

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

November 26, 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 staff's projection for GDP growth in 2019 is well aligned with the projections from both the Survey of Professional Forecasters (SPF) and the Blue Chip consensus, but it is a few tenths of a percentage point higher than each in 2020. The staff's unemployment rate forecast is the same as the SPF and Blue Chip projections in 2019, but it is 0.2 percentage point below them in 2020.

The staff's forecast of headline CPI inflation for 2019 is a little higher than the Blue Chip and SPF forecasts but well aligned with them for 2020. With regard to headline PCE price inflation, the staff projection is the same as the SPF consensus projection in 2019 but 0.2 percentage point below it in 2020. The staff's projection for core PCE price inflation is below the SPF forecast in 2019 and 2020.

Comparison of Tealbook and Outside Forecasts

	2019	2020
GDP (Q4/Q4 percent change)		
November Tealbook	2.1	2.1
Blue Chip (11/10/19)	2.2	1.7
SPF median (11/15/19)	2.2	1.8
Unemployment rate (Q4 level)		
November Tealbook	3.6	3.5
Blue Chip (11/10/19)	3.6	3.7
SPF median (11/15/19)	3.6	3.7
CPI inflation (Q4/Q4 percent change)		
November Tealbook	2.0	2.0
Blue Chip (11/10/19)	1.9	2.0
SPF median (11/15/19)	1.8	2.1
PCE price inflation (Q4/Q4 percent change)		
November Tealbook	1.5	1.7
SPF median (11/15/19)	1.5	1.9
Core PCE price inflation (Q4/Q4 percent change)		
November Tealbook	1.6	1.9
SPF median (11/15/19)	1.8	2.0

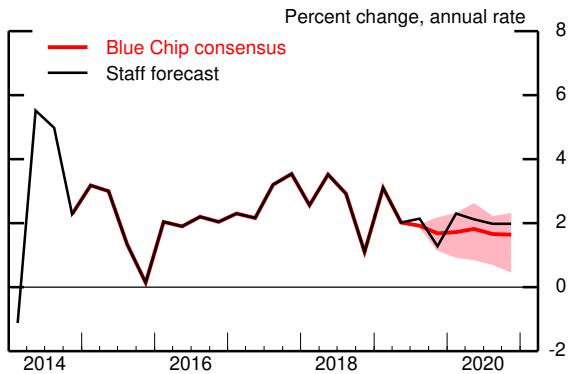
Note: SPF is the Survey of Professional Forecasters, CPI is the consumer price index, and PCE is personal consumption expenditures. Blue Chip does not provide results for overall and core PCE price inflation. The Blue Chip consensus forecast includes input from about 50 panelists, and the SPF about 40.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

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

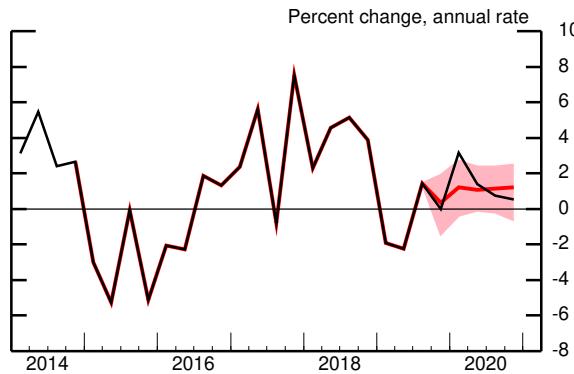
Tealbook Forecast Compared with Blue Chip

(Blue Chip survey released November 10, 2019)

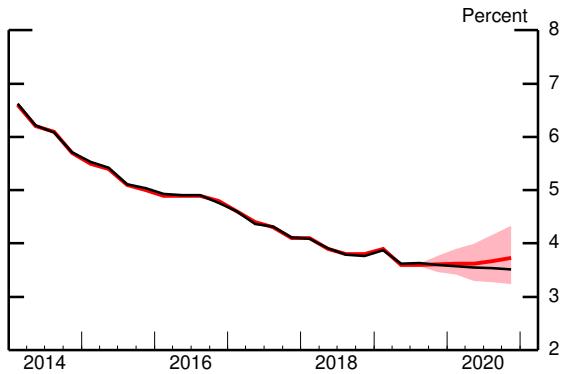
Real GDP



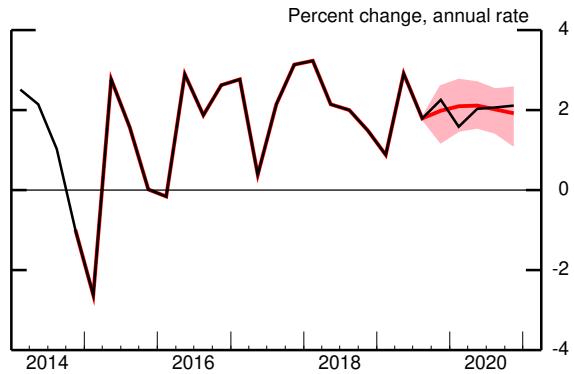
Industrial Production



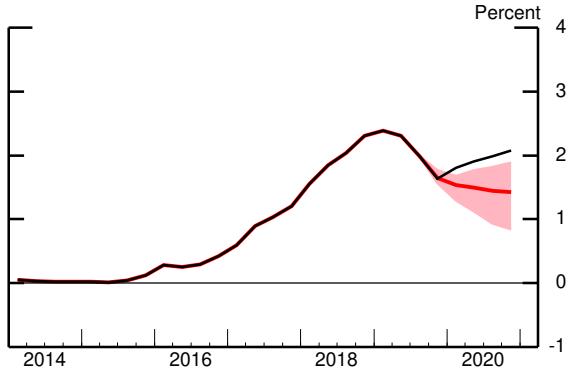
Unemployment Rate



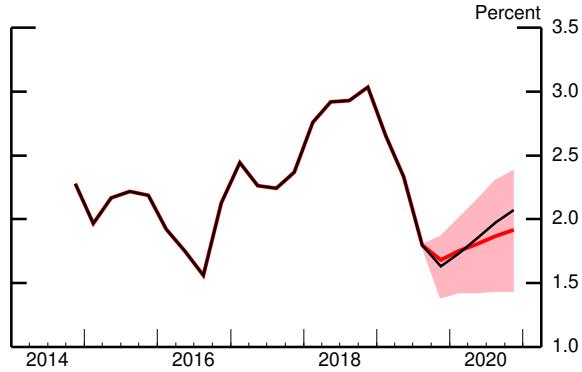
Consumer Price Index



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 September FOMC meeting. The following table compares the staff's current economic projection with the one we presented in the September Tealbook.

The current projection is very similar to that in the September Tealbook. In particular, our projection of slowing GDP growth and an unemployment rate that essentially moves sideways over the medium term remains the same.

Looking more closely at the differences relative to September, in the second half of this year—while both data on GDP and the unemployment rate have come in close to what we expected in September—core PCE inflation has surprised us somewhat to the downside. Beyond this year, output growth is projected to be slightly stronger, the unemployment rate a touch lower, and core PCE inflation a bit higher than in the September Tealbook.

The federal funds rate assumed in our projection is revised lower in the near term to reflect the Committee's recent decisions to lower the federal funds rate target, but that revision fades over time, as the policy rule that we use in our baseline projection calls for the funds rate to increase to about its assumed long-run value by the end of 2022.

Staff Economic Projections Compared with the September Tealbook

Variable	2019		2019	2020	2021	2022	Longer run
	H1	H2					
Real GDP ¹ <i>September Tealbook</i>	2.6 2.5	1.7 1.8	2.1 2.1	2.1 2.0	1.9 1.8	1.7 1.7	1.7 1.7
Unemployment rate ² <i>September Tealbook</i>	3.6 3.6	3.6 3.7	3.6 3.7	3.5 3.6	3.5 3.6	3.5 3.6	4.4 4.4
PCE inflation ¹ <i>September Tealbook</i>	1.4 1.3	1.5 1.6	1.5 1.5	1.7 1.8	1.9 1.8	1.9 1.8	2.0 2.0
Core PCE inflation ¹ <i>September Tealbook</i>	1.5 1.4	1.8 2.1	1.6 1.8	1.9 1.8	1.9 1.8	1.9 1.8	n.a. n.a.
Federal funds rate ² <i>September Tealbook</i>	2.40 2.40	1.65 2.23	1.65 2.23	2.05 2.40	2.34 2.46	2.49 2.50	2.50 2.50
Memo: Federal funds rate, end of period <i>September Tealbook</i>	2.38 2.38	1.64 2.24	1.64 2.24	2.06 2.40	2.37 2.47	2.53 2.50	2.50 2.50
Output gap ^{2,3} <i>September Tealbook</i>	1.6 1.5	1.5 1.5	1.5 1.5	1.8 1.7	1.8 1.6	1.7 1.4	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.

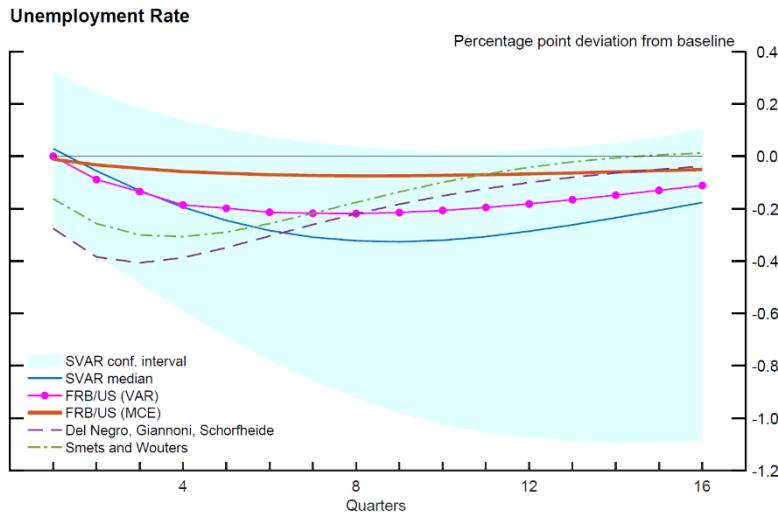
3. Percent difference between actual and potential. A negative number indicates that the economy is operating below potential.

n.a. Not available.

How Sensitive Is the Economy to Interest Rates?

Despite the importance of the question and decades of research, a great deal of uncertainty still surrounds the sensitivity of economic activity to changes in the federal funds rate. This uncertainty is illustrated in the figure by the range of model estimates of the response of the unemployment rate to a reduction in the federal funds rate. Specifically, the figure shows the impulse response of the unemployment rate to an immediate 100 basis point reduction in the federal funds rate that then fades over the next several quarters from four estimated structural models and a time-series structural vector autoregressive (SVAR) model.¹ The choice of the model matters a lot for the speed and magnitude of the response: Across models, the peak response of the unemployment rate ranges between negative 0.1 and negative 0.4 percentage point, with very different timing. The blue shaded area denotes the 90 percent confidence interval from the time-series model, which is very wide. The staff's judgmental projection embeds an overall interest rate sensitivity that is derived from the FRB/US model with VAR expectations. The staff's analysis of monetary strategies such as framework memos and the Monetary Policy Strategies section uses the FRB/US model under model-consistent expectations (MCE).

These models provide a sense of the average reaction of economic activity to interest rates over the sample used in estimation. However, some research has suggested that the economy might have become less interest sensitive over time or that the sensitivity may depend on the state of the economy.² For example, secular declines in interest sensitivity could result from declines in the



Note: The models used are FRB/US (a version with model-consistent expectations, MCE, and a version with VAR-based expectations); the Smets and Wouters (2007) model; the Del Negro, Giannoni, and Schorfheide (2015) model; and a Bayesian SVAR model from Caldara and Herbst (2019).
Source: Staff calculations.

