

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)

Report to the FOMC on Economic Conditions and Monetary Policy



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

March 8, 2019

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

Comparing the Staff Projection with Other Forecasts

The Blue Chip consensus expects GDP growth this year that is $\frac{1}{4}$ percentage point stronger than the staff's projection, while both the staff and Blue Chip project an unemployment rate of 3.6 percent by year-end. In 2020, the Blue Chip projects GDP growth to be $\frac{1}{4}$ percentage point lower than in the staff forecast, and they expect the unemployment rate to edge up to 3.8 percent. The Blue Chip and staff projections for CPI inflation are similar in both 2019 and 2020. As before, the staff's projections for short-term interest rates are above the range of Blue Chip forecasters, and our projection for longer-term rates are relatively high as well. (Note that we do not include the Survey of Professional Forecasters in this comparison because the most recent SPF projection is from November. The SPF ordinarily released in February was postponed because of the government shutdown and is now scheduled for March 22.)

Please note that the Blue Chip data are embargoed until March 10.

Comparison of Tealbook and Outside Forecasts

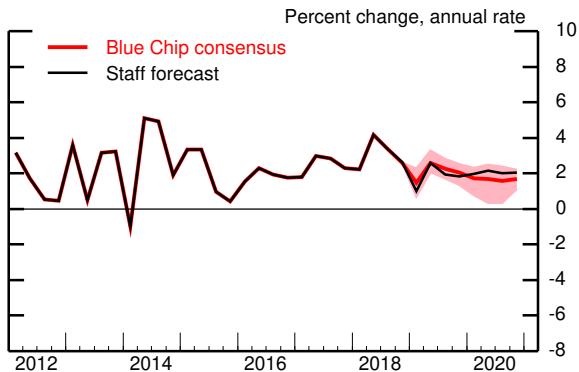
	2018	2019	2020
GDP (Q4/Q4 percent change)			
Staff Forecast (03/08/19)	3.1	1.8	2.0
Blue Chip (03/10/19)	3.1	2.1	1.7
Unemployment rate (Q4 level)			
Staff Forecast (03/08/19)	3.8	3.6	3.6
Blue Chip (03/10/19)	3.8	3.6	3.8
CPI inflation (Q4/Q4 percent change)			
Staff Forecast (03/08/19)	2.2	2.1	2.2
Blue Chip (03/10/19)	2.2	2.0	2.2

Note: CPI is the consumer price index. The Blue Chip consensus forecast includes input from about 50 panelists.

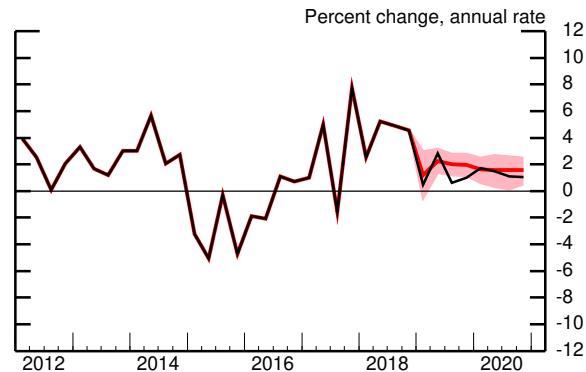
Source: Blue Chip Economic Indicators.

Tealbook Forecast Compared with Blue Chip

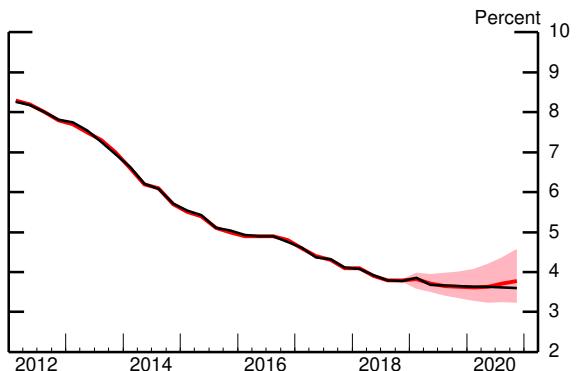
Real GDP



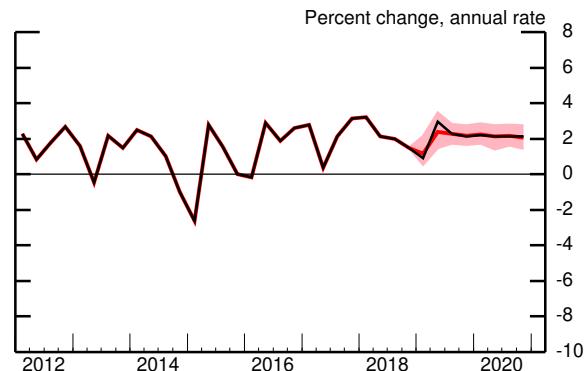
Industrial Production



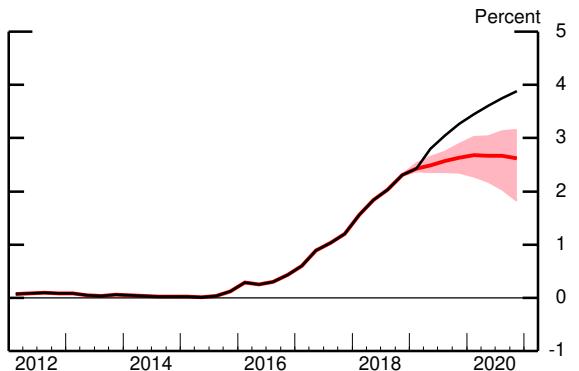
Unemployment Rate



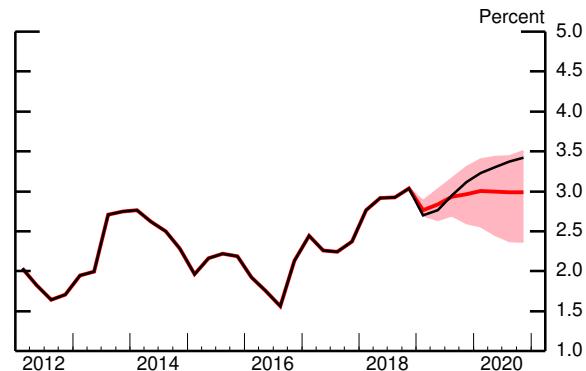
Consumer Price Index



Treasury Bill Rate



10-Year Treasury Yield



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

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

Revisions to the Staff Projection since the Previous SEP

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

Recent data for real GDP growth have been below our expectations in the December Tealbook, while readings on labor market conditions have been close, on balance, to what we had expected. Our projection for real GDP growth this year has been revised down, mostly reflecting the soft incoming spending data, along with a downward revision to our projection for foreign economic growth, which have been only partially offset by somewhat more favorable trajectories for equity prices and interest rates. The downward revision to GDP, along with an upward revision to our estimate of the sustainable labor force participation rate, imply that our forecast for resource utilization is less tight than in the December Tealbook. The unemployment rate is a little higher, and the output gap is smaller.

Our forecast for core inflation in 2019 and over the medium term is unchanged from our projection in the December Tealbook, and we continue to expect core inflation to run at 2 percent over the next few years. Total inflation is projected to be a bit below 2 percent over the medium term—slightly lower than in the December forecast—reflecting projected declines in crude oil prices.

The path for the federal funds rate derived from the inertial version of the Taylor (1999) rule used in our baseline forecast is notably lower than its trajectory in December, reflecting the narrower output gap in this projection.

Staff Economic Projections Compared with the December Tealbook

Variable	2018	2019		2019	2020	2021	Longer run
		H1	H2				
Real GDP ¹ December Tealbook	3.1 3.0	1.8 2.5	1.9 2.2	1.8 2.4	2.0 2.0	1.5 1.4	1.7 1.7
Unemployment rate ² December Tealbook	3.8 3.7	3.7 3.5	3.6 3.4	3.6 3.4	3.6 3.4	3.7 3.5	4.6 4.6
PCE inflation ¹ December Tealbook	1.9 1.8	1.8 1.8	1.9 1.9	1.8 1.8	1.9 2.0	1.9 2.0	2.0 2.0
Core PCE inflation ¹ December Tealbook	1.9 1.8	2.1 2.2	1.9 1.9	2.0 2.0	2.0 2.0	2.0 2.0	n.a. n.a.
Federal funds rate ² December Tealbook	2.22 2.22	2.71 2.88	3.20 3.49	3.20 3.49	3.84 4.30	4.12 4.66	2.50 2.50
Memo: Federal funds rate, end of period December Tealbook	2.38 2.24	2.73 2.91	3.22 3.51	3.22 3.51	3.85 4.31	4.13 4.66	2.50 2.50
Output gap ^{2,3} December Tealbook	1.9 2.2	2.1 2.5	2.1 2.8	2.1 2.8	2.3 2.9	1.9 2.4	n.a. n.a.

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

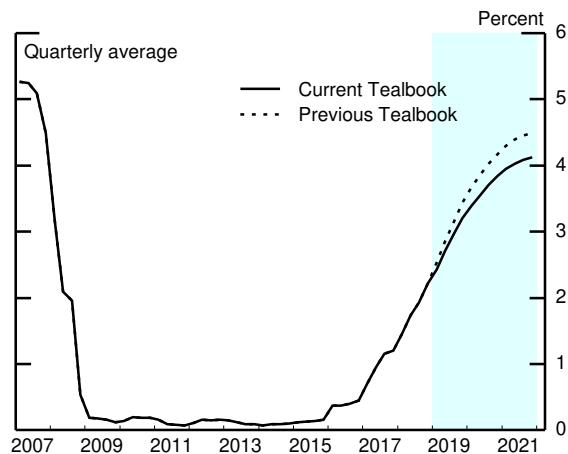
2. Percent, final quarter of period indicated.

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

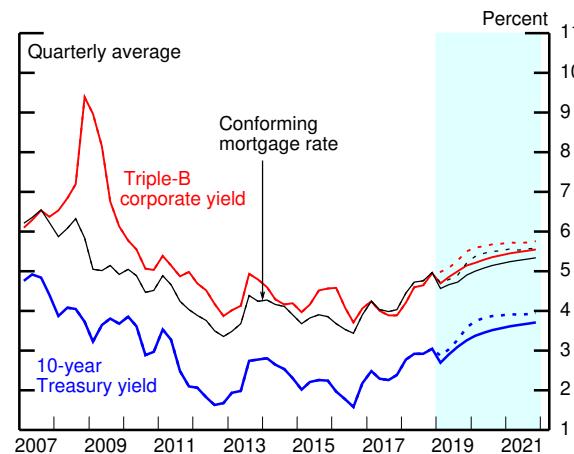
n.a. Not available.

Key Background Factors underlying the Baseline Staff Projection

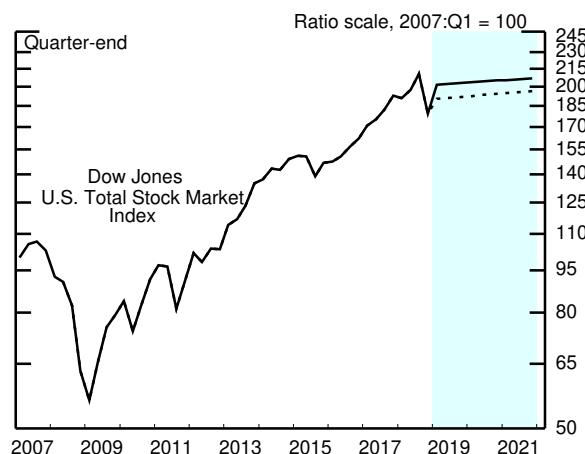
Federal Funds Rate



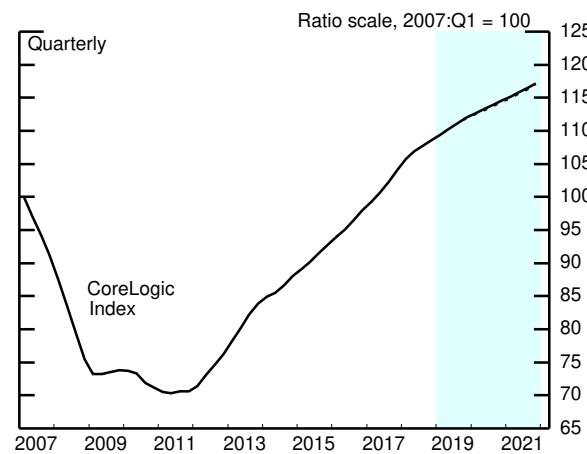
Long-Term Interest Rates



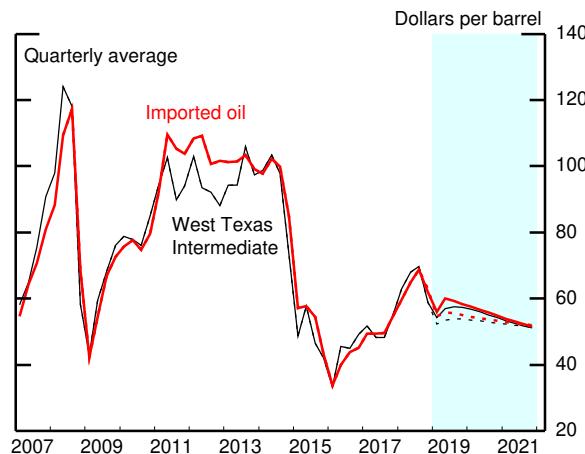
Equity Prices



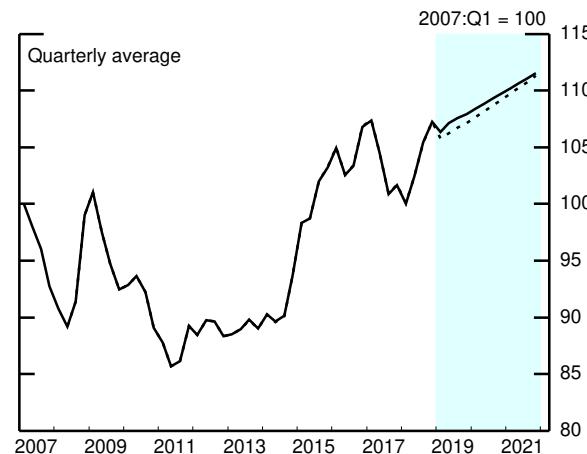
House Prices



Crude Oil Prices



Broad Real Dollar



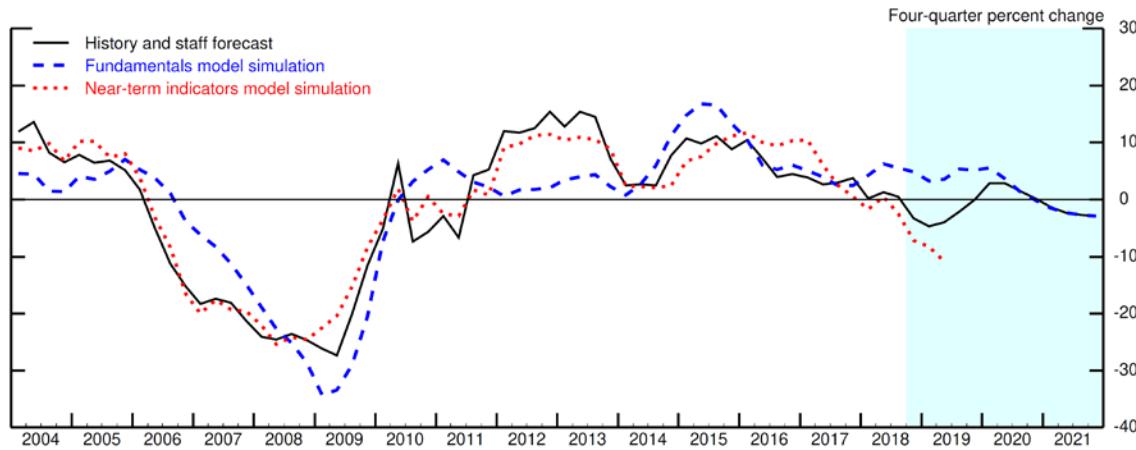
The Current Weakness in Residential Investment

Housing activity was surprisingly weak last year. Residential investment declined for the first time since the recovery began, and incoming data indicate that the weakness has extended into this year. We had expected the rise in mortgage interest rates in 2018 to be a drag on the housing market, but investment has been weaker than we projected, even though the level of mortgage rates at the end of last year was close to our projection at the beginning of the year.

Coming into 2018, the staff expected slow but steady growth in residential investment, consistent with a simulation of our fundamentals model, shown by the dashed blue line in figure 1. This model relates housing demand and investment to a set of fundamentals that includes mortgage rates. Unsurprisingly, mortgage rates—which rose about 1 percentage point from the end of 2017 through late 2018—exerted considerable downward pressure on the model’s projection of investment growth in 2018, but this pressure was offset by other factors, including strong overall economic growth and healthy gains in household income.

In contrast, the dotted red line shows a simulation of a different model that we use specifically to inform our near-term outlook. This model conditions on several indicators that we select from a much larger set of data using a standard machine learning technique. The indicators model also saw a considerable drag on investment growth from the rise in mortgage rates last year and by roughly the same magnitude as in the fundamentals model. But it took additional negative signal from other indicators—most notably, the low level of homebuying sentiment, shown in figure 2—yielding a forecast for growth in 2018 that tracked a bit below the staff’s current estimate of actual investment (the solid black line in figure 1).

Figure 1: Residential Investment Growth



Note: Shaded area denotes projection period for staff forecast.
Source: U.S. Department of Commerce, Bureau of Economic Analysis; staff models.

Figure 2: Homebuying Conditions



Note: Three-month moving average of the percent responding that it is a good time to buy less the percent responding it is a bad time to buy.
Source: University of Michigan Surveys of Consumers.

Figure 3: Michigan Survey Detail



Note: Three-month moving average of the percent responding that it is a good or bad time to buy a home for the given reason.
Source: University of Michigan Surveys of Consumers.

According to the detailed questions in the University of Michigan Surveys of Consumers, the decline in homebuying sentiment in recent years is the result of households' perceptions of both higher mortgage rates and rising housing prices (figure 3). Although prices have decelerated recently, they remain much higher relative to income than several years ago, which has combined with higher mortgage rates to reduce affordability. We think that rising house prices, taken in combination with moderate levels of investment, have reflected relatively tight supply conditions, including of land, labor and materials. That said, it seems unlikely that supply conditions worsened sufficiently in 2018 to account for the swing in investment.

Another possible contributor to weak residential investment was tax policy. The Tax Cuts and Jobs Act put new caps on both the mortgage interest deduction and the deduction for state and local taxes, and it increased the number of filers who claim the standard deduction rather than itemizing. However, we have not found evidence in the data of a material drag of tax reform on housing activity or prices. Accordingly, we continue to believe that the effects of the changes in tax policy on nationwide housing demand are likely small, as the additional disposable income flowing to households from lower tax rates is estimated to roughly balance out the less favorable treatment of housing itself.

In summary, we view residential investment last year as having been weaker than our usual reading of the fundamentals would suggest, though closer to what one would expect after accounting for homebuying sentiment. Looking ahead, residential investment in our projection begins to grow again in the second quarter, consistent with the decline in mortgage rates since November. Even so, we assume that the portion of the weakness picked up by sentiment will persist for the next year or so, keeping the pace of growth below that of our fundamentals model. Thereafter, the staff forecast and the model come back into alignment, and both decelerate in response to the expected slowing in overall economic growth and projected further increases in mortgage rates.

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

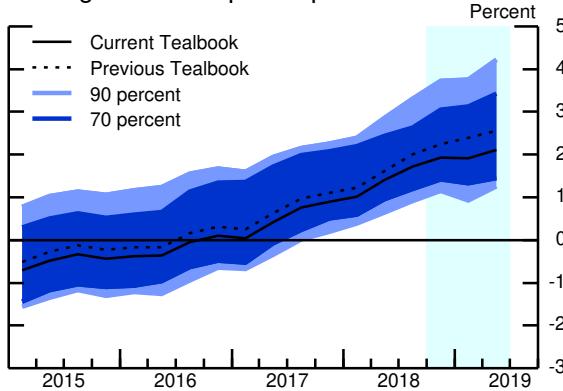
(Percent change at annual rate from final quarter of preceding period except as noted)

Measure	2016	2017	2018	2018 Q4	2019 Q1	2019 Q2
Output gap¹	.1	.9	1.9	1.9	1.9	2.1
Previous Tealbook	.3	1.1	2.2	2.2	2.4	2.6
Real GDP	1.9	2.5	3.1	2.6	1.0	2.6
Previous Tealbook	1.9	2.5	3.1	2.8	2.3	2.6
Measurement error in GDP	-.3	.0	.3	.0	-.8	.0
Previous Tealbook	-.3	.0	.2	.1	-.1	.1
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.

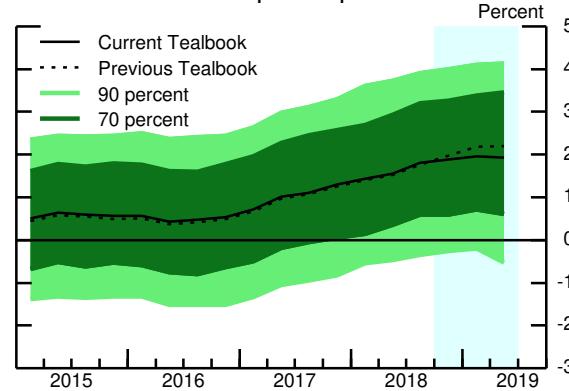
Judgmental Output Gap



Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.

Source: Various macroeconomic data; staff assumptions.

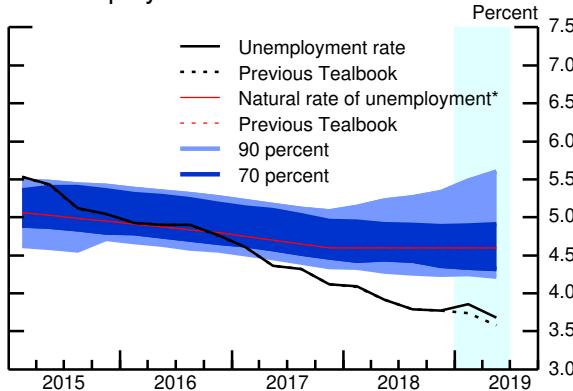
Model-Based Output Gap



Note: Shaded regions denote model-computed uncertainty bands.

Source: Various macroeconomic data; staff assumptions.

Unemployment Rate

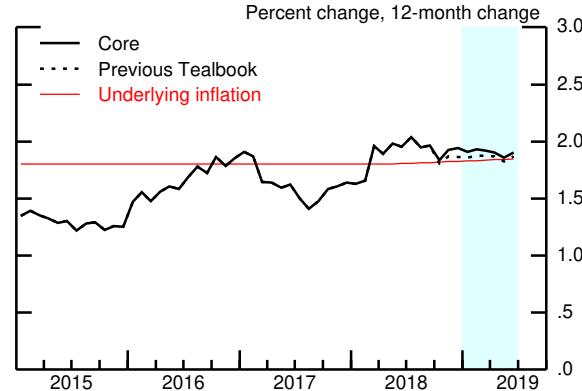


Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the natural rate.

*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.

Federal Reserve System Nowcasts of 2019:Q1 Real GDP Growth
(Percent change at annual rate from previous quarter)

Federal Reserve Entity	Type of model	Nowcast as of Mar. 7, 2019
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	2.4
New York	• Factor-augmented autoregressive model combination • Factor-augmented autoregressive model combination, financial factors only • Dynamic factor model	2.3 2.2 .9
Cleveland	• Bayesian regressions with stochastic volatility • Tracking model	1.9 1.2
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	.5
Chicago	• Dynamic factor models • Bayesian VARs	3.2 1.9
St. Louis	• Dynamic factor models • News index model • Let-the-data-decide regressions	.7 2.4 1.9
Kansas City	• Accounting-based tracking estimate	1.8
Board of Governors	• Tealbook estimate (judgmental) • Monthly dynamic factor models (DFM-45) • Mixed-frequency dynamic factor model (DFM-BM)	1.0 2.1 1.9
Memo: Median of Federal Reserve System nowcasts		1.9

Summary of the Near-Term Outlook for GDP

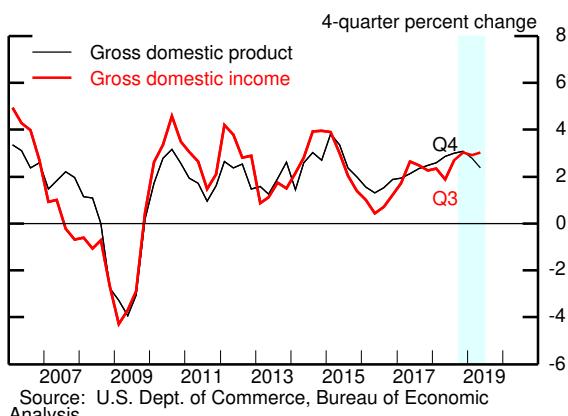
(Percent change at annual rate except as noted)

Measure	2018:Q4		2019:Q1		2019:Q2	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	2.8	2.6	2.3	1.0	2.6	2.6
Private domestic final purchases	4.0	2.9	2.3	1.0	2.5	2.7
Personal consumption expenditures	3.8	2.8	2.4	1.0	2.5	2.8
Residential investment	-4.4	-4.9	-3.4	-8.6	1.4	1.3
Nonres. private fixed investment	7.1	5.5	3.2	3.4	3.1	2.1
Government purchases	1.7	.0	.4	.7	3.7	4.0
<i>Contributions to change in real GDP</i>						
Inventory investment ¹	-.7	.4	.1	.2	.1	-.1
Net exports ¹	-.2	-.2	.1	-.1	-.3	-.3

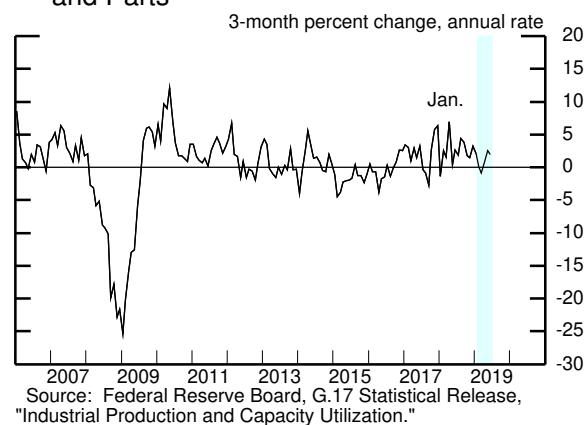
1. Percentage points.

Recent Nonfinancial Developments (1)

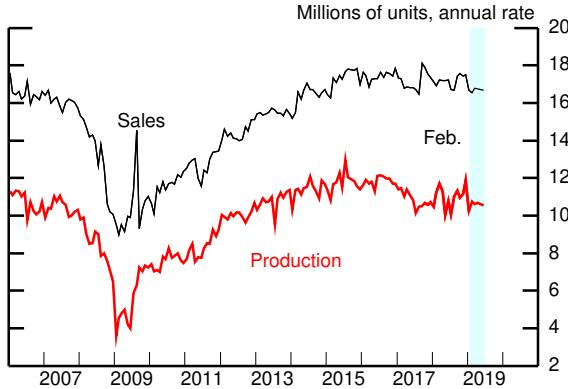
Real GDP and GDI



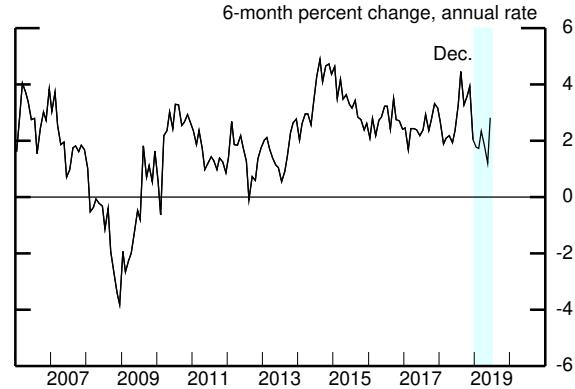
Manufacturing IP ex. Motor Vehicles and Parts



Sales and Production of Light Motor Vehicles

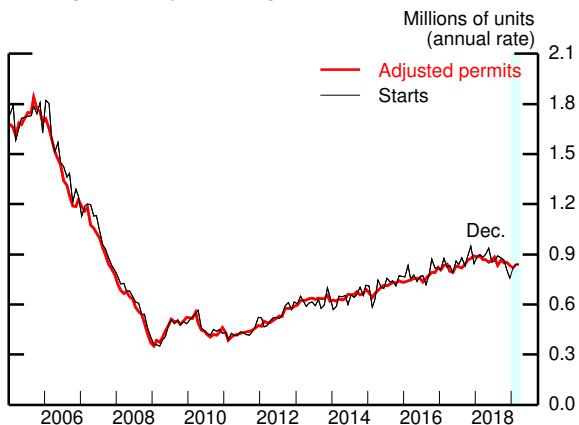


Real PCE Growth



Recent Nonfinancial Developments (2)

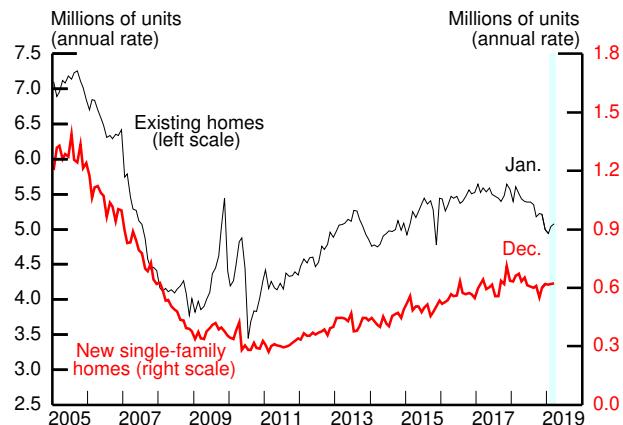
Single-Family Housing Starts and Permits



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

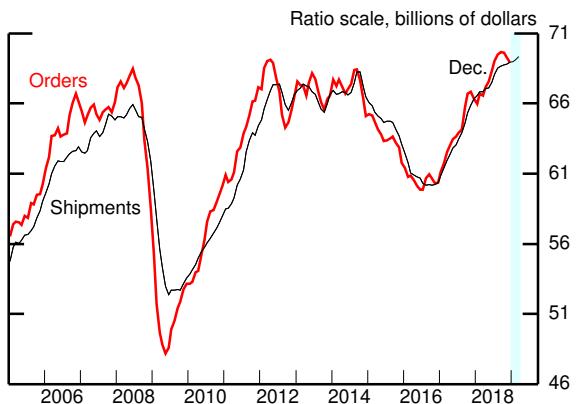
Source: U.S. Census Bureau.

Home Sales



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

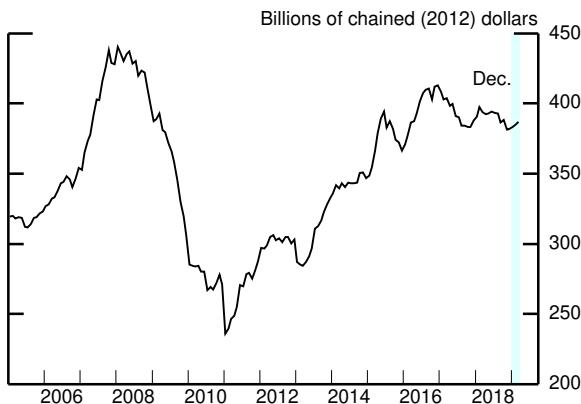
Nondefense Capital Goods ex. Aircraft



Note: Data are 3-month moving averages.

Source: U.S. Census Bureau.

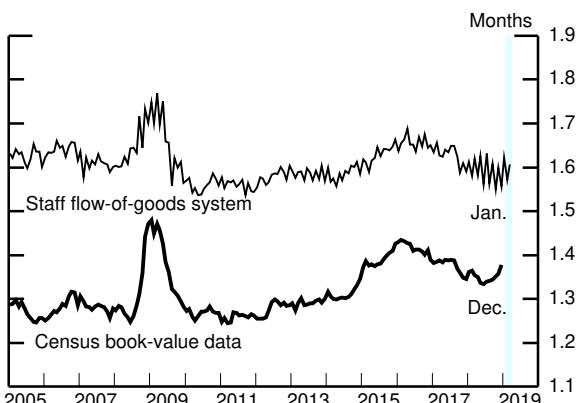
Nonresidential Construction Put in Place



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

Source: U.S. Census Bureau.

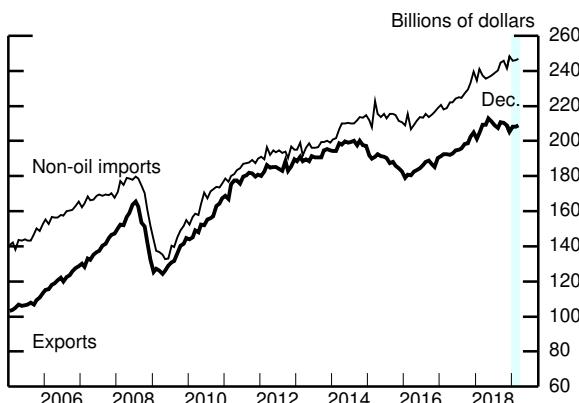
Inventory Ratios



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

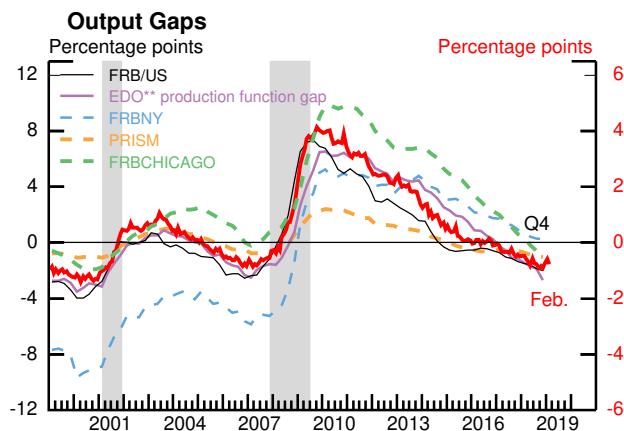


Note: Forecasts are linear interpolations of quarterly values.

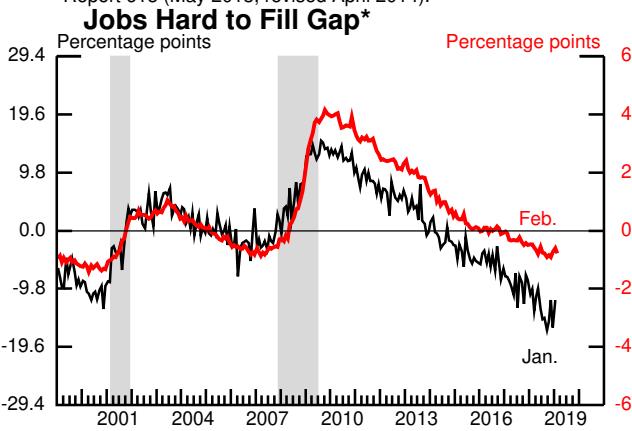
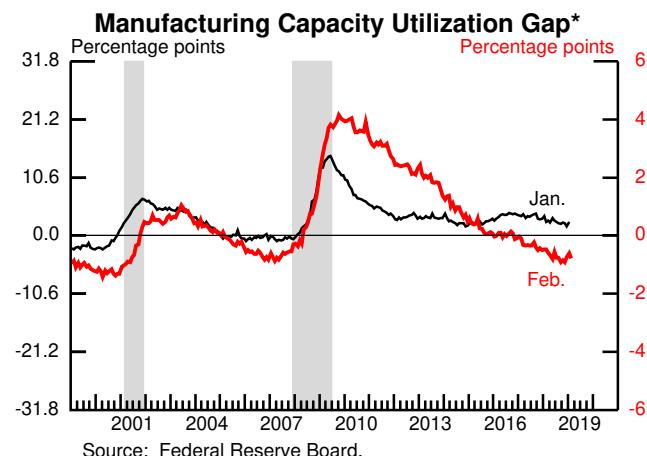
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis; U.S. Census Bureau.

Alternative Measures of Slack

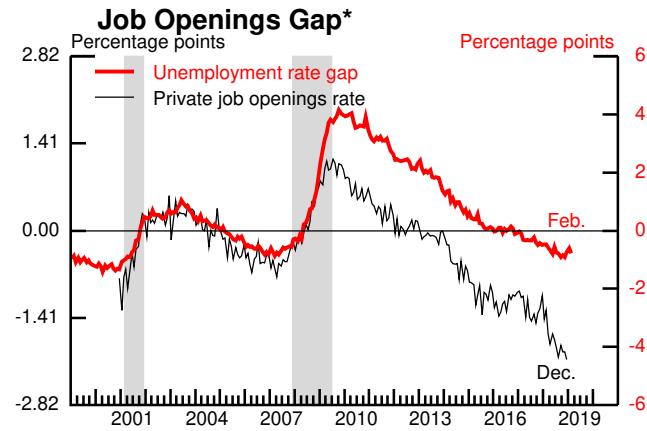
The red line in each panel is the staff's measure of the unemployment rate gap (right axis).



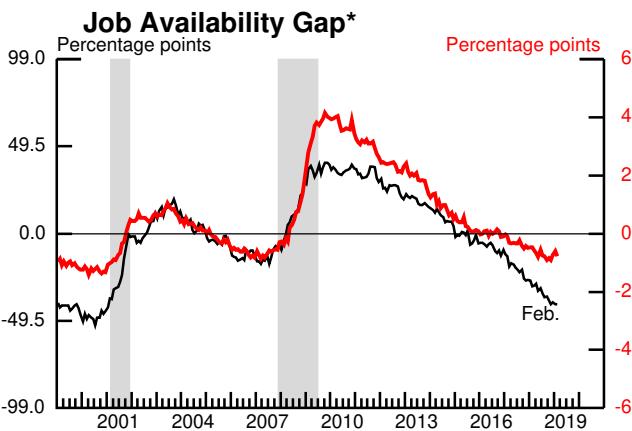
** EDO is Estimated, Dynamic, Optimization-based model.
Source: Federal Reserve Board; PRISM: Federal Reserve Board Bank of Chicago; Federal Reserve Board Bank of Philadelphia, PRISM Model Documentation (June 2011); FRBNY: Federal Reserve Bank of New York Staff Report 618 (May 2013, revised April 2014).



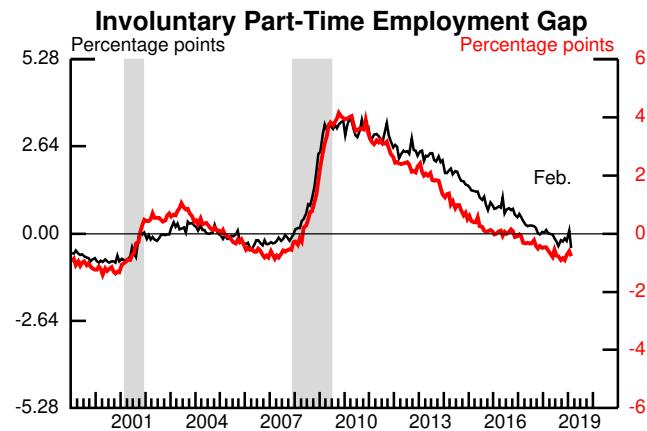
Note: Percent of small businesses surveyed with at least one "hard to fill" job opening. Seasonally adjusted by Federal Reserve Board Staff.
Source: National Federation of Independent Business, Small Business Economic Trends Survey.



