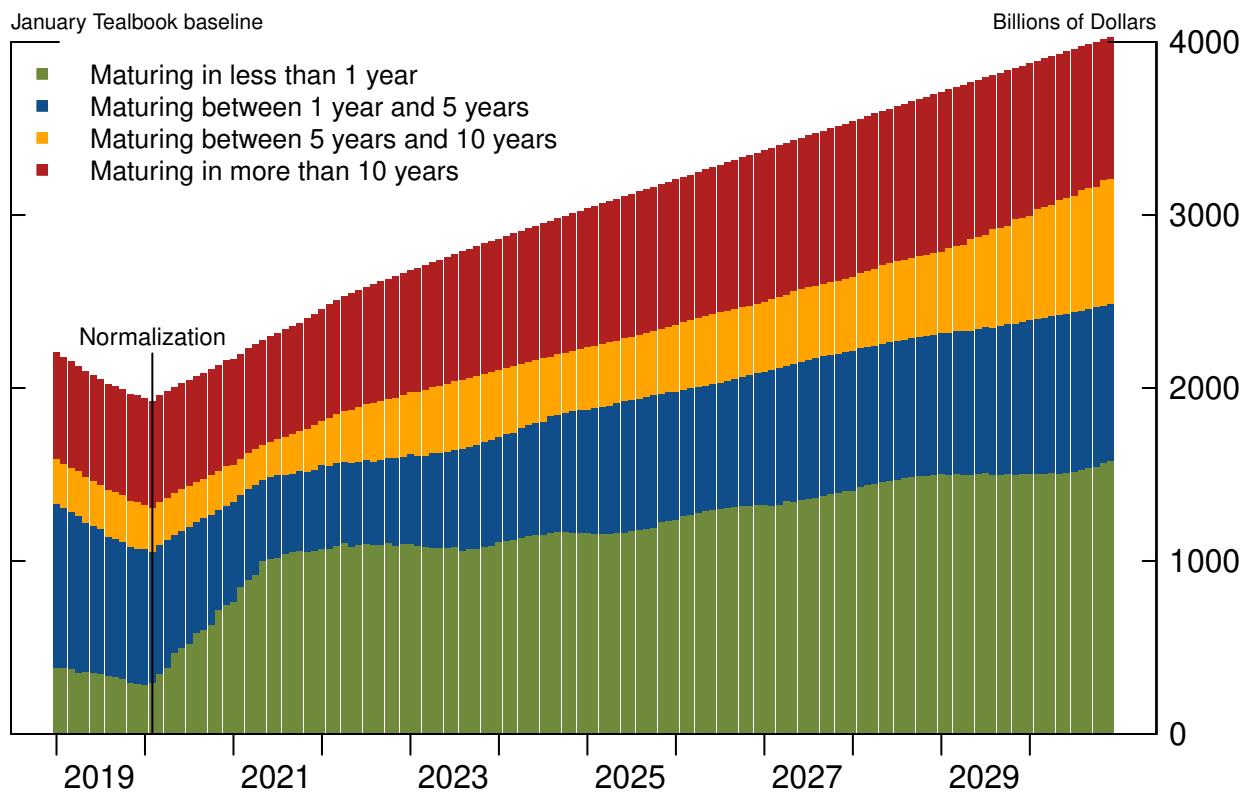
\*\*Loans and other credit extensions includes discount window credit; central bank liquidity swaps; and net portfolio holdings of Maiden Lane LLC.