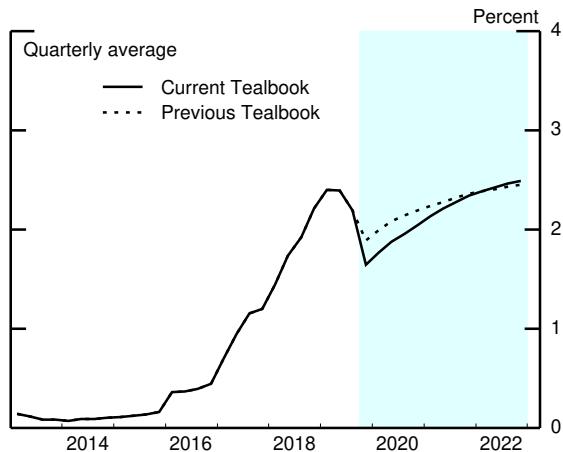
¹ The models used are FRB/US (a version with model-consistent expectations, MCE, and a version with VAR-based expectations); the Smets and Wouters (2007) model; the Del Negro, Giannoni, and Schorfheide (2015) model; and a Bayesian SVAR model from Caldara and Herbst (2019).

See Frank Smets and Rafael Wouters (2007), "Shocks and Frictions in U.S. Business Cycles: A Bayesian DSGE Approach," *American Economic Review*, vol. 97 (June), pp. 586–606; Marco Del Negro, Marc P. Giannoni, and Frank Schorfheide (2015), "Inflation in the Great Recession and New Keynesian Models," *American Economic Journal: Macroeconomics*, vol. 7 (January), pp. 168–96; and Dario Caldara and Edward Herbst (2019), "Monetary Policy, Real Activity, and Credit Spreads: Evidence from Bayesian Proxy SVARs," *American Economic Journal: Macroeconomics*, vol. 11 (January), pp. 157–92.

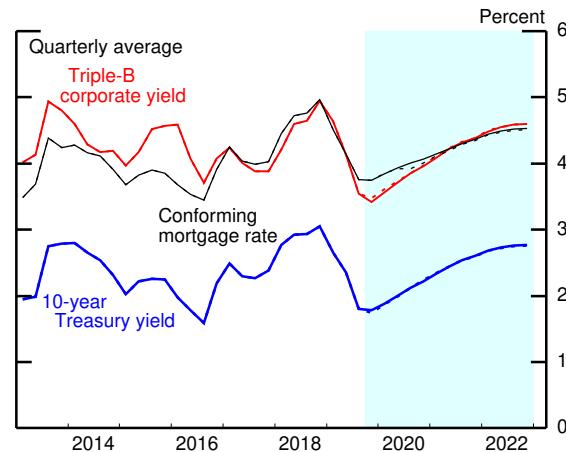
² For recent papers, see, for example, Jonathan L. Willis and Guangye Cao (2015), "Has the U.S. Economy Become Less Interest Rate Sensitive?" *Federal Reserve Bank of Kansas City, Economic Review*, vol. 100 (Second

Key Background Factors underlying the Baseline Staff Projection

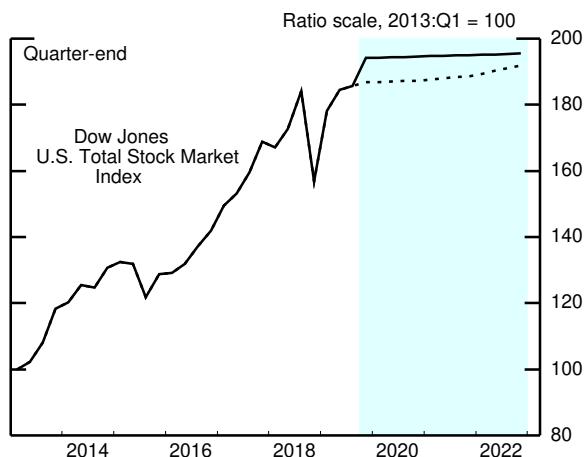
Federal Funds Rate



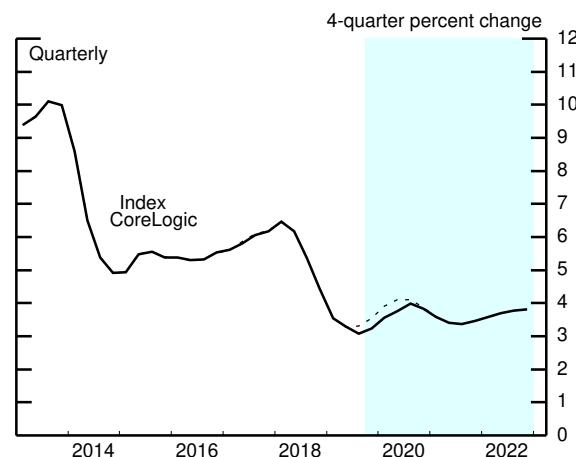
Long-Term Interest Rates



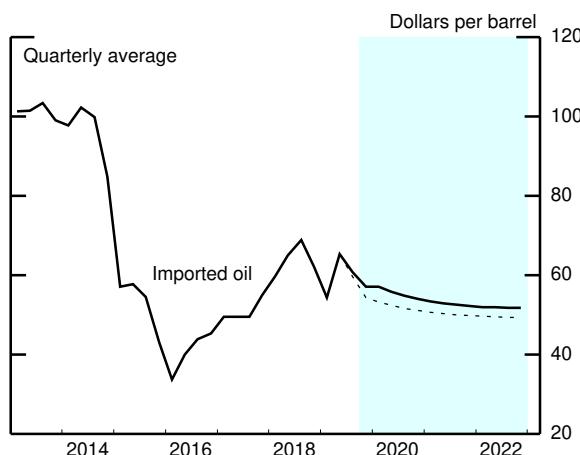
Equity Prices



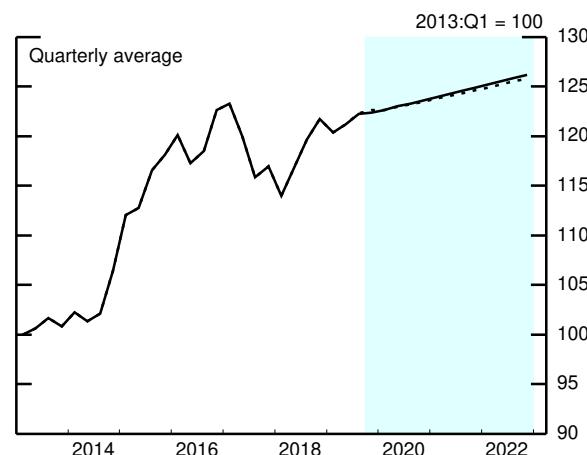
House Prices



Oil Prices



Broad Real Dollar



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

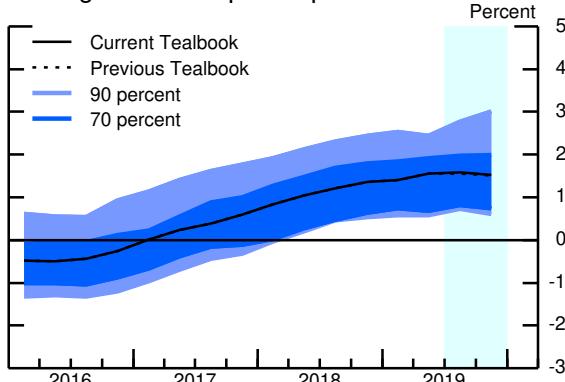
(Percent change at annual rate from final quarter of preceding period except as noted)

Measure	2017	2018	2019	2019 Q2	2019 Q3	2019 Q4
Output gap¹	.6	1.4	1.5	1.6	1.6	1.5
<i>Previous Tealbook</i>	.6	1.4	1.5	1.5	1.6	1.5
Real GDP	2.8	2.5	2.1	2.0	2.1	1.3
<i>Previous Tealbook</i>	2.8	2.5	2.1	2.0	1.7	1.6
Measurement error in GDP	.1	-.1	.2	-.4	.2	-.2
<i>Previous Tealbook</i>	.1	-.1	.1	-.4	-.2	.0
Potential output	1.8	1.8	1.8	1.8	1.8	1.8
<i>Previous Tealbook</i>	1.8	1.8	1.8	1.8	1.8	1.8

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

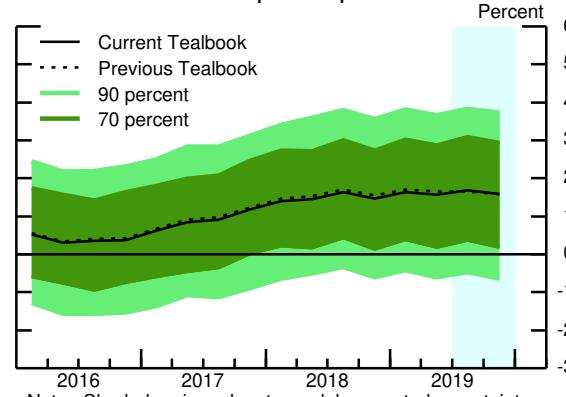
1. Percent, average for the final quarter in the period.

Judgmental Output Gap



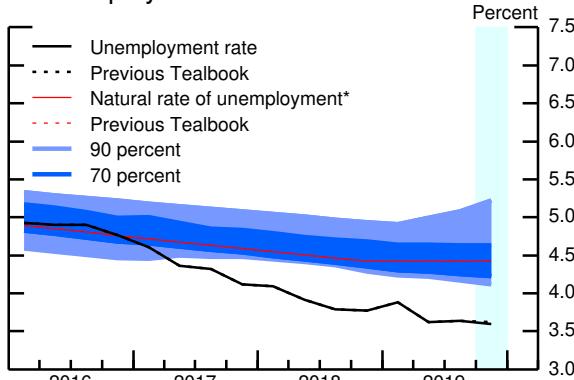
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.

Model-Based Output Gap



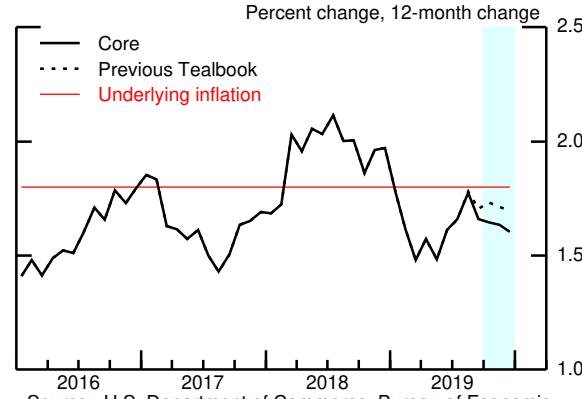
Note: Shaded regions denote model-computed uncertainty bands.
Source: Various macroeconomic data; staff assumptions.