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



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



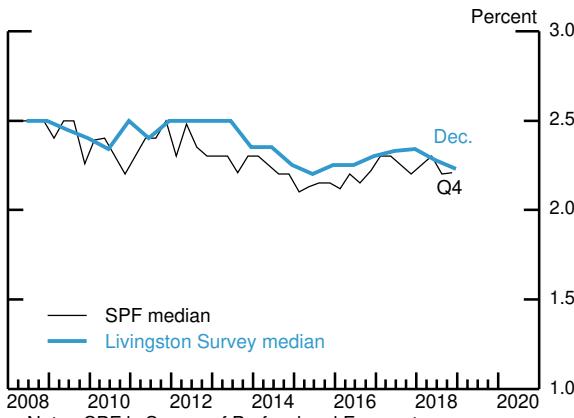
Note: Percent of employment.
Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey.

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

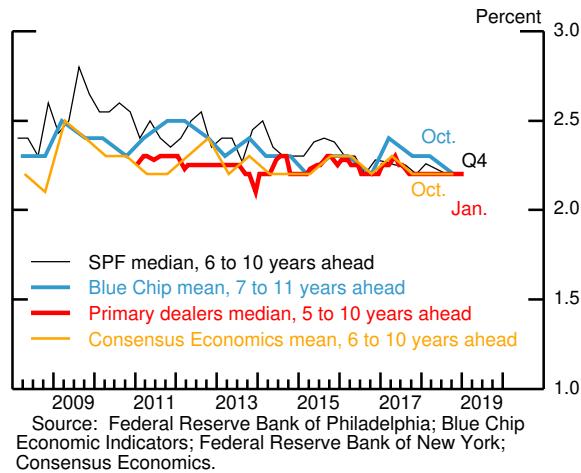
Note: The shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research. Output gaps are multiplied by negative 0.52 to facilitate comparison with the unemployment rate gap. Manufacturing capacity utilization gap is constructed by subtracting its average rate from 1972 to 2018. Other gaps were constructed by subtracting each series' average in 2004:Q4 and 2005:Q1.

Survey Measures of Longer-Term Inflation Expectations

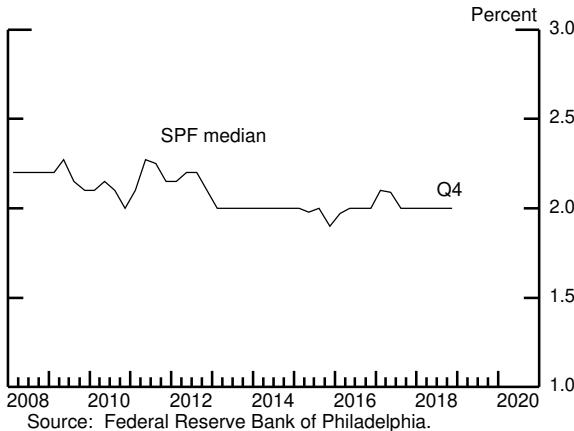
CPI Next 10 Years



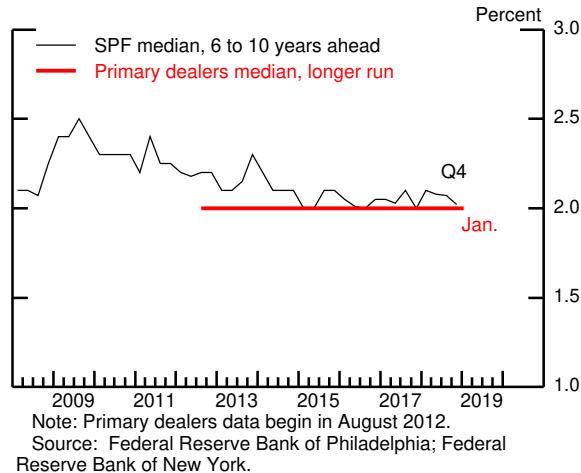
CPI Forward Expectations



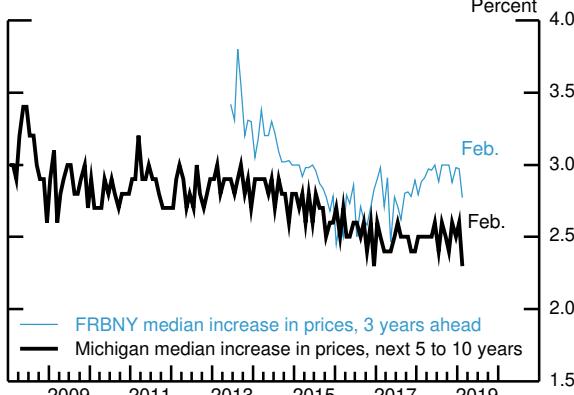
PCE Next 10 Years



PCE Forward Expectations

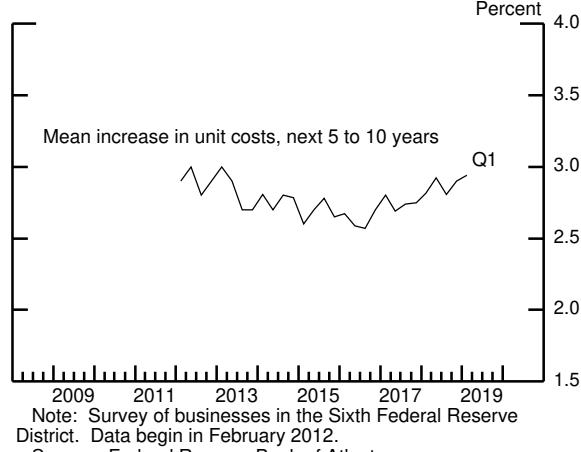


Surveys of Consumers



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

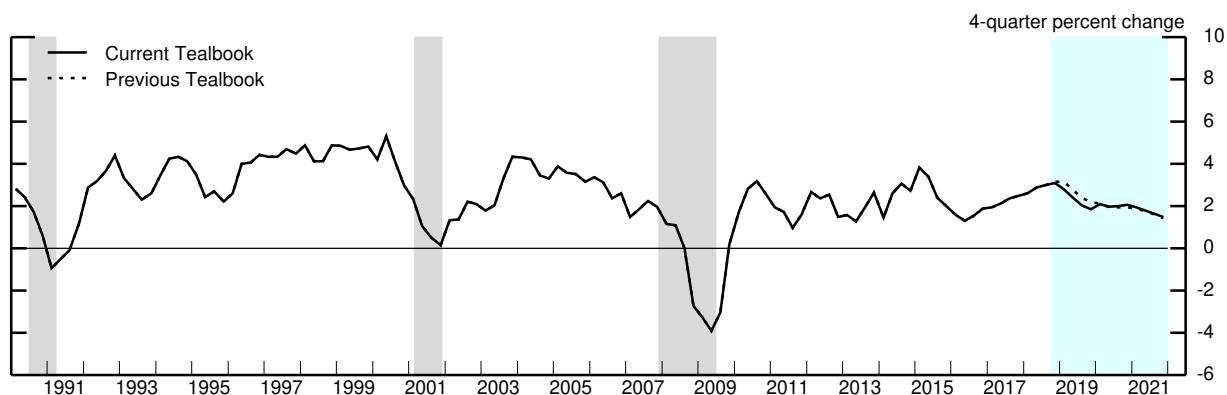
Survey of Business Inflation Expectations



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

Measure	2018	2018 H2	2019 H1	2019	2020	2021
Real GDP	3.1	3.0	1.8	1.8	2.0	1.5
Previous Tealbook	3.1	3.1	2.4	2.2	1.9	1.4
Final sales	2.6	1.6	1.7	2.1	1.9	1.5
Previous Tealbook	3.0	2.2	2.3	2.3	1.9	1.5
Personal consumption expenditures	2.7	3.2	1.9	2.3	2.2	2.0
Previous Tealbook	2.9	3.7	2.5	2.4	2.2	1.9
Residential investment	-3.3	-4.2	-3.8	-.1	.1	-2.8
Previous Tealbook	-3.2	-4.0	-1.1	.7	-.6	-.4
Nonresidential structures	5.3	-2.9	2.2	2.0	-1.0	-2.3
Previous Tealbook	5.9	-1.8	2.8	1.9	-.8	-2.0
Equipment and intangibles	7.5	6.1	2.9	2.7	2.5	1.8
Previous Tealbook	7.9	6.8	3.3	2.8	2.2	1.6
Federal purchases	2.8	2.5	4.3	3.5	2.7	1.0
Previous Tealbook	3.2	3.3	3.3	3.4	2.9	.9
State and local purchases	1.0	.6	1.2	1.2	1.0	1.0
Previous Tealbook	1.4	1.4	1.2	1.2	1.0	1.0
Exports	2.2	-1.8	1.4	1.7	2.7	3.2
Previous Tealbook	2.3	-1.6	2.4	2.3	3.0	3.1
Imports	3.5	5.9	2.7	2.6	3.1	2.9
Previous Tealbook	3.5	5.9	2.4	2.5	2.9	2.6
Contributions to change in real GDP (percentage points)						
Inventory change	.5	1.4	.1	-.2	.1	.0
Previous Tealbook	.2	.8	.1	-.1	.1	-.1
Net exports	-.3	-1.1	-.2	-.2	-.1	.0
Previous Tealbook	-.3	-1.1	-.1	-.1	-.1	.0

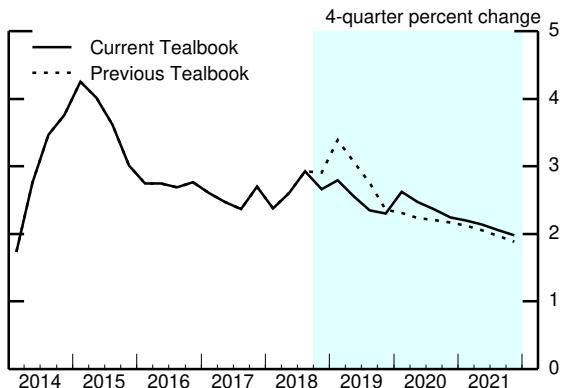
Real GDP



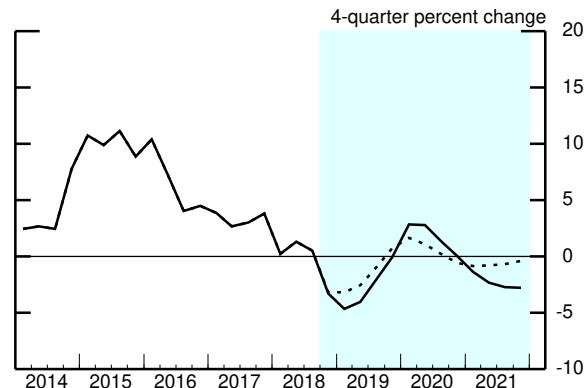
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
 Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Components of Final Demand

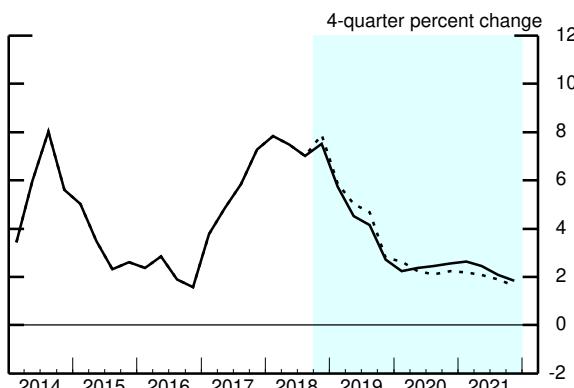
Personal Consumption Expenditures



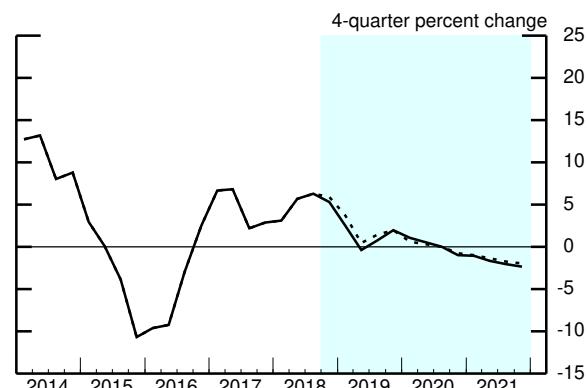
Residential Investment



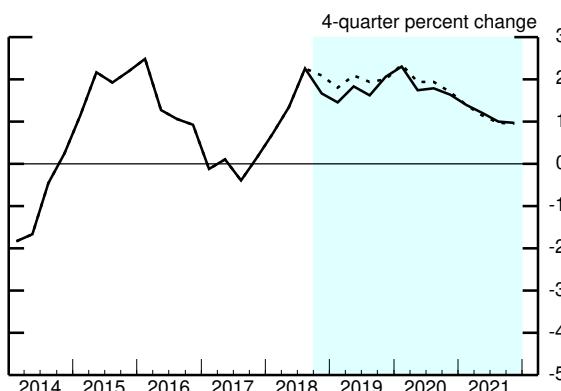
Equipment and Intangibles



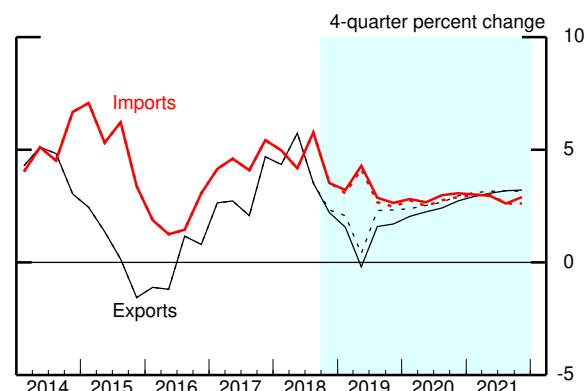
Nonresidential Structures



Government Consumption and Investment

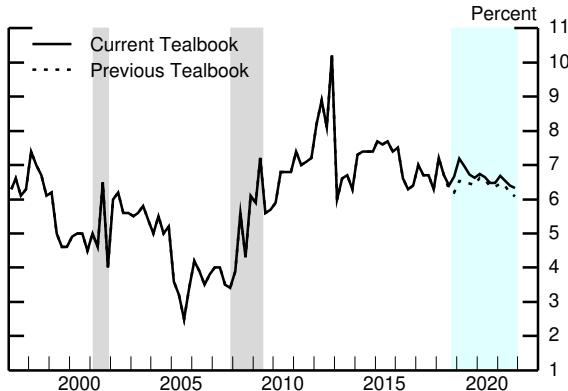
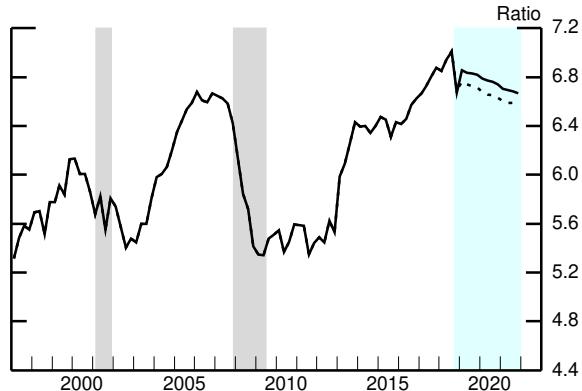
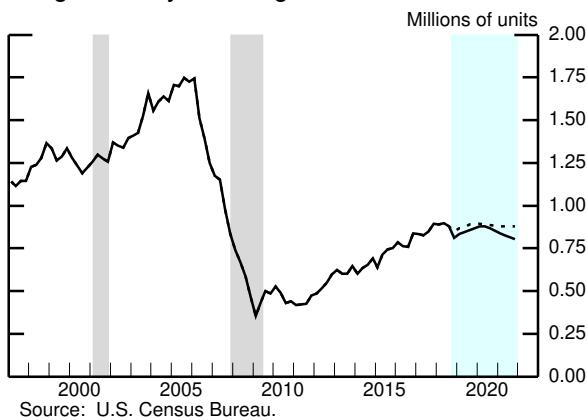
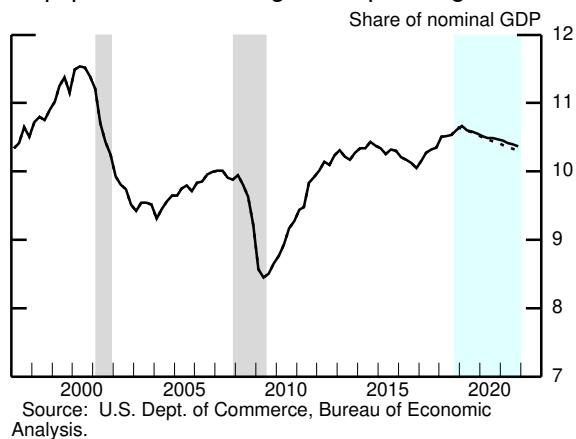
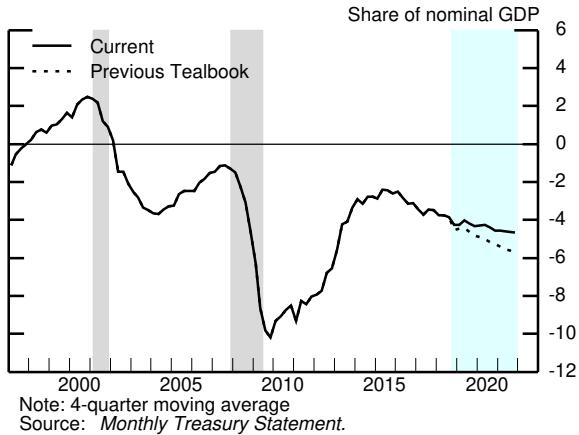
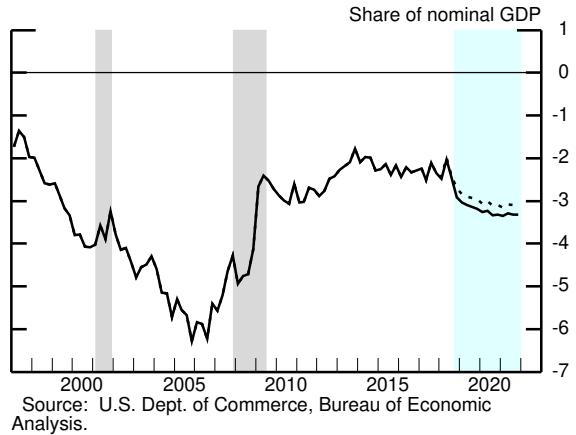


Exports and Imports



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

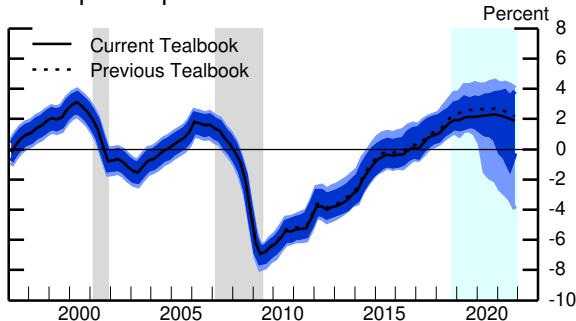
Aspects of the Medium-Term Projection

Personal Saving Rate**Wealth-to-Income Ratio****Single-Family Housing Starts****Equipment and Intangibles Spending****Federal Surplus/Deficit****Current Account Surplus/Deficit**

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

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

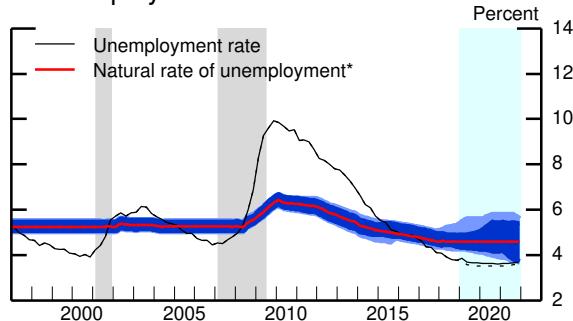
Output Gap



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

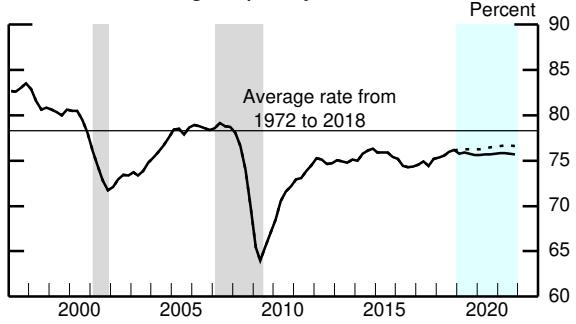


Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the natural rate.

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

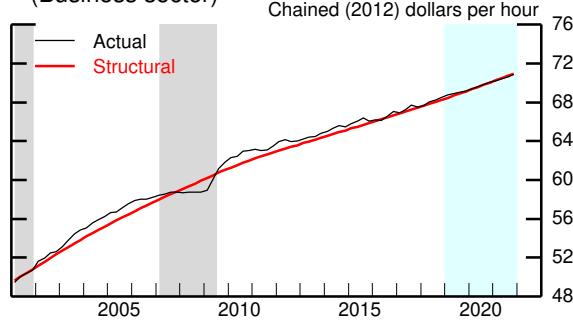
Source: Various macroeconomic data; staff assumptions.

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> ¹										
Structural labor productivity ²	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	.6	.5
Multifactor productivity	.8	1.1	1.4	1.1	.2	.3	.3	.3	.5	.6
Structural hours	1.5	1.3	.8	.5	.4	.3	.8	.2	.6	.5
Previous Tealbook	1.5	1.3	.8	.4	.4	.3	.8	.6	.6	.5
Labor force participation	.4	-.1	-.2	-.4	-.5	-.3	-.2	-.2	-.2	-.2
Previous Tealbook	.4	-.1	-.2	-.5	-.5	-.3	-.2	-.2	-.2	-.2
Memo:										
Output gap ³	-1.2	2.5	.3	-5.4	.1	.9	1.9	2.1	2.3	1.9
Previous Tealbook	-1.2	2.5	.3	-5.3	.3	1.1	2.2	2.6	2.7	2.2

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 ¹ Previous Tealbook	223 220	211 222	164 192	150 171	131 120	77 70
Private employment ¹ Previous Tealbook	215 214	206 213	159 180	143 160	121 110	67 60
Labor force participation rate ² Previous Tealbook	63.0 63.0	63.0 63.0	63.1 63.0	63.0 63.0	62.9 62.8	62.7 62.6
Civilian unemployment rate ² Previous Tealbook	3.8 3.8	3.8 3.8	3.7 3.6	3.6 3.5	3.6 3.5	3.7 3.6
Employment to population ratio ² Previous Tealbook	60.6 60.6	60.6 60.6	60.8 60.7	60.7 60.7	60.7 60.6	60.4 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

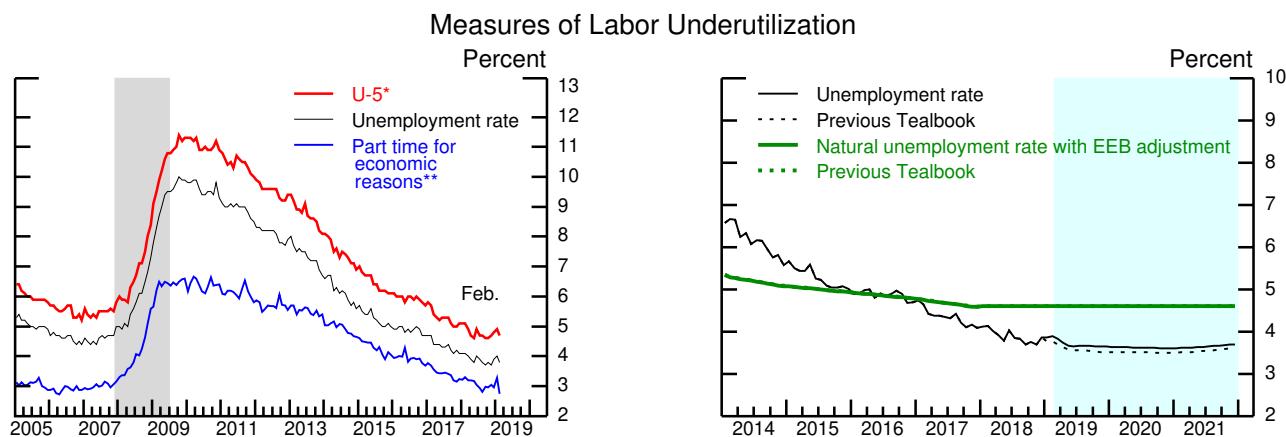
Measure	2018	2018 H2	2019 H1	2019	2020	2021
<i>Percent change at annual rate from final quarter of preceding period</i>						
PCE chain-weighted price index Previous Tealbook	1.9 1.8	1.5 1.5	1.8 1.7	1.8 1.8	1.9 1.9	1.9 2.0
Food and beverages Previous Tealbook	.5 .5	.3 .4	2.0 2.2	2.2 2.3	2.3 2.3	2.3 2.3
Energy Previous Tealbook	3.5 4.2	.6 1.8	-5.0 -8.5	-2.2 -4.1	-1.0 -.1	-.7 .5
Excluding food and energy Previous Tealbook	1.9 1.8	1.7 1.5	2.1 2.2	2.0 2.0	2.0 2.0	2.0 2.0
Prices of core goods imports ¹ Previous Tealbook	.5 .5	-.6 -.7	.4 .9	.6 .9	.8 .9	.7 .8
<i>12-month percent change</i>						
PCE chain-weighted price index Previous Tealbook	1.7 1.7	1.5 1.5	1.5 1.5	1.7 1.7	1.7 1.6	1.6 1.6
Excluding food and energy Previous Tealbook	1.9 1.9	1.9 1.9	1.9 1.9	1.9 1.9	1.9 1.9	1.9 1.8

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)

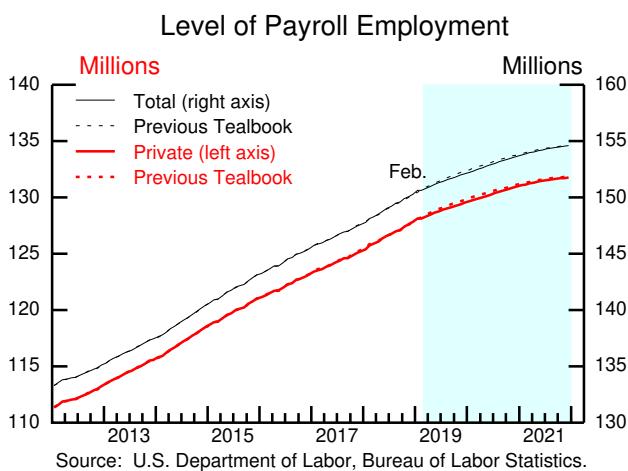


* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.

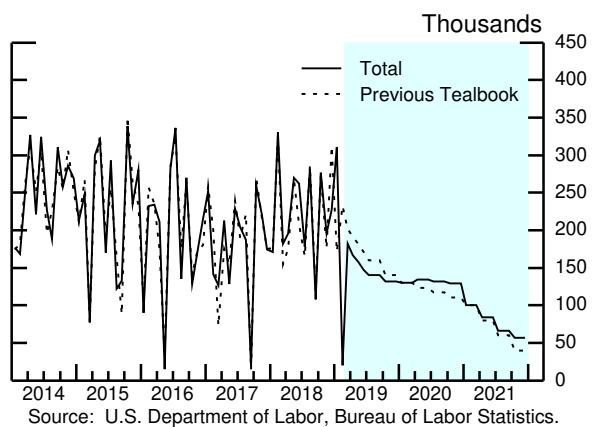
** Percent of Current Population Survey employment.

EEB Extended and emergency unemployment benefits.

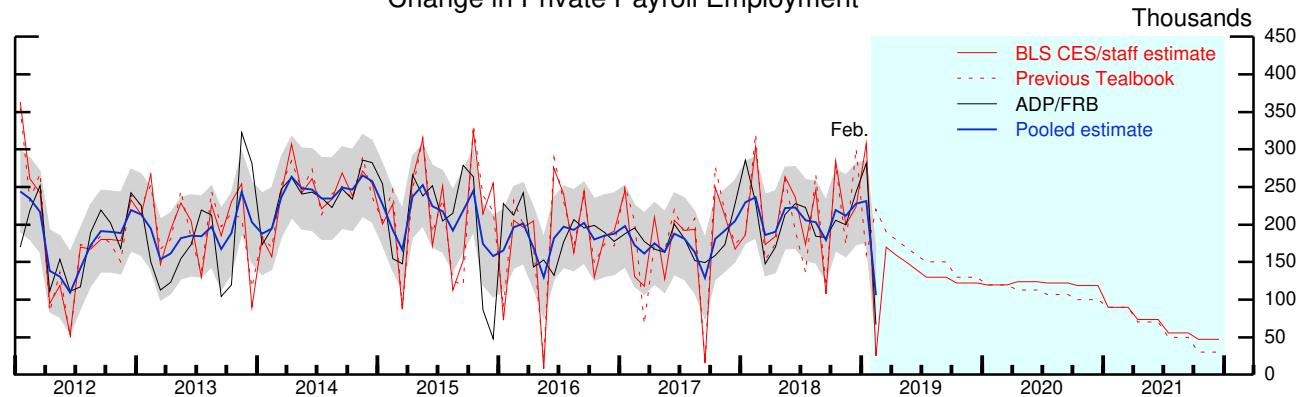
Source: U.S. Department of Labor, Bureau of Labor Statistics.



Change in Total Payroll Employment



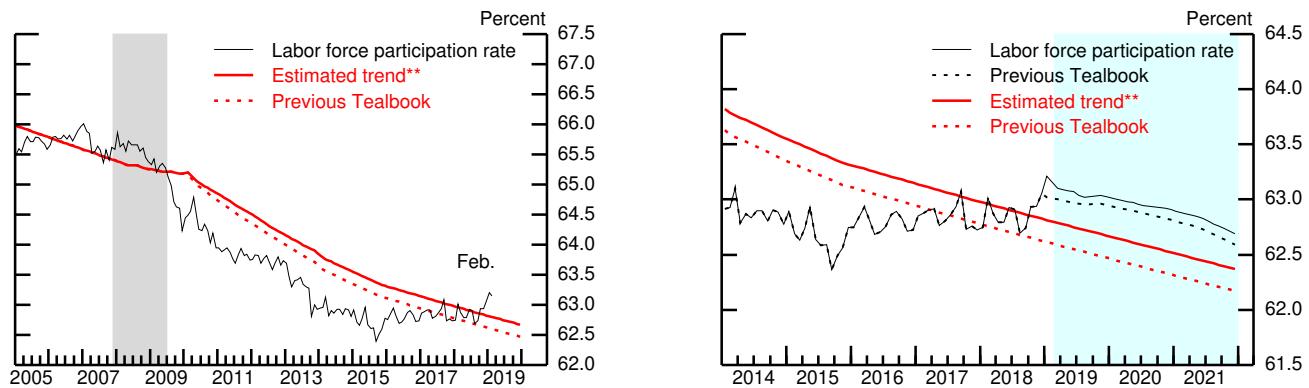
Change in Private Payroll Employment



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*

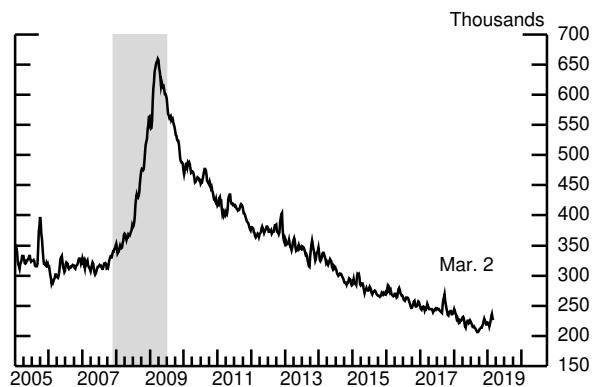


* Published data adjusted by staff to account for changes in population weights.

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

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

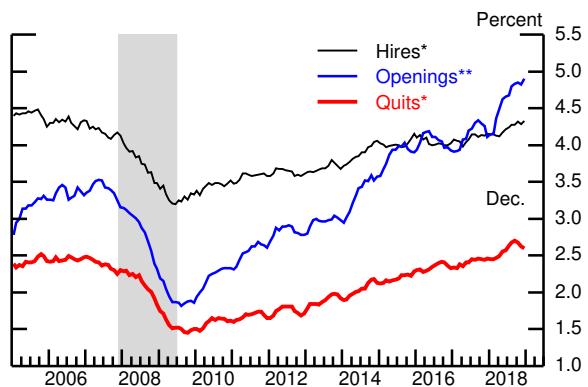
Initial Unemployment Insurance Claims*



* 4-week moving average.

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

Hires, Quits, and Job Openings

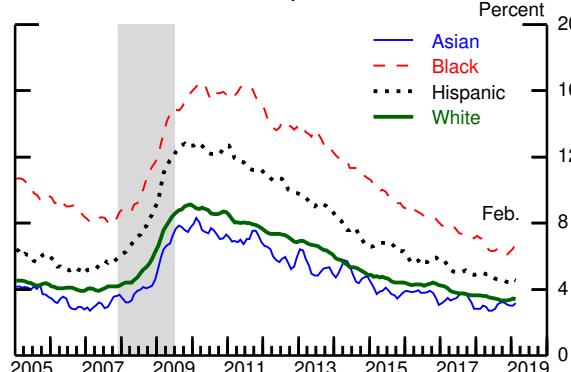


* Percent of private nonfarm payroll employment, 3-month moving average.

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

Source: Job Openings and Labor Turnover Survey.

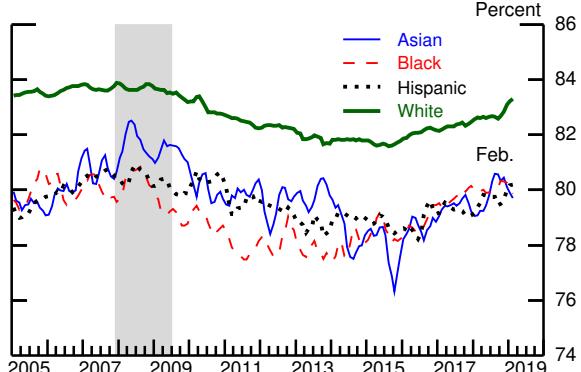
Unemployment Rate by Racial/Ethnic Group



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



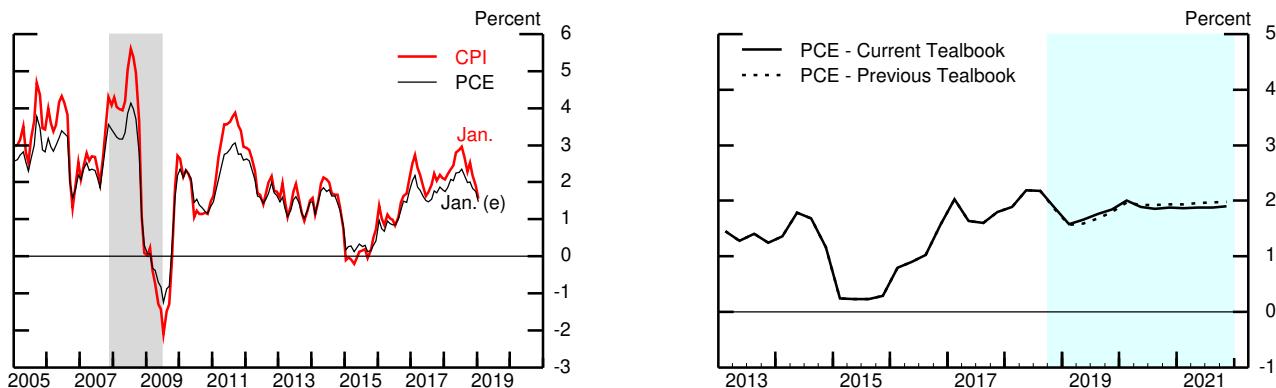
Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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

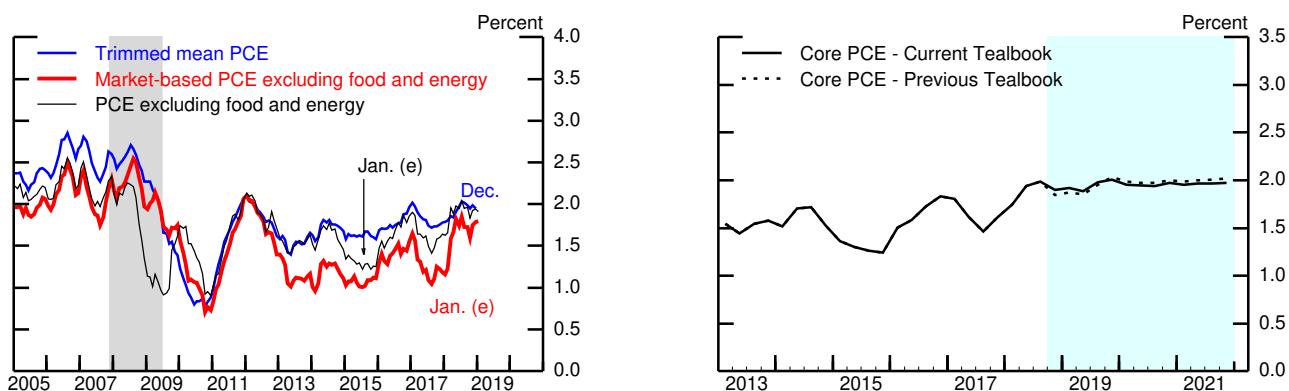
Headline Consumer Price Inflation



Note: PCE prices for January 2019 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.

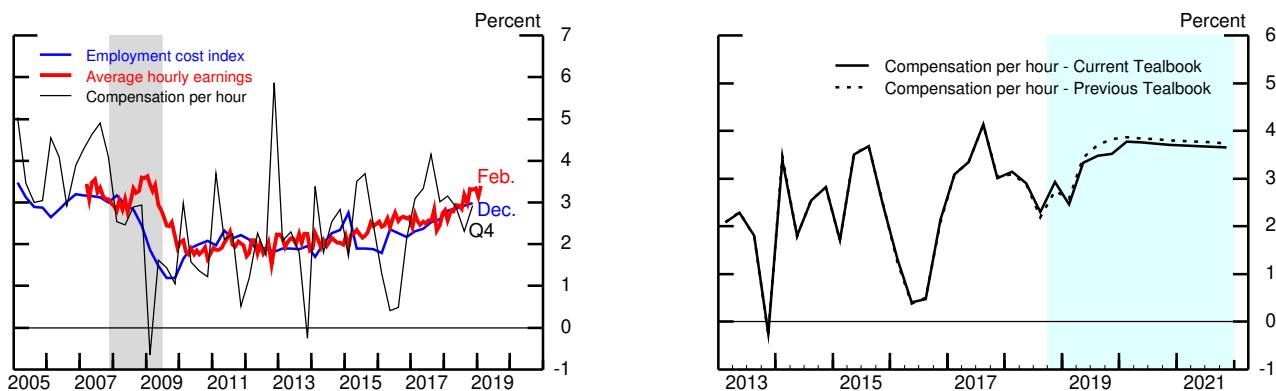
Measures of Underlying PCE Price Inflation



Note: Core PCE prices from January to January 2019 are staff estimates (e).