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

## Projections for the Characteristics of SOMA Treasury Securities Holdings

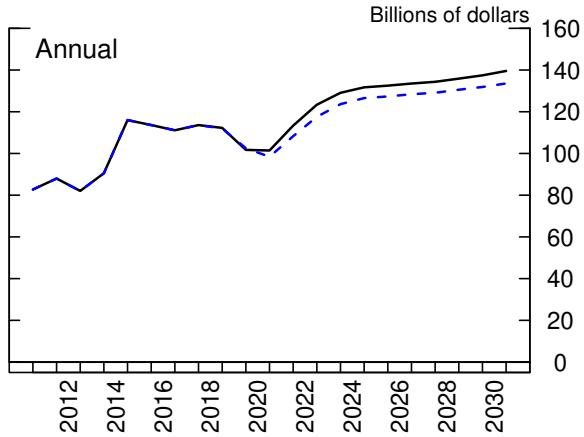
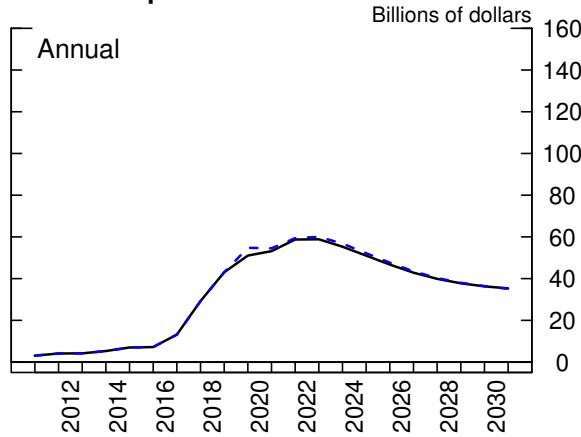
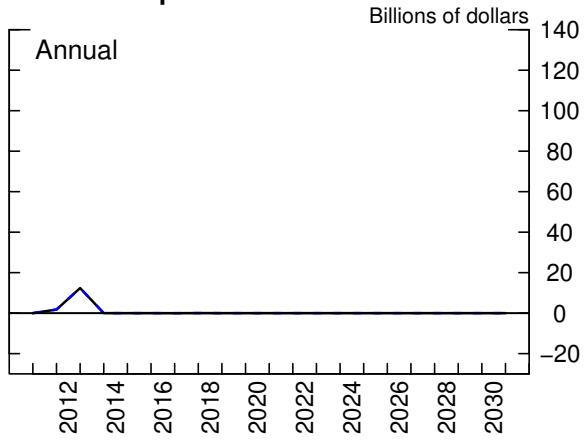
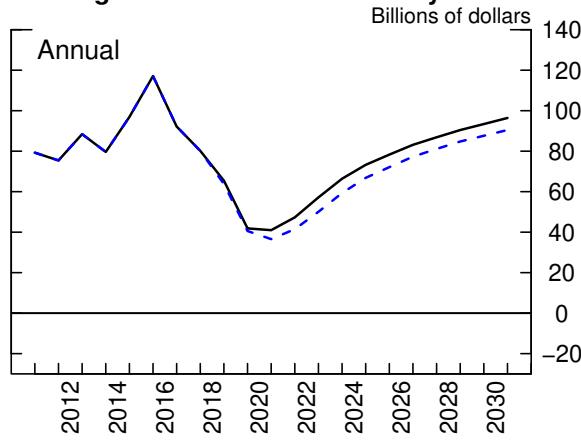
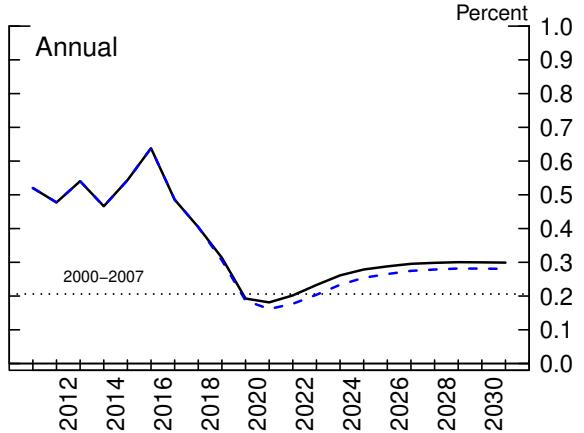
**SOMA Weighted-Average Treasury Duration**

Balance Sheet &amp; Income

**Maturity Composition of SOMA Treasury Portfolio**

## Income Projections

— January Tealbook baseline    - - December Tealbook baseline

**Interest Income****Interest Expense****Realized Capital Gains****Earnings Remittances to Treasury****Remittances as a Percent of GDP****Memo: Unrealized Gains/Losses**