Unemployment Rate



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

Core PCE Price Inflation



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

Summary of the Near-Term Outlook for GDP

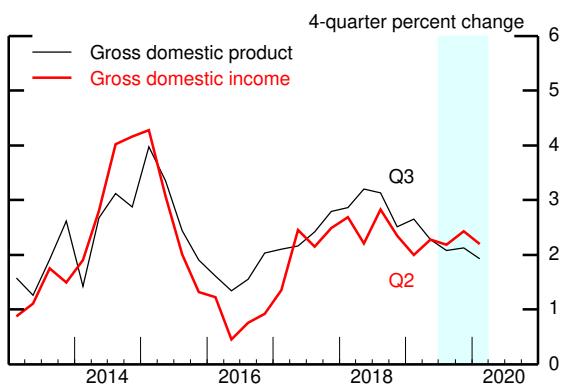
(Percent change at annual rate except as noted)

Measure	2019:Q3		2019:Q4		2020:Q1	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	1.7	2.1	1.6	1.3	2.2	2.3
Private domestic final purchases	2.1	2.3	2.1	1.9	2.0	2.1
Personal consumption expenditures	2.8	3.0	2.3	2.1	2.4	2.4
Residential investment	4.8	4.6	5.8	5.9	7.3	7.2
Nonres. private fixed investment	-2.1	-2.0	-.2	-.1	-1.3	-.9
Government purchases	1.3	1.6	.9	.8	2.0	1.8
<i>Contributions to change in real GDP</i>						
Inventory investment ¹	-.1	.1	-.2	-.4	-.2	-.2
Net exports ¹	-.3	-.1	-.1	-.1	.3	.4

1. Percentage points.

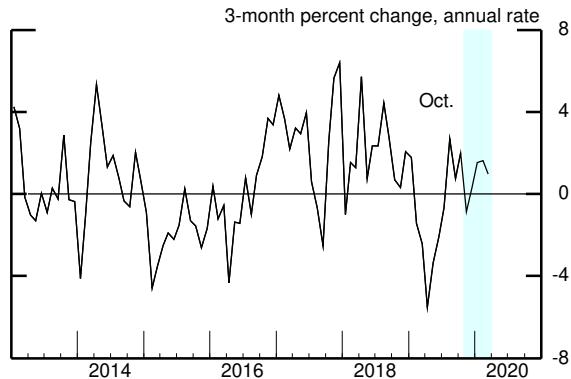
Recent Nonfinancial Developments (1)

Real GDP and GDI



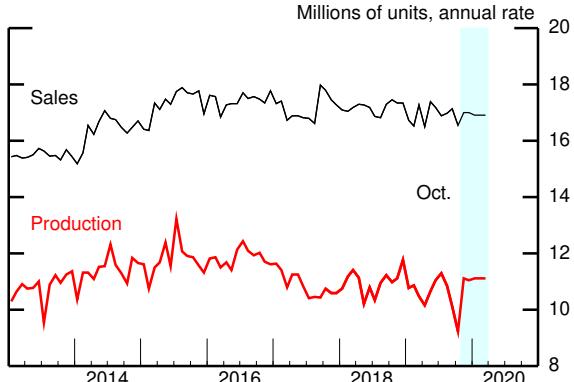
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Manufacturing IP ex. Motor Vehicles and Parts



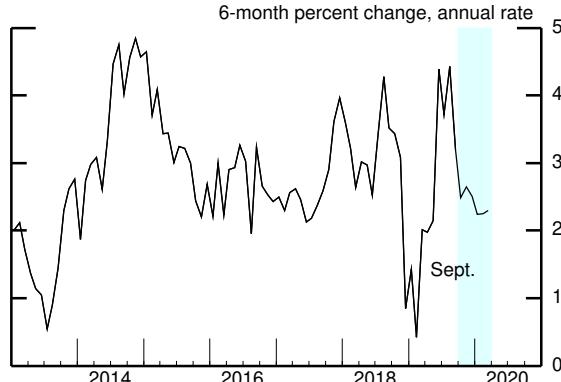
Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."

Sales and Production of Light Motor Vehicles

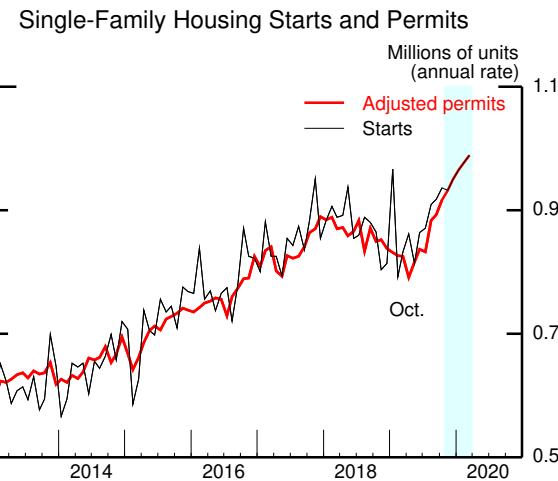


Source: Ward's Communications; Chrysler; General Motors; FRB seasonal adjustments.

Real PCE Growth

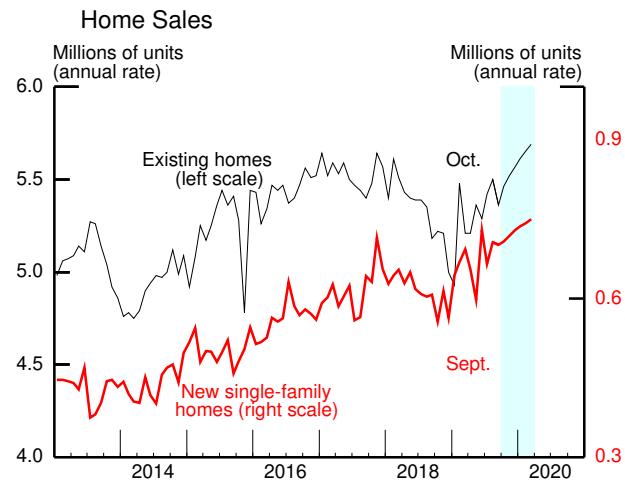


Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

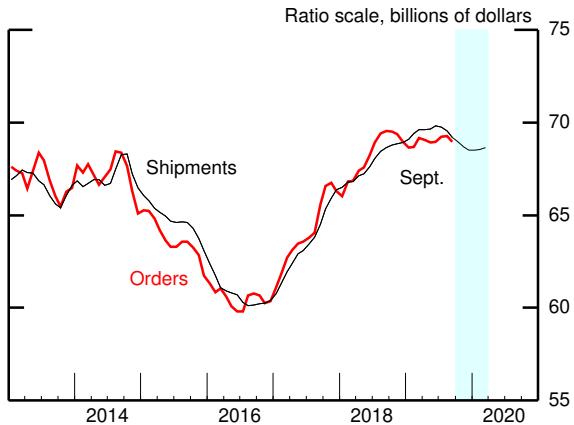
Recent Nonfinancial Developments (2)

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

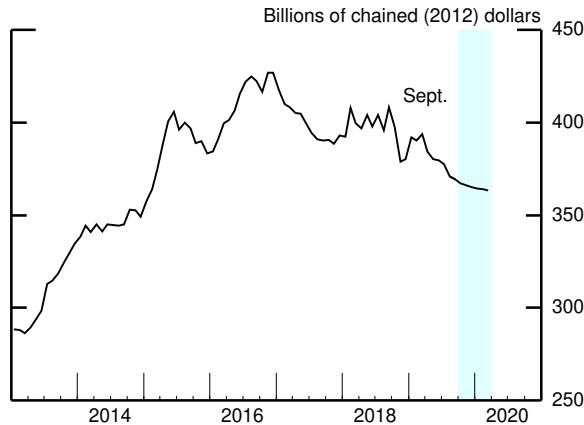
Source: U.S. Census Bureau.



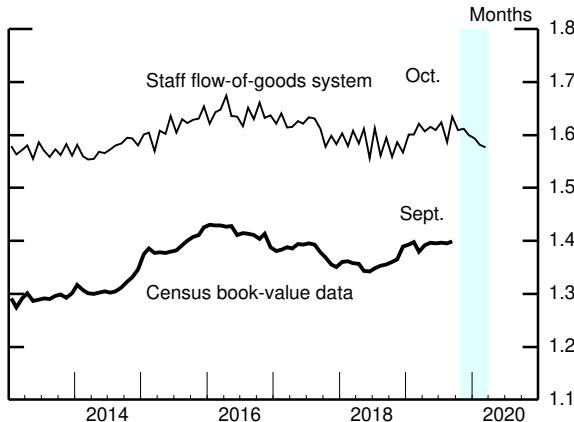
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

Nondefense Capital Goods ex. Aircraft

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

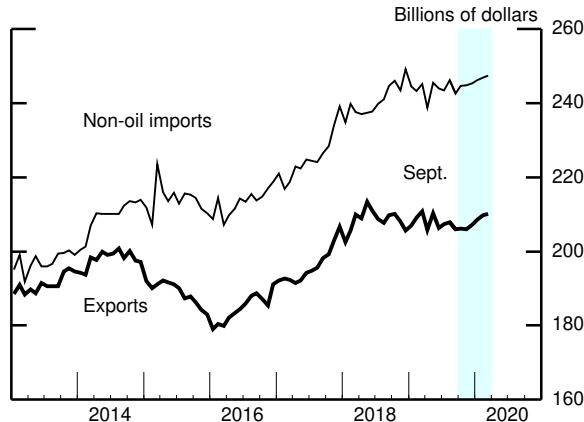
Nonresidential Construction Put in Place

Note: Nominal CPIP deflated by BEA prices through 2019:Q2 and by the staff's estimated deflator thereafter.
Source: U.S. Census Bureau.

Inventory Ratios

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

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

Exports and Non-oil Imports

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

Federal Reserve System Nowcasts of 2019:Q4 Real GDP Growth
(Percent change at annual rate from previous quarter)

Federal Reserve entity	Type of model	Nowcast as of Nov. 26, 2019
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	2.2
New York	• Factor-augmented autoregressive model combination • Factor-augmented autoregressive model combination, financial factors only • Dynamic factor model	2.6 2.4 .7
Cleveland	• Bayesian regressions with stochastic volatility • Tracking model	1.2 1.6
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	.6
Chicago	• Dynamic factor model • Bayesian VARs	1.8 1.1
St. Louis	• Dynamic factor model • News index model • Let-the-data-decide regressions	1.4 1.6 2.3
Kansas City	• Accounting-based tracking estimate	1.7
Board of Governors	• Tealbook estimate (judgmental) • Mixed-frequency dynamic factor model (DFM-SM) • Mixed-frequency dynamic factor model (DFM-BM)	1.3 1.3 2.3
Memo: Median of Federal Reserve System nowcasts		1.6

THE OUTLOOK FOR THE LABOR MARKET

The labor market remains tight. Although the pace of payroll growth has softened this year, it continues to be above the pace consistent with no change in resource utilization. The unemployment rate remains near half-century lows, and the labor force participation rate has continued to increase modestly against the backdrop of its declining trend. Looking ahead, with output growth rising a little faster than its potential rate next year and hovering around its potential rate in 2021 and 2022, we expect just a little further tightening of the labor market in this projection.

- According to currently published data, after rising 223,000 per month in 2018, nonfarm payroll employment rose at an average monthly clip of 167,000 this year through October.⁴ The pace of total payroll gains in the published data has increased over the past three months relative to the first half of the year and came in notably stronger than we had been expecting.
 - As indicated in the table below, we expect that the BLS benchmark revision early next year will lower total payroll employment growth by 42,000 per month from the second quarter of 2018 through the first quarter of this year, and we estimate that it will hold down payroll growth by 16,000 per month through the end of this year. (The exhibits elsewhere in the Tealbook are based on the published BLS data.)

	2018				2019				Annual averages	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2018	2019
1. Currently estimated	228	243	189	233	174	152	188	156 ^f	223	168 ^f
2. Adjusted for expected revision	228	201	147	191	132	136	172	140	192	145
3. Expected revision	--	-42	-42	-42	-42	-16	-16	-16	-32	-23

- In contrast to the BLS estimate that private payrolls have increased about 150,000 per month throughout the year, our in-house measure of private nonfarm payrolls based on microdata from the payroll-processing firm ADP (which we call ADP-FRB) has shown a marked deceleration recently. This

⁴ The strike of UAW workers against GM held down payroll growth by 46,000 in October, and we expect it to boost payroll growth by 46,000 in November.

overstate job growth by about 36,000 jobs per month. Our proposed adjustment of 36,000 is larger than the staff's post-benchmark "guesstimate," which assumes job growth is overstated by just 16,000 jobs per month.