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

Labor Cost Growth



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

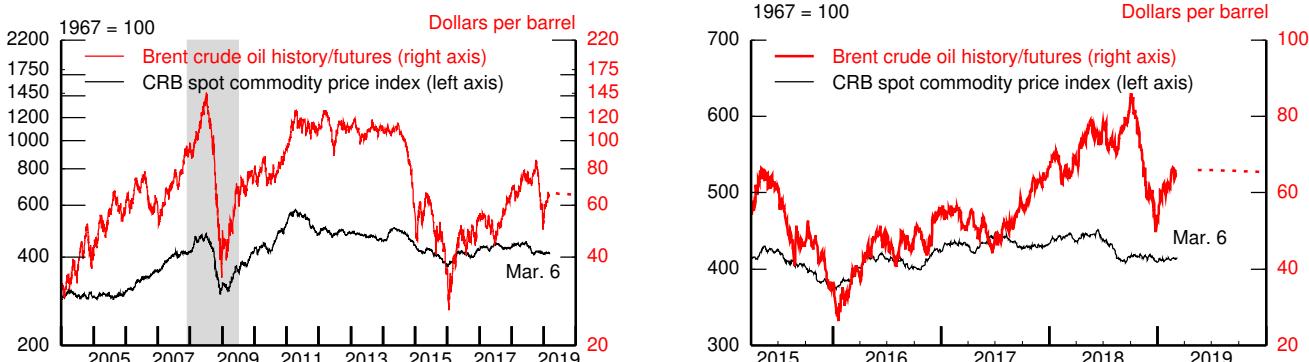
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

Inflation Developments and Outlook (2)

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

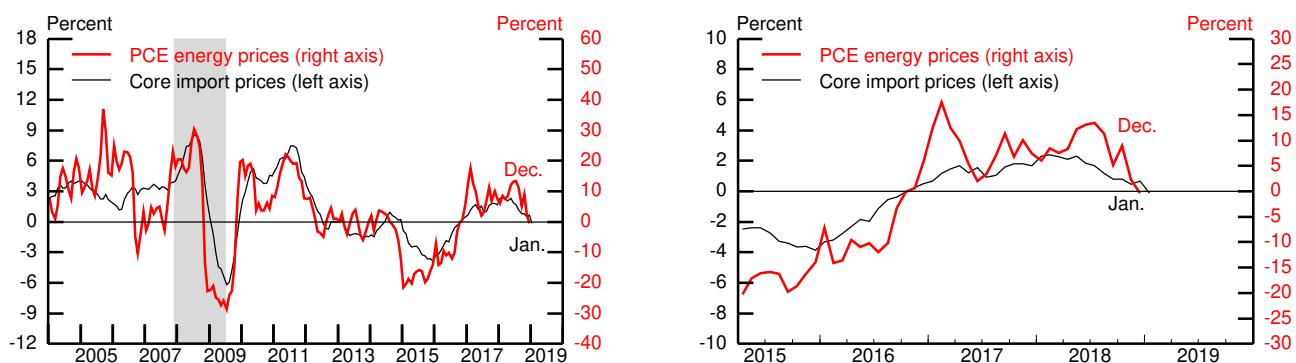
Commodity and Oil Price Levels



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

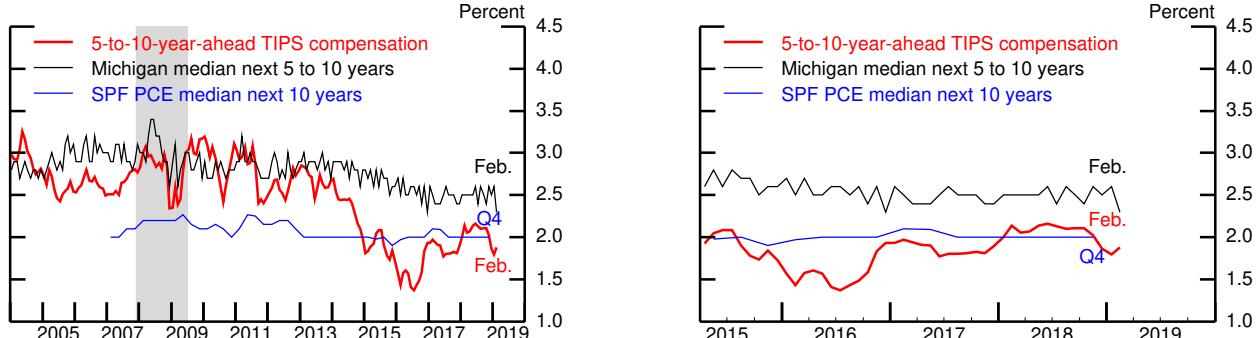
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

Energy and Import Price Inflation



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

Long-Term Inflation Expectations and Compensation



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

SPF Survey of Professional Forecasters.

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

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

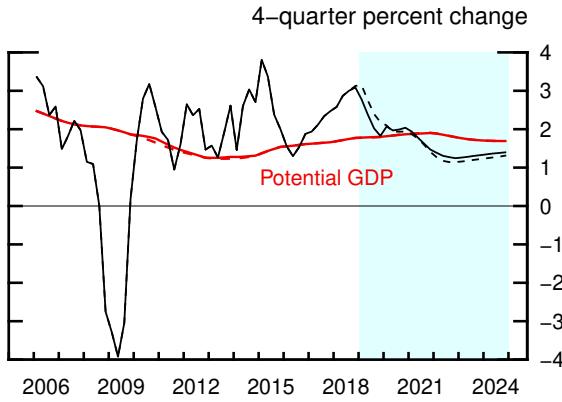
The Long-Term Outlook

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

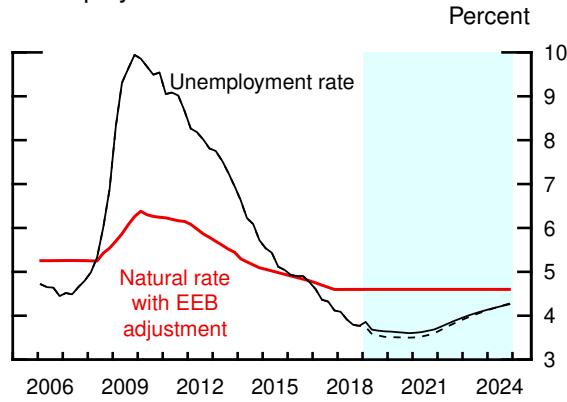
Measure	2019	2020	2021	2022	2023	2024	Longer run
Real GDP Previous Tealbook	1.8 2.2	2.0 1.9	1.5 1.4	1.2 1.1	1.3 1.2	1.4 1.3	1.7 1.7
Civilian unemployment rate ¹ Previous Tealbook	3.6 3.5	3.6 3.5	3.7 3.6	3.9 3.9	4.1 4.1	4.3 4.3	4.6 4.6
PCE prices, total Previous Tealbook	1.8 1.8	1.9 1.9	1.9 2.0	1.9 2.0	2.0 2.1	2.0 2.1	2.0 2.0
Core PCE prices Previous Tealbook	2.0 2.0	2.0 2.0	2.0 2.0	2.0 2.0	2.0 2.1	2.1 2.1	2.0 2.0
Federal funds rate ¹ Previous Tealbook	3.20 3.44	3.84 4.18	4.12 4.49	4.04 4.36	3.82 4.07	3.57 3.72	2.50 2.50
10-year Treasury yield ¹ Previous Tealbook	3.3 3.6	3.6 3.9	3.7 4.0	3.7 3.9	3.6 3.7	3.6 3.6	3.4 3.4

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

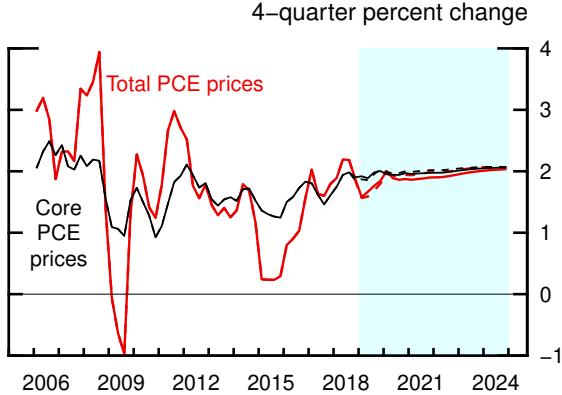
Real GDP



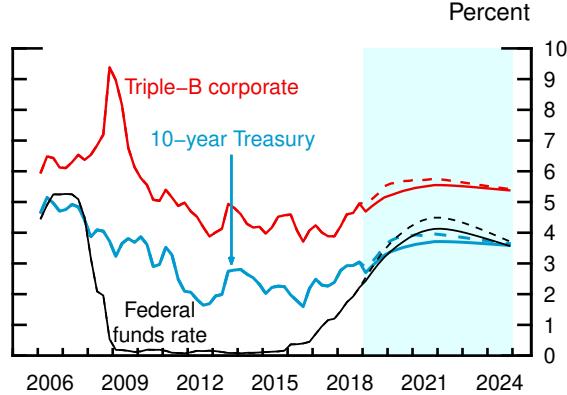
Unemployment Rate



PCE Prices



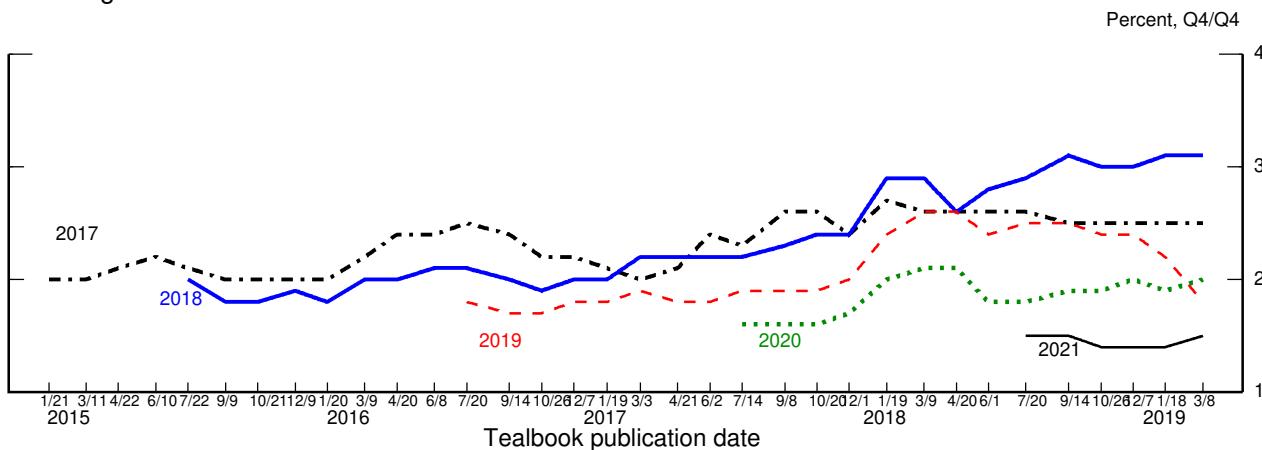
Interest Rates



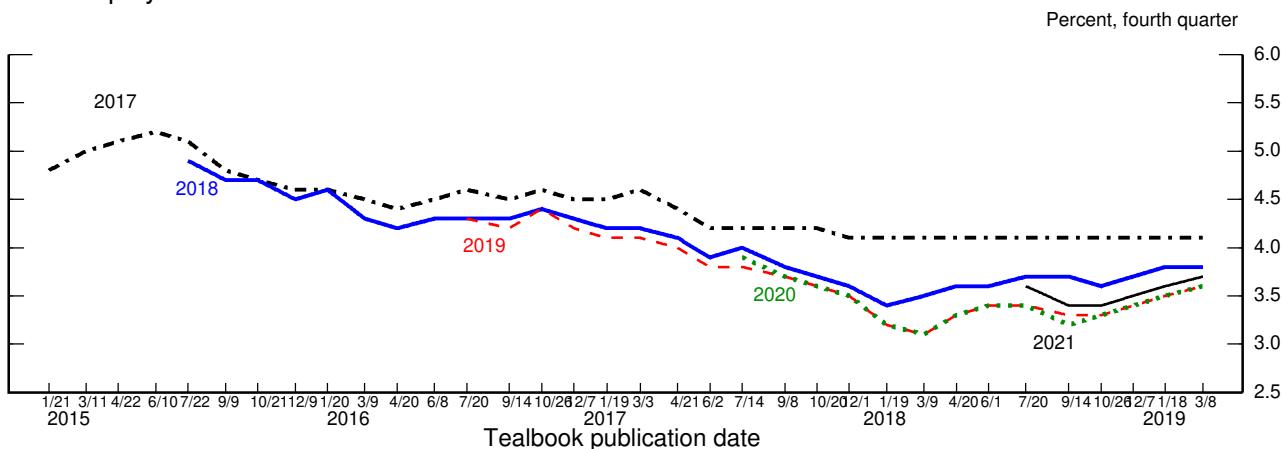
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

Evolution of the Staff Forecast

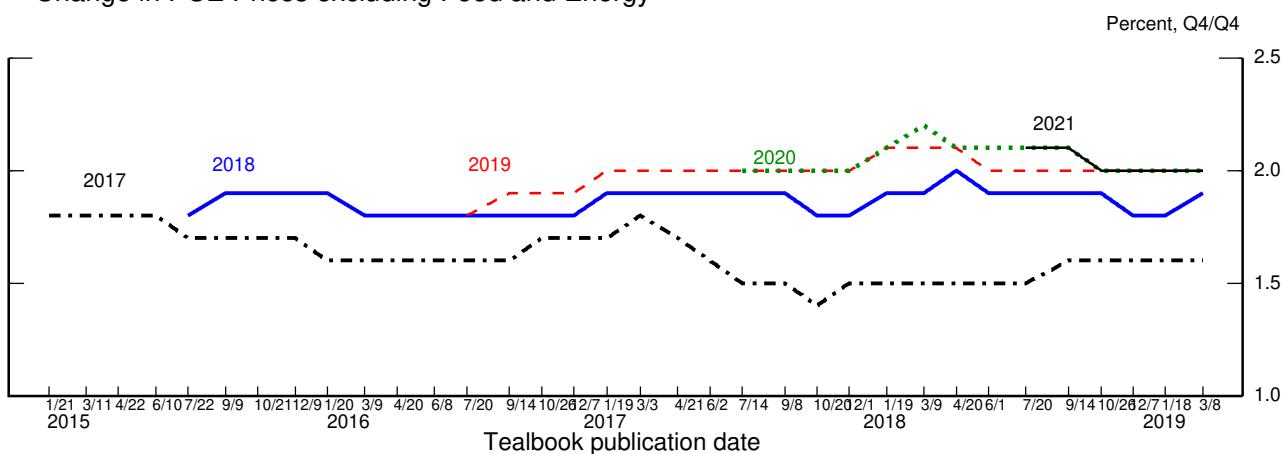
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



Euro-Area Growth and the Export Slowdown

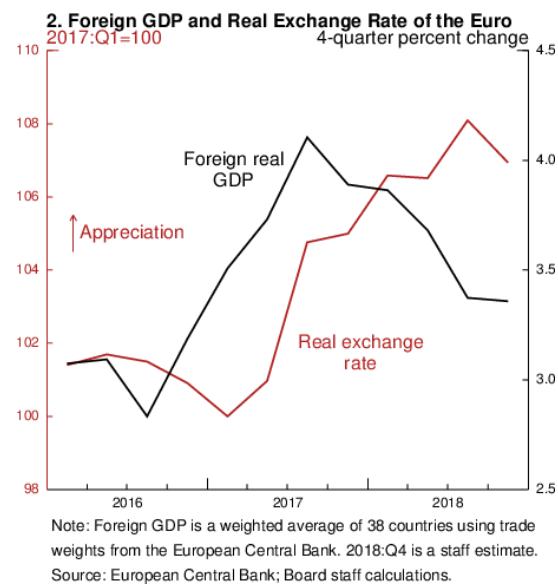
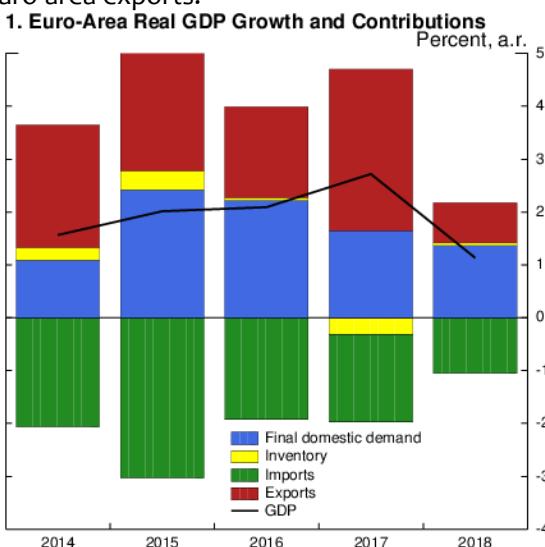
Euro-area real GDP growth (black line in figure 1) slowed markedly, from 2.7 percent in 2017 to 1.1 percent in 2018, with Italy falling into a technical recession and Germany avoiding one only narrowly. Observers have suggested that weaker demand from China may help explain this slowdown. This discussion examines the factors behind the recent euro-area slowdown. We find that, although weaker external demand accounts for the slowdown in euro-area growth, China does not appear to have played a dominant role.

Weaker export growth has been the main source of the euro-area slowdown. The contribution of exports to real GDP growth (red bars in figure 1) declined from 3.1 percentage points in 2017 to 0.8 percentage point in 2018, more than fully accounting for the slowdown in growth over the same period.

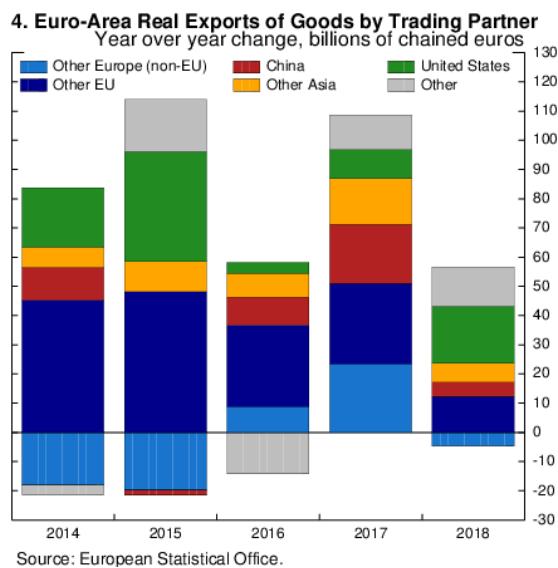
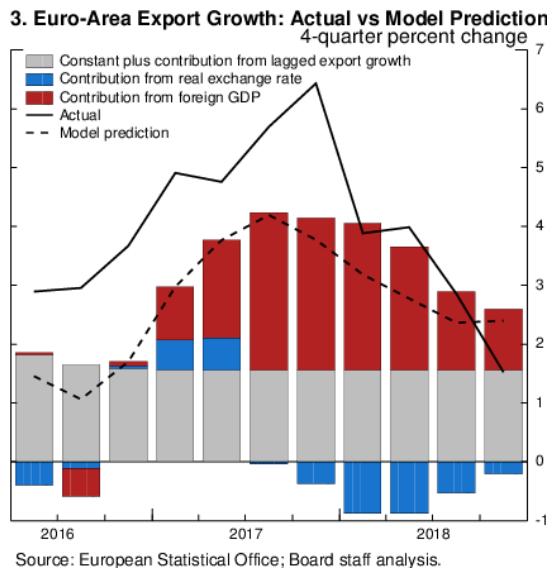
What drove this export slowdown? Two factors are the significant slowdown in average growth of the euro area's main trading partners in 2018 (black line in figure 2) and the substantial appreciation of the trade-weighted real euro in 2017 and in the first half of 2018 (red line). To quantify the importance of these factors, we estimated the historical relationship between euro-area real export growth, the trade-weighted real euro, and foreign growth from 2001 to 2016. We then used this model to predict export growth in 2017 and 2018 (dashed black line in figure 3 on the next page) and parse the contributions from the euro and foreign growth.¹ The model suggests that the slowdown in foreign growth (red bar) was an important factor, although euro appreciation (blue bars) also weighed on exports somewhat. That said, the model can explain only part of the slowdown in actual export growth (solid black line).

What trading partners account for the slowdown in actual export growth? Although exports to China have slowed (proportionally) more than total exports, China accounts for less than 10 percent of euro-area exports, and the slowdown in exports has been broad based across most major trading partners. As a result, China's direct contribution to the slowdown (red bars in figure 4 on the next page), while noticeable, has been limited compared with the contributions from other important trading partners such as other European economies (light and dark blue bars).

A disproportionate share of the slowdown in exports to Europe has come from emerging European economies (such as Turkey and Russia included in the light blue bar of figure 4). This fact suggests that the general tightening in global financial conditions in 2018, which weighed substantially on domestic demand in emerging markets around the world, may have also been an important driver of the slowdown in euro-area exports.

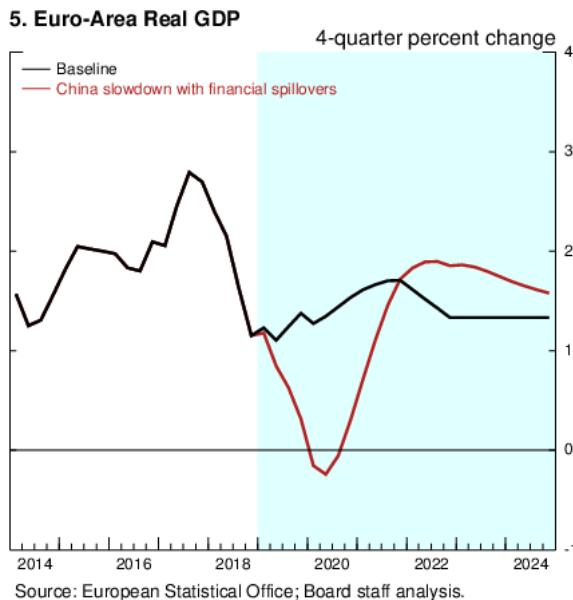


¹ We regress the four-quarter change in real exports on the four-quarter changes in foreign real GDP (using weights reflecting each country's importance in euro-area trade) and the real trade-weighted euro, as well as the first lag of the dependent variable. Since we include a lagged dependent variable, we generate the out-of-sample forecast recursively using the model's prediction of lagged real export growth (rather than actual lagged export growth).



It is possible that this accounting decomposition significantly understates the importance of China; the Chinese slowdown could have weighed heavily on growth in the euro area's other trading partners, which in turn would reduce their imports from the euro area. However, we tested this hypothesis, and we did not find that euro-area exports weakened most to countries with relatively stronger trading relationships with China. In addition, even though Chinese import growth slumped markedly in the fourth quarter of 2018, euro-area export growth in that quarter was relatively solid. All told, our analysis suggests that while a weakening of export growth has played an important role in the euro-area slowdown, slackening demand from China has been a significant but not dominant factor; weaker demand from other European economies has played an even more important role.

The foregoing analysis has considered the effects of the fairly modest deceleration in China's growth to 6.4 percent in 2018 from 6.7 percent in the previous year. An important open question is how the euro area would be affected in the event of a more substantial falloff in China's growth accompanied by a rise in financial stress. According to the staff's SIGMA model, a slowing in China's GDP growth to 4 percent in 2019–2020—compared with around 6 percent in our baseline—could push the euro area into recession (figure 5, red line) given its limited ability to respond by easing monetary or fiscal policy.



The Foreign GDP Outlook

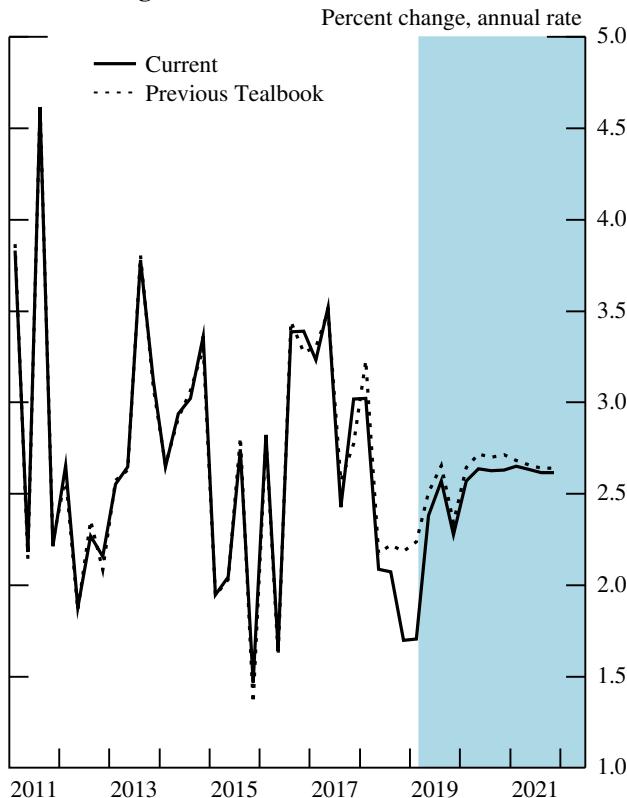
Real GDP*

Percent change, annual rate

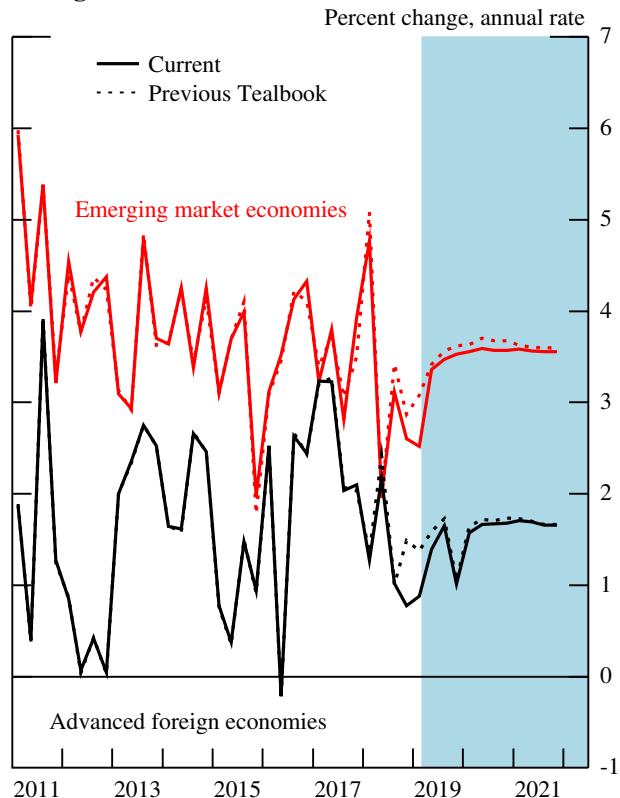
	2018			2019			2020	2021
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	2.6	2.1	1.7	1.7	2.4	2.4	2.6	2.6
Previous Tealbook	2.7	2.2	2.2	2.2	2.5	2.5	2.7	2.7
2. Advanced Foreign Economies	1.7	1.0	.8	.9	1.4	1.3	1.6	1.7
Previous Tealbook	1.9	1.0	1.5	1.4	1.6	1.4	1.7	1.7
3. Canada	1.9	2.0	.4	.8	1.9	1.7	1.9	1.7
4. Euro Area	1.6	.6	.9	1.0	1.1	1.0	1.4	1.7
5. Japan	.8	-2.4	1.9	.5	.6	-.3	.9	.8
6. United Kingdom	1.1	2.5	.7	.5	.9	1.9	1.8	1.6
7. Emerging Market Economies	3.4	3.1	2.6	2.5	3.4	3.5	3.6	3.6
Previous Tealbook	3.5	3.4	2.9	3.1	3.4	3.6	3.7	3.6
8. China	6.9	5.8	5.9	5.7	6.1	6.3	5.9	5.7
9. Emerging Asia ex. China	4.0	2.7	2.9	2.7	3.4	3.5	3.5	3.4
10. Mexico	1.7	2.4	1.0	.8	2.0	2.2	2.6	2.8
11. Brazil	.9	2.2	.5	1.7	2.2	2.4	2.7	2.8

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

Total Foreign GDP



Foreign GDP



The Foreign Inflation Outlook

Consumer Prices*

Percent change, annual rate

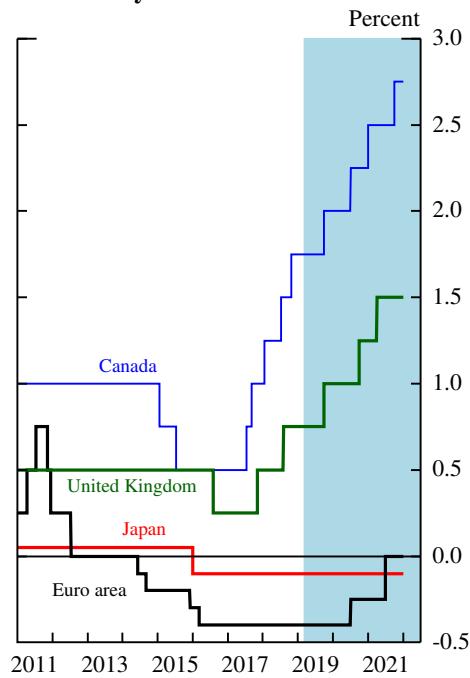
	2018			2019			2020	2021
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign Previous Tealbook	2.1	3.6	2.0	.5	2.3	2.4	2.3	2.3
	2.1	3.6	2.1	1.9	2.2	2.4	2.3	2.3
2. Advanced Foreign Economies Previous Tealbook	1.9	2.5	.7	.5	1.6	1.9	1.5	1.5
	1.8	2.5	.9	1.0	1.3	1.9	1.5	1.6
3. Canada	2.2	2.6	1.1	.9	3.0	2.0	2.0	2.0
4. Euro Area	2.2	2.6	.7	-.2	1.1	1.3	1.2	1.3
5. Japan	.6	2.0	-.1	1.1	.7	3.6	.9	1.0
6. United Kingdom	2.2	2.9	1.9	.8	2.0	2.2	2.2	2.2
7. Emerging Market Economies Previous Tealbook	2.3	4.3	2.8	.6	2.7	2.7	2.8	2.8
	2.3	4.3	2.9	2.5	2.8	2.7	2.9	2.8
8. China	1.1	4.1	2.4	.0	2.4	2.1	2.5	2.5
9. Emerging Asia ex. China	2.2	2.0	1.2	.0	2.5	2.7	2.8	2.7
10. Mexico	3.9	6.8	4.6	1.3	2.8	3.3	3.2	3.2
11. Brazil	3.7	6.6	2.5	2.0	3.6	4.2	4.3	4.3

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

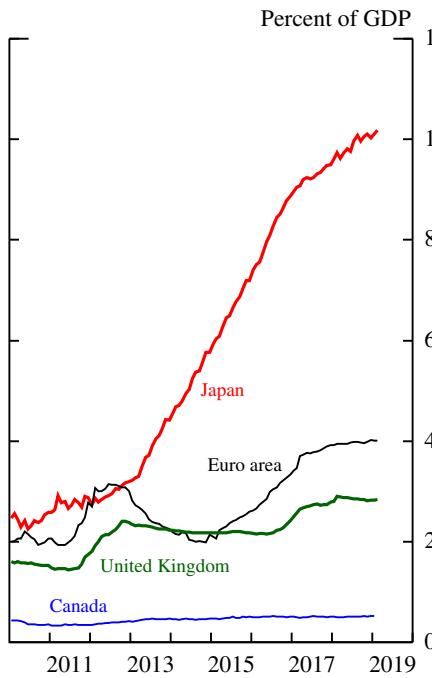
Int'l Econ Devel & Outlook

Foreign Monetary Policy

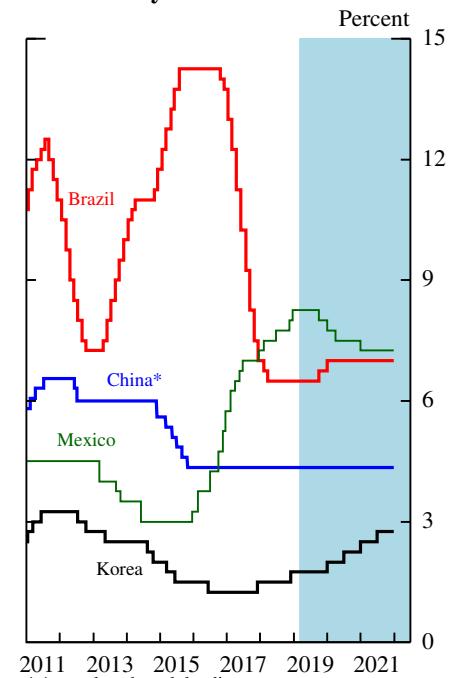
AFE Policy Rates



AFE Central Bank Balance Sheets

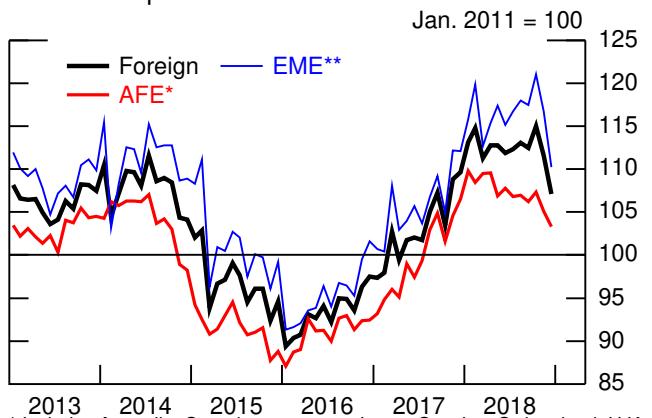


EME Policy Rates

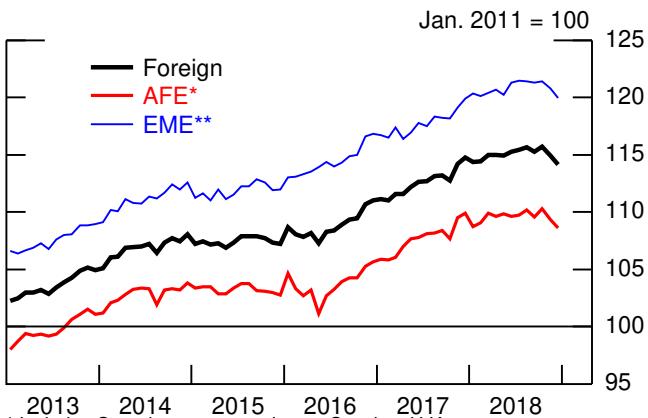


Recent Foreign Indicators

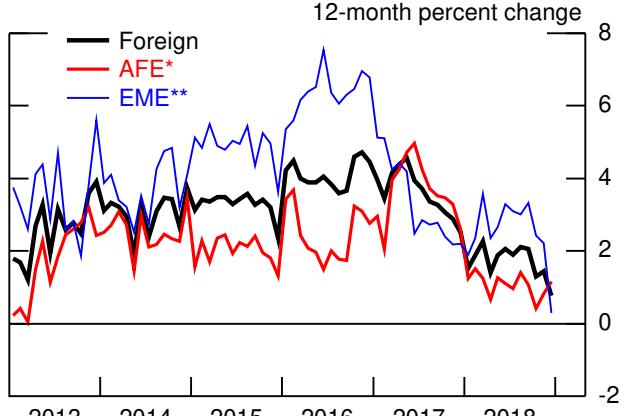
Int'l Econ Devel & Outlook

Nominal Exports

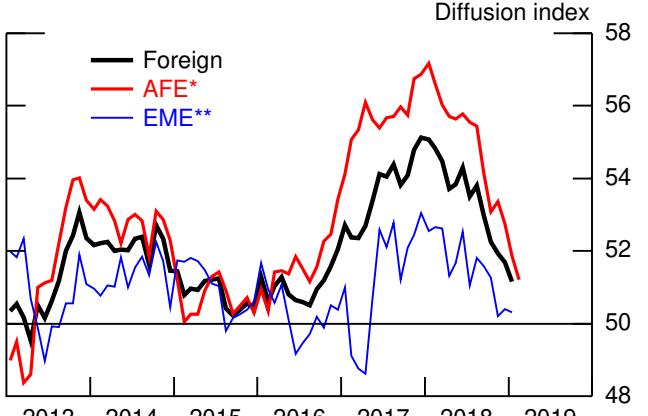
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Singapore, Taiwan, Thailand.

Industrial Production

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

Retail Sales

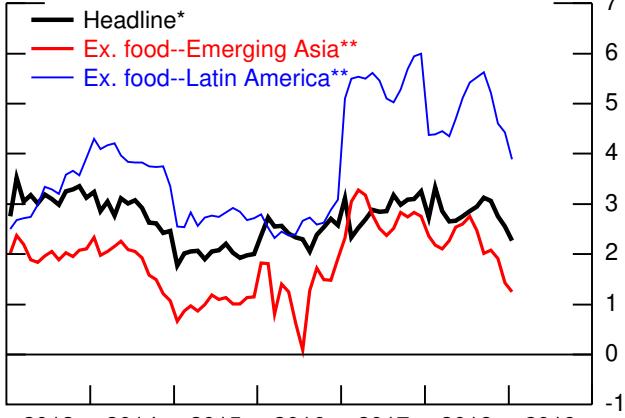
* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, Chile, China, Korea, Mexico, Singapore, Taiwan.

Manufacturing PMI

* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, China, India, Indonesia, Israel, Korea, Mexico, Russia, Singapore, Taiwan, and Turkey.

Consumer Prices: Advanced Foreign Economies
12-month percent change

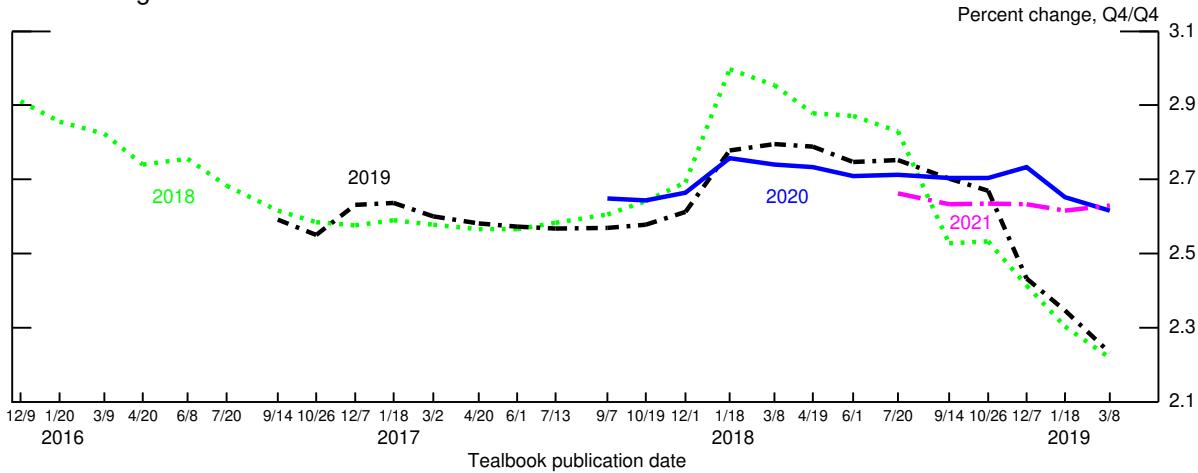
Note: Includes Canada, euro area, Japan, U.K.
* Excludes all food and energy; staff calculation.
Source: Haver Analytics.