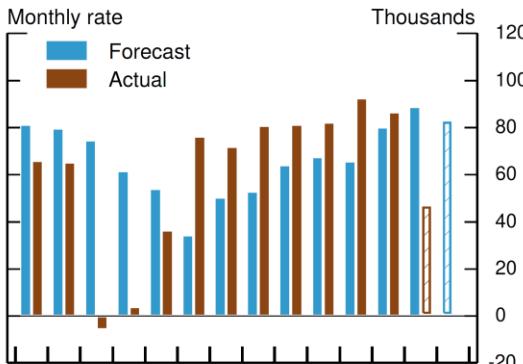
Our alternative view of underlying job growth is informed by the CES preliminary benchmark revision, ADP-FRB data, and the likely revisions to CES data arising from overestimation of birth-death job creation—that is, downward revisions of roughly 36,000 jobs per month since March 2019. Figure 2 shows this alternative view. The black line shows published CES private job growth, adjusted for the October General Motors strike. The dashed red line shows our adjusted CES series, where the March preliminary benchmark revision is taken on board and the data for April through October are reduced by 36,000 per month based on our previously discussed estimates (note that the staff's preliminary benchmark guesstimate would lie between the black and dashed red lines). The dashed green line is an adjusted version of the staff's ADP-FRB series, where we have taken on board the preliminary benchmark revision according to routine staff methods rather than waiting for the official release.

Elsewhere in the Tealbook, the staff reports a "pooled estimate," combining signals from the CES and ADP-FRB without accounting for the preliminary benchmark revision. The blue line in figure 2 is an alternative pooled estimate based on the adjusted CES and ADP-FRB data depicted by the dashed lines. Combining these adjusted signals, we estimate that underlying private employment growth is 71,000 jobs per month (blue line).⁴

Other evidence that there has been a pronounced slowing in job growth is provided by the leisure and hospitality sector, which made the largest contribution to the preliminary benchmark revision. This sector, which is often heavily reliant on birth-death contributions, has been weaker in the ADP data than in the CES data in recent months and has seen a large decline in job openings this year.

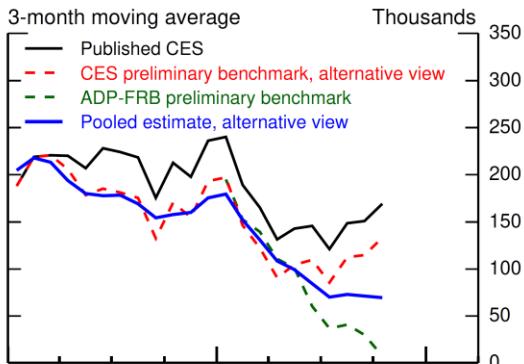
At first glance, recent readings on the unemployment rate and initial unemployment claims suggest a more optimistic view, but these indicators are not dispositive. The unemployment rate is low, but it has been roughly flat for some time—consistent with payroll growth that has not exceeded a breakeven pace. Claims may remain low because employers are acting first on the hiring margin: job openings, although at high levels, have declined markedly in recent months, and hiring has leveled off. The labor market is in a precarious position: True employment growth is barely sufficient to accommodate trend labor force growth, and a negative aggregate demand shock during the next year could swiftly raise unemployment and create significant recession risk.

Figure 1. CES Net Birth-Death Private Employment Contributions



Note: Annual values are calculated from net employment contributions in April of previous year to March of current year.
Source: BLS; authors' calculations.

Figure 2. Alternative View of Private Employment Growth

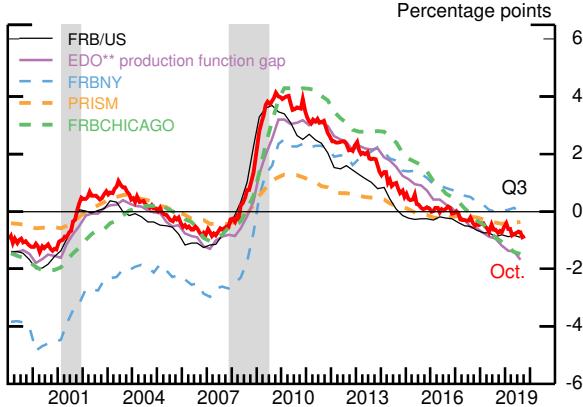


Note: October 2019 CES values adjusted for General Motors strike.
Source: BLS; authors' calculations.

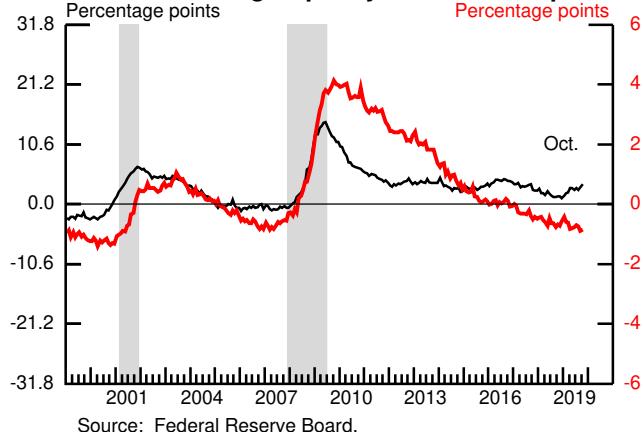
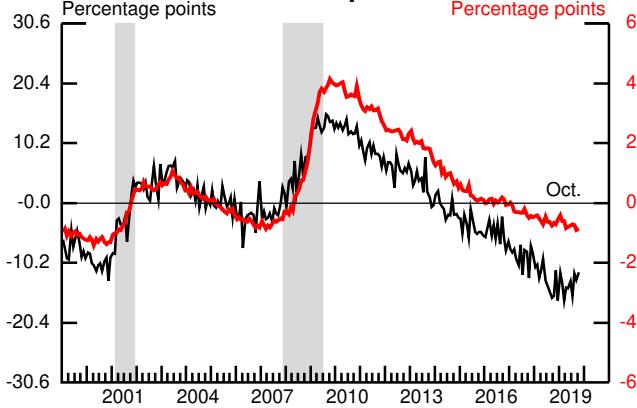
⁴ For details on the pooled estimate and evidence that combining the CES and ADP-FRB data improves tracking of the labor market, see Cajner and others (2019) cited in footnote 1.

Alternative Measures of Slack

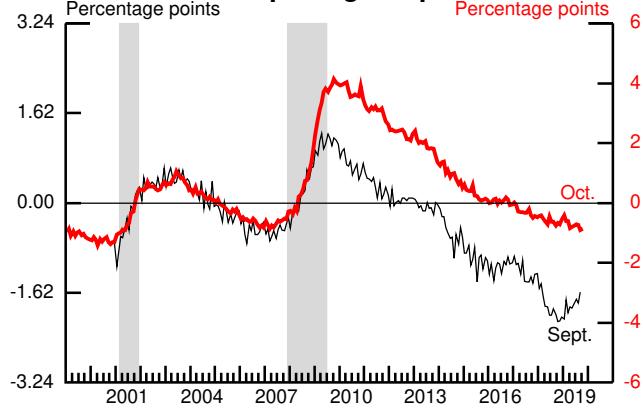
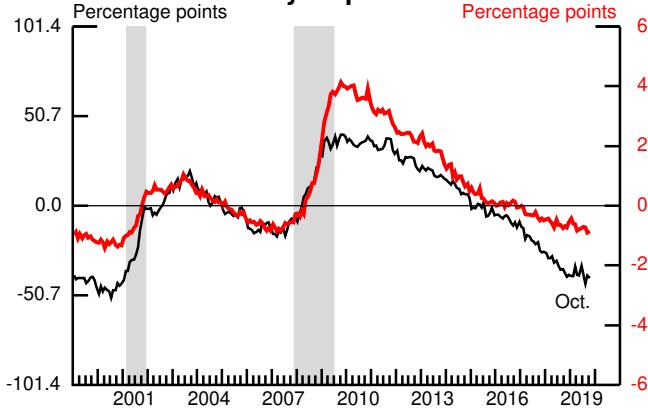
The red line in each panel is the staff's measure of the unemployment rate gap (right axis).

Output Gaps

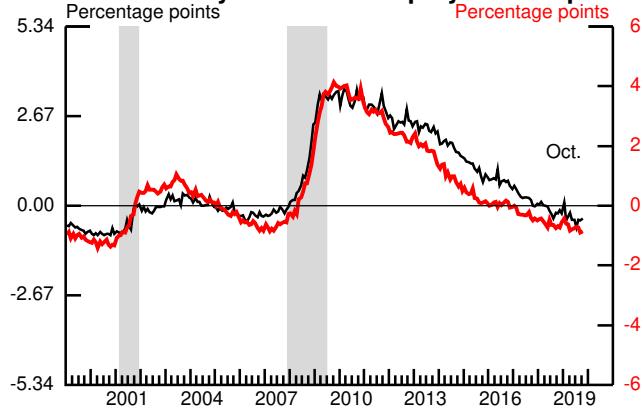
** EDO is Estimated, Dynamic, Optimization-based model.
Source: Federal Reserve Board; PRISM: Federal Reserve Bank of Chicago; Federal Reserve Bank of Philadelphia, PRISM Model Documentation (June 2011); FRBNY: Federal Reserve Bank of New York Staff Report 618 (May 2013, revised April 2014).

Manufacturing Capacity Utilization Gap***Jobs Hard to Fill Gap***

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.

Private Job Openings Gap***Job Availability Gap***

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

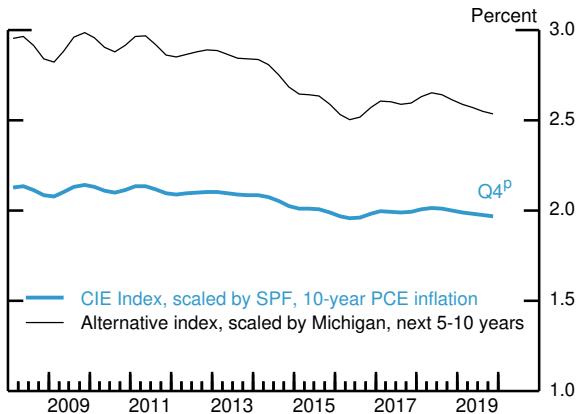
Involuntary Part-Time Employment Gap

* 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.

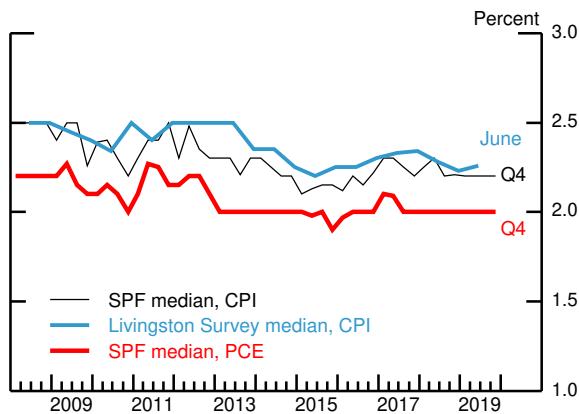
Survey Measures of Longer-Term Inflation Expectations

Index of Common Inflation Expectations



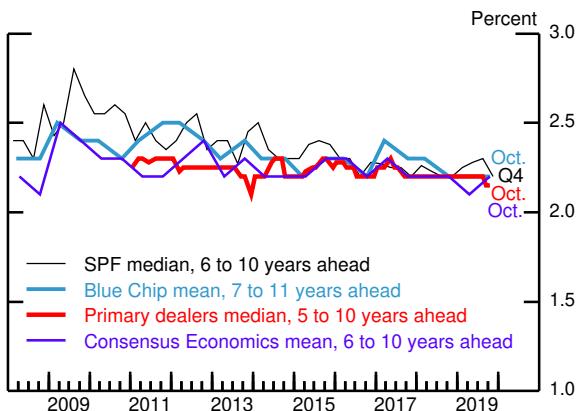
p Preliminary estimate based on data available to date.
Note: Index of 21 inflation expectations indicators.
Source: Staff calculations.

Next 10 Years



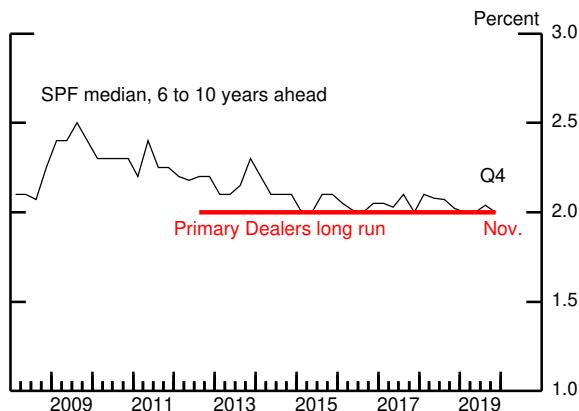
Note: SPF is Survey of Professional Forecasters.
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations



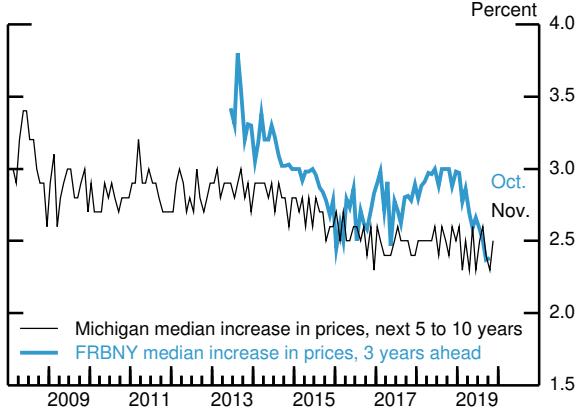
Source: Federal Reserve Bank of Philadelphia; Blue Chip Economic Indicators; Federal Reserve Bank of New York; Consensus Economics.

PCE Forward Expectations



Source: Federal Reserve Bank of Philadelphia; Federal Reserve Bank of New York.

Surveys of Consumers



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

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

Survey of Business Inflation Expectations

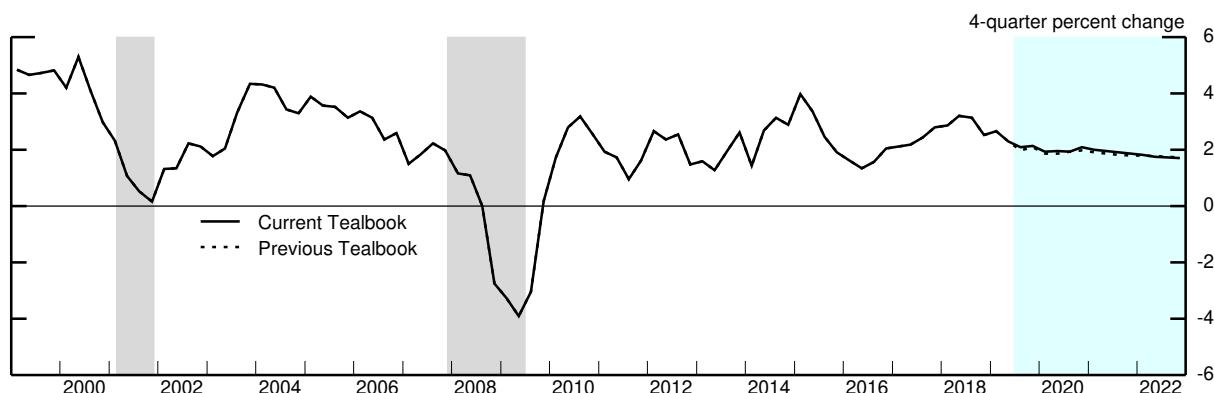


Note: Survey of businesses in the Sixth Federal Reserve District. Data begin in February 2012.

Source: Federal Reserve Bank of Atlanta.

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

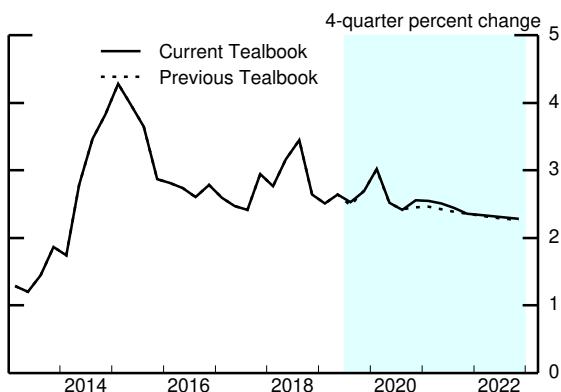
Measure	2018	2019 H1	2019 H2	2019	2020	2021	2022
Real GDP	2.5	2.6	1.7	2.1	2.1	1.9	1.7
<i>Previous Tealbook</i>	2.5	2.6	1.6	2.1	2.0	1.8	1.7
Final sales	2.2	2.8	1.9	2.3	2.4	1.9	1.7
<i>Previous Tealbook</i>	2.2	2.8	1.8	2.3	2.2	1.8	1.6
Personal consumption expenditures	2.6	2.8	2.5	2.7	2.6	2.4	2.3
<i>Previous Tealbook</i>	2.6	2.8	2.6	2.7	2.5	2.4	2.3
Residential investment	-4.4	-2.0	5.2	1.6	3.9	-3.0	-3.7
<i>Previous Tealbook</i>	-4.4	-2.0	5.3	1.6	4.6	-2.9	-3.8
Nonresidential structures	2.6	-3.9	-10.4	-7.2	-2.5	-.8	-1.8
<i>Previous Tealbook</i>	2.6	-3.9	-8.5	-6.2	-2.6	-1.3	-2.1
Equipment and intangibles	6.8	3.3	1.7	2.5	2.7	3.2	1.9
<i>Previous Tealbook</i>	6.8	3.3	1.0	2.1	2.0	3.0	1.7
Federal purchases	2.7	5.2	2.4	3.8	1.7	.2	.4
<i>Previous Tealbook</i>	2.7	5.2	2.1	3.6	1.9	.2	.7
State and local purchases	.9	3.0	.5	1.8	1.0	1.0	1.1
<i>Previous Tealbook</i>	.9	3.0	.5	1.8	1.0	1.0	1.1
Exports	.4	-.9	-.2	-.6	2.7	3.3	3.5
<i>Previous Tealbook</i>	.4	-.9	-.4	-.6	2.7	3.3	3.6
Imports	3.2	-.8	.6	-.1	2.0	3.1	3.2
<i>Previous Tealbook</i>	3.2	-.8	1.1	.2	2.1	3.0	3.2
Contributions to change in real GDP (percentage points)							
Inventory change	.3	-.2	-.2	-.2	-.3	.0	.0
<i>Previous Tealbook</i>	.3	-.2	-.1	-.2	-.2	.0	.1
Net exports	-.4	.0	-.1	-.1	.0	-.1	-.1
<i>Previous Tealbook</i>	-.4	.0	-.2	-.1	.0	-.1	.0

Real GDP

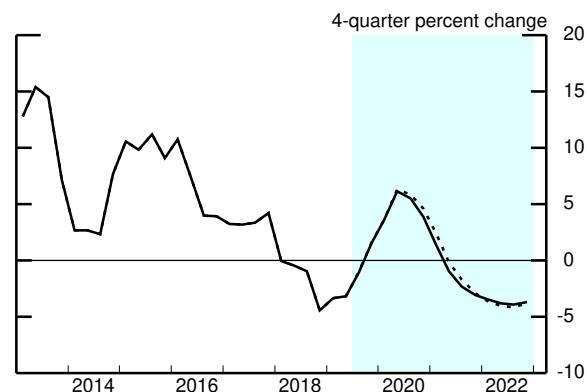
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Components of Final Demand

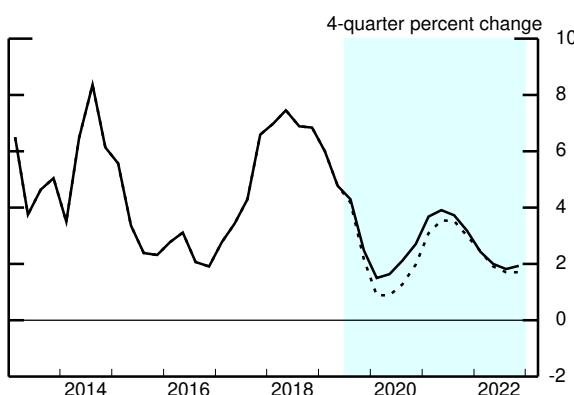
Personal Consumption Expenditures



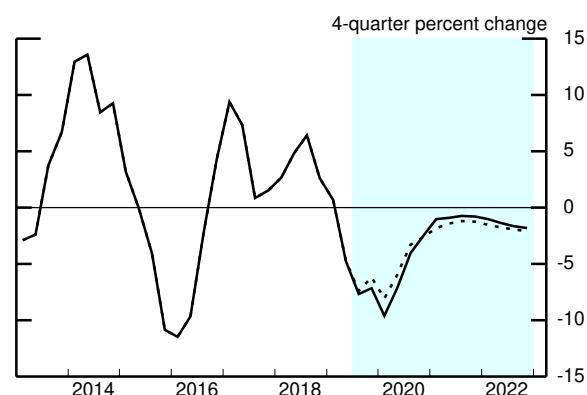
Residential Investment



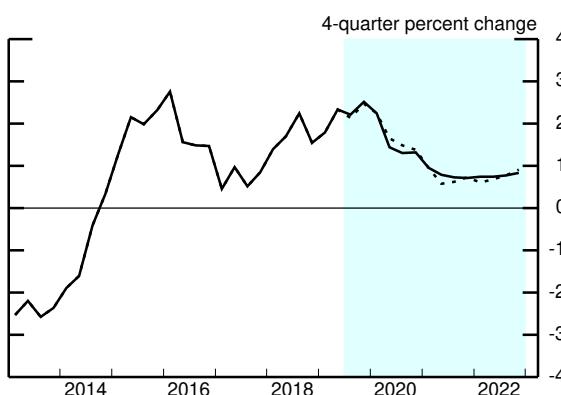
Equipment and Intangibles



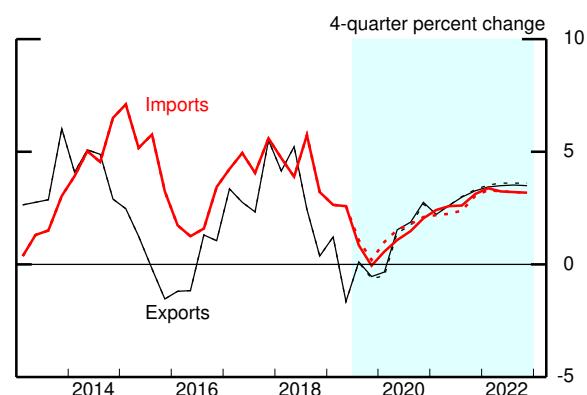
Nonresidential Structures



Government Consumption and Investment

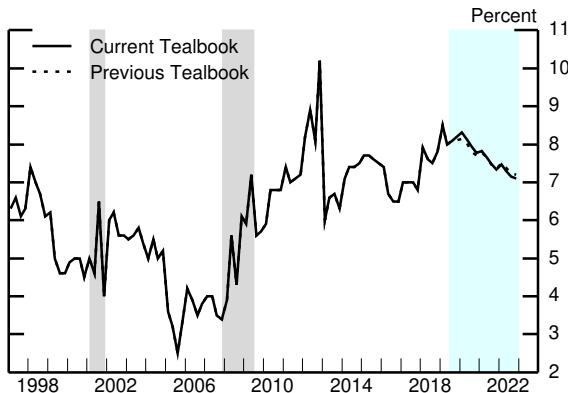


Exports and Imports

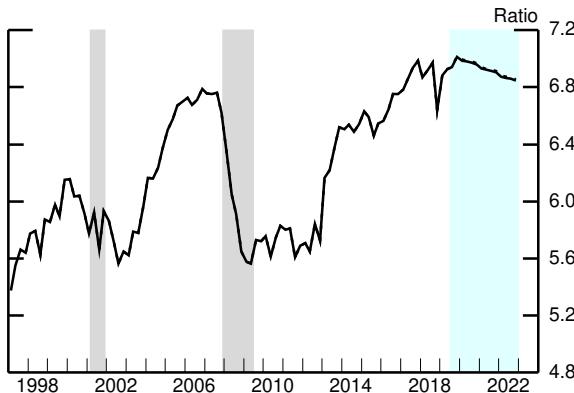


Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Aspects of the Medium-Term Projection