Consumer Prices: Emerging Market Economies
12-month percent change

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

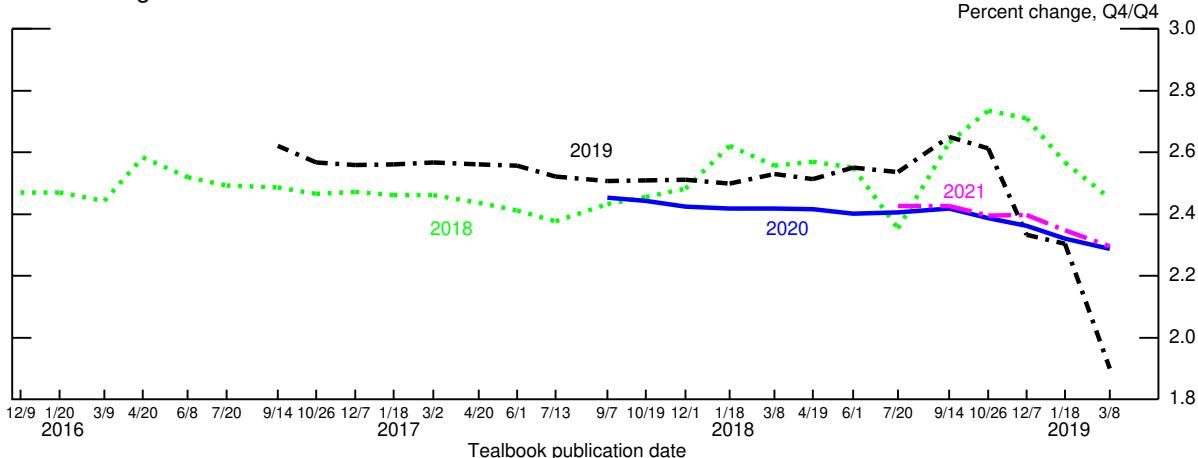
Evolution of Staff's International Forecast

Total Foreign GDP

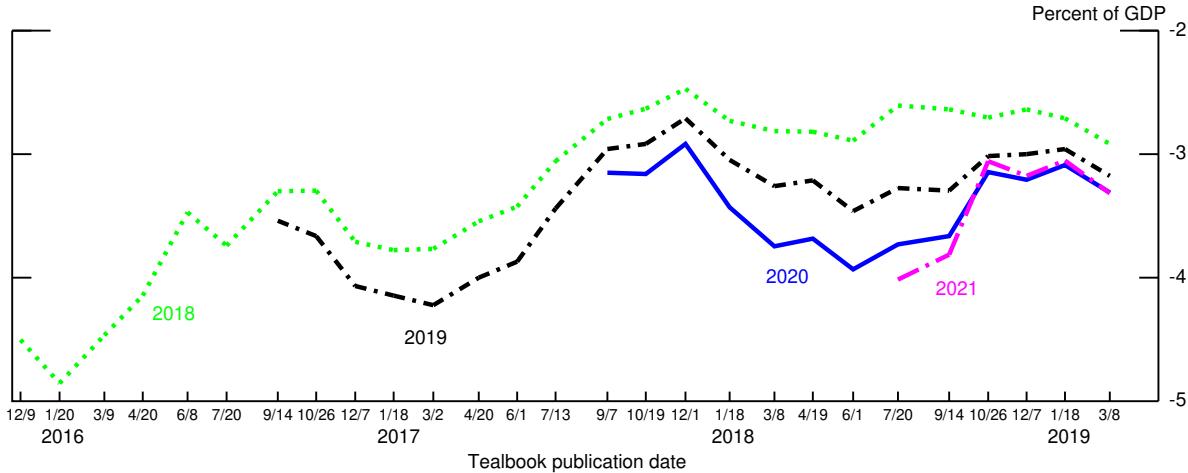


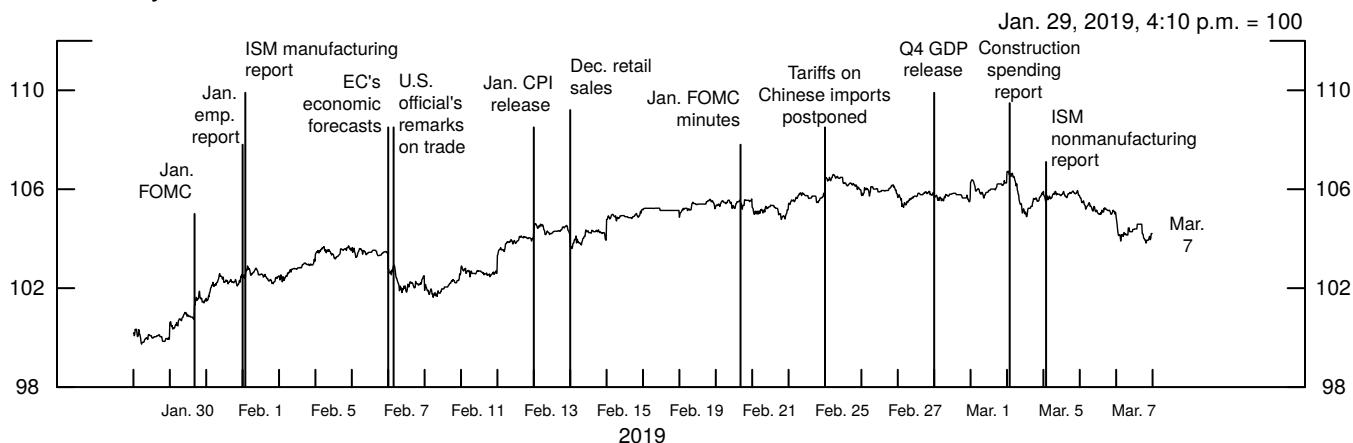
Int'l Econ Devel & Outlook

Total Foreign CPI

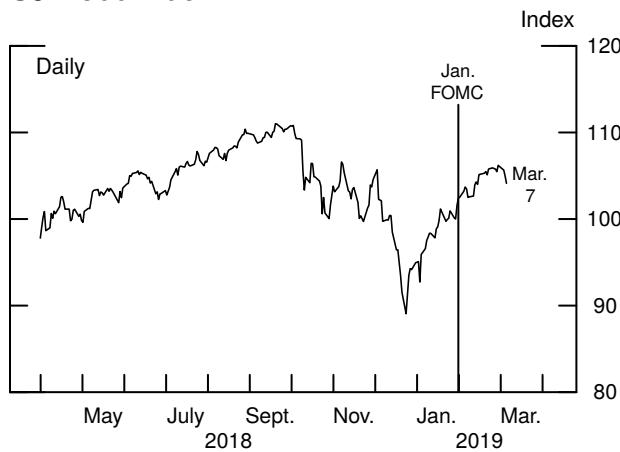


U.S. Current Account Balance

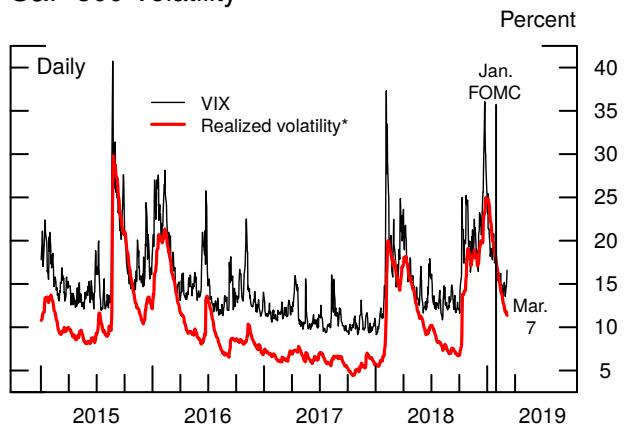


Corporate Asset Market Developments**Intraday S&P 500 Futures**

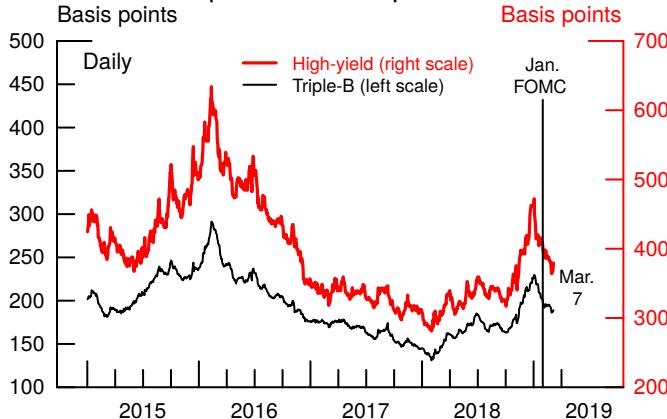
Note: Data are spaced at 5-minute intervals from 9:30 a.m. to 4:10 p.m.
Source: Bloomberg.

S&P 500 Index

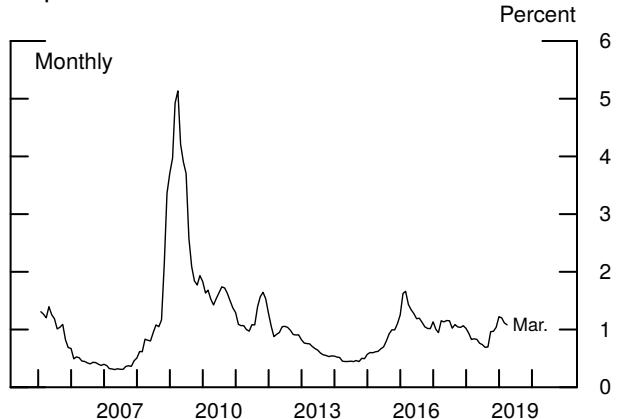
Source: Bloomberg.

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 March value is the monthly average to date.
Source: Moody's KMV; Board staff calculations.

The Partial Recovery in Investor Risk Sentiment This Year

Investor risk appetite has rebounded considerably year-to-date after having deteriorated markedly in the fourth quarter in the face of rising U.S. recession concerns, worries that the Federal Reserve would continue along a path of policy firming and balance sheet reduction despite those concerns, greater global risks, and heightened trade tensions. This year, asset prices have been boosted primarily by communications indicating that the FOMC would be “patient” in adjusting the stance of policy and by optimism regarding trade negotiations with China. Nonetheless, investor risk sentiment has not fully recovered to its elevated September levels.¹

Although the S&P 500 index is up roughly 10 percent this year, it remains about 6 percent below its level at the end of September.² Likewise, risk spreads on speculative-grade corporate bonds relative to comparable-maturity Treasury securities, which climbed sharply last quarter, have narrowed about 80 basis points year-to-date but are still about 50 basis points wider than in late September. In contrast, the dollar is little changed, on net, over the same period.³

Consistent with a net deterioration in investor risk sentiment, 2- and 10-year nominal Treasury yields are now lower by 34 basis points and 41 basis points, respectively, than at the end of September. Expectations for more accommodative monetary policy than was anticipated last fall also contributed importantly to the decline in yields. Indeed, the June 2020 federal funds futures rate fell 55 basis points since September. The sizable decline in the market-implied path of the federal funds rate suggests that investors believe the FOMC is more attuned to the downside risks to the macroeconomic outlook than in September.

Selected Financial Market Quotes

	Change from Sept. 28 to present	Change from Dec. 31 to present	Current level
1. S&P 500 index	-5.7%	9.7%	2,748
2. High-yield credit spreads	53 bps	-83 bps	379 bps
3. 2-year Treasury yield	-34 bps	-2 bps	2.48%
4. 10-year nominal Treasury yield	-41 bps	-6 bps	2.64%
5. June 2020 fed funds futures rate	-55 bps	3 bps	228 bps
6. Broad USD index	1.4%	-.2%	105

Note: Sept. 28 is the last trading day of 2018:Q3. The broad USD index = 100 on Jan. 2, 2018.

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

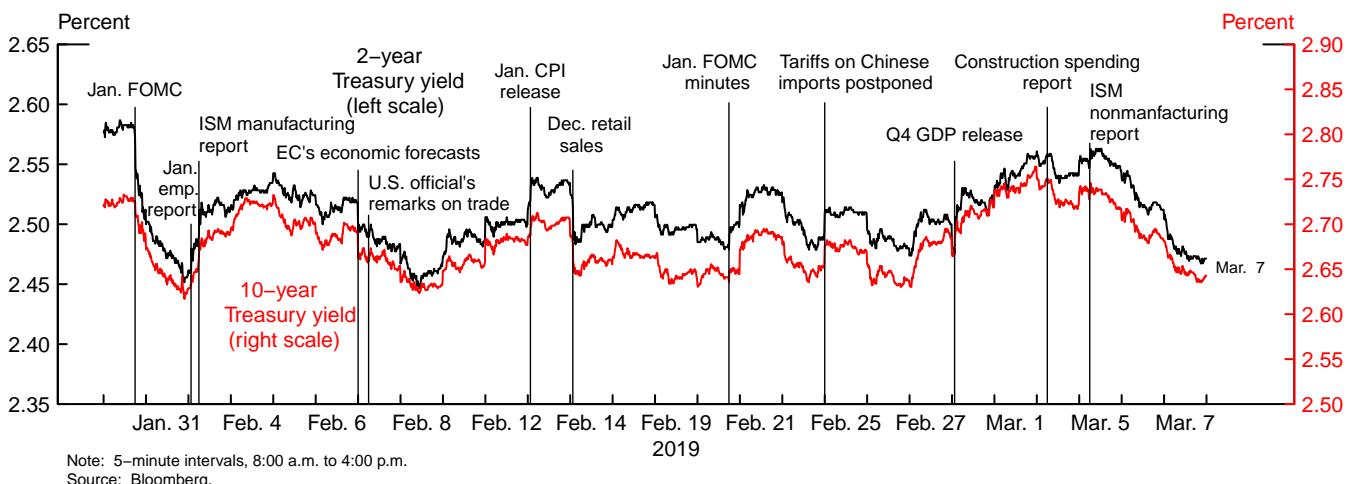
¹ This discussion reflects data that were available through March 7, before the release of the BLS February Employment Situation report on the morning of March 8.

² We use the last trading day of the third quarter—September 28, 2018—as our reference date. The conclusions are qualitatively unchanged if we instead use as the reference date the S&P 500 index’s all-time closing high on September 20, 2018; relative to its peak, the S&P 500 index is down 6.2 percent.

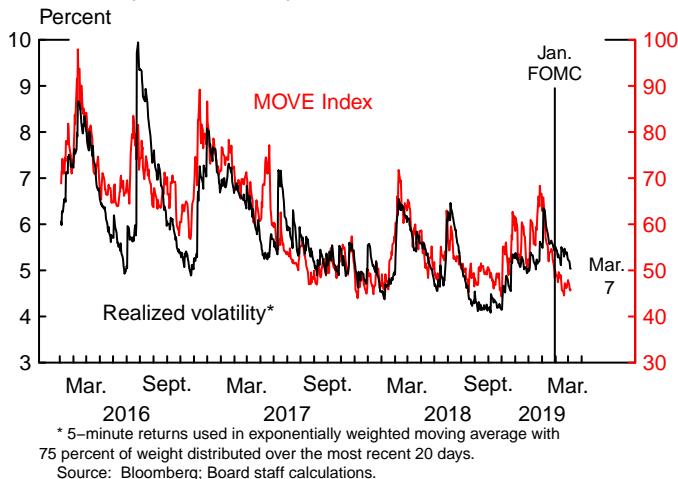
³ The modest change in the broad dollar since September potentially reflects two offsetting factors: (1) the net deterioration in investor risk sentiment, which typically would be associated with dollar appreciation; and (2) more accommodative U.S. monetary policy relative to the change in monetary policy expectations abroad, which typically would be associated with dollar depreciation.

Policy Expectations and Treasury Yields

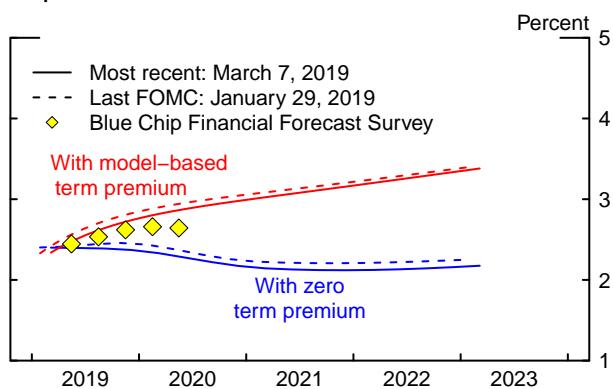
Selected Interest Rates



Volatility of Treasury Yields



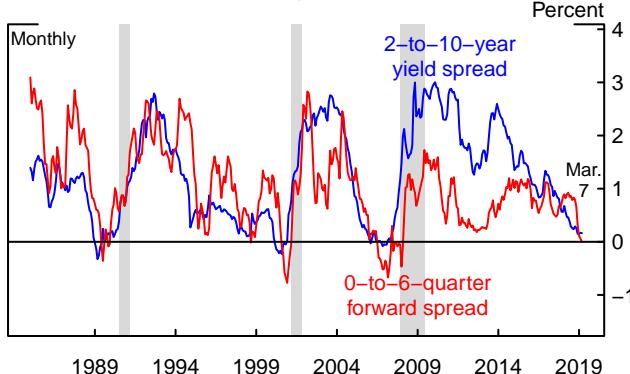
Implied Federal Funds Rate



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 published March 1.

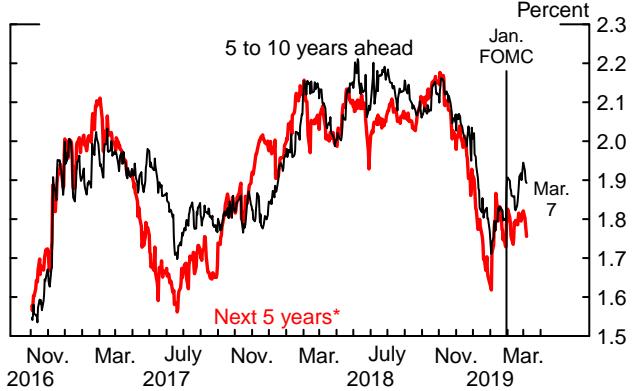
Source: Bloomberg; Wolters Kluwer Legal and Regulatory Solutions U.S.; Blue Chip Financial Forecasts; Board staff calculations.

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 February 2019 are monthly averages. Data for March 2019 based on values for March 7. 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.

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.

Foreign Developments

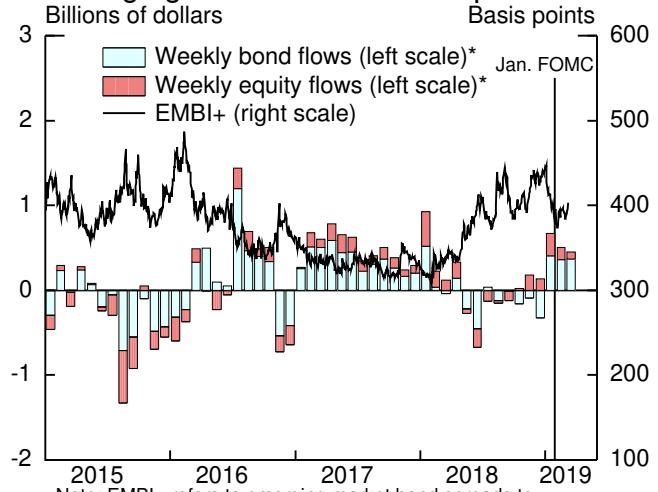
Equity Indexes



Note: Indexes denominated in local currency.

Source: Bloomberg.

Emerging Market Flows and Spreads

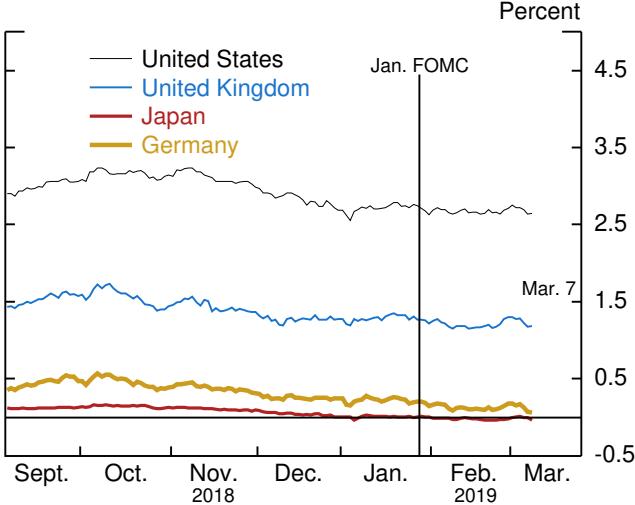


Note: EMBI+ refers to emerging market bond spreads to Treasury securities.

* Average weekly flow by month.

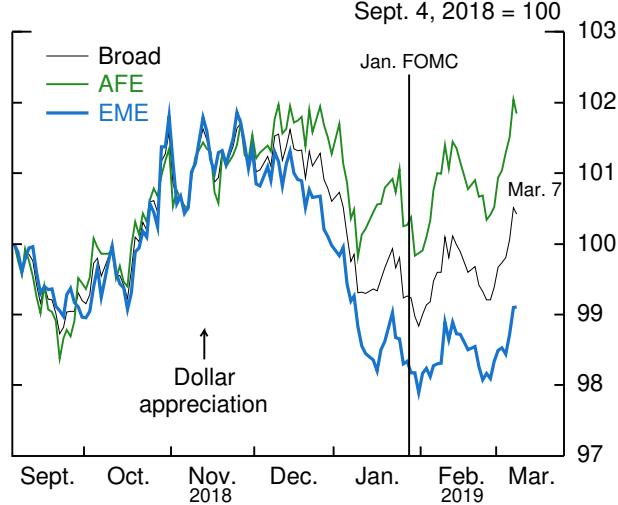
Source: Emerging Portfolio Fund Research. Excludes intra-China flows.

10-Year AFE Sovereign Yields



Source: Bloomberg.

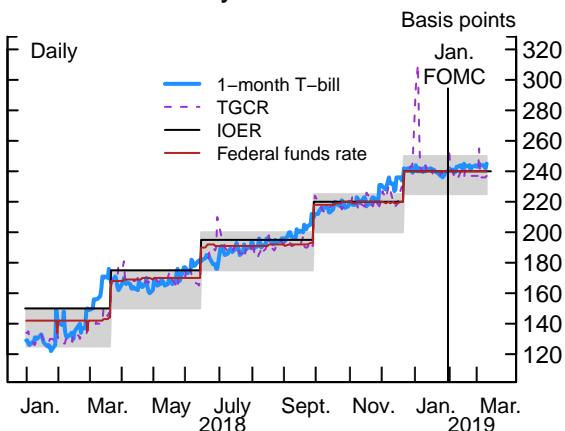
Exchange Rates



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

Short-Term Funding Markets

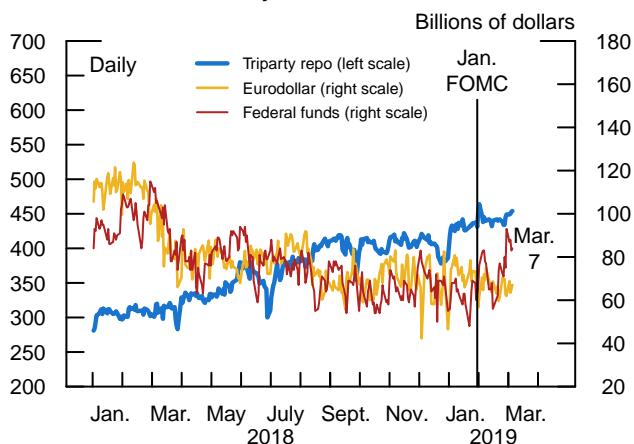
Selected Money Market Rates



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.

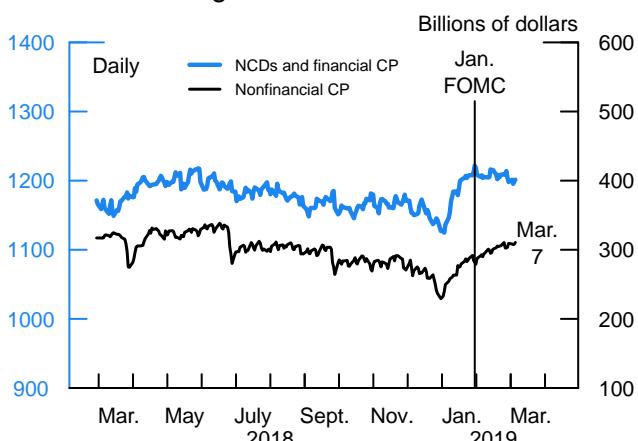
Source: Federal Reserve Board, Form FR 2420, Report of Selected Money Market Rates.

Selected Money Market Volumes



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

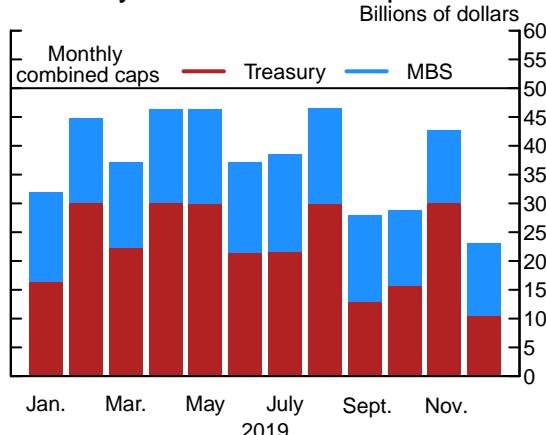
Outstanding Levels of NCDs and CP



Note: Levels are not seasonally adjusted and include both foreign and domestic issuers. The chart considers only outstanding NCDs maturing in one year or less. CP is commercial paper; NCD is negotiable certificate of deposit.

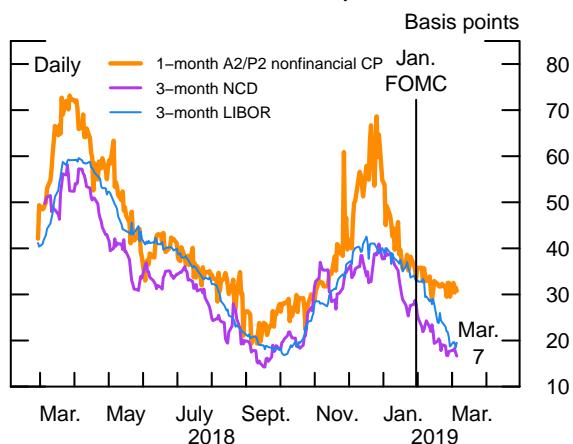
Source: Depository Trust & Clearing Corporation.

Treasury and MBS Redemptions



Source: Board staff calculations.

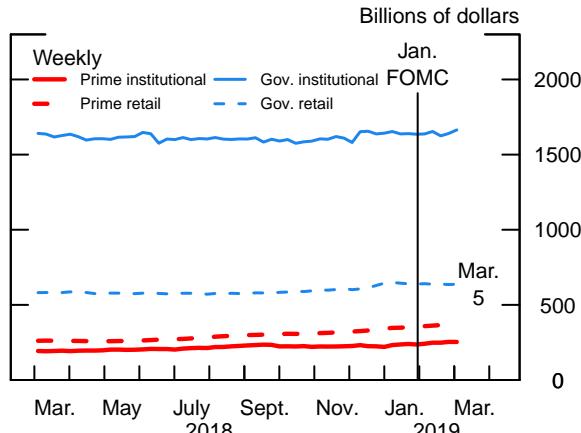
Unsecured Short-Term Spreads



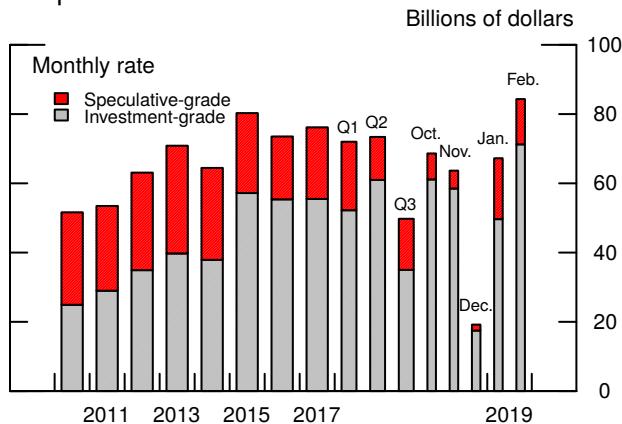
Note: All spreads are to overnight index swap rates. The 3-month NCD spread is computed as a 5-day moving average. CP is commercial paper; NCD is negotiable certificate of deposit.

Source: Depository Trust & Clearing Corporation.

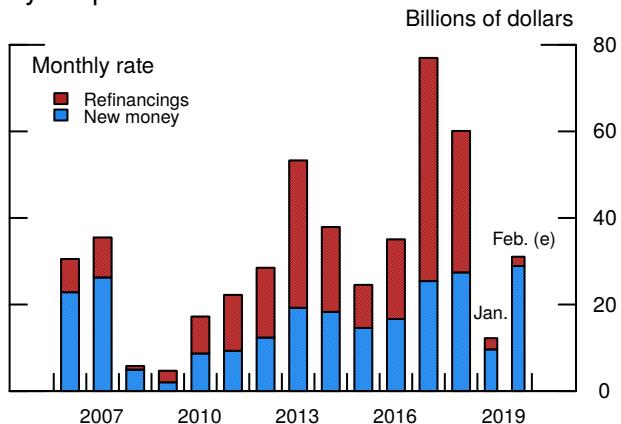
MMF Assets under Management



Note: MMF is money market fund.
Source: iMoneyNet.

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

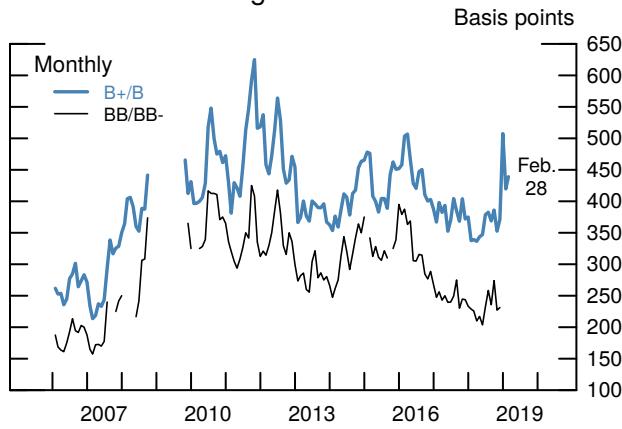
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.
Source: Mergent Fixed Income Securities Database.

Institutional Leveraged Loan Issuance, by Purpose

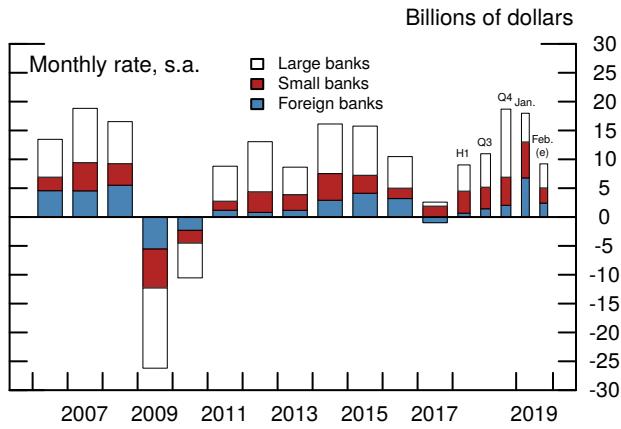
Note: The value for February is an estimate based on actual issuance through February 21, 2019, and expected issuance from February 21 through the end of the month. The annual bars are divided by 12 to arrive at monthly averages.

e Estimated.

Source: Thomson Reuters LPC.

Average Spreads of New-Issue Institutional Leveraged Loans

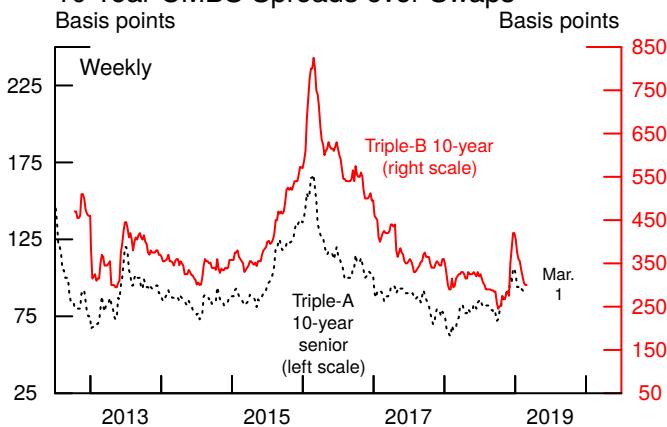
Note: Breaks in the series represent periods with no issuance. Spreads are calculated against 3-month LIBOR. The spreads do not include up-front fees.
Source: S&P LCD.

Commercial and Industrial Loans

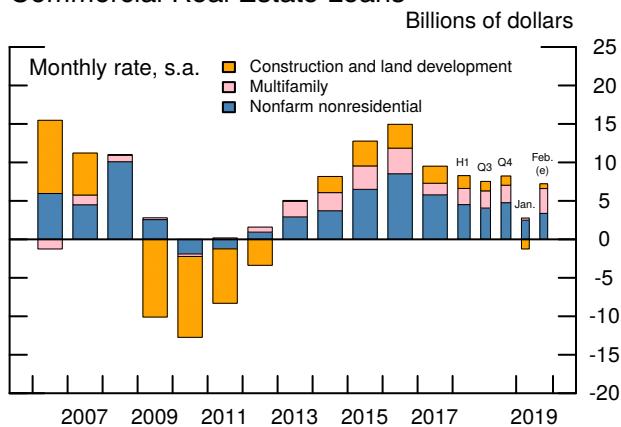
Note: Yearly rates are Q4 to Q4; half-years are based on Q4 and Q2 average levels; quarterly and monthly annual rates use corresponding average levels. Large banks are defined as the largest 25 banks by assets.

e Estimated.

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

10-Year CMBS Spreads over Swaps

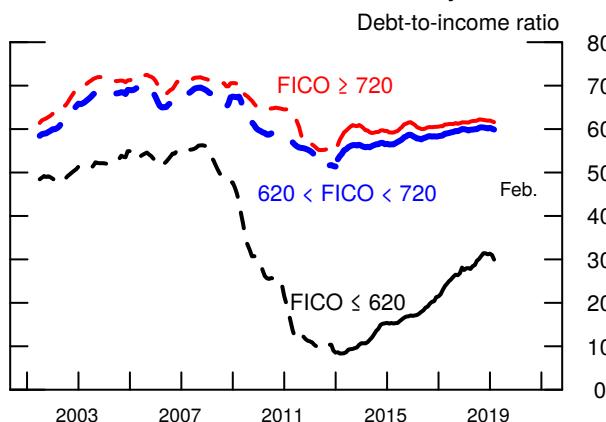
Note: CMBS is commercial mortgage-backed securities.
Source: J.P. Morgan.

Commercial Real Estate Loans

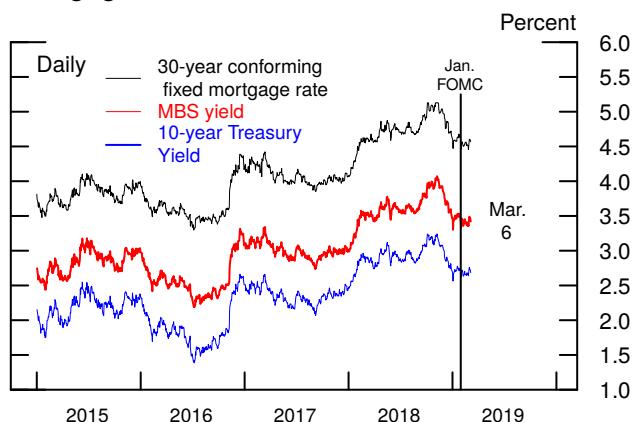
Note: Yearly rates are Q4 to Q4; half-years are based on Q4 and Q2 average levels; quarterly and monthly annual rates use corresponding average levels. Large banks are defined as the largest 25 banks by assets.

e Estimated.

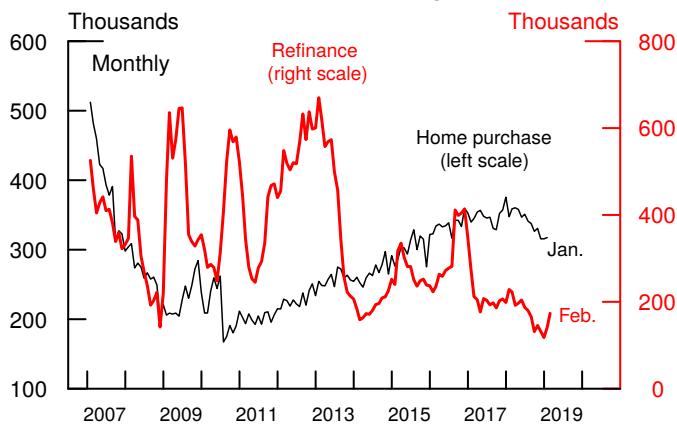
Source: Federal Reserve Board, FR 2644, Weekly Report of Selected Assets and Liabilities of Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks.

Household Finance**Maximum Debt-to-Income Ratio, by Credit Score**

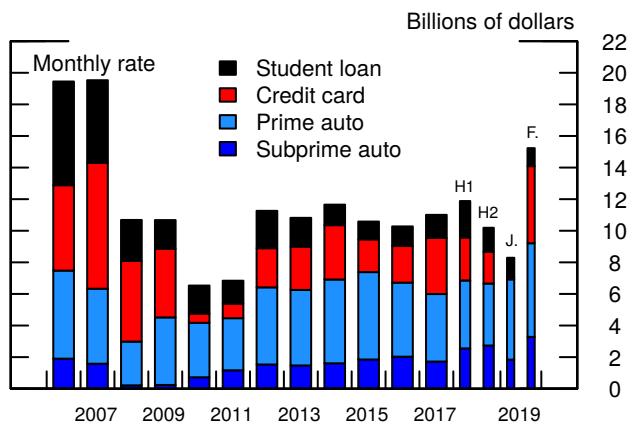
Note: Weighted average of maximums by borrower and loan type, where types are defined by loan-to-value ratio, property location, and credit score.
Source: For frontiers shown with dashed lines, McDash and CoreLogic; for frontiers shown with solid lines, Optimal Blue.