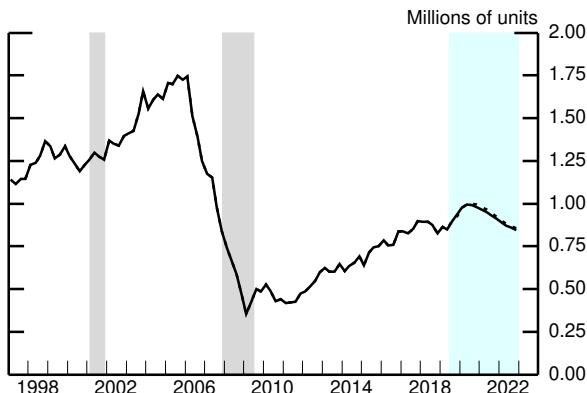
Personal Saving Rate

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

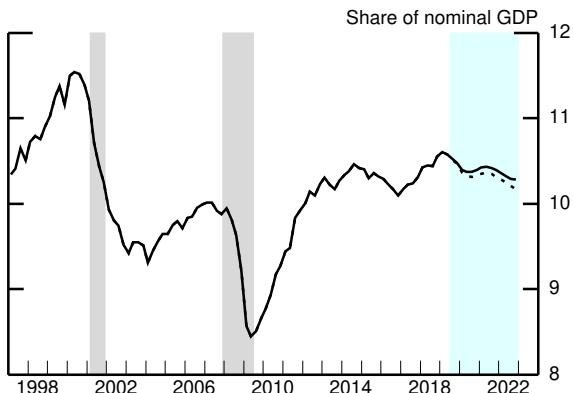
Wealth-to-Income Ratio

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

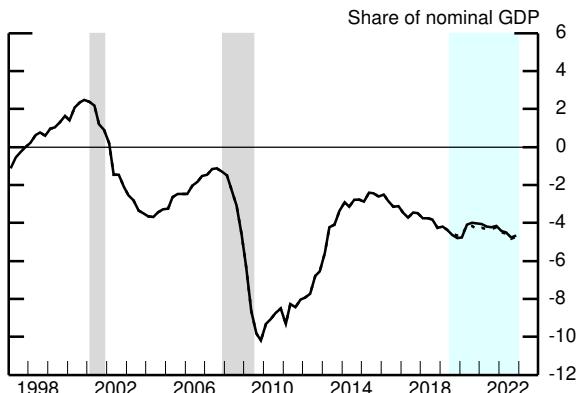
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Single-Family Housing Starts

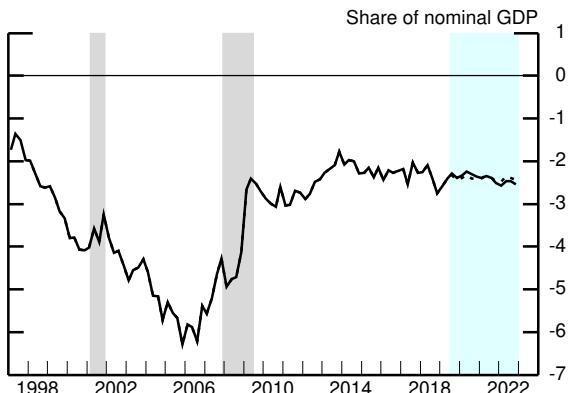
Source: U.S. Census Bureau.

Equipment and Intangibles Spending

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

Federal Surplus/Deficit

Note: 4-quarter moving average.
Source: Monthly Treasury Statement.

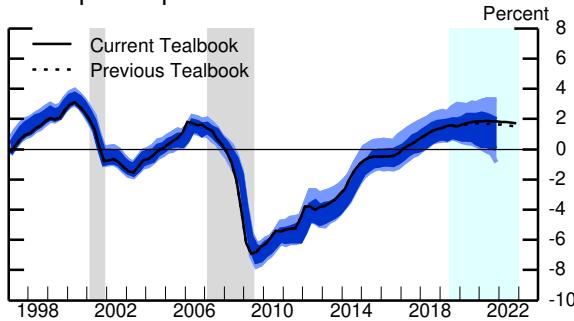
Current Account Surplus/Deficit

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

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

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

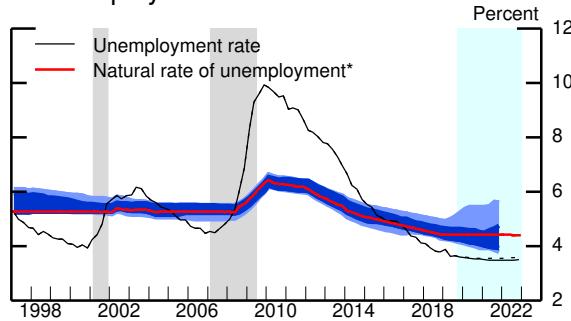
Output Gap



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

Source: Various macroeconomic data; staff assumptions.

Unemployment Rate

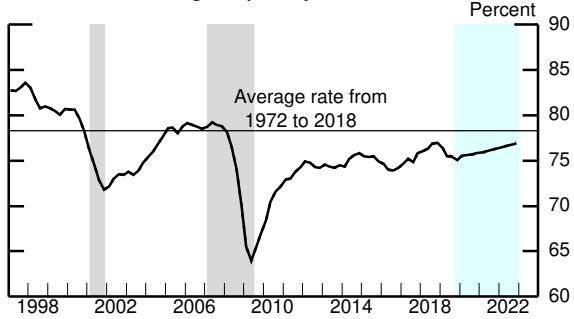


Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the natural rate.

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

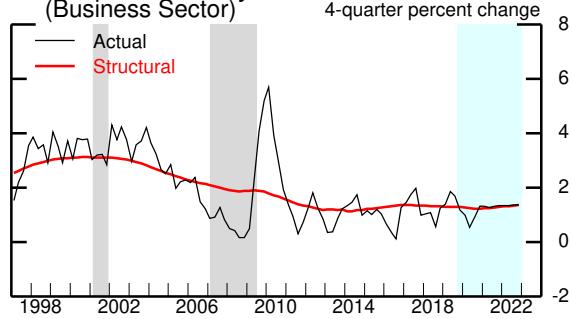
Source: Various macroeconomic data; staff assumptions.

Manufacturing Capacity Utilization Rate



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

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	2011-17	2018	2019	2020	2021	2022
Potential output <i>Previous Tealbook</i>	3.1	3.6	2.7	1.9	1.5	1.8	1.8	1.8	1.8	1.8
Selected contributions: ¹										
Structural labor productivity ² <i>Previous Tealbook</i>	1.7	2.9	2.7	1.8	1.3	1.3	1.3	1.2	1.3	1.4
Capital deepening	.7	1.4	1.0	.5	.8	.7	.7	.5	.5	.4
Multifactor productivity	.8	1.1	1.4	1.1	.2	.4	.4	.5	.6	.7
Structural hours <i>Previous Tealbook</i>	1.5	1.3	.8	.5	.4	.9	.3	.6	.5	.5
Labor force participation <i>Previous Tealbook</i>	.4	-.1	-.2	-.4	-.4	-.2	-.1	-.2	-.2	-.3
Memo:										
Output gap ³ <i>Previous Tealbook</i>	-1.2	2.5	.3	-5.4	.6	1.4	1.5	1.8	1.8	1.7

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	2019 H1	2019 H2	2019	2020	2021	2022
Nonfarm payroll employment ¹ <i>Previous Tealbook</i>	223 223	163 163	172 141	168 152	130 116	95 89	74 68
Private employment ¹ <i>Previous Tealbook</i>	215 215	156 156	151 120	153 138	121 107	85 79	64 58
Labor force participation rate ² <i>Previous Tealbook</i>	63.0 63.0	62.9 62.9	63.2 63.1	63.2 63.1	63.0 62.8	62.8 62.6	62.6 62.3
Civilian unemployment rate ² <i>Previous Tealbook</i>	3.8 3.8	3.6 3.6	3.6 3.6	3.6 3.6	3.5 3.6	3.5 3.6	3.5 3.6
Employment-to-population ratio ² <i>Previous Tealbook</i>	60.6 60.6	60.6 60.6	60.9 60.8	60.9 60.8	60.8 60.5	60.7 60.3	60.4 60.1

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	2019 H1	2019 H2	2019	2020	2021	2022
<i>Percent change at annual rate from final quarter of preceding period</i>							
PCE chain-weighted price index <i>Previous Tealbook</i>	1.9 1.9	1.4 1.4	1.5 1.5	1.5 1.4	1.7 1.7	1.9 1.8	1.9 1.8
Food and beverages <i>Previous Tealbook</i>	.5 .5	1.8 1.8	.4 .4	1.1 1.1	2.3 2.3	2.3 2.3	2.3 2.3
Energy <i>Previous Tealbook</i>	3.9 3.9	-.7 -.7	-2.7 -6.5	-1.7 -3.6	-2.8 -2.9	.4 .5	1.0 1.1
Excluding food and energy <i>Previous Tealbook</i>	1.9 1.9	1.5 1.5	1.8 2.0	1.6 1.7	1.9 1.8	1.9 1.8	1.9 1.8
Prices of core goods imports ¹ <i>Previous Tealbook</i>	.2 .2	-1.1 -1.1	-.7 -.3	-.9 -.7	1.0 1.0	1.0 1.0	.9 .9
<i>12-month percent change</i>	Sept. 2019	Oct. 2019 ²	Nov. 2019 ²	Dec. 2019 ²	Jan. 2020 ²	Feb. 2020 ²	Mar. 2020 ²
PCE chain-weighted price index <i>Previous Tealbook</i>	1.3 1.4	1.4 1.4	1.5 1.5	1.5 1.5	1.7 1.7	1.8 1.8	1.7 1.7
Excluding food and energy <i>Previous Tealbook</i>	1.7 1.7	1.6 1.7	1.6 1.7	1.6 1.7	1.7 1.8	1.8 1.9	1.9 2.0

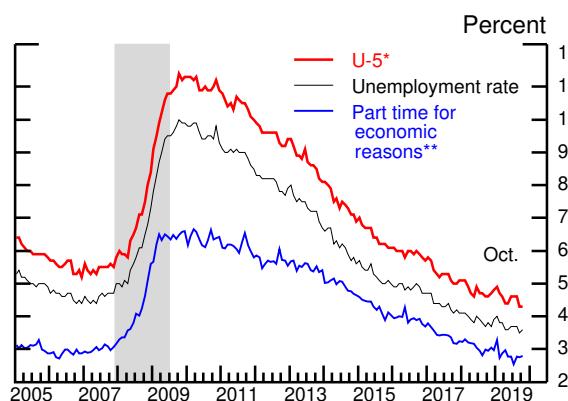
1. Core goods imports exclude computers, semiconductors, oil, and natural gas.

2. Staff forecast.

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

Labor Market Developments and Outlook (1)

Measures of Labor Underutilization

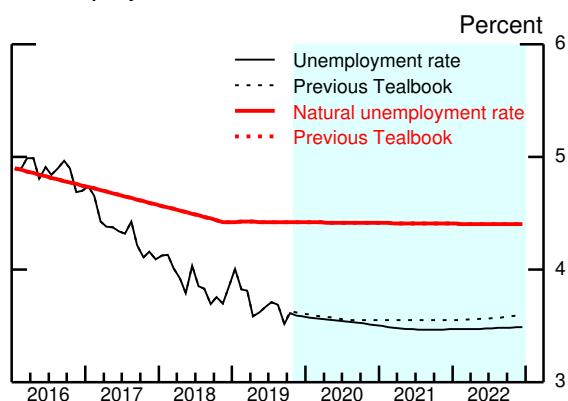


* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.