Mortgage Rate and MBS Yield

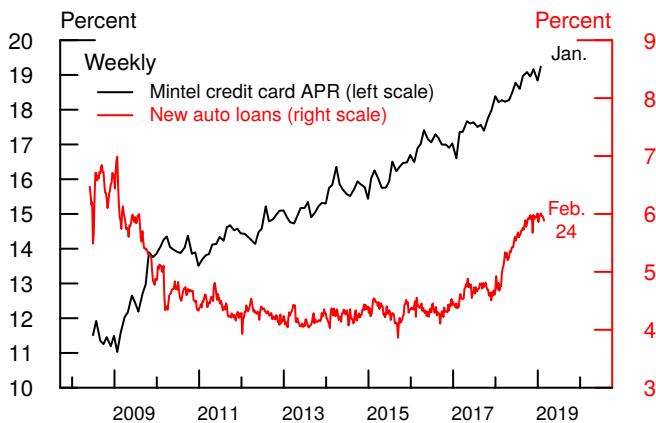
Note: The mortgage-backed securities (MBS) yield is the Fannie Mae 30-year current-coupon rate.
Source: For MBS yield, Barclays; for mortgage rate, Loansifter.

Purchase and Refinance Originations

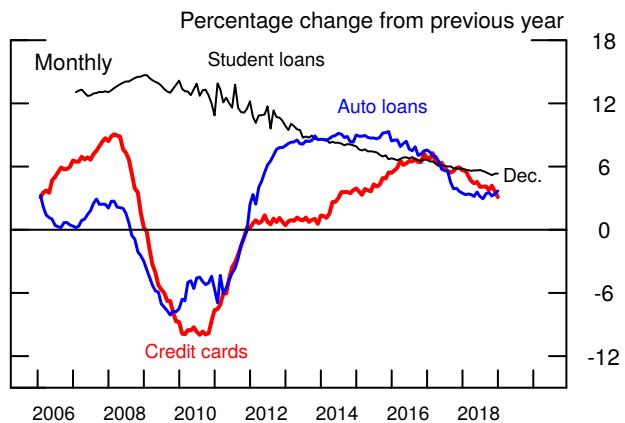
Note: The data are seasonally adjusted by Federal Reserve Board staff.
Source: For values through 2017, data reported under the Home Mortgage Disclosure Act of 1975; for values after 2017, staff estimates.

Gross Consumer ABS Issuance

Source: Merrill Lynch; Bloomberg.

Consumer Interest Rates

Note: Series are seasonally adjusted.
Source: Mintel data are reported monthly; J.D. Power.

Consumer Credit

Source: Federal Reserve Board.

Appendix

Technical Note on Financial Conditions Indexes

The table “Overview of Selected FCIs” provides a summary of various financial conditions indexes (FCIs) that have been developed at the Federal Reserve Board and elsewhere. The historical evolution of these indexes is reported in the exhibit “Selected Financial Conditions Indexes.”

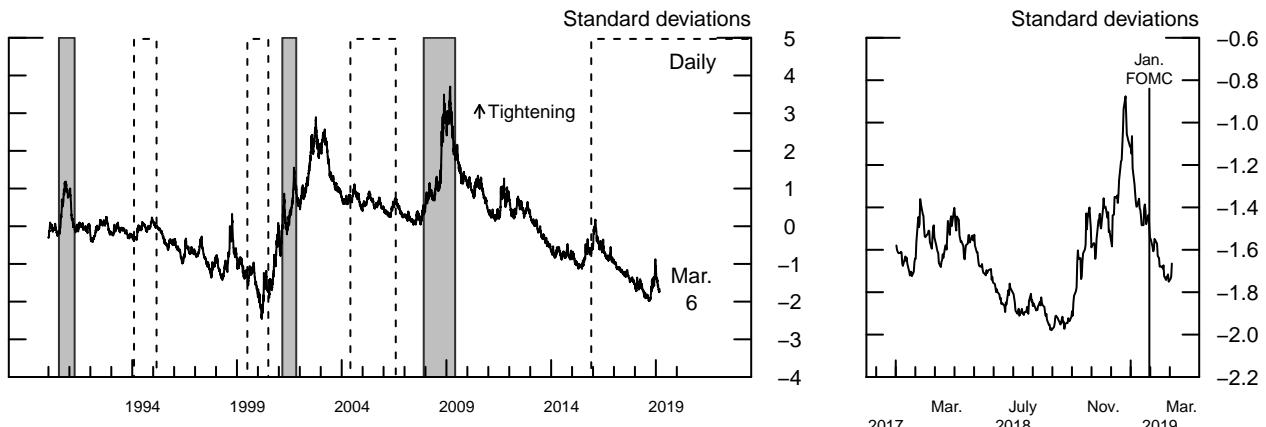
Overview of Selected FCIs

Index	Frequency	Sample start	Methodology	Components
Staff FCI for nonfinancial corporations	Daily	1973	Difference in equity returns between two portfolios of firms with credit ratings above and just below investment grade	Nonfinancial firms' stock returns and credit ratings; five Fama-French factors, plus momentum and quality minus junk factors
SLOOS Bank Lending Standards Index	Quarterly	1991	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	Lending standards for 11 loan categories
Goldman Sachs Financial Conditions Index	Daily	1990	Weighted average of financial variables with weights pinned down by the contribution of each financial variable on real GDP growth over the following year using a VAR model	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, and the broad value of the U.S. dollar
Chicago Fed National Financial Conditions Index	Weekly	1971	Dynamic factor model	100 financial variables related to money markets (28 indicators), debt and equity markets (27 indicators), and the banking system (45 indicators)
St. Louis Fed Financial Stress Index	Weekly	1993	Principal component analysis	18 variables, including short- and long-term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, break-even inflation rate, and the S&P 500 index
Kansas City Fed Financial Stress Index	Monthly	1990	Principal component analysis	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: CRSP; Yahoo Finance; Moody's Bond Ratings; Ken French website; AQR Capital Management website; Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices; Bloomberg; Federal Reserve Banks of Chicago, St. Louis, and Kansas City.

Selected Financial Conditions Indexes

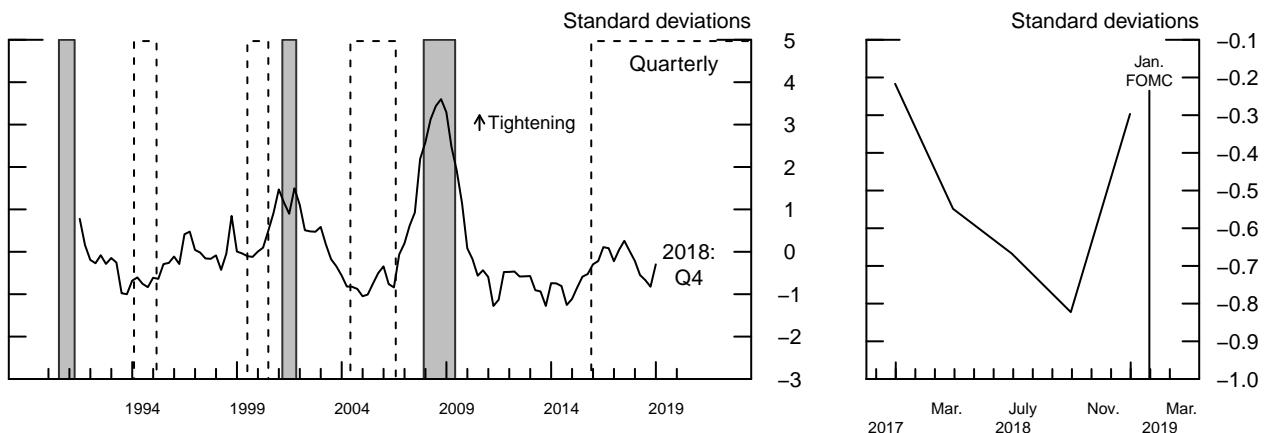
Staff FCI for Nonfinancial Corporations



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.

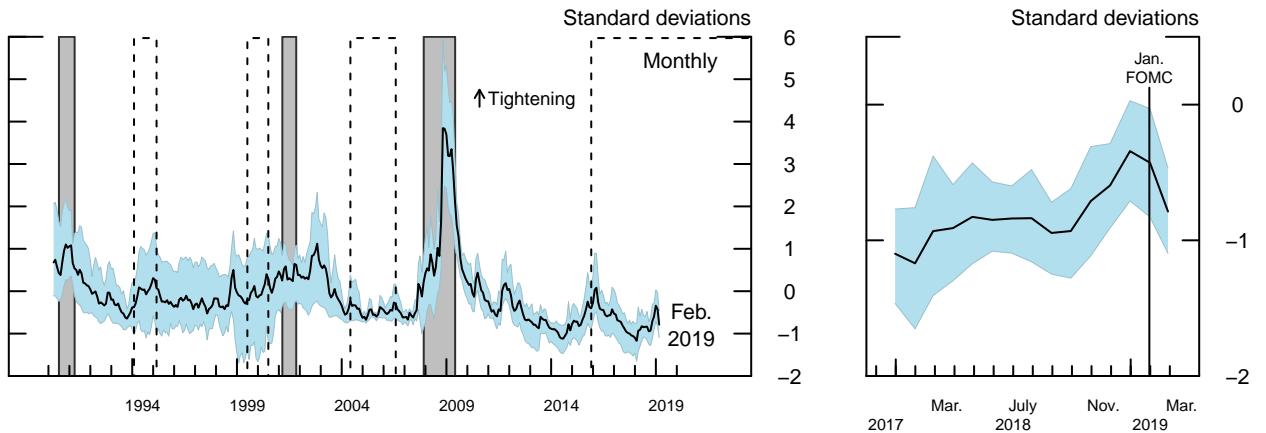
SLOOS Bank Lending Standards Index



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



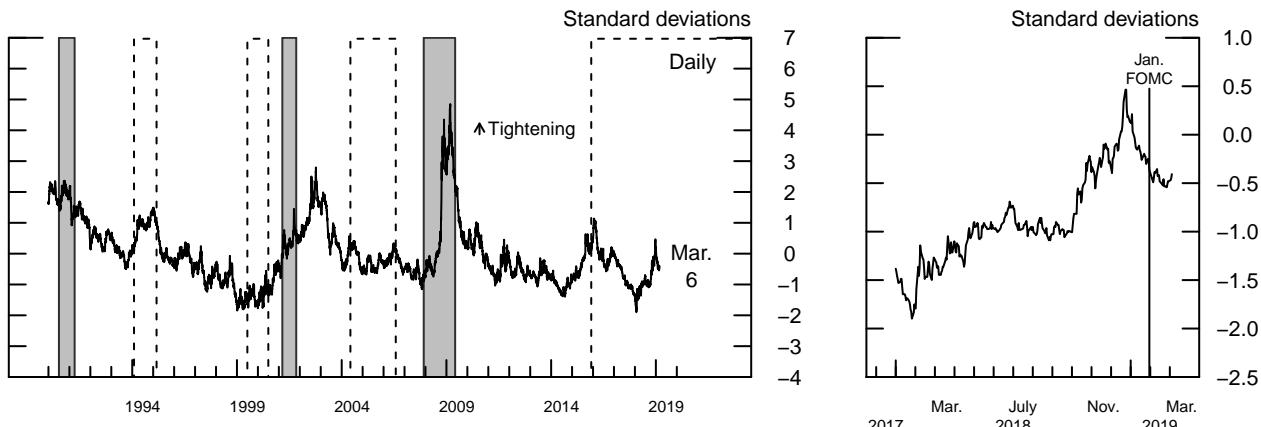
Note: Mean FCI represents the mean of FCIs developed by Goldman Sachs and the Federal Reserve Banks of Chicago, St. Louis, and Kansas City. The blue shaded region represents the range of these 4 standardized FCIs.

Source: Bloomberg; The 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

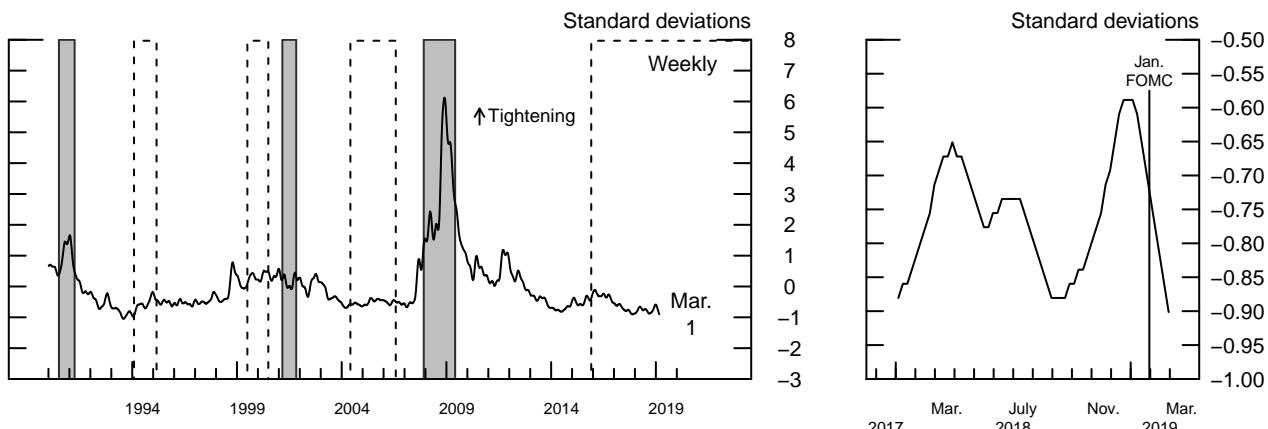
Goldman Sachs FCI



Note: The index is a weighted average of 5 financial variables: the federal funds rate, the 10-year Treasury yield, the triple-B yields 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.

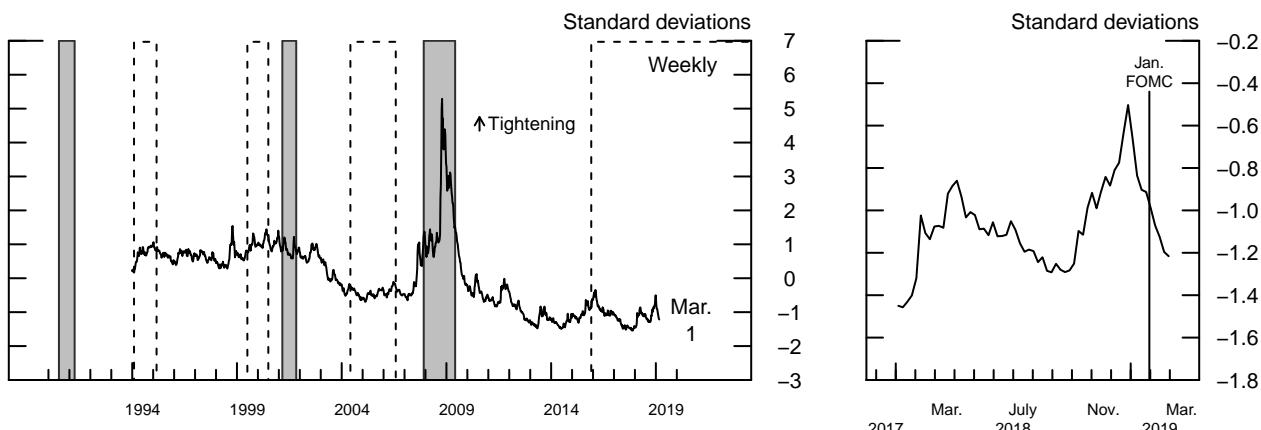
Chicago Fed NFCI



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



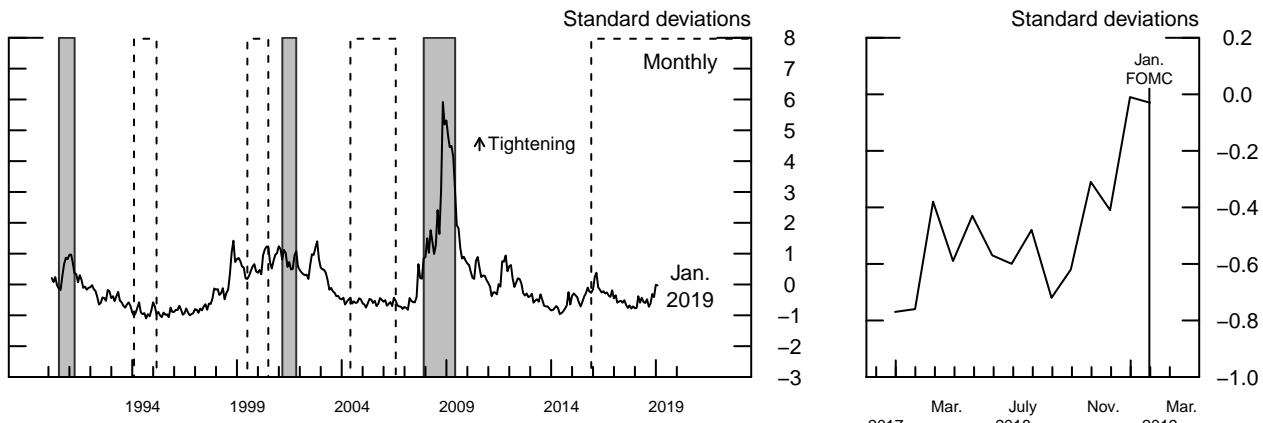
Note: The index is the principal component of 18 variables including short- and long-term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, breakeven inflation rate, and the S&P 500 index.

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



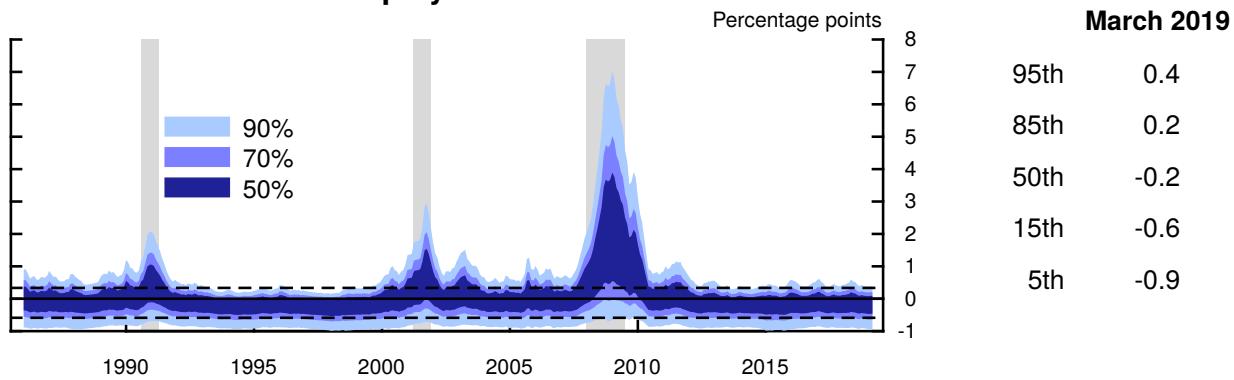
Note: The index is the principal component of 11 financial variables including short- and long-term interest rates, corporate and consumer yield spreads, the VIX, and the volatility of bank stock prices.

Source: Federal Reserve Bank of Kansas City.

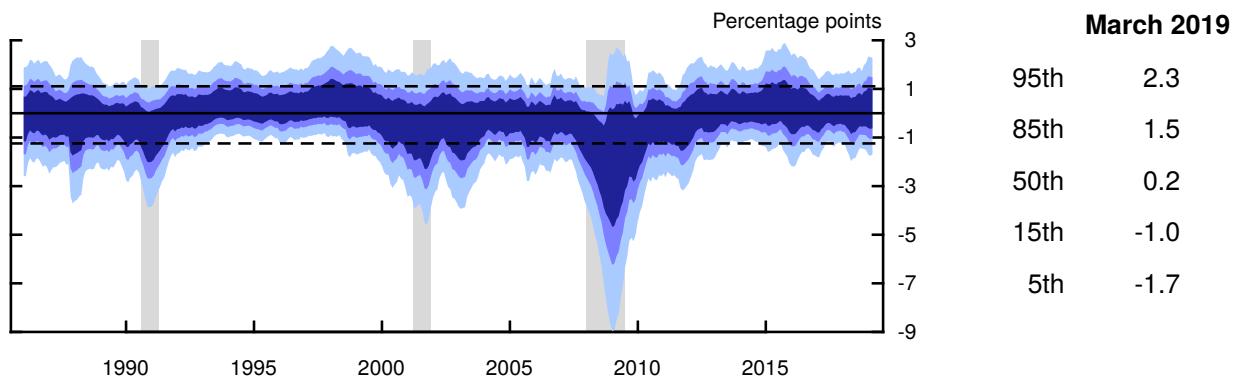
For all panels: Indexes are standardized. Values above (below) zero represent tighter (easier) than average financial conditions. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. The dashed boxes denote monetary policy tightening cycles.

Time-Varying Macroeconomic Risk

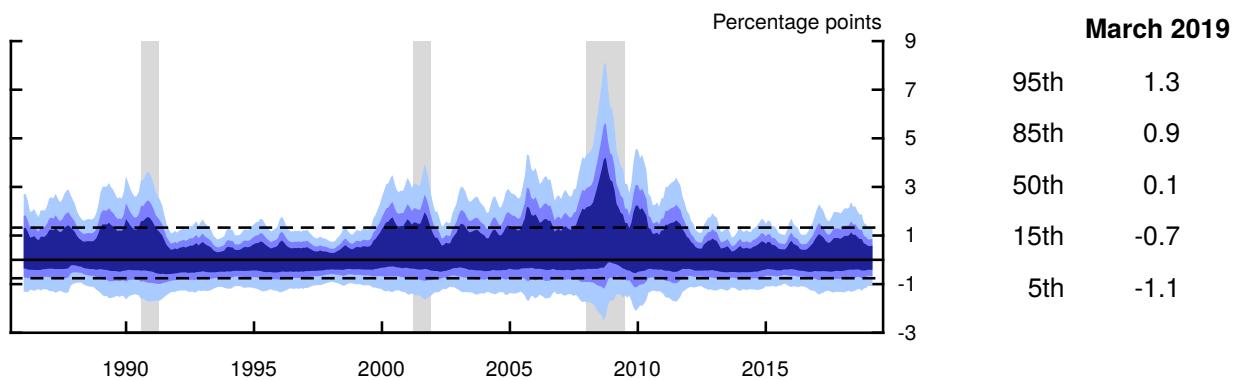
Unemployment Rate



GDP Growth



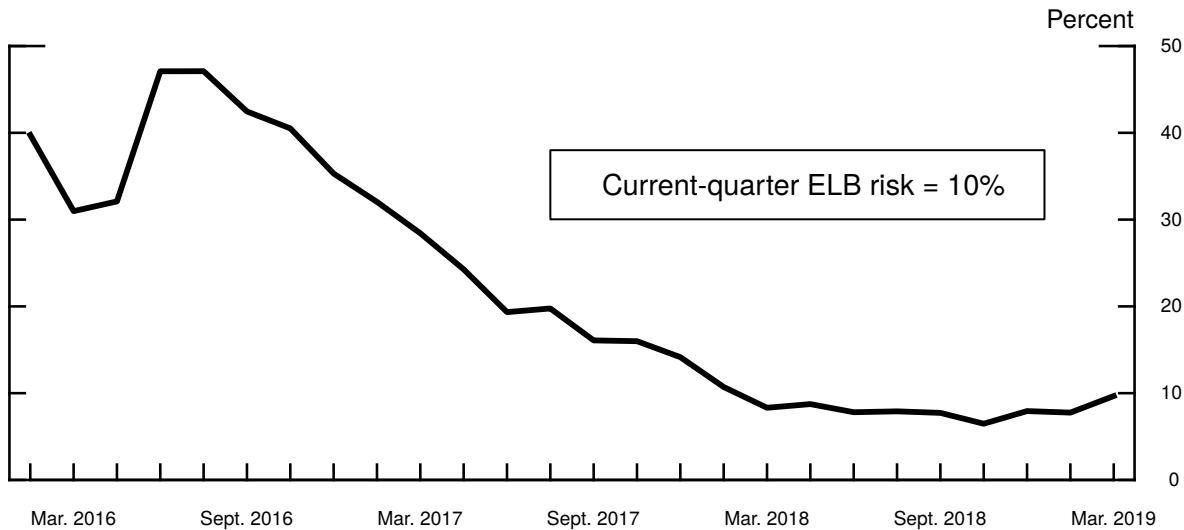
CPI Inflation



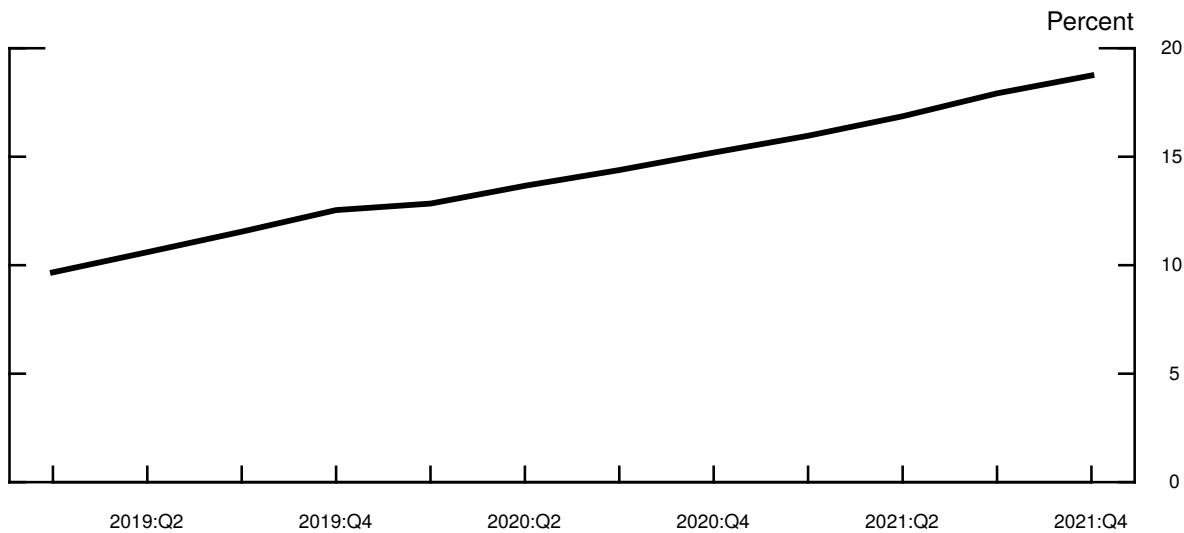
Note: The exhibit shows estimates of quantiles of the distribution of errors for four-quarter-ahead staff forecasts. The estimates are conditioned on indicators of real activity, inflation, financial market strain, and the volatility of high-frequency macroeconomic indicators. The tables show selected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

Effective Lower Bound Risk Estimate

ELB Risk since Liftoff



ELB Risk over the Projection Period



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

Alternative Scenarios

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

Measure and scenario	2019		2020	2021	2022	2023-24
	H1	H2				
<i>Real GDP</i>						
Tealbook baseline and extension	1.8	1.9	2.0	1.5	1.2	1.4
Momentum weakens further	1.1	.3	1.9	1.5	1.6	1.7
Recession	1.0	-1.0	-.6	2.0	2.2	2.2
Lower inflation expectations	1.1	1.9	2.1	1.5	1.3	1.4
Steeper Phillips curve	1.8	1.8	2.0	1.3	1.0	1.2
Even stronger supply side	1.9	2.4	3.2	2.9	2.2	2.0
Foreign slowdown	1.4	.9	1.2	1.4	1.5	1.6
Everything goes right abroad	2.1	2.7	2.6	1.5	1.1	1.2
<i>Unemployment rate¹</i>						
Tealbook baseline and extension	3.7	3.6	3.6	3.7	3.9	4.3
Momentum weakens further	3.8	4.1	4.2	4.3	4.4	4.5
Recession	4.0	4.2	5.5	5.9	5.2	4.3
Lower inflation expectations	3.9	3.8	3.7	3.8	4.0	4.3
Steeper Phillips curve	3.7	3.6	3.7	3.8	4.2	4.6
Even stronger supply side	3.7	3.6	3.3	3.1	3.2	3.5
Foreign slowdown	3.7	3.8	4.2	4.4	4.6	4.7
Everything goes right abroad	3.6	3.5	3.2	3.2	3.5	3.9
<i>Total PCE prices</i>						
Tealbook baseline and extension	1.8	1.9	1.9	1.9	1.9	2.0
Momentum weakens further	1.8	1.9	1.8	1.8	1.9	1.9
Recession	1.8	1.8	1.6	1.7	1.7	1.8
Lower inflation expectations	1.5	1.5	1.5	1.6	1.6	1.7
Steeper Phillips curve	2.0	2.3	2.5	2.8	2.9	2.9
Even stronger supply side	1.8	1.8	1.8	1.8	1.8	1.9
Foreign slowdown	1.5	1.0	1.4	1.7	1.8	2.0
Everything goes right abroad	2.2	2.5	2.2	2.0	2.0	2.1
<i>Core PCE prices</i>						
Tealbook baseline and extension	2.1	1.9	2.0	2.0	2.0	2.1
Momentum weakens further	2.1	1.9	1.9	1.9	1.9	2.0
Recession	2.1	1.8	1.7	1.7	1.8	1.9
Lower inflation expectations	1.8	1.5	1.6	1.6	1.7	1.7
Steeper Phillips curve	2.3	2.3	2.6	2.8	2.9	2.9
Even stronger supply side	2.1	1.8	1.9	1.8	1.9	1.9
Foreign slowdown	2.0	1.3	1.5	1.8	1.9	2.0
Everything goes right abroad	2.4	2.4	2.3	2.1	2.1	2.1
<i>Federal funds rate¹</i>						
Tealbook baseline and extension	2.7	3.2	3.8	4.1	4.0	3.6
Momentum weakens further	2.7	2.9	3.1	3.1	3.0	2.9
Recession	2.5	2.4	.1	.3	.9	2.2
Lower inflation expectations	2.6	2.9	3.3	3.5	3.4	3.0
Steeper Phillips curve	2.7	3.3	4.2	4.8	4.9	4.3
Even stronger supply side	2.4	2.4	2.7	3.2	3.4	3.4
Foreign slowdown	2.6	3.0	3.0	3.1	3.0	3.0
Everything goes right abroad	2.8	3.4	4.5	4.9	4.7	4.0

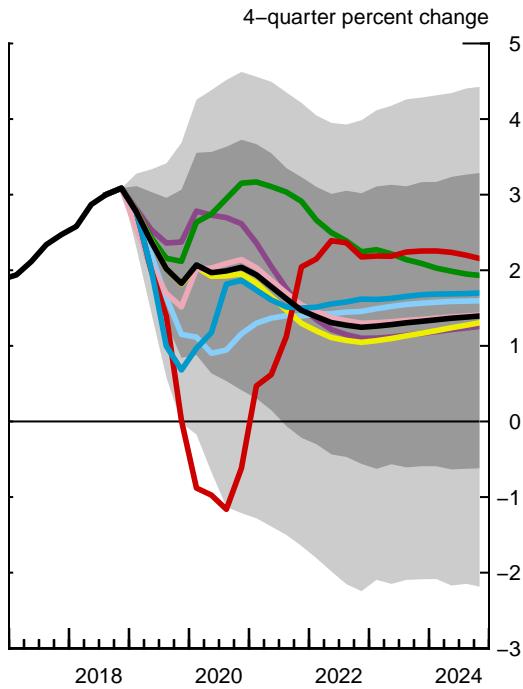
1. Percent, average for the final quarter of the period.

Forecast Confidence Intervals and Alternative Scenarios

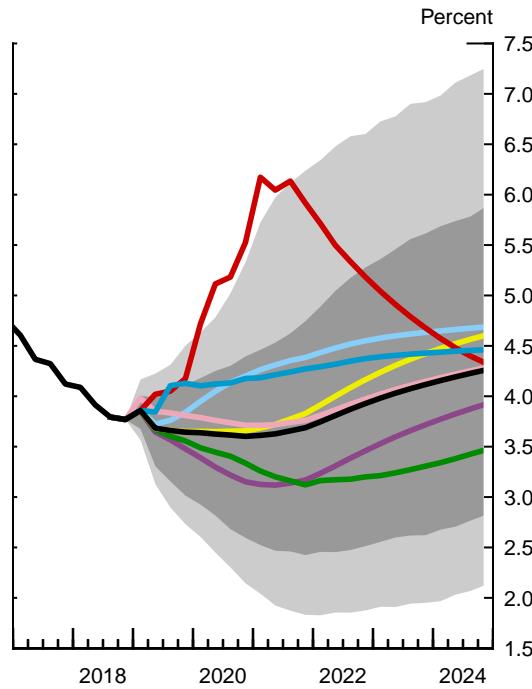
Confidence Intervals Based on FRB/US Stochastic Simulations*

- | | | |
|--|--|---|
| █ Tealbook baseline and extension
█ Momentum weakens further
█ Recession | █ Lower inflation expectations
█ Steeper Phillips curve
█ Even stronger supply side | █ Foreign slowdown
█ Everything goes right abroad |
|--|--|---|

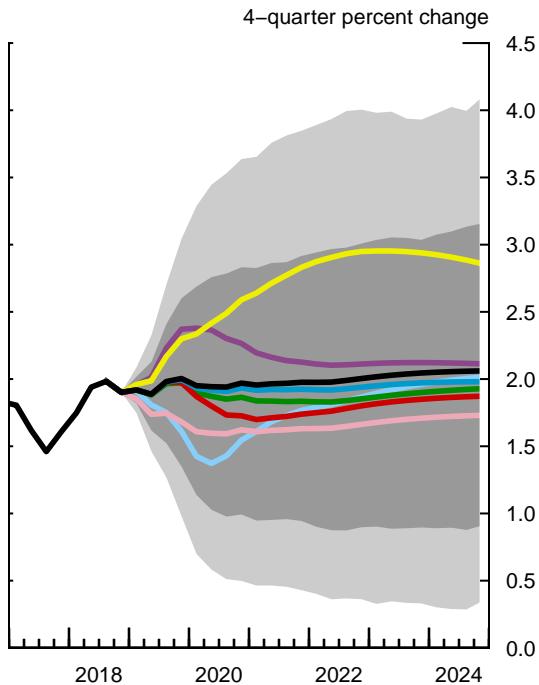
Real GDP



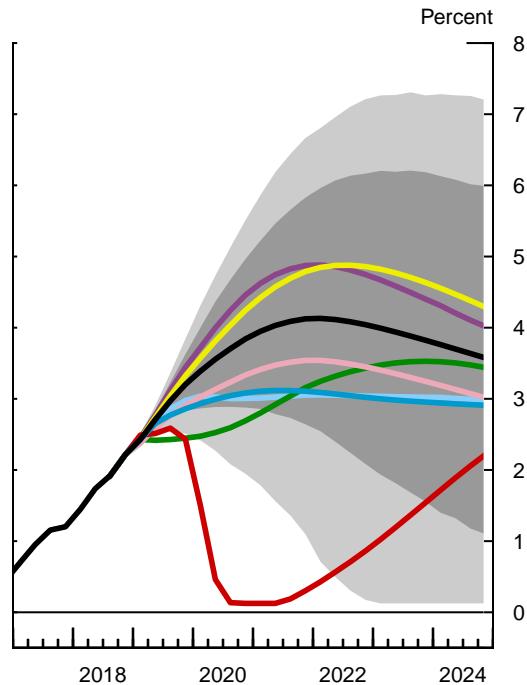
Unemployment Rate



PCE Prices excluding Food and Energy



Federal Funds Rate



* The dark gray shaded area is the 70 percent interval, and the light gray shaded area is the 90 percent interval from stochastic simulations around the Tealbook baseline.

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

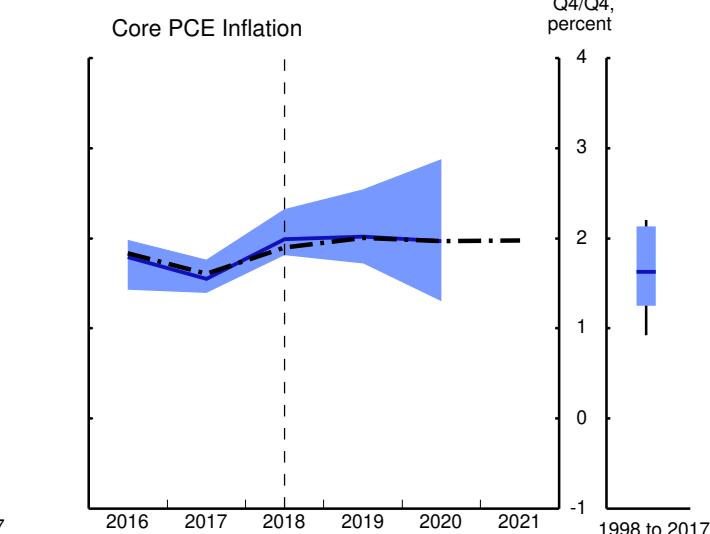
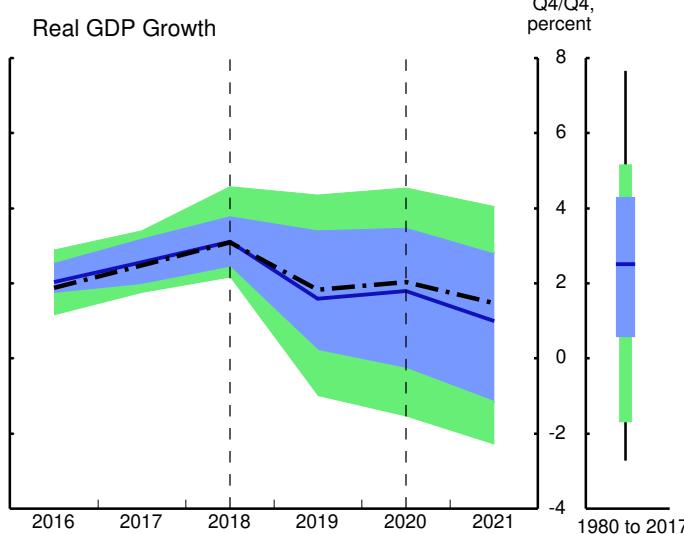
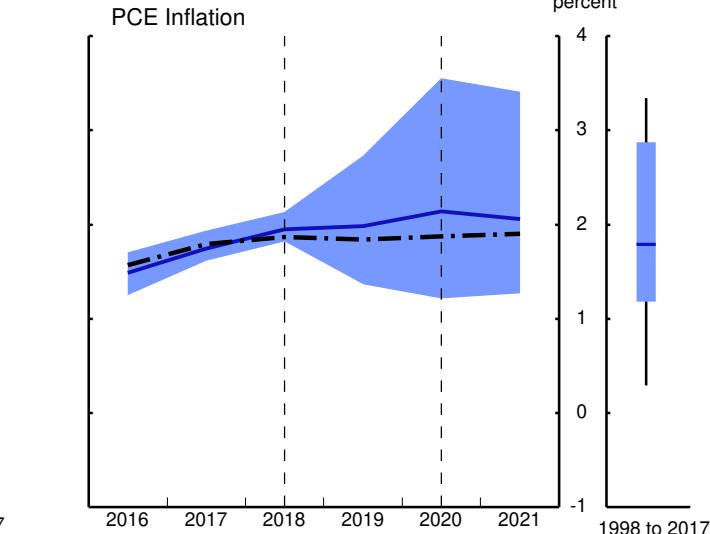
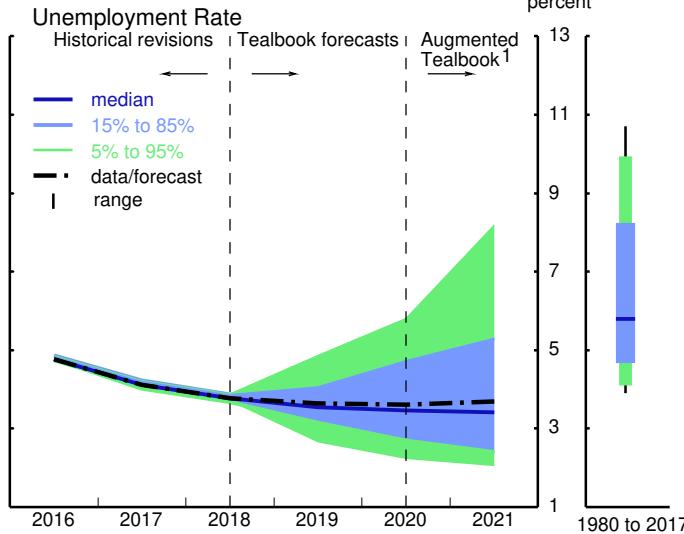
Measure	2019	2020	2021	2022	2023	2024
<i>Real GDP</i> <i>(percent change, Q4 to Q4)</i>						
Projection	1.8	2.0	1.5	1.2	1.3	1.4
Confidence interval						
Tealbook forecast errors	.2–3.4	-.3–3.5	-1.2–2.8
FRB/US stochastic simulations	.8–3.1	.4–3.7	-.2–3.2	-.6–3.0	-.6–3.2	-.6–3.3
<i>Civilian unemployment rate</i> <i>(percent, Q4)</i>						
Projection	3.6	3.6	3.7	3.9	4.1	4.3
Confidence interval						
Tealbook forecast errors	3.1–4.1	2.7–4.7	2.4–5.3
FRB/US stochastic simulations	3.0–4.1	2.6–4.4	2.4–4.7	2.5–5.3	2.6–5.6	2.8–5.9
<i>PCE prices, total</i> <i>(percent change, Q4 to Q4)</i>						
Projection	1.8	1.9	1.9	1.9	2.0	2.0
Confidence interval						
Tealbook forecast errors	1.4–2.7	1.2–3.5	1.3–3.4
FRB/US stochastic simulations	1.1–2.6	.8–2.8	.8–2.9	.7–3.1	.8–3.1	.8–3.2
<i>PCE prices excluding food and energy</i> <i>(percent change, Q4 to Q4)</i>						
Projection	2.0	2.0	2.0	2.0	2.0	2.1
Confidence interval						
Tealbook forecast errors	1.7–2.5	1.3–2.9
FRB/US stochastic simulations	1.3–2.6	1.0–2.8	.9–2.9	.9–3.0	.9–3.0	.9–3.2
<i>Federal funds rate</i> <i>(percent, Q4)</i>						
Projection	3.2	3.8	4.1	4.0	3.8	3.6
Confidence interval						
FRB/US stochastic simulations	2.8–3.6	2.9–5.0	2.6–5.8	2.1–6.2	1.6–6.2	1.1–6.0

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.

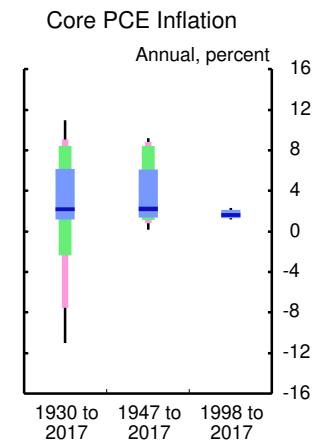
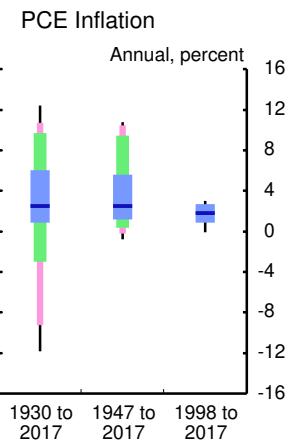
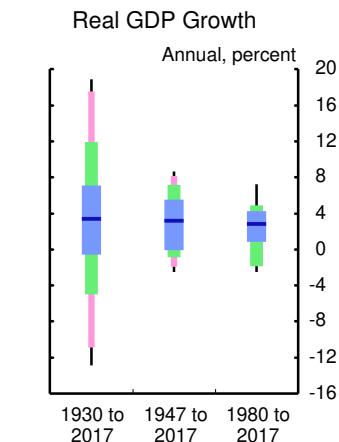
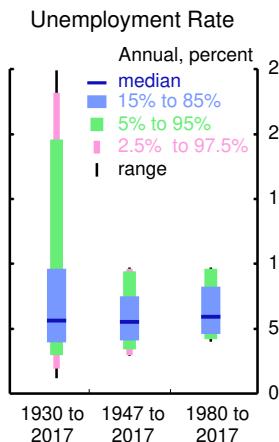
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Prediction Intervals Derived from Historical Tealbook Forecast Errors

Forecast Error Percentiles



Historical Distributions



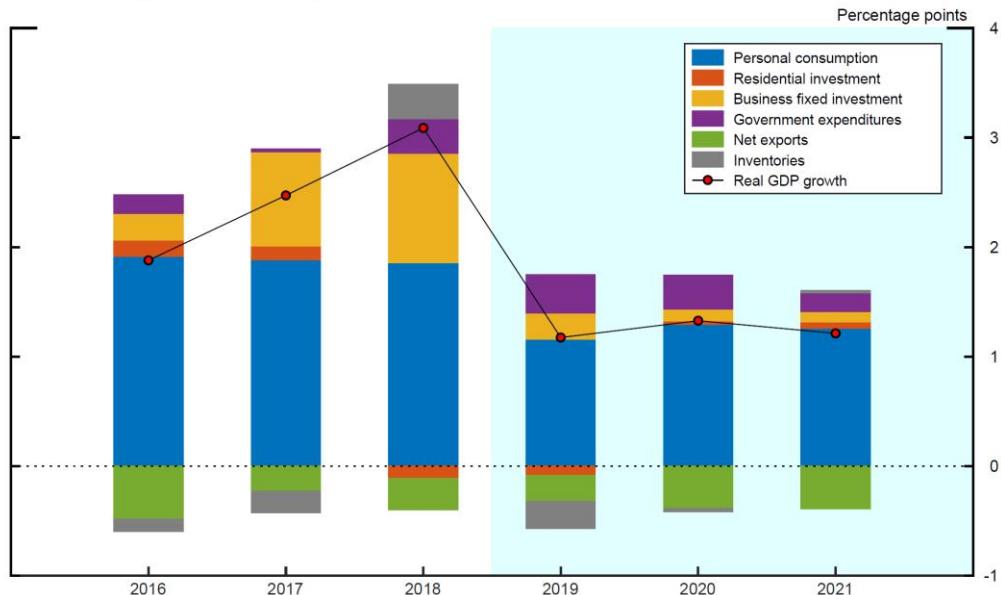
Note: See the technical note in the appendix for more information on this exhibit.

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

The EDO model projection. The EDO model projects that real GDP will grow 1.5 percent in 2019, 1.9 percent in 2020, and 2.2 percent in 2021, roughly $\frac{1}{4}$ percentage point below potential growth in each year. The output gap, currently estimated in EDO to be negative 0.2 percent, is projected to reach negative 0.6 percent in the last quarter of 2021. The EDO model's projection of below-potential real GDP growth is driven by the slow fading of favorable risk premium shocks—the main fundamental driver of aggregate demand—and the waning effects of the currently accommodative stance of monetary policy. Core inflation hovers around 2.2 percent over the projection period, slightly above the Committee's 2 percent objective. For a number of years, wages have been below the level consistent with the model's wage Phillips curve, holding down marginal costs and depressing inflation over that period. The model expects these wage shocks to fade gradually, which offsets the downward pressure from decreasing resource utilization on the trajectory for inflation.³

Conclusion. While the EDO projection of GDP growth is stronger than that of the FRB/US model, it is worth noting that both models forecast an economy growing below potential, as favorable but transitory conditions quickly fade and financial conditions continue to tighten for most of their projections. The slowdown in economic growth is more pronounced in the models' forecasts compared with both the staff judgmental projection and outside projections (for example, the Blue Chip survey), which forecast a more gradual slowing of real GDP growth.

Figure 1: Decomposition of Real GDP Growth Forecast in FRB/US



Note: The blue shaded area indicates the forecast.
Source: Staff calculations.

³ More information about forecasts from the EDO model is provided in the memo to the Committee on March 12, 2019, "System DSGE Project Forecasts."

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

Measure and projection	2019		2020		2021	
	December Tealbook	Current Tealbook	December Tealbook	Current Tealbook	December Tealbook	Current Tealbook
<i>Real GDP</i>						
Staff	2.4	1.8	2.0	2.0	1.4	1.5
FRB/US	1.1	1.2	1.0	1.3	.9	1.2
EDO ¹	2.3	1.5	2.1	1.9	2.3	2.2
<i>Unemployment rate²</i>						
Staff	3.4	3.6	3.4	3.6	3.5	3.7
FRB/US	4.2	4.1	4.7	4.5	5.1	4.8
EDO ¹	4.0	4.3	4.4	4.7	4.7	4.9
<i>Total PCE prices</i>						
Staff	1.8	1.8	2.0	1.9	2.0	1.9
FRB/US	1.7	2.0	1.9	1.9	1.9	1.9
EDO ¹	1.8	2.0	2.1	2.2	2.1	2.2
<i>Core PCE prices</i>						
Staff	2.0	2.0	2.0	2.0	2.0	2.0
FRB/US	1.9	2.2	2.0	2.0	2.0	1.9
EDO ¹	1.8	2.2	2.1	2.2	2.2	2.2
<i>Federal funds rate²</i>						
Staff	3.5	3.2	4.3	3.8	4.7	4.1
FRB/US	2.9	3.0	3.0	3.1	2.7	2.9
EDO ¹	3.2	3.1	3.7	3.5	3.9	3.8

1. The EDO projections labeled "December Tealbook" and "Current Tealbook" integrate over the posterior distribution of model parameters.

2. Percent, average for Q4.

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	.10	.14	.09	.10
Previous Tealbook	.08	.05	.03	.05
<i>Between 1 3/4 and 2 1/4 percent</i>				
Current Tealbook	.25	.26	.29	.25
Previous Tealbook	.22	.21	.30	.24
<i>Less than 1 percent</i>				
Current Tealbook	.12	.08	.03	.12
Previous Tealbook	.17	.22	.09	.19

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	.10	.30	.06
Previous Tealbook	.02	.17	.20	.03
<i>Decrease by 1 percentage point</i>				
Current Tealbook	.11	.01	.01	.03
Previous Tealbook	.12	.00	.03	.07

Probability of Recession Over Next 4 Quarters

Probability of transitioning into or remaining in a recession	Staff	FRB/US	BMA	Term Spread	Unconditional
Current Tealbook	.08	.13	.13	.58	.23
Previous Tealbook	.08	.16	.23	.58	.23

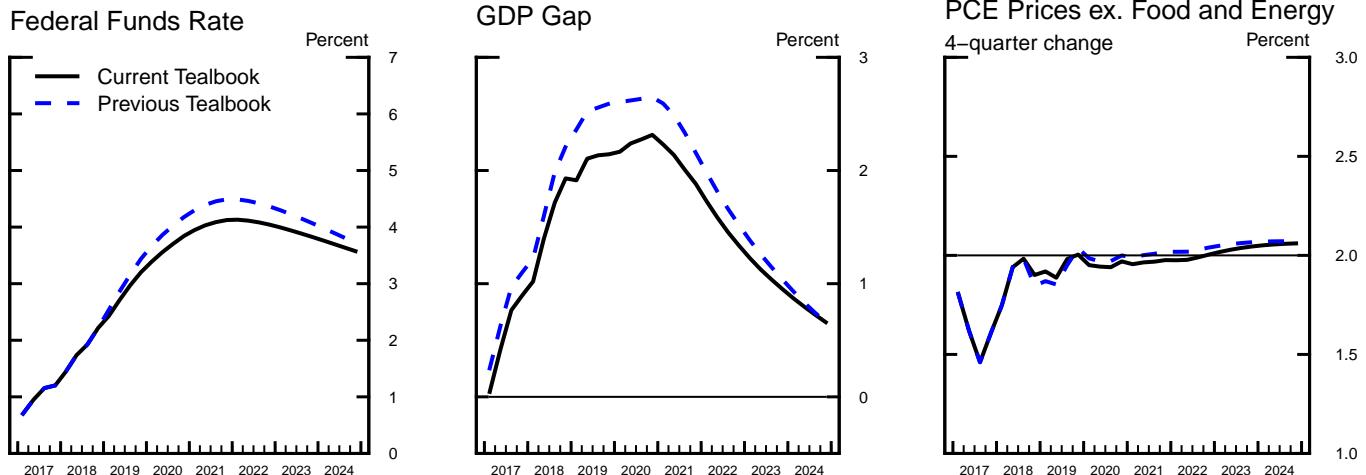
Note: "Staff" represents stochastic simulations in FRB/US around the staff judgmental baseline; baselines for FRB/US, EDO, and BVAR are generated by those models. The "BMA" model uses model averaging techniques to infer the probability from a selection of real and financial variables. "Term Spread" shows the probability implied by the spread between the current month's 10-year and 3-month Treasury yields. "Unconditional" is calculated using NBER recession dating from 1973:Q1 to the most recent quarter with a BEA estimate of GDP.

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Simple Policy Rules¹

	(Percent)	<u>2019:Q2</u>	<u>2019:Q3</u>
Taylor (1999) rule	4.41	4.58	
<i>Previous Tealbook</i>	4.78	4.95	
Taylor (1993) rule	3.36	3.51	
<i>Previous Tealbook</i>	3.52	3.68	
First-difference rule	2.52	2.55	
<i>Previous Tealbook projection</i>	2.53	2.56	
Flexible price-level targeting rule	2.20	2.02	
<i>Previous Tealbook projection</i>	2.20	2.03	
<i>Addendum:</i>			
Tealbook baseline	2.71	2.97	

Key Elements of the Staff Projection



A Medium-Term Notion of the Equilibrium Real Federal Funds Rate²

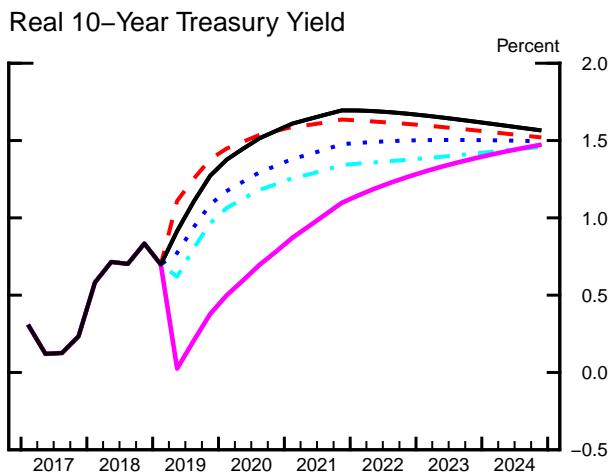
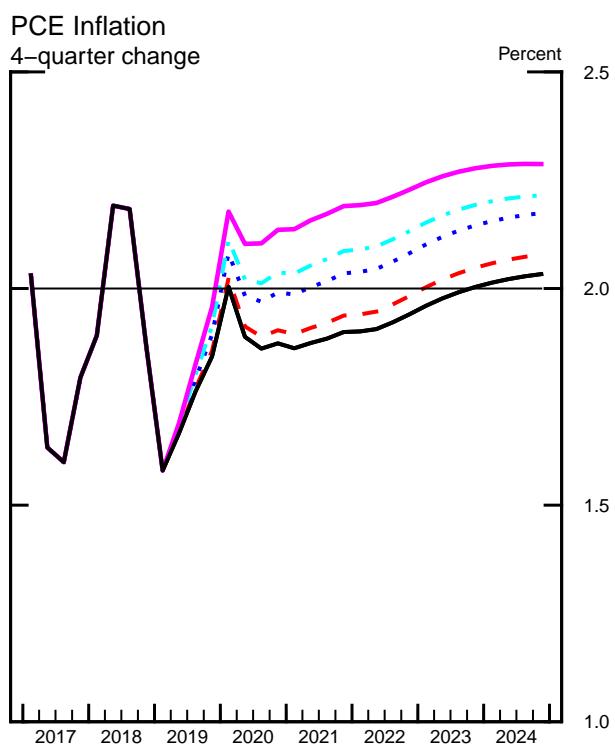
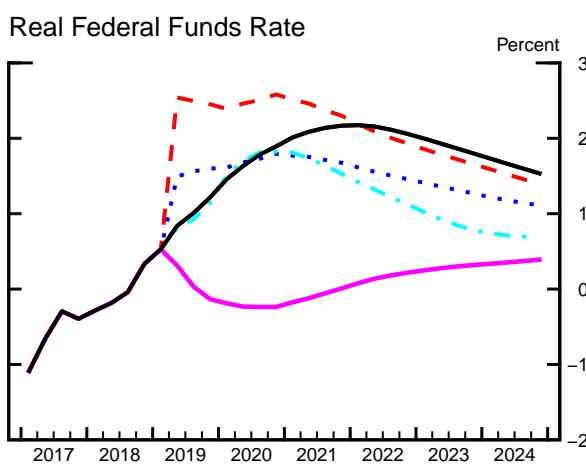
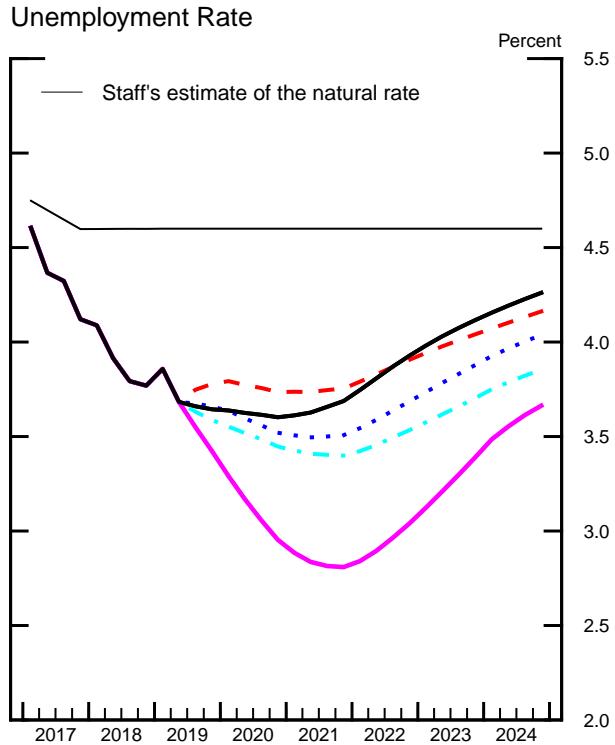
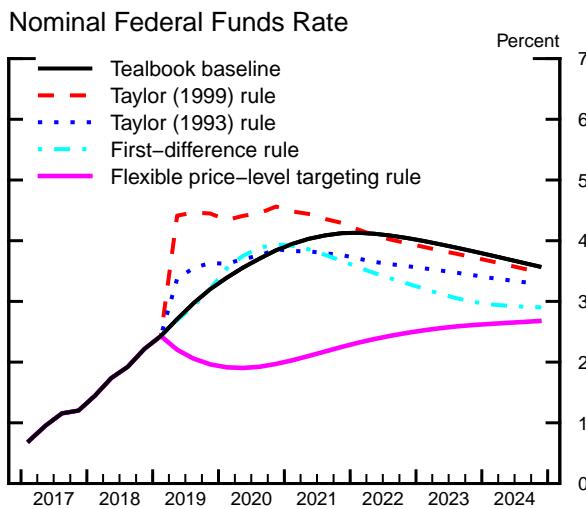
	(Percent)	Current Value	Previous Tealbook
Tealbook baseline			
FRB/US r^*		2.60	3.03
Average projected real federal funds rate		1.56	1.83
SEP-consistent baseline			
FRB/US r^*		1.68	
Average projected real federal funds rate		.97	

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

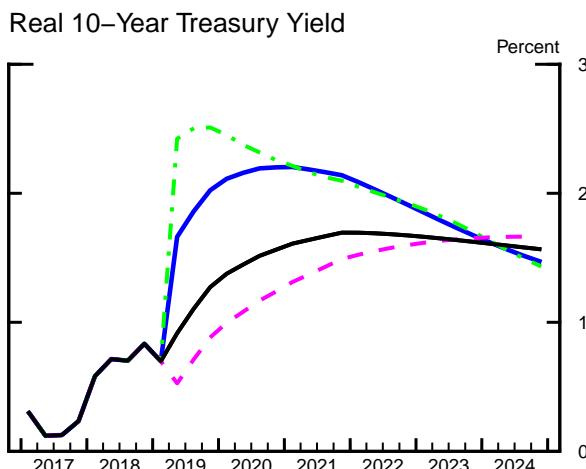
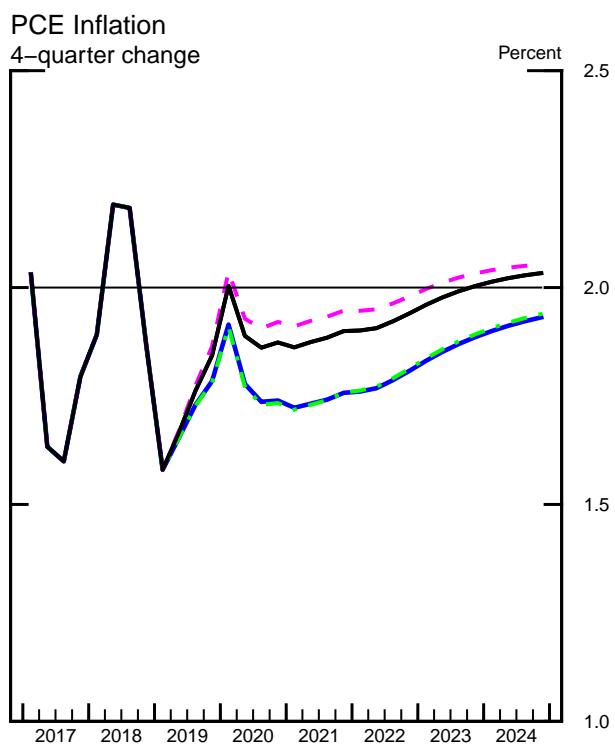
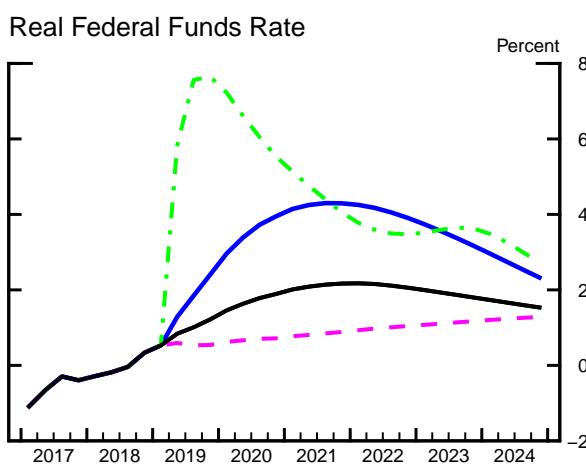
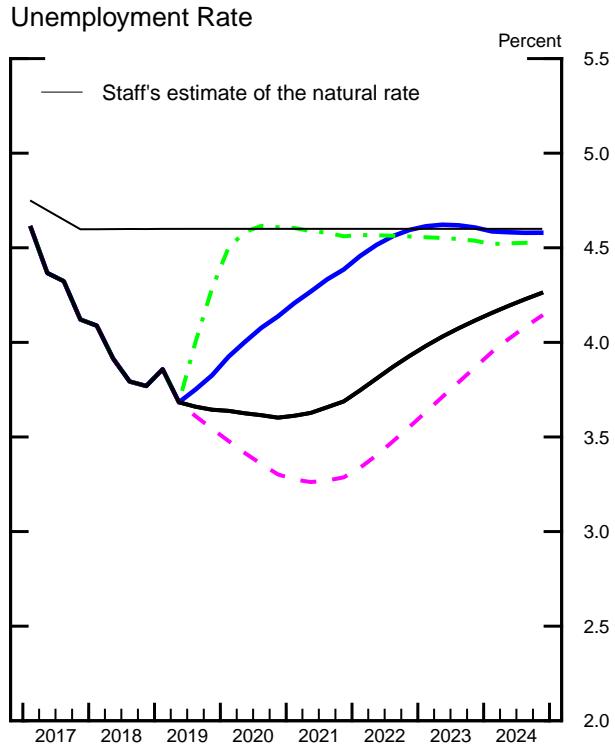
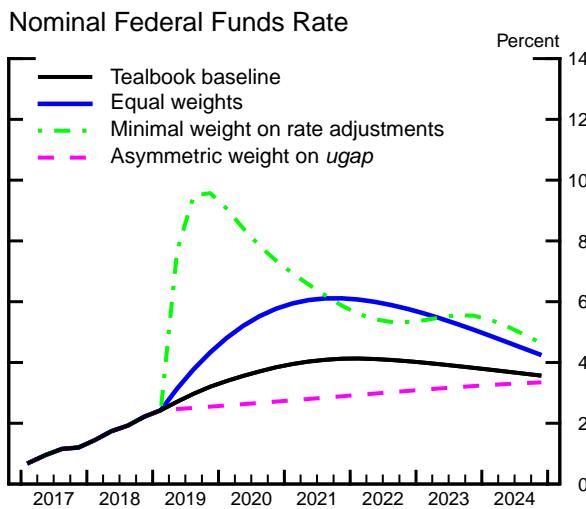
Monetary Policy Strategies



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.

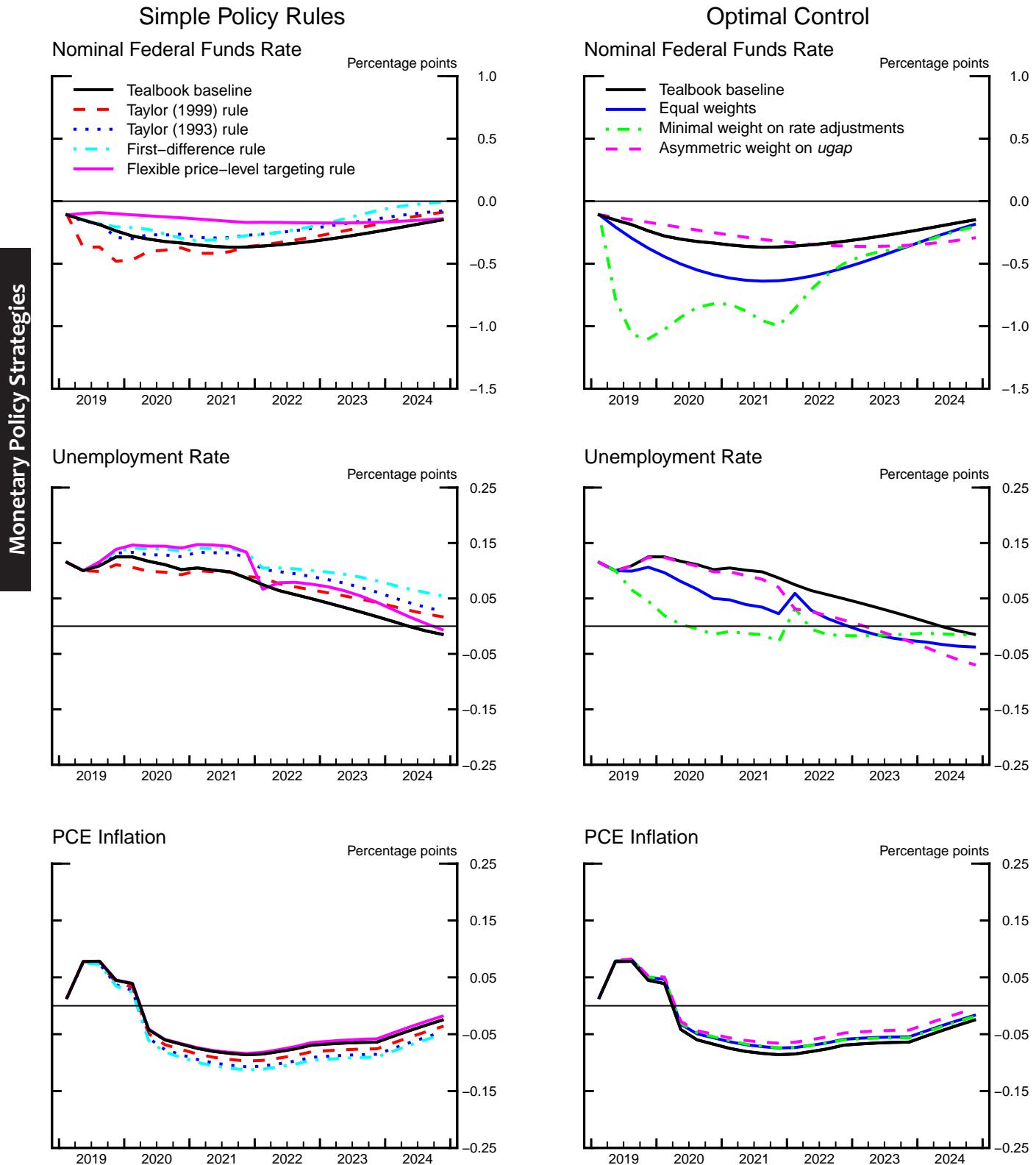
Optimal Control Simulations under Commitment

Monetary Policy Strategies



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.

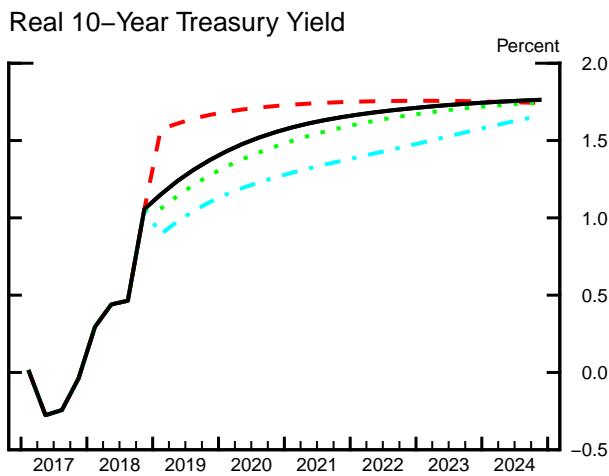
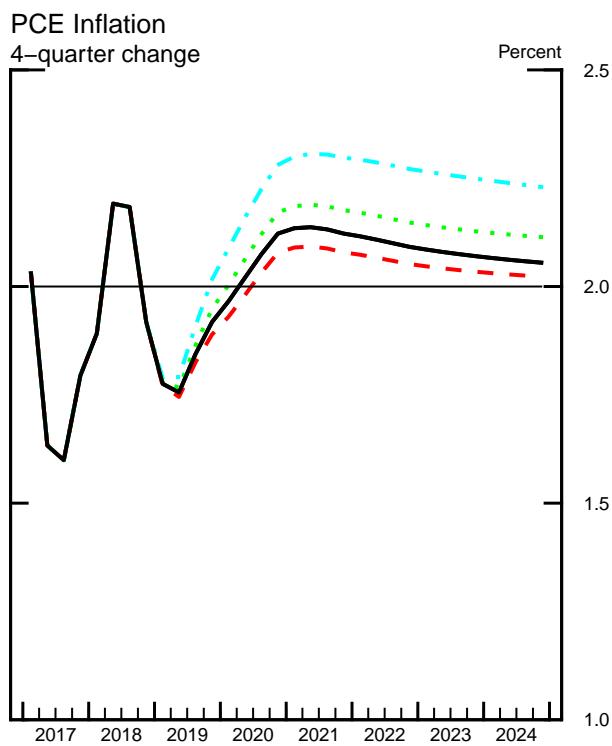
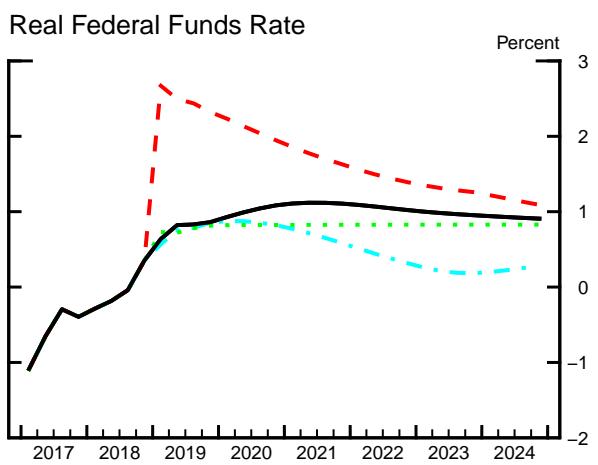
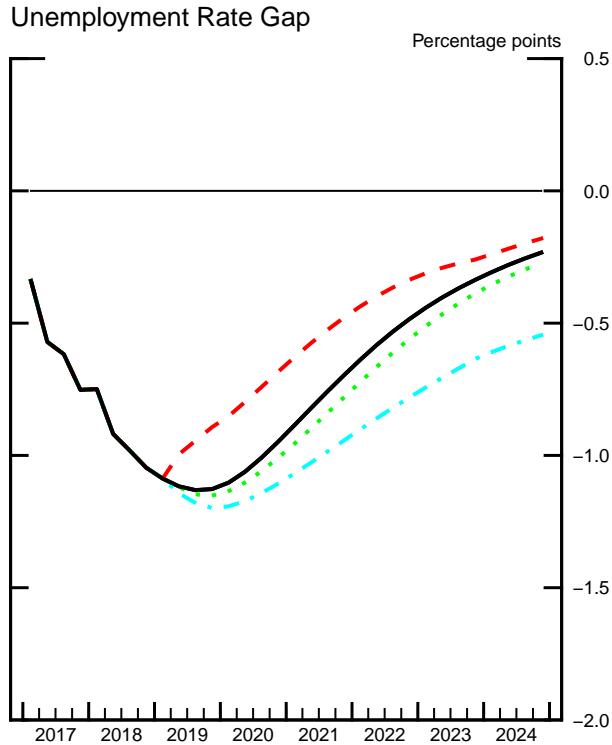
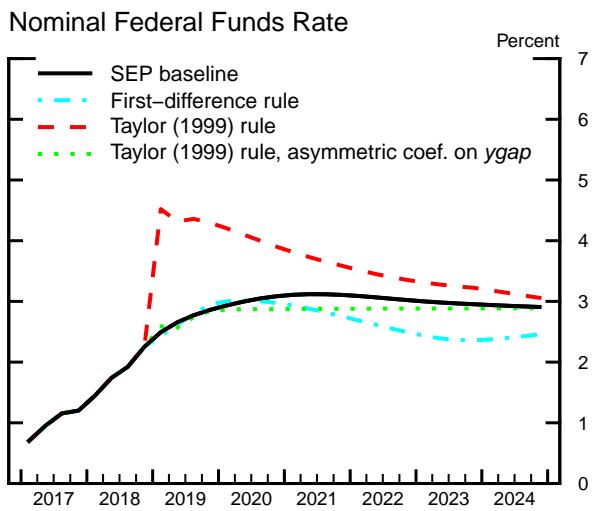
Changes in Prescriptions and Outcomes from the January Tealbook



Note: For each simple policy rule and optimal control policy reported in the previous two exhibits, we report the difference between prescriptions and economic outcomes under the current Tealbook baseline and the corresponding simulated variables under the January Tealbook baseline. To facilitate inference about the implications of revisions in the staff projection, we set the start of the simulation period under both the current Tealbook baseline and the January Tealbook baseline to 2019:Q2.

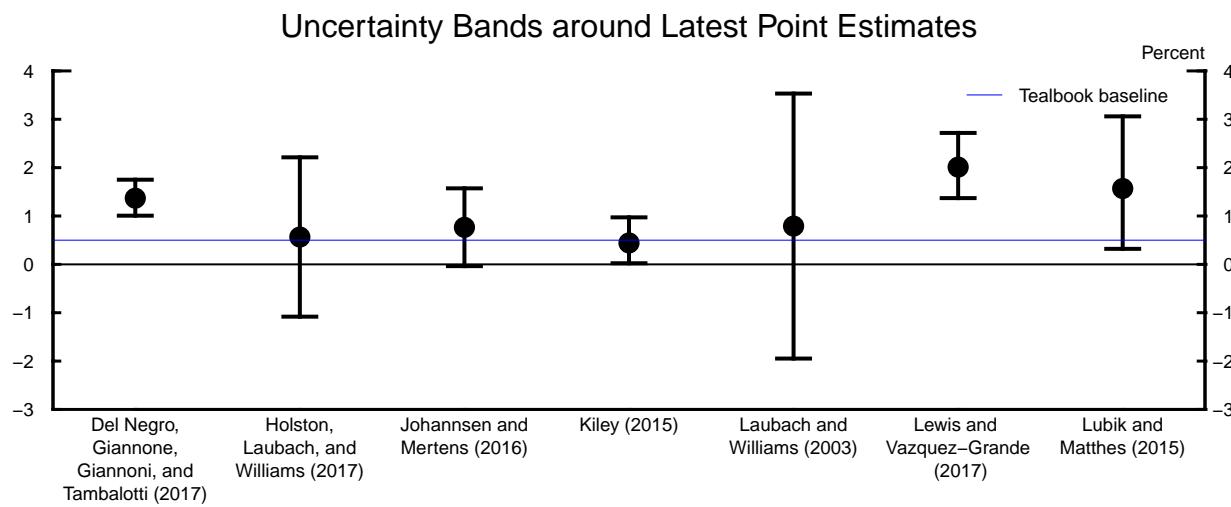
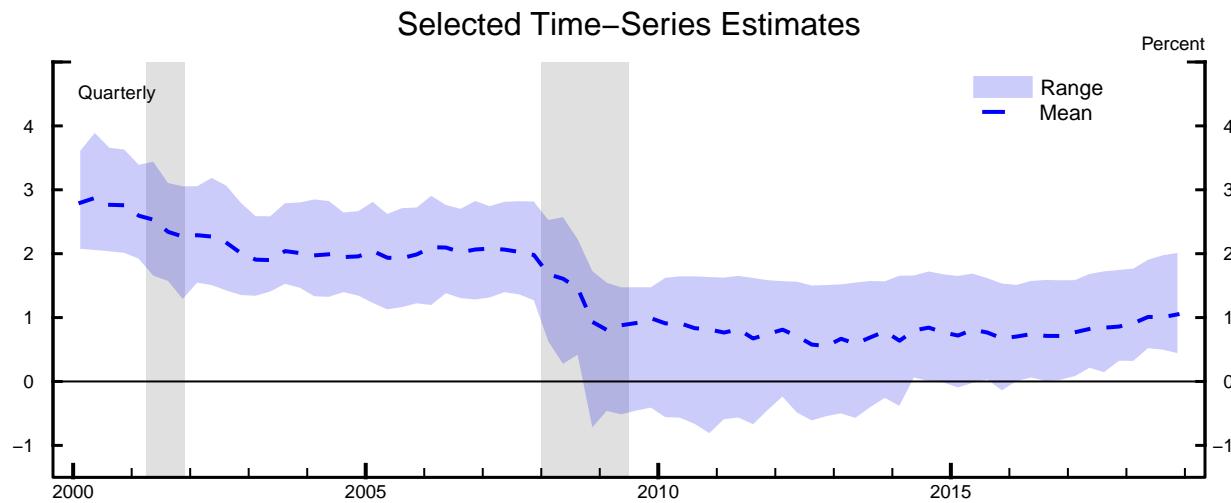
Policy Rule Simulations Using a Projection Consistent with the SEP

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. Because the most recent SEP was conducted in December 2018, the FRB/US simulations under the SEP-consistent baseline begin in the current quarter. The unemployment rate gap is defined as the difference between the unemployment rate and the natural rate of unemployment.