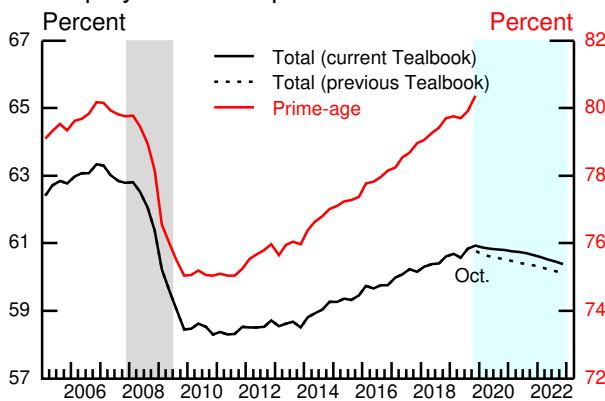
** Percent of Current Population Survey employment.

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

Unemployment Rate



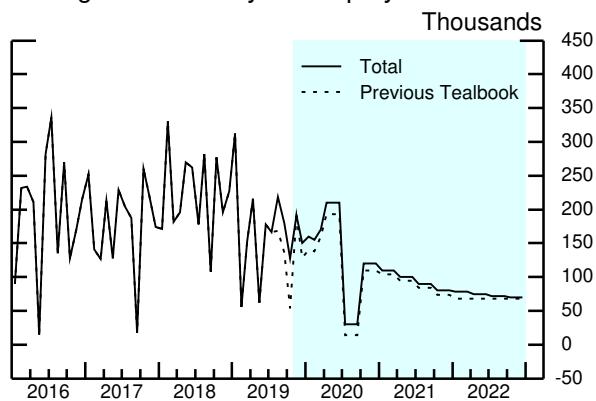
Employment-to-Population Ratio



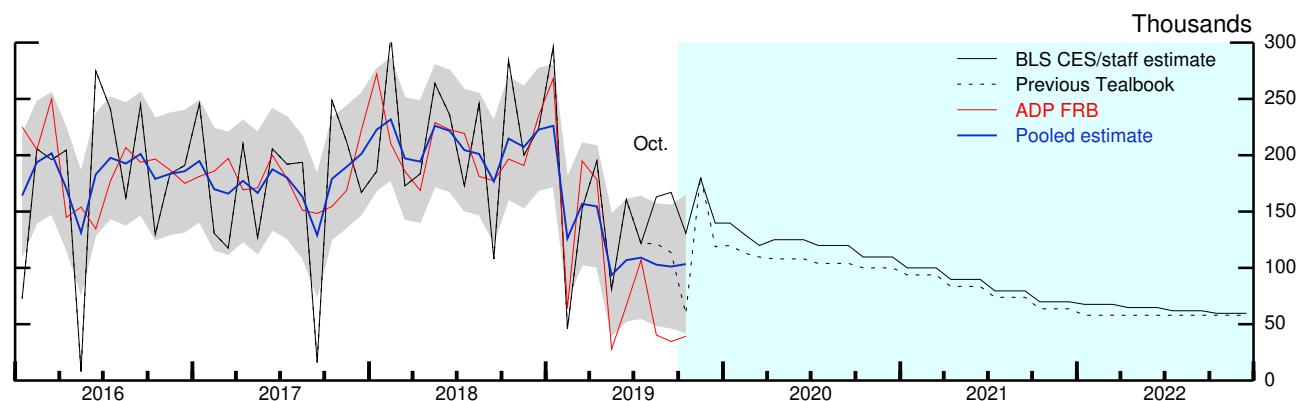
Note: Every curve except the one for the prime-age population corresponds with the left axis.

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

Change in Total Payroll Employment



Change in Private Payroll Employment

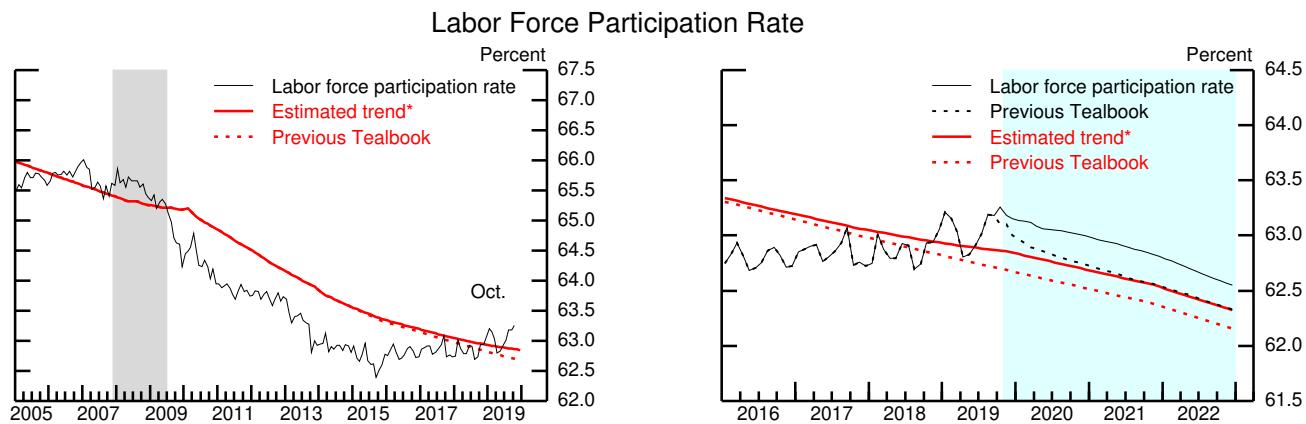


Note: Gray shaded area around blue line is 90 percent confidence interval around pooled estimate.

Source: U.S. Department of Labor, Bureau of Labor Statistics; staff calculations using microdata from ADP.

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

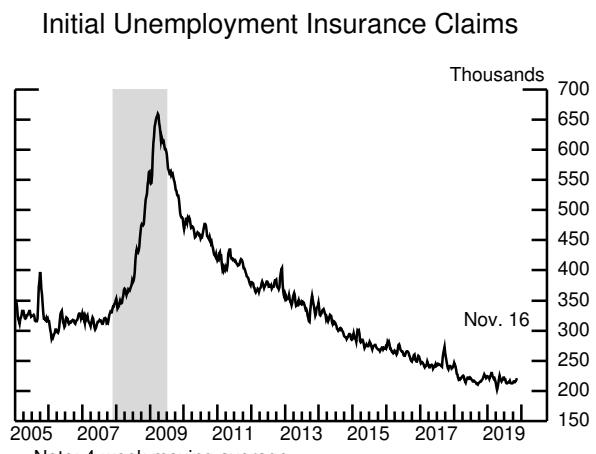
Labor Market Developments and Outlook (2)



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

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

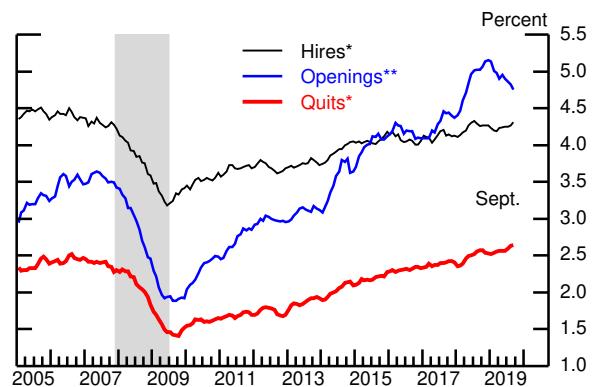
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.



Note: 4-week moving average.

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

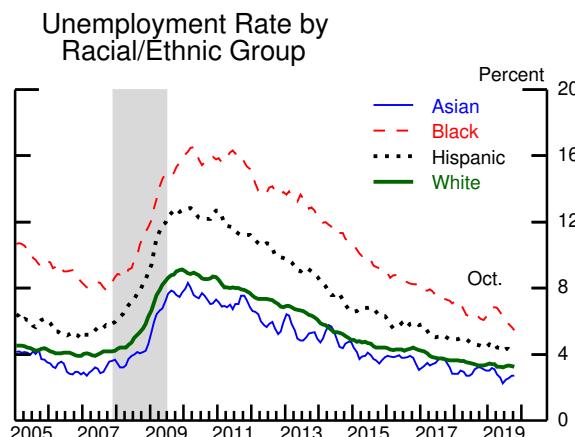
Hires, Quits, and Job Openings



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

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

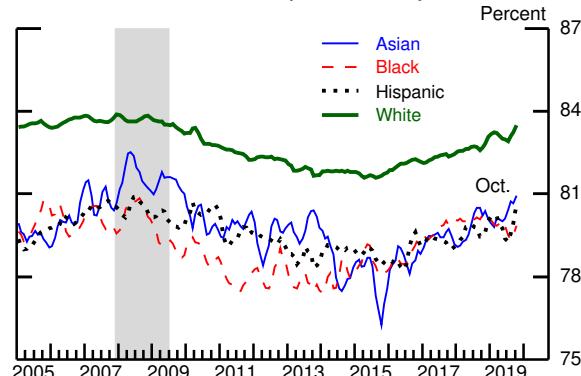
Source: Job Openings and Labor Turnover Survey.



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

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

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



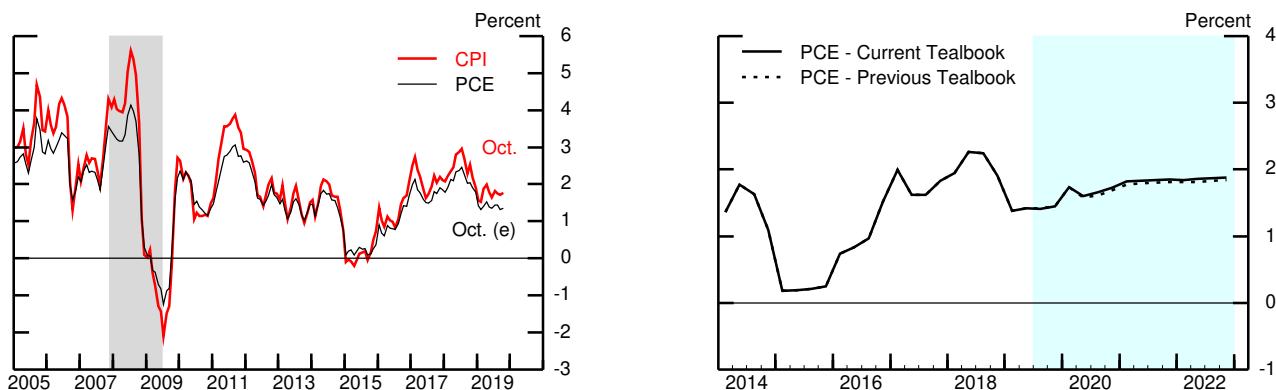
Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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

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

Inflation Developments and Outlook (1)

(Percent change from year-earlier period)

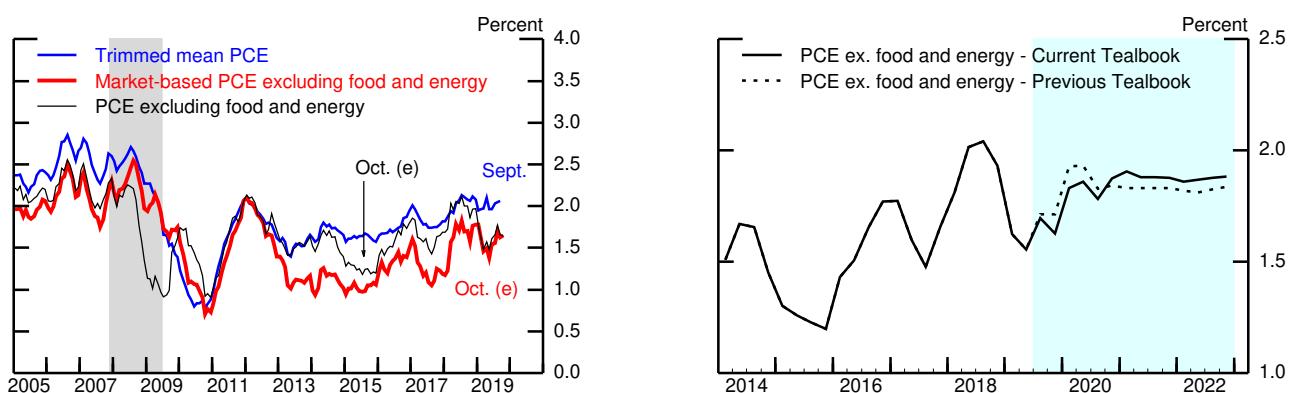
Headline Consumer Price Inflation



Note: PCE prices from August to October 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.