Estimates of the Equilibrium Real Federal Funds Rate in the Longer Run



Longer-Run Values from Selected Forecasters

	<u>Release Date</u>	<u>Percent</u>
Tealbook baseline	Mar. 2019	.50
Median SEP	Dec. 2018	.75
Median Survey of Primary Dealers	Jan. 2019	.75
Median Blue Chip (6-to-10-year)	Oct. 2018	.84
Congressional Budget Office (10-year)	Jan. 2019	1.13

Note: In all cases, the latest time-series estimate is for 2018:Q4. The shaded vertical areas in the top panel are NBER recessions. In addition to the studies listed in the middle panel, the computation of the mean and the range in the top panel includes estimates from Christensen and Rudebusch (2017). The middle panel reports, where available, 68 percent uncertainty bands around each point estimate for 2018:Q4. See the technical appendix for sources.

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 rate¹</i>							
Taylor (1999)	2.2	4.4	4.6	4.3	4.0	3.7	3.5
Taylor (1993)	2.2	3.6	3.9	3.8	3.6	3.4	3.3
First-difference	2.2	3.2	3.9	3.7	3.3	3.0	2.9
Flexible price-level targeting	2.2	2.0	2.0	2.3	2.5	2.6	2.7
Extended Tealbook baseline	2.2	3.2	3.8	4.1	4.0	3.8	3.6
<i>Real GDP</i>							
Taylor (1999)	3.0	1.6	2.0	1.6	1.4	1.4	1.4
Taylor (1993)	3.0	1.8	2.2	1.7	1.4	1.3	1.4
First-difference	3.0	2.0	2.3	1.7	1.5	1.4	1.4
Flexible price-level targeting	3.0	2.3	3.0	1.9	1.3	1.1	1.3
Extended Tealbook baseline	3.0	1.8	2.0	1.5	1.2	1.3	1.4
<i>Unemployment rate¹</i>							
Taylor (1999)	3.8	3.8	3.7	3.8	3.9	4.0	4.2
Taylor (1993)	3.8	3.7	3.5	3.5	3.7	3.9	4.0
First-difference	3.8	3.6	3.4	3.4	3.5	3.7	3.9
Flexible price-level targeting	3.8	3.4	3.0	2.8	3.0	3.4	3.7
Extended Tealbook baseline	3.8	3.6	3.6	3.7	3.9	4.1	4.3
<i>Total PCE prices</i>							
Taylor (1999)	1.5	1.9	1.9	1.9	2.0	2.0	2.1
Taylor (1993)	1.5	1.9	2.0	2.0	2.1	2.1	2.2
First-difference	1.5	1.9	2.0	2.1	2.1	2.2	2.2
Flexible price-level targeting	1.5	2.0	2.1	2.2	2.2	2.3	2.3
Extended Tealbook baseline	1.5	1.8	1.9	1.9	1.9	2.0	2.0
<i>Core PCE prices</i>							
Taylor (1999)	1.7	2.0	2.0	2.0	2.0	2.1	2.1
Taylor (1993)	1.7	2.1	2.1	2.1	2.1	2.2	2.2
First-difference	1.7	2.1	2.1	2.2	2.2	2.2	2.2
Flexible price-level targeting	1.7	2.1	2.2	2.3	2.3	2.3	2.3
Extended Tealbook baseline	1.7	2.0	2.0	2.0	2.0	2.0	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 rate¹</i>								
Taylor (1999)	2.4	4.4	4.5	4.4	4.3	4.4	4.5	4.6
Taylor (1993)	2.4	3.4	3.6	3.6	3.6	3.7	3.8	3.9
First-difference	2.4	2.7	2.9	3.2	3.5	3.8	3.9	3.9
Flexible price-level targeting	2.4	2.2	2.1	2.0	1.9	1.9	1.9	2.0
Extended Tealbook baseline	2.4	2.7	3.0	3.2	3.4	3.6	3.7	3.8
<i>Real GDP</i>								
Taylor (1999)	2.8	2.4	1.9	1.6	1.8	1.7	1.9	2.0
Taylor (1993)	2.8	2.4	2.0	1.8	2.1	2.1	2.2	2.2
First-difference	2.8	2.4	2.1	2.0	2.3	2.2	2.3	2.3
Flexible price-level targeting	2.8	2.4	2.3	2.3	2.8	3.0	3.0	3.0
Extended Tealbook baseline	2.8	2.4	2.0	1.8	2.1	2.0	2.0	2.0
<i>Unemployment rate¹</i>								
Taylor (1999)	3.9	3.7	3.7	3.8	3.8	3.8	3.8	3.7
Taylor (1993)	3.9	3.7	3.7	3.7	3.6	3.6	3.6	3.5
First-difference	3.9	3.7	3.6	3.6	3.6	3.5	3.5	3.4
Flexible price-level targeting	3.9	3.7	3.5	3.4	3.3	3.2	3.1	3.0
Extended Tealbook baseline	3.9	3.7	3.7	3.6	3.6	3.6	3.6	3.6
<i>Total PCE prices</i>								
Taylor (1999)	1.6	1.7	1.8	1.9	2.0	1.9	1.9	1.9
Taylor (1993)	1.6	1.7	1.8	1.9	2.1	2.0	2.0	2.0
First-difference	1.6	1.7	1.8	1.9	2.1	2.0	2.0	2.0
Flexible price-level targeting	1.6	1.7	1.8	2.0	2.2	2.1	2.1	2.1
Extended Tealbook baseline	1.6	1.7	1.8	1.8	2.0	1.9	1.9	1.9
<i>Core PCE prices</i>								
Taylor (1999)	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Taylor (1993)	1.9	1.9	2.0	2.1	2.0	2.0	2.0	2.1
First-difference	1.9	1.9	2.0	2.1	2.1	2.1	2.1	2.1
Flexible price-level targeting	1.9	1.9	2.0	2.1	2.1	2.2	2.2	2.2
Extended Tealbook baseline	1.9	1.9	2.0	2.0	2.0	1.9	1.9	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 rate¹</i>							
Equal weights	2.2	4.3	5.8	6.1	5.8	5.1	4.3
Minimal weight on rate adjustments	2.2	9.6	7.3	5.9	5.3	5.5	4.7
Asymmetric weight on ugap	2.2	2.5	2.7	2.9	3.1	3.2	3.3
Extended Tealbook baseline	2.2	3.2	3.8	4.1	4.0	3.8	3.6
<i>Real GDP</i>							
Equal weights	3.0	1.4	1.3	1.1	1.3	1.7	1.7
Minimal weight on rate adjustments	3.0	.8	1.0	1.6	1.7	1.7	1.6
Asymmetric weight on ugap	3.0	2.0	2.5	1.7	1.2	1.1	1.2
Extended Tealbook baseline	3.0	1.8	2.0	1.5	1.2	1.3	1.4
<i>Unemployment rate¹</i>							
Equal weights	3.8	3.8	4.1	4.4	4.6	4.6	4.6
Minimal weight on rate adjustments	3.8	4.3	4.6	4.6	4.6	4.5	4.5
Asymmetric weight on ugap	3.8	3.5	3.3	3.3	3.6	3.9	4.1
Extended Tealbook baseline	3.8	3.6	3.6	3.7	3.9	4.1	4.3
<i>Total PCE prices</i>							
Equal weights	1.5	1.8	1.7	1.8	1.8	1.9	1.9
Minimal weight on rate adjustments	1.5	1.8	1.7	1.8	1.8	1.9	1.9
Asymmetric weight on ugap	1.5	1.9	1.9	1.9	2.0	2.0	2.1
Extended Tealbook baseline	1.5	1.8	1.9	1.9	1.9	2.0	2.0
<i>Core PCE prices</i>							
Equal weights	1.7	1.9	1.8	1.8	1.9	1.9	2.0
Minimal weight on rate adjustments	1.7	1.9	1.8	1.8	1.9	1.9	2.0
Asymmetric weight on ugap	1.7	2.0	2.0	2.0	2.0	2.1	2.1
Extended Tealbook baseline	1.7	2.0	2.0	2.0	2.0	2.0	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 rate¹</i>								
Equal weights	2.4	3.1	3.8	4.3	4.8	5.2	5.5	5.8
Minimal weight on rate adjustments	2.4	7.7	9.5	9.6	9.1	8.4	7.8	7.3
Asymmetric weight on <i>ugap</i>	2.4	2.5	2.5	2.5	2.6	2.6	2.7	2.7
Extended Tealbook baseline	2.4	2.7	3.0	3.2	3.4	3.6	3.7	3.8
<i>Real GDP</i>								
Equal weights	2.8	2.4	1.8	1.4	1.4	1.1	1.2	1.3
Minimal weight on rate adjustments	2.8	2.4	1.4	.8	.5	.1	.5	1.0
Asymmetric weight on <i>ugap</i>	2.8	2.4	2.1	2.0	2.4	2.4	2.4	2.5
Extended Tealbook baseline	2.8	2.4	2.0	1.8	2.1	2.0	2.0	2.0
<i>Unemployment rate¹</i>								
Equal weights	3.9	3.7	3.8	3.8	3.9	4.0	4.1	4.1
Minimal weight on rate adjustments	3.9	3.7	4.0	4.3	4.5	4.6	4.6	4.6
Asymmetric weight on <i>ugap</i>	3.9	3.7	3.6	3.5	3.5	3.4	3.4	3.3
Extended Tealbook baseline	3.9	3.7	3.7	3.6	3.6	3.6	3.6	3.6
<i>Total PCE prices</i>								
Equal weights	1.6	1.7	1.7	1.8	1.9	1.8	1.7	1.7
Minimal weight on rate adjustments	1.6	1.7	1.7	1.8	1.9	1.8	1.7	1.7
Asymmetric weight on <i>ugap</i>	1.6	1.7	1.8	1.9	2.0	1.9	1.9	1.9
Extended Tealbook baseline	1.6	1.7	1.8	1.8	2.0	1.9	1.9	1.9
<i>Core PCE prices</i>								
Equal weights	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8
Minimal weight on rate adjustments	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8
Asymmetric weight on <i>ugap</i>	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Extended Tealbook baseline	1.9	1.9	2.0	2.0	2.0	1.9	1.9	2.0

1. Percent, average for the quarter.

by the simulation; this period extends several decades beyond the time horizon shown in the exhibits. The simulations are conducted under the assumption that market participants as well as price and wage setters form model-consistent expectations and are predicated on the staff's extended Tealbook projection, which includes the macroeconomic effects of the Committee's large-scale asset purchase programs. When the Tealbook is published early in a quarter, all of the simulations begin in that quarter; when the Tealbook is published late in a quarter, all of the simulations begin in the subsequent quarter.

COMPUTATION OF OPTIMAL CONTROL POLICIES UNDER COMMITMENT

The optimal control simulations posit that policymakers choose a path for the federal funds rate to minimize a discounted weighted sum of squared inflation gaps (measured as the difference between four-quarter headline PCE price inflation, π_t^{PCE} , and the Committee's 2 percent objective), squared unemployment gaps ($ugap_t$, measured as the difference between the unemployment rate and the staff's estimate of the natural rate), and squared changes in the federal funds rate. In the following equation, the resulting loss function embeds the assumption that policymakers discount the future using a quarterly discount factor, $\beta = 0.9963$:

$$L_t = \sum_{\tau=0}^T \beta^\tau \{ \lambda_\pi (\pi_{t+\tau}^{PCE} - \pi^{LR})^2 + \lambda_{u,t+\tau} (ugap_{t+\tau})^2 + \lambda_R (R_{t+\tau} - R_{t+\tau-1})^2 \}.$$

The exhibit "Optimal Control Simulations under Commitment" considers three specifications of the weights on the inflation gap, the unemployment gap, and the rate change components of the loss function. The box "Optimal Control and the Loss Function" in the Monetary Policy Strategies section of the June 2016 Tealbook B provides motivations for the three specifications of the loss function. The table "Loss Functions" shows the weights used in the three specifications.

Loss Functions				
	λ_π	$\lambda_{u,t+\tau}$		λ_R
		$ugap_{t+\tau} < 0$	$ugap_{t+\tau} \geq 0$	
Equal weights	1	1	1	1
Minimal weight on rate adjustments	1	1	1	0.01
Asymmetric weight on $ugap$	1	0	1	1

The first specification, "Equal weights," assigns equal weights to all three components at all times. The second specification, "Minimal weight on rate adjustments," places almost no weight on changes in the federal funds rate.³ The third specification, "Asymmetric weight on $ugap$," uses the same weights as the equal-weights specification whenever the unemployment rate is above the staff's estimate of the natural rate, but it assigns no penalty to the unemployment rate

³ The inclusion of a minimal but strictly positive weight on changes in the federal funds rate helps ensure a well-behaved numerical solution.

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

Interval	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate ¹	
	01/18/19	03/08/19	01/18/19	03/08/19	01/18/19	03/08/19	01/18/19	03/08/19	01/18/19	03/08/19
<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	4.9	4.9	3.4	3.4	1.6	1.6	1.6	1.6	3.8	3.8
Q4	4.4	4.6	2.8	2.6	1.4	1.5	1.5	1.7	3.8	3.8
2019:Q1	3.9	2.7	2.3	1.0	1.3	1.3	2.3	2.3	3.7	3.9
Q2	4.7	4.6	2.6	2.6	2.1	2.3	2.0	2.0	3.6	3.7
Q3	4.1	4.1	1.9	1.9	2.0	2.0	2.0	2.0	3.6	3.7
Q4	3.9	3.8	1.9	1.8	1.8	1.8	1.9	1.8	3.5	3.6
2020:Q1	4.1	4.1	1.9	2.0	2.0	1.9	2.1	2.0	3.5	3.6
Q2	4.2	4.4	1.9	2.2	1.9	1.9	2.0	2.0	3.5	3.6
Q3	4.0	4.1	1.9	2.0	1.9	1.8	2.0	1.9	3.5	3.6
Q4	3.9	4.0	1.9	2.0	1.9	1.8	2.0	1.9	3.5	3.6
<i>Two-quarter²</i>										
2018:Q2	5.9	5.9	3.2	3.2	2.2	2.2	2.1	2.1	-.2	-.2
Q4	4.7	4.7	3.1	3.0	1.5	1.5	1.5	1.7	-.1	-.1
2019:Q2	4.3	3.6	2.4	1.8	1.7	1.8	2.2	2.1	-.2	-.1
Q4	4.0	3.9	1.9	1.9	1.9	1.9	1.9	1.9	-.1	-.1
2020:Q2	4.1	4.2	1.9	2.1	2.0	1.9	2.0	2.0	.0	.0
Q4	4.0	4.0	1.9	2.0	1.9	1.8	2.0	1.9	.0	.0
<i>Four-quarter³</i>										
2017:Q4	4.5	4.5	2.5	2.5	1.8	1.8	1.6	1.6	-.7	-.7
2018:Q4	5.3	5.3	3.1	3.1	1.8	1.9	1.8	1.9	-.3	-.3
2019:Q4	4.1	3.8	2.2	1.8	1.8	1.8	2.0	2.0	-.3	-.2
2020:Q4	4.1	4.1	1.9	2.0	1.9	1.9	2.0	2.0	.0	.0
2021:Q4	3.5	3.6	1.4	1.5	2.0	1.9	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	4.5	4.2	2.6	2.2	1.7	1.7	1.9	1.9	3.6	3.7
2020	4.1	4.1	2.0	2.0	1.9	1.9	2.0	2.0	3.5	3.6
2021	3.8	3.8	1.7	1.7	2.0	1.9	2.0	2.0	3.5	3.6

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 ¹	2019 ¹	2020 ¹	2021 ¹
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Real GDP <i>Previous Tealbook</i>	4.2	3.4	2.6	1.0	2.6	1.9	1.8	2.0	2.2	2.0	2.0	3.1	1.8	2.0	1.5
	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
Final sales <i>Previous Tealbook</i>	5.4	1.0	2.2	.8	2.7	2.4	2.5	2.0	2.0	1.8	1.9	2.6	2.1	1.9	1.5
	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
Priv. dom. final purch. <i>Previous Tealbook</i>	4.3	3.0	2.9	1.0	2.7	2.7	2.6	2.1	2.2	2.1	1.9	3.1	2.2	2.1	1.6
	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
Personal cons. expend. <i>Previous Tealbook</i>	3.8	3.5	2.8	1.0	2.8	2.7	2.7	2.3	2.3	2.2	2.2	2.7	2.3	2.2	2.0
	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
Durables	8.6	3.7	5.9	-3.1	4.3	2.2	2.1	1.8	1.7	1.7	1.6	4.0	1.3	1.7	1.4
Nondurables	4.0	4.6	2.8	1.6	3.3	2.8	2.8	2.4	2.3	2.3	2.3	2.9	2.6	2.3	2.1
Services	3.0	3.2	2.4	1.5	2.5	2.7	2.7	2.3	2.3	2.3	2.2	2.4	2.4	2.3	2.0
Residential investment <i>Previous Tealbook</i>	-1.3	-3.6	-4.9	-8.6	1.3	4.5	3.0	2.5	1.0	-1.1	-2.1	-3.3	-1	.1	-2.8
	-1.3	-3.6	-4.4	-3.4	1.4	2.9	2.2	.1	-.8	-.5	-1.1	-3.2	.7	-.6	-.4
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	8.7	2.5	5.5	3.4	2.1	2.5	2.2	1.0	2.0	2.3	1.5	7.0	2.6	1.7	.9
	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
Equipment & intangibles <i>Previous Tealbook</i>	7.1	4.4	7.9	3.7	2.2	2.9	2.1	1.8	2.6	3.3	2.5	7.5	2.7	2.5	1.8
	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
Nonres. structures <i>Previous Tealbook</i>	14.5	-3.4	-2.3	2.3	2.1	1.2	2.4	-1.4	.0	-.9	-1.5	5.3	2.0	-1.0	-2.3
	14.5	-3.4	-.2	4.6	1.0	.4	1.8	-.9	-.1	-.8	-1.2	5.9	1.9	-.8	-2.0
Net exports ² <i>Previous Tealbook²</i>	-841	-950	-964	-973	-992	-1009	-1013	-1020	-1030	-1053	-1053	-914	-997	-1039	-1062
	-841	-950	-961	-955	-972	-984	-988	-991	-996	-1014	-1015	-913	-975	-1004	-1023
Exports	9.3	-4.9	1.4	.9	1.9	2.2	1.8	2.3	2.7	2.9	3.1	2.2	1.7	2.7	3.2
Imports	-.6	9.3	2.6	1.7	3.6	3.4	1.8	2.4	3.0	4.7	2.1	3.5	2.6	3.1	2.9
Gov't. cons. & invest. <i>Previous Tealbook</i>	2.5	2.6	.0	.7	4.0	1.8	1.7	1.7	1.8	1.9	1.1	1.7	2.1	1.6	1.0
	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
Federal	3.7	3.5	1.6	.1	8.8	2.6	2.8	2.9	3.1	3.5	1.4	2.8	3.5	2.7	1.0
Defense	6.0	4.9	6.9	4.8	3.0	2.7	2.9	3.0	3.2	3.3	1.3	5.2	3.3	2.7	.6
Nonddefense	.5	1.6	-5.6	-6.5	17.9	2.6	2.7	2.7	3.1	3.7	1.7	-.4	3.8	2.8	1.4
State & local	1.8	2.0	-.9	1.1	1.2	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.2	1.0	1.0
Change in priv. inventories ² <i>Previous Tealbook²</i>	-37	90	97	100	96	72	38	35	43	56	65	45	77	50	60
	-37	90	46	52	55	44	32	29	26	37	44	32	46	34	36

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 <i>Previous Tealbook</i>	1.5 1.5	2.6 2.6	2.7 2.7	2.0 2.0	1.9 1.9	2.5 2.5	3.1 3.1	1.8 2.2	2.0 1.9	1.5 1.4
Final sales <i>Previous Tealbook</i>	1.9 1.9	2.0 2.0	3.0 3.0	1.9 1.9	2.1 2.1	2.6 2.6	2.6 3.0	2.1 2.3	1.9 1.9	1.5 1.5
Priv. dom. final purch. <i>Previous Tealbook</i>	2.6 2.6	2.6 2.6	4.3 4.3	2.7 2.7	2.7 2.7	3.3 3.3	3.1 3.3	2.2 2.3	2.1 1.9	1.6 1.6
Personal cons. expend. <i>Previous Tealbook</i>	1.6 1.6	1.9 1.9	3.8 3.8	3.0 3.0	2.8 2.8	2.7 2.7	2.7 2.9	2.3 2.4	2.2 2.2	2.0 1.9
Durables	6.3	5.0	9.2	6.0	6.8	7.7	4.0	1.3	1.7	1.4
Nondurables	.7	2.8	3.0	3.0	2.0	3.0	2.9	2.6	2.3	2.1
Services	1.2	1.1	3.2	2.6	2.4	1.8	2.4	2.4	2.3	2.0
Residential investment <i>Previous Tealbook</i>	15.4 15.4	7.1 7.1	7.8 7.8	8.9 8.9	4.5 4.5	3.8 3.8	-3.3 -3.2	-.1 .7	.1 -.6	-2.8 -.4
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	5.6 5.6	5.4 5.4	6.4 6.4	-.7 -.7	1.8 1.8	6.3 6.3	7.0 7.4	2.6 2.6	1.7 1.5	.9 .8
Equipment & intangibles <i>Previous Tealbook</i>	6.1 6.1	5.1 5.1	5.6 5.6	2.6 2.6	1.6 1.6	7.3 7.3	7.5 7.9	2.7 2.8	2.5 2.2	1.8 1.6
Nonres. structures <i>Previous Tealbook</i>	4.0 4.0	6.7 6.7	8.8 8.8	-10.7 -10.7	2.5 2.5	2.9 2.9	5.3 5.9	2.0 1.9	-1.0 -.8	-2.3 -2.0
Net exports ¹ <i>Previous Tealbook¹</i>	-569 -569	-533 -533	-578 -578	-725 -725	-786 -786	-859 -859	-914 -913	-997 -975	-1039 -1004	-1062 -1023
Exports	2.1	6.0	3.0	-1.6	.8	4.7	2.2	1.7	2.7	3.2
Imports	.6	3.0	6.7	3.4	3.1	5.4	3.5	2.6	3.1	2.9
Gov't. cons. & invest. <i>Previous Tealbook</i>	-2.1 -2.1	-2.4 -2.4	.2 .2	2.2 2.2	.9 .9	.1 .1	1.7 2.1	2.1 2.0	1.6 1.7	1.0 .9
Federal	-2.6	-6.1	-1.2	1.2	.2	1.3	2.8	3.5	2.7	1.0
Defense	-4.7	-6.5	-3.6	-.2	-.7	1.3	5.2	3.3	2.7	.6
Nondefense	1.2	-5.5	2.7	3.4	1.5	1.3	-.4	3.8	2.8	1.4
State & local	-1.7	.2	1.1	2.8	1.4	-.5	1.0	1.2	1.0	1.0
Change in priv. inventories ¹ <i>Previous Tealbook¹</i>	71 71	109 109	87 87	129 129	23 23	23 23	45 32	77 46	50 34	60 36

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

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

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

Item	2018			2019				2020				2018 ¹	2019 ¹	2020 ¹	2021 ¹
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
GDP chain-wt. price index <i>Previous Tealbook</i>	3.0	1.8	1.8	1.8	2.0	2.1	1.9	2.1	2.2	2.0	1.9	2.2	2.0	2.1	2.1
PCE chain-wt. price index <i>Previous Tealbook</i>	2.0	1.6	1.5	1.3	2.3	2.0	1.8	1.9	1.9	1.8	1.8	1.9	1.8	1.9	1.9
Energy <i>Previous Tealbook</i>	.7	3.3	-2.0	-18.5	10.7	1.1	.0	-.8	-1.0	-1.2	-1.2	3.5	-2.2	-1.0	-.7
Food <i>Previous Tealbook</i>	1.2	.4	.3	1.8	2.1	2.4	2.4	2.3	2.3	2.3	2.3	.5	2.2	2.3	2.3
Ex. food & energy <i>Previous Tealbook</i>	2.1	1.6	1.7	2.3	2.0	2.0	1.8	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0
Ex. food & energy, market based <i>Previous Tealbook</i>	2.2	1.2	1.5	2.3	1.9	1.8	1.6	1.9	1.8	1.8	1.8	1.7	1.9	1.8	1.8
CPI <i>Previous Tealbook</i>	2.1	2.0	1.5	.9	3.0	2.3	2.1	2.2	2.2	2.1	2.1	2.2	2.1	2.2	2.2
Ex. food & energy <i>Previous Tealbook</i>	1.9	2.0	2.2	2.6	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.2	2.4	2.4	2.4
ECI, hourly compensation ² <i>Previous Tealbook²</i>	2.4	3.0	2.4	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.0	2.8	2.8	2.8
Business sector															
Output per hour <i>Previous Tealbook</i>	3.4	1.4	1.8	.4	.7	.6	.8	1.2	1.5	1.3	1.3	1.9	.6	1.3	1.1
Compensation per hour <i>Previous Tealbook</i>	.3	3.2	3.6	2.7	3.8	3.8	3.8	3.7	3.7	3.7	3.7	2.9	3.5	3.7	3.7
Unit labor costs <i>Previous Tealbook</i>	.5	2.8	3.4	3.7	3.9	3.9	3.9	3.8	3.8	3.8	3.8	2.7	3.8	3.8	3.7
Core goods imports chain-wt. price index ³ <i>Previous Tealbook³</i>	.6	-1.2	.0	-.1	.8	.8	.8	.9	.9	.8	.8	.5	.6	.8	.7
Page 127 of 136															

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 <i>Previous Tealbook</i>	2.1 2.1	1.8 1.8	1.6 1.6	.9 .9	1.5 1.5	2.0 2.0	2.2 2.2	2.0 1.9	2.1 2.1	2.1 2.1
PCE chain-wt. price index <i>Previous Tealbook</i>	1.8 1.8	1.2 1.2	1.2 1.2	.3 .3	1.6 1.6	1.8 1.8	1.9 1.8	1.8 1.8	1.9 1.9	1.9 2.0
Energy <i>Previous Tealbook</i>	2.1 2.1	-2.9 -2.9	-6.9 -6.9	-16.4 -16.4	2.1 2.1	8.1 8.1	3.5 4.2	-2.2 -4.1	-1.0 -.1	-.7 .5
Food <i>Previous Tealbook</i>	1.3 1.3	.7 .7	2.8 2.8	.3 .3	-1.8 -1.8	.7 .7	.5 .5	2.2 2.3	2.3 2.3	2.3 2.3
Ex. food & energy <i>Previous Tealbook</i>	1.8 1.8	1.6 1.6	1.5 1.5	1.2 1.2	1.8 1.8	1.6 1.6	1.9 1.8	2.0 2.0	2.0 2.0	2.0 2.0
Ex. food & energy, market based <i>Previous Tealbook</i>	1.5 1.5	1.1 1.1	1.2 1.2	1.1 1.1	1.5 1.5	1.2 1.2	1.7 1.7	1.9 1.9	1.8 1.9	1.8 1.9
CPI <i>Previous Tealbook</i>	1.9 1.9	1.2 1.2	1.2 1.2	.4 .4	1.8 1.8	2.1 2.1	2.2 2.2	2.1 2.0	2.2 2.3	2.2 2.3
Ex. food & energy <i>Previous Tealbook</i>	1.9 1.9	1.7 1.7	1.7 1.7	2.0 2.0	2.2 2.2	1.8 1.7	2.2 2.2	2.4 2.5	2.4 2.4	2.4 2.5
ECI, hourly compensation ¹ <i>Previous Tealbook¹</i>	1.8 1.8	2.0 2.0	2.3 2.3	1.9 1.9	2.2 2.2	2.6 2.6	3.0 3.0	2.8 2.9	2.8 2.8	2.8 2.8
Business sector										
Output per hour <i>Previous Tealbook</i>	.1 .2	1.8 1.8	.2 .1	.7 .7	1.1 1.1	.7 .8	1.9 1.9	.6 .8	1.3 1.2	1.1 1.2
Compensation per hour <i>Previous Tealbook</i>	5.9 5.9	-.3 -.3	2.8 2.8	2.5 2.5	2.1 2.1	3.0 3.0	2.9 2.7	3.5 3.8	3.7 3.8	3.7 3.7
Unit labor costs <i>Previous Tealbook</i>	5.7 5.7	-2.0 -2.0	2.7 2.7	1.8 1.8	1.0 1.0	2.3 2.3	1.0 .8	2.9 3.0	2.4 2.6	2.5 2.5
Core goods imports chain-wt. price index ² <i>Previous Tealbook²</i>	-.4 -.4	-2.2 -2.2	-.4 -.4	-4.4 -4.4	-.7 -.7	1.1 1.1	.5 .5	.6 .9	.8 .9	.7 .8

1. Private-industry workers.

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

Other Macroeconomic Indicators

Item	2018			2019				2020				2018 ¹	2019 ¹	2020 ¹	2021 ¹	Class II FOMC - Restricted (FR)
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
<i>Employment and production</i>																
Nonfarm payroll employment ²	243	189	233	171	157	140	132	130	134	132	129	223	150	131	77	
Unemployment rate ³	3.9	3.8	3.8	3.9	3.7	3.7	3.6	3.6	3.6	3.6	3.6	3.8	3.6	3.6	3.7	
<i>Previous Tealbook³</i>	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	
Natural rate of unemployment ³	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	
<i>Previous Tealbook³</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 ³	60.4	60.4	60.6	60.7	60.8	60.7	60.7	60.7	60.7	60.7	60.7	60.6	60.7	60.7	60.4	
Employment-to-Population Trend ³	60.0	60.0	59.9	59.9	59.9	59.8	59.8	59.8	59.7	59.7	59.7	59.9	59.8	59.7	59.5	
Output gap ⁴	1.4	1.7	1.9	1.9	2.1	2.1	2.1	2.2	2.2	2.3	2.3	1.9	2.1	2.3	1.9	
<i>Previous Tealbook⁴</i>	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	
Industrial production ⁵	5.2	4.9	4.6	.5	2.8	.6	1.0	1.7	1.5	1.1	1.0	4.3	1.2	1.3	.7	
<i>Previous Tealbook⁵</i>	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	
Manufacturing industr. prod. ⁵	2.3	3.8	2.6	-.7	2.0	.5	.9	.9	1.0	1.2	1.1	2.6	.7	1.0	.5	
<i>Previous Tealbook⁵</i>	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	
Capacity utilization rate - mfg. ³	75.5	76.0	76.2	75.8	75.9	75.7	75.7	75.6	75.7	75.7	75.8	76.2	75.7	75.8	75.7	
<i>Previous Tealbook³</i>	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	
Housing starts ⁶	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
Light motor vehicle sales ⁶	17.2	16.9	17.5	16.7	16.7	16.8	16.8	16.8	16.8	16.7	16.7	17.2	16.7	16.7	16.6	
<i>Income and saving</i>																
Nominal GDP ⁵	7.6	4.9	4.6	2.7	4.6	4.1	3.8	4.1	4.4	4.1	4.0	5.3	3.8	4.1	3.6	
Real disposable pers. income ⁵	1.8	2.6	4.2	3.3	2.1	1.5	2.2	2.8	1.8	1.5	2.2	3.3	2.3	2.1	1.8	
<i>Previous Tealbook⁵</i>	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	
Personal saving rate ³	6.7	6.4	6.7	7.1	7.0	6.7	6.6	6.7	6.6	6.5	6.5	6.7	6.6	6.5	6.3	
<i>Previous Tealbook³</i>	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	
Corporate profits ⁷	12.5	14.7	-4.4	-10.1	1.9	2.2	-1.7	-4.7	4.5	2.7	2.2	6.7	-2.0	1.1	1.4	
Profit share of GNP ³	10.8	11.1	10.9	10.6	10.5	10.4	10.3	10.1	10.1	10.1	10.0	10.9	10.3	10.0	9.8	
Gross national saving rate ³	18.5	18.8	18.5	18.9	18.6	18.5	18.4	18.2	18.3	18.2	18.3	18.5	18.4	18.3	18.1	
Net national saving rate ³	3.3	3.6	3.7	4.1	3.6	3.4	3.2	2.9	2.9	2.9	2.8	3.7	3.2	2.8	2.4	

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

2. Average monthly change, thousands.

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

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

5. Percent change, annual rate.

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

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

Greensheets

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 ¹	181	192	251	227	193	179	223	150	131	77
Unemployment rate ²	7.8	7.0	5.7	5.0	4.8	4.1	3.8	3.6	3.6	3.7
<i>Previous Tealbook</i> ²	7.8	7.0	5.7	5.0	4.8	4.1	3.8	3.5	3.5	3.6
Natural rate of unemployment ²	5.6	5.4	5.1	4.9	4.8	4.6	4.6	4.6	4.6	4.6
<i>Previous Tealbook</i> ²	5.6	5.4	5.1	4.9	4.8	4.6	4.6	4.6	4.6	4.6
Employment-to-Population Ratio ²	58.7	58.5	59.3	59.4	59.8	60.2	60.6	60.7	60.7	60.4
Employment-to-Population Trend ²	60.5	60.4	60.3	60.2	60.1	60.1	59.9	59.8	59.7	59.5
Output gap ³	-3.8	-3.0	-1.0	-.4	.1	.9	1.9	2.1	2.3	1.9
<i>Previous Tealbook</i> ³	-3.7	-2.8	-.8	-.2	.3	1.1	2.2	2.6	2.7	2.2
Industrial production	2.2	2.3	3.4	-3.3	-.5	3.0	4.3	1.2	1.3	.7
<i>Previous Tealbook</i>	2.2	2.3	3.4	-3.3	-.5	3.0	4.1	1.3	1.5	.8
Manufacturing industr. prod.	1.4	1.1	1.4	-1.6	-.1	1.9	2.6	.7	1.0	.5
<i>Previous Tealbook</i>	1.4	1.1	1.4	-1.6	-.1	1.9	2.5	1.2	1.0	.5
Capacity utilization rate - mfg. ²	74.7	75.1	76.3	75.4	74.4	75.2	76.2	75.7	75.8	75.7
<i>Previous Tealbook</i> ²	74.7	75.1	76.3	75.4	74.4	75.2	76.1	76.2	76.5	76.6
Housing starts ⁴	.8	.9	1.0	1.1	1.2	1.2	1.2	1.2	1.2	1.2
Light motor vehicle sales ⁴	14.4	15.5	16.5	17.4	17.5	17.1	17.2	16.7	16.7	16.6
<i>Income and saving</i>										
Nominal GDP	3.6	4.4	4.4	2.9	3.4	4.5	5.3	3.8	4.1	3.6
Real disposable pers. income	4.9	-2.5	5.2	3.1	1.6	2.8	3.3	2.3	2.1	1.8
<i>Previous Tealbook</i>	4.9	-2.5	5.2	3.1	1.6	2.8	3.0	2.6	2.1	1.6
Personal saving rate ²	10.2	6.3	7.4	7.4	6.4	6.3	6.7	6.6	6.5	6.3
<i>Previous Tealbook</i> ²	10.2	6.3	7.4	7.4	6.4	6.3	6.2	6.4	6.4	6.1
Corporate profits ⁵	.7	3.9	5.9	-10.7	7.6	3.3	6.7	-2.0	1.1	1.4
Profit share of GNP ²	11.9	11.8	12.0	10.4	10.8	10.7	10.9	10.3	10.0	9.8
Gross national saving rate ²	18.8	19.2	20.2	19.4	18.3	18.3	18.5	18.4	18.3	18.1
Net national saving rate ²	3.7	4.0	5.1	4.3	3.0	3.1	3.7	3.2	2.8	2.4

1. Average monthly change, thousands.

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

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

Values are for the fourth quarter of the year indicated.

4. Level, millions; values are annual averages.

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

Staff Projections of Government-Sector Accounts and Related Items

Item	2016	2017	2018	2019	2020	2021	2018	2019				
							Q4	Q1	Q2	Q3		
Unified federal budget¹							Nominal dollars, billions					
Receipts	3,268	3,316	3,329	3,507	3,707	3,846	771	736	1,139	861		
Outlays	3,853	3,982	4,108	4,391	4,672	4,903	1,090	1,122	1,108	1,071		
Surplus/deficit	-585	-665	-779	-884	-965	-1,057	-319	-387	32	-210		
Surplus/deficit	-3.2	-3.5	-3.8	-4.2	-4.4	-4.6	-6.2	-7.5	.6	-4.0		
<i>Previous Tealbook</i>	-3.2	-3.5	-3.8	-4.6	-5.2	-5.6	-7.3	-7.2	-.2	-4.2		
Primary surplus/deficit	-1.9	-2.1	-2.2	-2.5	-2.4	-2.6	-4.3	-5.8	2.6	-2.7		
Net interest	1.3	1.4	1.6	1.7	2.0	2.1	1.9	1.6	2.0	1.3		
Cyclically adjusted surplus/deficit	-3.0	-3.6	-4.4	-5.0	-5.4	-5.7	-7.0	-8.3	-.3	-4.9		
Federal debt held by public	76.4	76.1	77.8	76.7	79.9	81.8	78.5	77.8	77.1	76.7		
Government in the NIPA²							Real percent change, annual rate					
Purchases	.9	.1	1.7	2.1	1.6	1.0	.0	.7	4.0	1.8		
Consumption	.9	-.1	1.5	1.6	1.2	.7	.4	.0	3.8	1.2		
Investment	.7	1.4	2.4	4.0	3.1	2.1	-.9	3.9	4.4	4.0		
State and local construction	1.8	-2.9	1.0	2.5	1.0	1.0	-9.1	2.0	3.0	3.0		
Real disposable personal income	1.6	2.8	3.2	2.2	2.1	1.8	4.2	3.1	2.2	1.5		
Contribution from transfers ³	.3	.2	.5	.8	.6	.8	.5	1.8	.3	.3		
Contribution from taxes ³	-.1	-.6	.0	-.8	-.5	-.5	-.2	-1.4	-.4	-.5		
Government employment							Average net change in monthly payrolls, thousands					
Federal	3	-2	0	2	1	1	1	2	2	1		
State and local	14	9	9	9	9	9	1	8	9	9		
Fiscal indicators²							Percentage point contribution to change in real GDP, annual rate					
Fiscal effect (FE) ⁴	.4	.1	.4	.7	.6	.4	.3	.6	1.1	.5		
Discretionary policy actions (FI)	.3	.2	.6	.6	.5	.2	.4	.5	1.0	.5		
<i>Previous Tealbook</i>	.3	.2	.7	.6	.5	.2	.6	.4	.9	.6		
Federal purchases	.0	.1	.2	.2	.2	.1	.1	.0	.5	.2		
State and local purchases	.1	-.1	.1	.1	.1	.1	-.1	.1	.1	.1		
Taxes and transfers	.1	.1	.3	.3	.2	.0	.3	.3	.3	.2		
Cyclical	-.1	-.1	-.2	-.1	-.1	.0	-.2	-.1	-.1	-.1		
Other	.2	.1	.0	.2	.1	.2	.1	.2	.3	.1		

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
Real GDP¹												
Total foreign	3.0	2.1	2.1	1.7	1.7	2.4	2.6	2.3	2.6	2.6	2.6	2.6
<i>Previous Tealbook</i>	3.1	2.0	2.1	2.1	2.1	2.4	2.6	2.3	2.6	2.7	2.7	2.7
Advanced foreign economies	1.3	2.2	1.0	.8	.9	1.4	1.7	1.0	1.6	1.7	1.7	1.7
Canada	1.3	2.6	2.0	.4	.8	1.9	1.7	1.7	1.9	1.9	1.8	1.8
Japan	-.4	1.9	-2.4	1.9	.5	.6	3.0	-3.5	.8	1.0	1.0	.9
United Kingdom	.4	1.7	2.5	.7	.5	.9	1.9	1.9	1.8	1.8	1.7	1.7
Euro area	1.4	1.7	.6	.9	1.0	1.1	1.0	1.1	1.2	1.4	1.5	1.6
Germany	1.5	1.8	-.8	.1	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4
Emerging market economies	4.8	2.0	3.1	2.6	2.5	3.4	3.5	3.5	3.6	3.6	3.6	3.6
Asia	5.8	4.3	3.9	4.0	3.8	4.4	4.6	4.6	4.4	4.4	4.4	4.4
Korea	4.1	2.4	2.3	3.9	1.8	2.4	2.5	2.5	2.5	2.5	2.5	2.5
China	7.4	6.3	5.8	5.9	5.7	6.1	6.4	6.3	6.0	6.0	5.9	5.9
Latin America	3.8	-.7	2.2	.8	1.0	2.3	2.3	2.4	2.6	2.7	2.7	2.7
Mexico	4.2	-.6	2.4	1.0	.8	2.0	2.1	2.3	2.5	2.6	2.6	2.6
Brazil	1.7	.2	2.2	.5	1.7	2.2	2.4	2.5	2.6	2.8	2.8	2.8
Consumer prices²												
Total foreign	2.5	1.7	3.6	2.0	.5	2.3	2.2	2.6	2.3	2.3	2.3	2.3
<i>Previous Tealbook</i>	2.6	1.7	3.7	2.2	2.0	2.3	2.3	2.7	2.3	2.3	2.3	2.3
Advanced foreign economies	2.4	1.4	2.5	.7	.5	1.6	1.5	2.4	1.5	1.5	1.5	1.5
Canada	3.3	1.2	2.6	1.1	.9	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Japan	2.8	-1.6	2.0	-.1	1.1	.7	1.0	6.3	.9	.9	1.0	1.0
United Kingdom	2.3	2.0	2.9	1.9	.8	2.0	2.2	2.3	2.3	2.2	2.2	2.2
Euro area	1.8	2.6	2.6	.7	-.2	1.1	1.3	1.3	1.2	1.2	1.2	1.2
Germany	1.7	2.7	3.1	1.1	.4	1.7	1.7	1.8	1.8	1.9	1.9	2.0
Emerging market economies	2.6	2.0	4.3	2.8	.6	2.7	2.7	2.7	2.8	2.8	2.8	2.8
Asia	1.9	1.2	3.3	1.9	.0	2.5	2.3	2.4	2.6	2.6	2.6	2.6
Korea	1.6	2.2	1.9	1.5	-2.2	1.3	1.9	1.9	2.0	2.1	2.1	2.1
China	1.5	.7	4.1	2.4	.0	2.4	2.1	2.1	2.4	2.5	2.5	2.5
Latin America	4.3	4.0	7.1	5.1	1.8	3.2	3.6	3.6	3.4	3.4	3.4	3.4
Mexico	4.1	3.8	6.8	4.6	1.3	2.8	3.3	3.3	3.2	3.2	3.2	3.2
Brazil	3.1	4.3	6.6	2.5	2.0	3.6	4.1	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
Real GDP¹										
Total foreign	2.2	3.0	3.0	2.0	2.8	3.0	2.2	2.2	2.6	2.6
<i>Previous Tealbook</i>	2.2	3.0	2.9	1.9	2.7	2.9	2.3	2.3	2.7	2.6
Advanced foreign economies	.3	2.4	2.1	.9	1.8	2.6	1.3	1.2	1.6	1.7
Canada	.7	3.4	2.8	-.4	1.8	2.9	1.6	1.5	1.9	1.7
Japan	.3	2.8	-.4	1.0	1.2	2.4	.3	.1	.9	.8
United Kingdom	1.6	2.6	3.1	2.2	1.7	1.6	1.3	1.3	1.8	1.6
Euro area	-1.1	.7	1.6	2.0	2.1	2.7	1.1	1.0	1.4	1.7
Germany	.2	1.6	2.3	1.3	1.9	2.8	.6	1.3	1.3	1.5
Emerging market economies	4.2	3.6	3.9	3.2	3.8	3.4	3.1	3.2	3.6	3.6
Asia	5.8	5.4	5.1	4.6	5.1	5.2	4.5	4.4	4.4	4.3
Korea	2.1	3.5	2.8	3.2	2.6	2.8	3.2	2.3	2.5	2.3
China	8.0	7.6	7.1	6.8	6.8	6.7	6.4	6.1	5.9	5.7
Latin America	2.9	1.7	2.8	1.9	2.5	1.7	1.5	2.0	2.7	2.8
Mexico	3.0	1.2	3.4	2.8	3.3	1.5	1.7	1.8	2.6	2.8
Brazil	2.5	2.6	-.1	-5.5	-2.3	2.3	1.1	2.2	2.7	2.8
Consumer prices²										
Total foreign	2.3	2.4	2.0	1.4	1.9	2.5	2.5	1.9	2.3	2.3
<i>Previous Tealbook</i>	2.3	2.4	2.0	1.4	1.9	2.6	2.6	2.3	2.3	2.3
Advanced foreign economies	1.3	1.0	1.2	.5	.9	1.5	1.7	1.5	1.5	1.5
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	2.3	.9	1.0
United Kingdom	2.6	2.1	.9	.1	1.2	3.0	2.3	1.8	2.2	2.2
Euro area	2.3	.8	.2	.3	.7	1.4	1.9	.8	1.2	1.3
Germany	2.0	1.4	.4	.5	1.1	1.6	2.2	1.4	1.9	2.1
Emerging market economies	3.1	3.4	2.6	2.0	2.6	3.2	2.9	2.2	2.8	2.8
Asia	2.7	3.2	1.8	1.5	2.2	2.0	2.1	1.8	2.6	2.6
Korea	1.7	1.1	1.0	.9	1.4	1.4	1.8	.7	2.0	2.1
China	2.1	2.9	1.5	1.5	2.1	1.8	2.2	1.7	2.5	2.5
Latin America	4.3	4.0	4.7	3.2	4.0	6.4	5.1	3.0	3.4	3.3
Mexico	4.1	3.6	4.2	2.3	3.3	6.6	4.8	2.7	3.2	3.2
Brazil	5.6	5.8	6.5	10.4	7.1	2.8	4.1	3.5	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

Quarterly Data

	2018				2019				Projected				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

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

U.S. current account balance	-496.7	-414.8	-509.2	-609.3	-636.9	-656.9	-673.8	-689.5	-713.7	-714.1	-745.8	-748.3				
<i>Previous Tealbook</i>	-486.8	-404.9	-499.3	-565.8	-599.4	-619.6	-630.1	-643.6	-672.5	-668.2	-695.5	-699.2				
Current account as percent of GDP	-2.5	-2.0	-2.5	-2.9	-3.0	-3.1	-3.1	-3.2	-3.3	-3.2	-3.3	-3.3				
<i>Previous Tealbook</i>	-2.4	-2.0	-2.4	-2.7	-2.8	-2.9	-2.9	-3.0	-3.1	-3.0	-3.1	-3.1				
Net goods & services	-625.8	-548.3	-644.5	-665.5	-664.3	-677.5	-683.4	-684.8	-694.3	-687.9	-702.3	-699.1				
Investment income, net	258.2	263.2	251.6	173.6	140.4	122.6	117.7	99.4	93.6	75.7	64.6	54.9				
Direct, net	310.4	316.4	310.6	277.9	259.3	260.0	271.6	271.3	282.6	283.5	291.6	300.5				
Portfolio, net	-52.2	-53.1	-59.0	-104.3	-118.9	-137.4	-153.9	-171.9	-189.0	-207.8	-227.0	-245.6				
Other income and transfers, net	-129.1	-129.7	-116.2	-117.4	-113.0	-102.0	-108.1	-104.1	-113.0	-102.0	-108.1	-104.1				

Annual Data

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Projected	Projected	Projected	Projected	Projected	Projected
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Billions of dollars																
U.S. current account balance	-426.8	-348.8	-365.2	-407.8	-432.9	-449.1	-507.5	-664.3	-730.5	-766.2						
<i>Previous Tealbook</i>	-426.8	-348.8	-365.2	-407.8	-432.9	-449.1	-489.2	-623.2	-683.8	-716.4						
Current account as percent of GDP	-2.6	-2.1	-2.1	-2.2	-2.3	-2.3	-2.5	-3.1	-3.3	-3.3						
<i>Previous Tealbook</i>	-2.6	-2.1	-2.1	-2.2	-2.3	-2.3	-2.4	-2.9	-3.1	-3.1						
Net goods & services	-537.4	-461.1	-489.6	-498.5	-502.0	-552.3	-621.0	-677.5	-695.9	-694.6						
Investment income, net	216.1	215.4	229.0	214.7	205.7	235.1	236.7	120.1	72.2	35.3						
Direct, net	285.5	283.3	284.2	284.6	272.6	298.4	303.8	265.6	289.5	321.1						
Portfolio, net	-69.4	-67.9	-55.3	-70.0	-66.9	-63.3	-67.2	-145.5	-217.4	-285.8						
Other income and transfers, net	-105.5	-103.1	-104.6	-123.9	-136.6	-132.0	-123.1	-106.8	-106.8	-106.8						

Class I FOMC – Restricted Controlled (FR)

Report to the FOMC on Economic Conditions and Monetary Policy

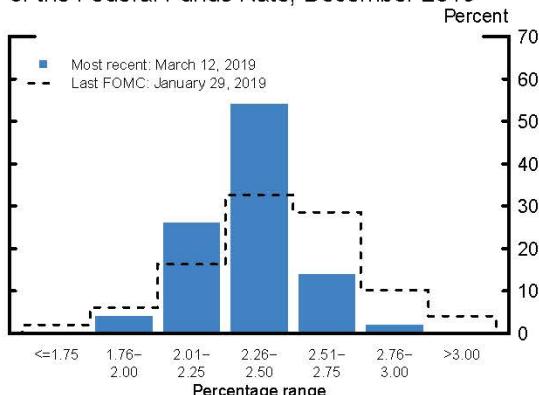


Book B Monetary Policy Alternatives

March 14, 2019

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

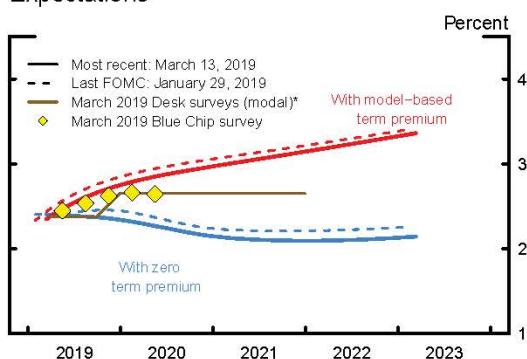
Figure 1: Market-Implied Probability Distribution of the Federal Funds Rate, December 2019



Note: Estimated from federal funds futures options, not adjusted for risk premiums.

Source: CME Group; Federal Reserve Board staff estimates.

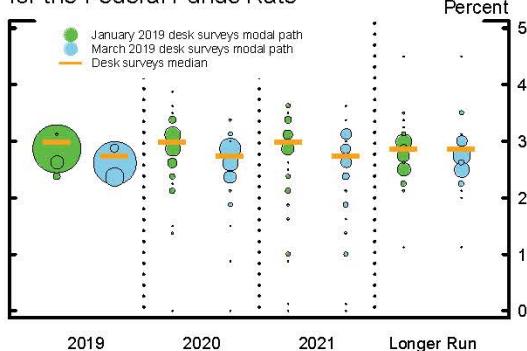
Figure 2: Measures of Federal Funds Rate Expectations



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. The Blue Chip path is the average of respondents' expectations for the federal funds rate.

* Median of respondents' modal paths for the federal funds rate.
Source: Bloomberg; Blue Chip; Board staff calculations; FRBNY.

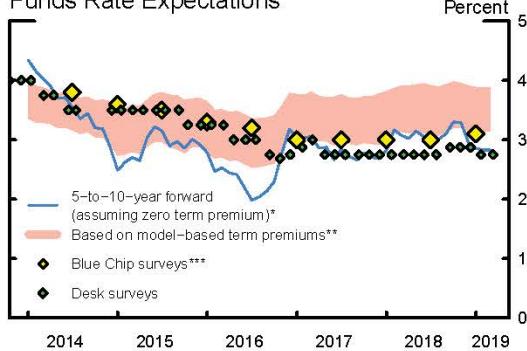
Figure 3: Desk Surveys Modal Projections for the Federal Funds Rate



Note: Based on all responses from the January and March 2019 Desk surveys. Each dot is centered on a different projected rate and is scaled in size by the number of respondents making that projection.

Source: FRBNY.

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

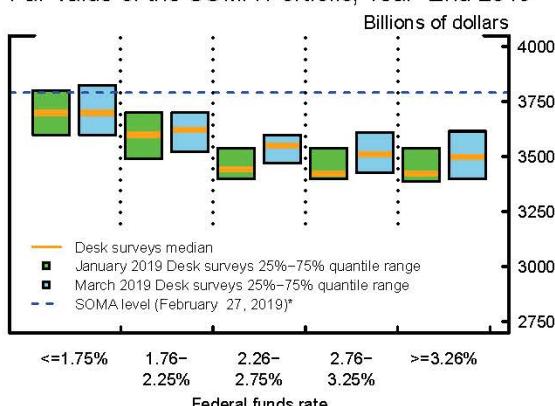


* Monthly average 5-to-10-year forward rate derived from prices of Treasury securities.

** 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 Priebsch (2017).

*** Most recent long-run survey value is from the December 2018 Blue Chip survey.
Source: Blue Chip; FRBNY; Federal Reserve Board staff estimates.

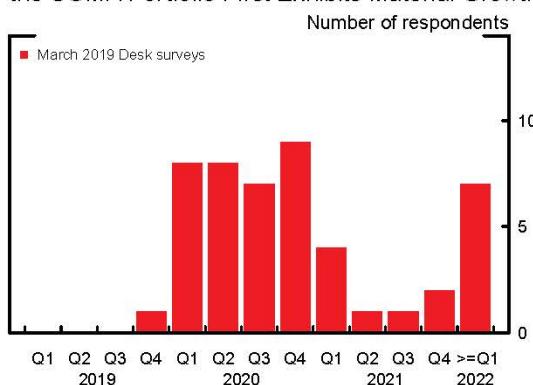
Figure 5: Desk Surveys Projections for the Par Value of the SOMA Portfolio, Year-End 2019



Note: Based on all responses from the January and March 2019 Desk surveys. Projections are shown conditional on different ranges of the target federal funds rate at year-end 2019.

* SOMA level is indicated at the time of the March 2019 Desk surveys.
Source: FRBNY.

Figure 6: Expected Quarter in which the Par Value of the SOMA Portfolio First Exhibits Material Growth



Note: Conditional on not moving to the zero-lower bound at any point between now and the end of 2025. Based on all responses from the March 2019 Desk surveys.
Source: FRBNY.

Redemptions and Reinvestments of SOMA Principal Payments

Projections for Treasury Securities
(Billions of dollars)

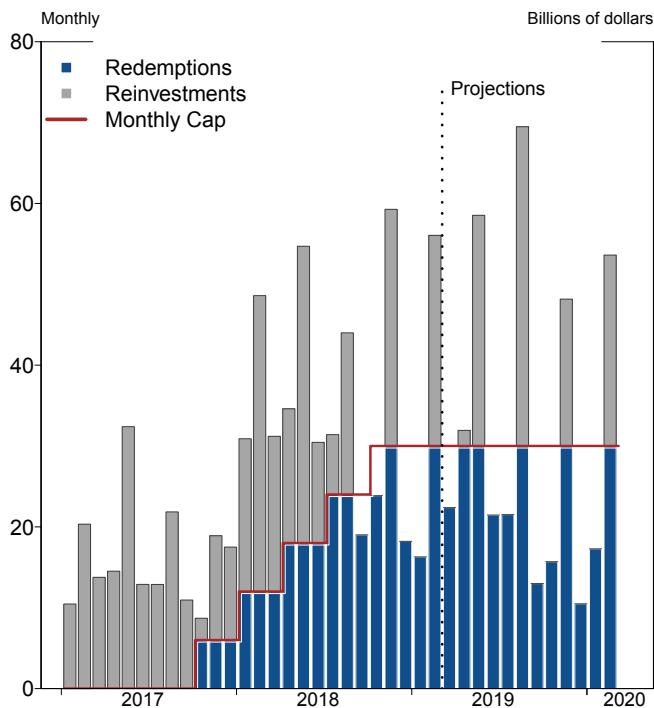
	Redemptions		Reinvestments	
	Period	Since Oct. 2017	Period	Since Oct. 2017
2019: Q1	68.7	315.7	26.1	250.3
2019: Q2	81.5	397.2	30.5	280.8
2019: Q3	64.5	461.7	39.5	320.3
2019: Q4	56.2	517.9	18.2	338.4
2018	229.1	247.1	197.1	224.2
2019	270.8	517.9	114.2	338.4
2020*	47.3	565.1	23.6	362.0

*Until projected normalization in February 2020.

Projections for Agency Securities
(Billions of dollars)

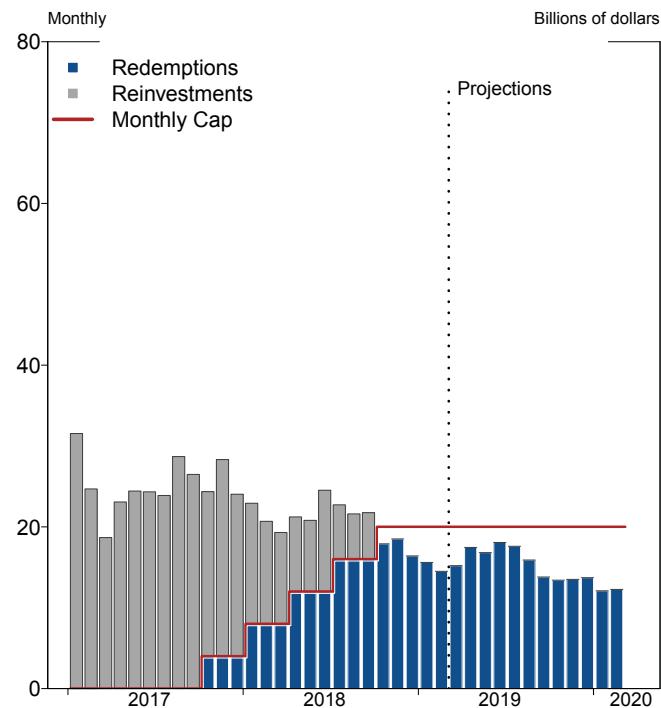
	Redemptions		Reinvestments	
	Period	Since Oct. 2017	Period	Since Oct. 2017
2019: Q1	45.3	218.1	0	152.3
2019: Q2	52.3	270.4	0	152.3
2019: Q3	47.3	317.7	0	152.3
2019: Q4	40.6	358.4	0	152.3
2018	160.8	172.8	87.6	152.3
2019	185.6	358.4	0.0	152.3
2020*	24.4	382.7	0.0	152.3

*Until projected normalization in February 2020.

SOMA Treasury Securities
Principal Payments

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

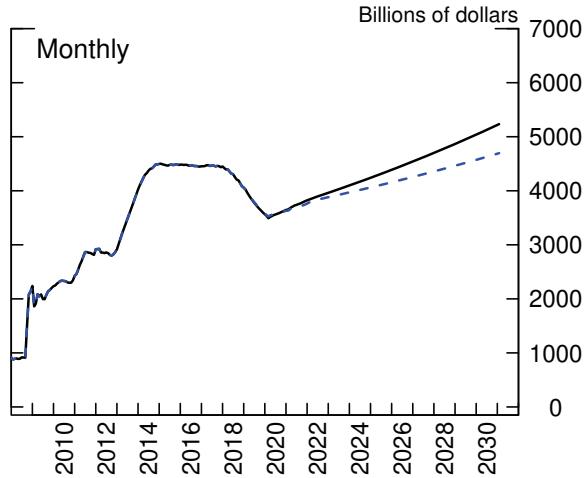
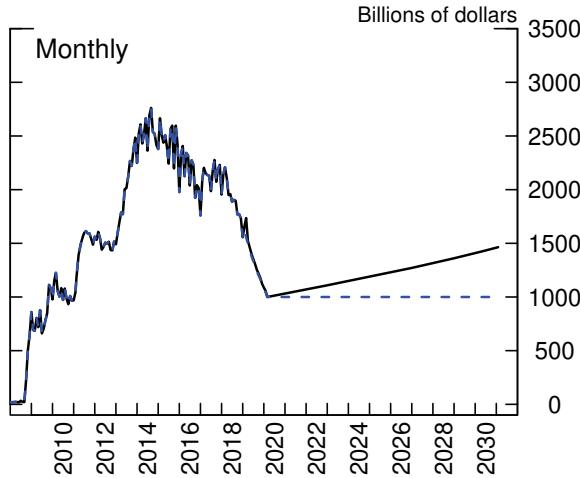
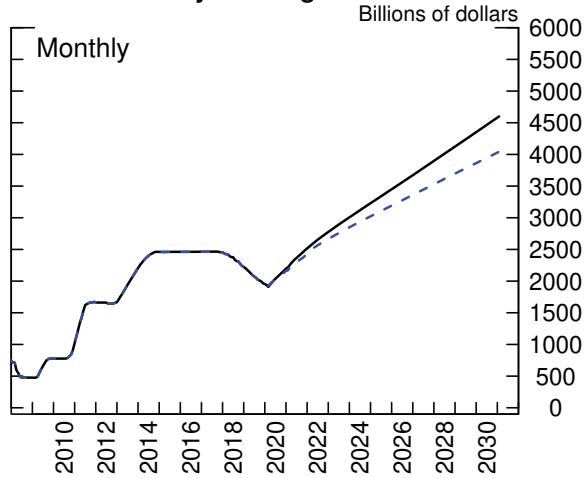
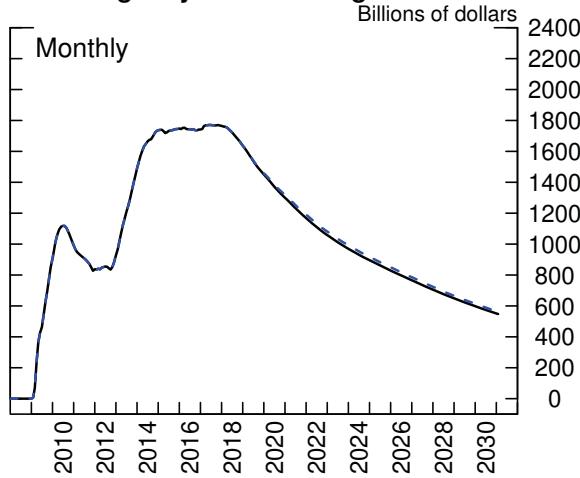
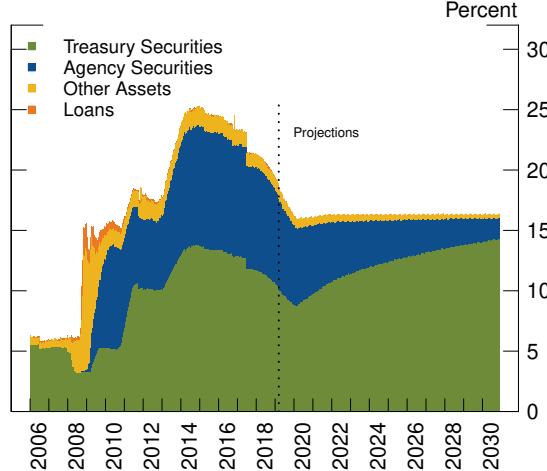
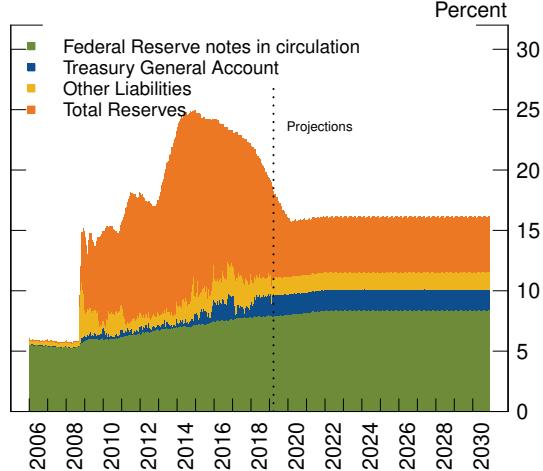
Source: Federal Reserve Board staff calculations

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

— March Tealbook baseline - - - January 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 -- March Tealbook
(Billions of dollars)

	Historical*			Projections				
	Aug 2014	Sep 2017	Feb 2019	Dec 2019	Dec 2020	Dec 2022	Dec 2025	Dec 2030
Total assets	4,416	4,460	3,968	3,565	3,646	3,962	4,387	5,218
Selected assets								
Loans and other credit extensions**	2	6	0	0	0	0	0	0
Securities held outright	4,157	4,240	3,785	3,407	3,501	3,835	4,280	5,134
U.S. Treasury securities	2,437	2,465	2,175	1,954	2,199	2,775	3,449	4,580
Agency debt securities	42	7	2	2	2	2	2	2
Agency mortgage-backed securities	1,678	1,768	1,608	1,450	1,300	1,058	829	551
Unamortized premiums	209	162	137	123	109	88	66	41
Unamortized discounts	-19	-14	-13	-12	-11	-8	-7	-5
Total other assets	66	66	59	47	47	47	47	47
Total liabilities	4,360	4,419	3,929	3,525	3,606	3,918	4,337	5,154
Selected liabilities								
Federal Reserve notes in circulation	1,249	1,532	1,665	1,748	1,856	2,041	2,259	2,684
Reverse repurchase agreements	277	557	256	255	264	283	313	372
Deposits with Federal Reserve Banks	2,825	2,323	2,003	1,519	1,483	1,591	1,761	2,092
Reserve balances held by depository institutions	2,762	2,073	1,736	1,088	1,034	1,110	1,228	1,460
U.S. Treasury, General Account	49	159	202	371	386	414	458	545
Other deposits	15	91	66	60	62	67	74	88
Earnings remittances due to the U.S. Treasury	3	2	2	0	0	0	0	0
Total Federal Reserve Bank capital***	56	41	39	39	40	44	50	63

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; February 2019 is the most recent historical value.

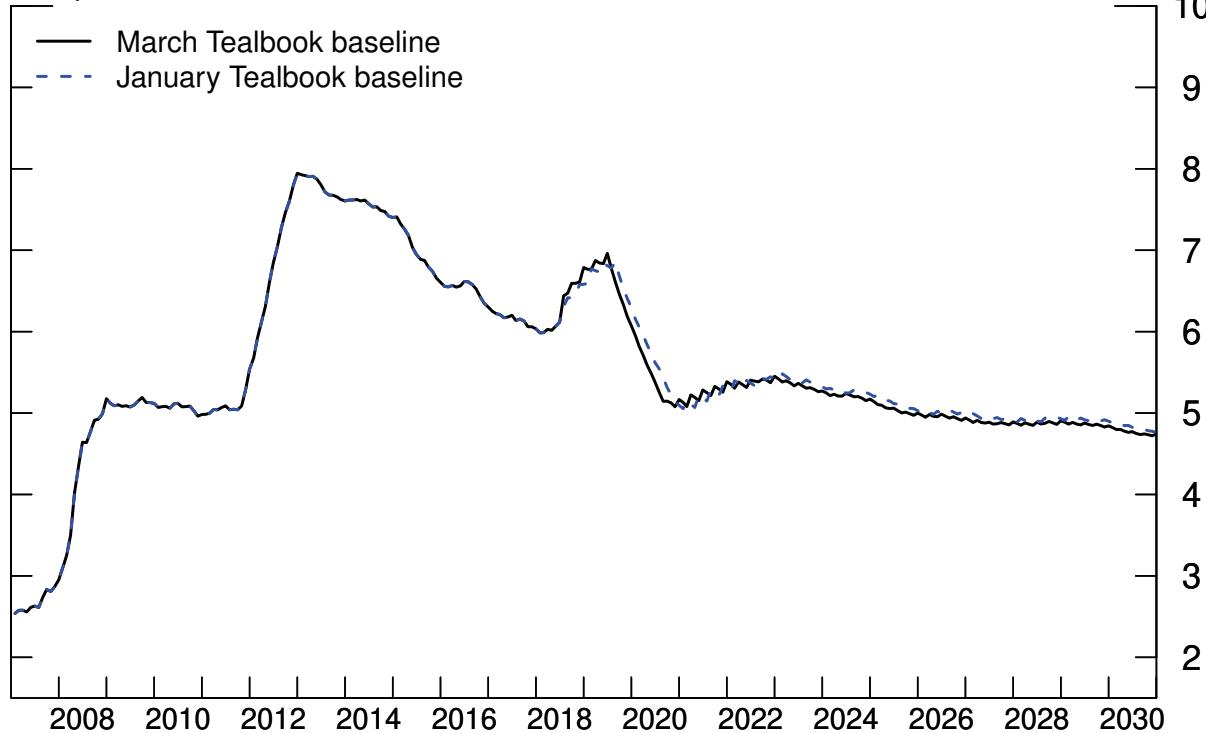
**Loans and other credit extensions includes discount window credit; central bank liquidity swaps; and net portfolio holdings of Maiden Lane LLC.

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

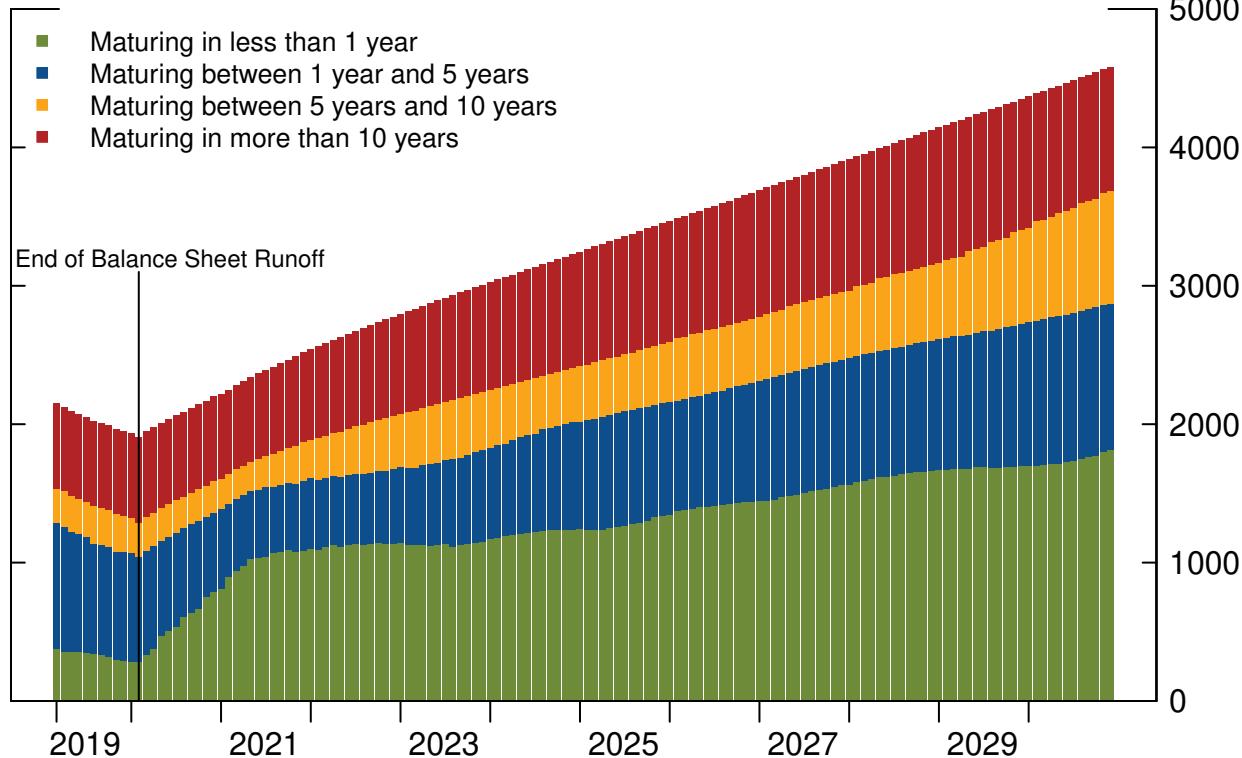
Projections for the Characteristics of SOMA Treasury Securities Holdings

SOMA Weighted-Average Treasury Duration

Monthly

**Maturity Composition of SOMA Treasury Portfolio**

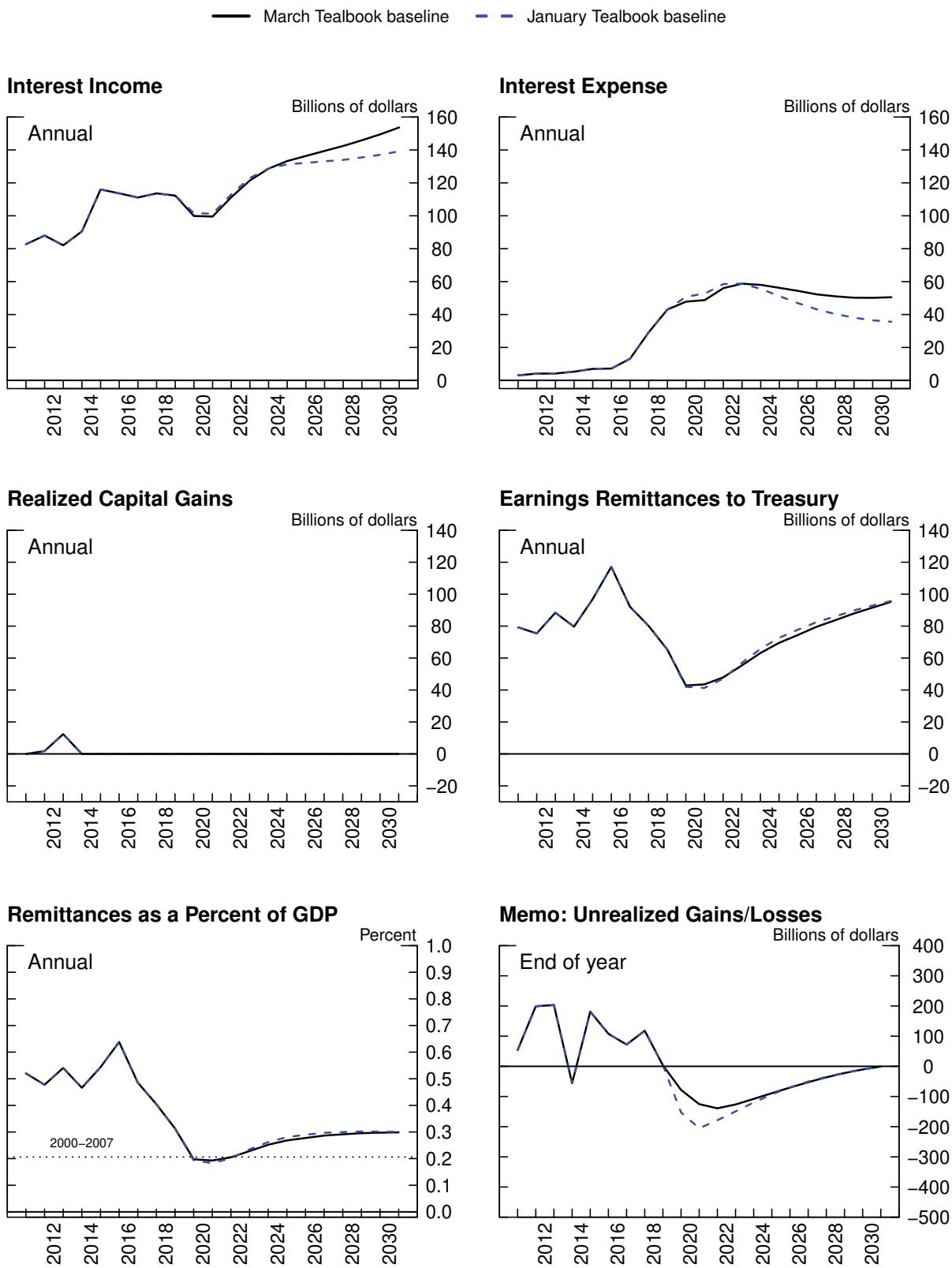
March Tealbook baseline



Balance Sheet & Income

Income Projections

Balance Sheet & Income



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

Date	March Tealbook TTPE	January Tealbook TTPE	January Tealbook TPE
Quarterly Averages			
2019:Q1	-130	-128	-77
Q2	-129	-126	-75
Q3	-127	-124	-73
Q4	-126	-123	-71
2020:Q4	-122	-118	-66
2021:Q4	-120	-115	-63
2022:Q4	-119	-112	-60
2023:Q4	-116	-109	-57
2024:Q4	-114	-105	-54
2025:Q4	-112	-103	-51
2026:Q4	-110	-100	-49
2027:Q4	-109	-98	-47
2028:Q4	-108	-96	-45
2029:Q4	-106	-93	-43
2030:Q4	-105	-91	-41

* The figures show estimated effects on the 10-year Treasury term premium.