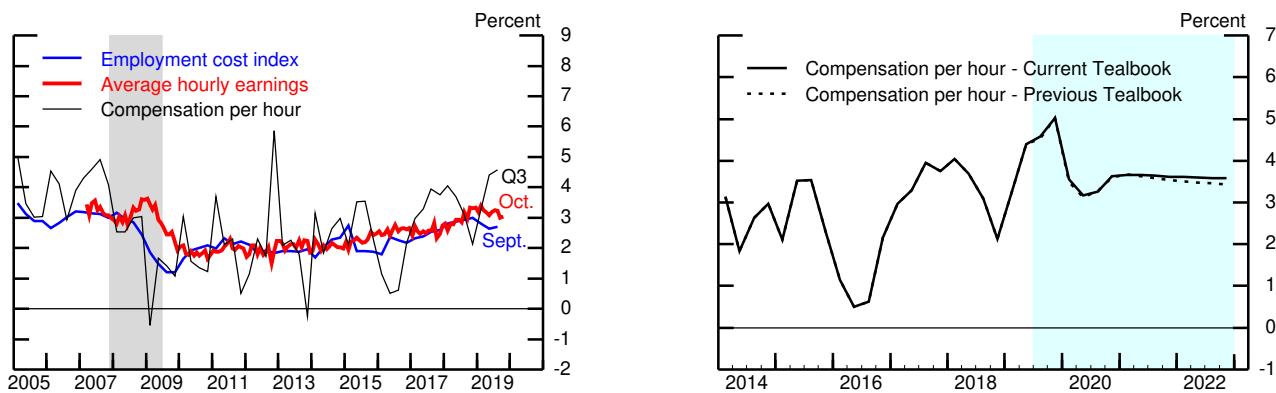
Measures of Core PCE Price Inflation



Note: Core PCE prices from August to October 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



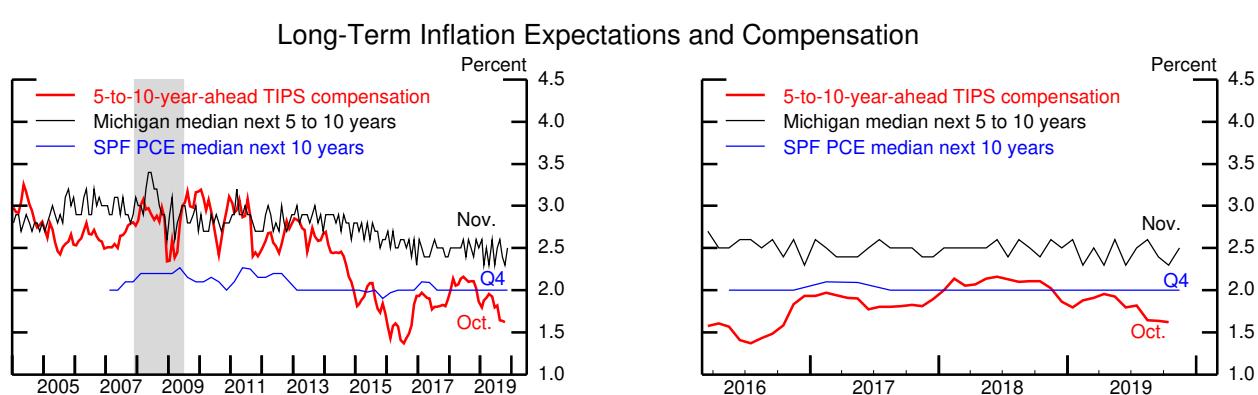
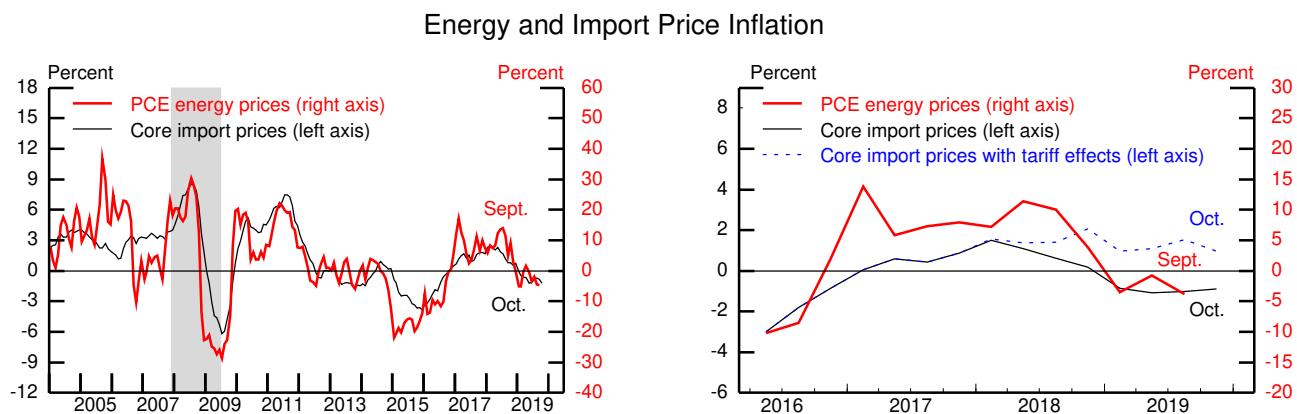
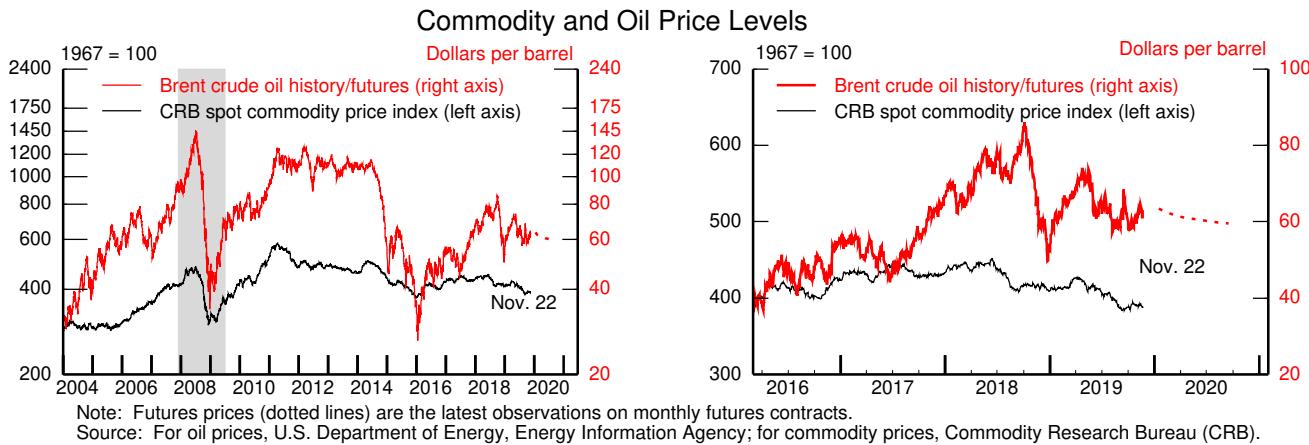
Note: Compensation per hour is for the business sector. Average hourly earnings are for the private nonfarm sector. The employment cost index is for the private sector.

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)



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

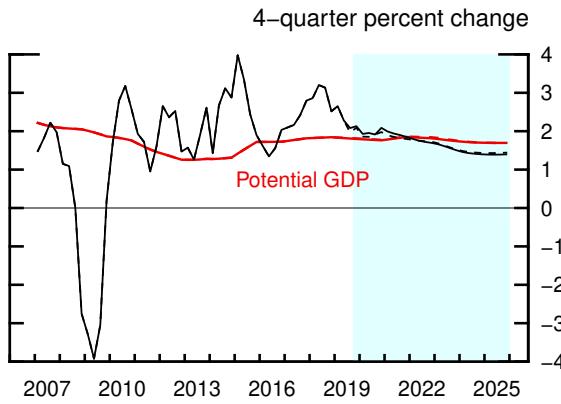
The Long-Term Outlook

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

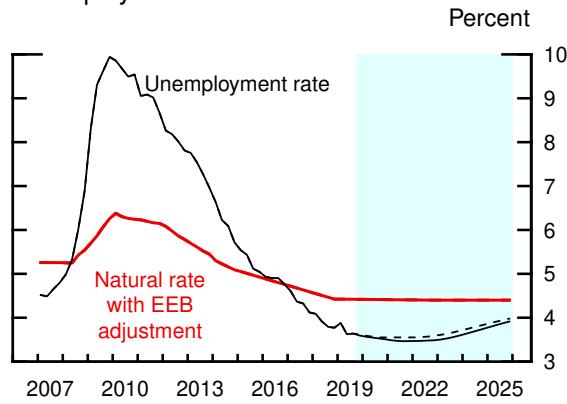
Measure	2019	2020	2021	2022	2023	2024	2025	Longer run
Real GDP Previous Tealbook	2.1	2.1	1.9	1.7	1.5	1.4	1.4	1.7
Civilian unemployment rate ¹ Previous Tealbook	3.6	3.5	3.5	3.5	3.6	3.8	3.9	4.4
PCE prices, total Previous Tealbook	1.5	1.7	1.9	1.9	1.9	2.0	2.0	2.0
Core PCE prices Previous Tealbook	1.6	1.9	1.9	1.9	1.9	2.0	2.0	2.0
Federal funds rate ¹ Previous Tealbook	1.65	2.05	2.34	2.49	2.55	2.59	2.60	2.50
10-year Treasury yield ¹ Previous Tealbook	1.8	2.2	2.6	2.8	2.8	2.9	2.9	3.0

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

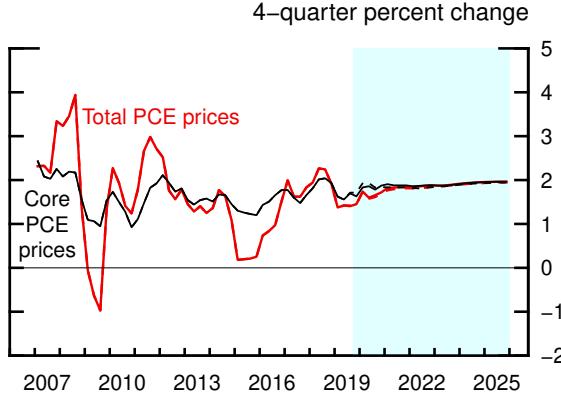
Real GDP



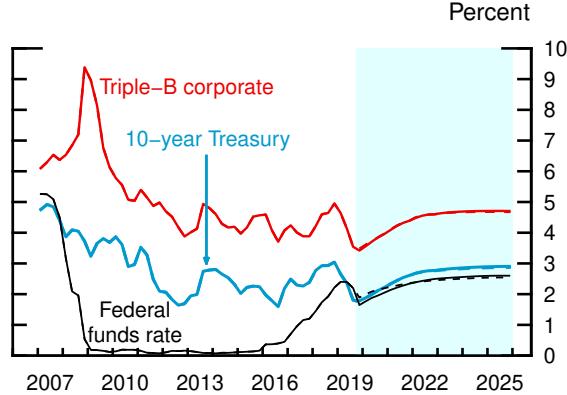
Unemployment Rate



PCE Prices



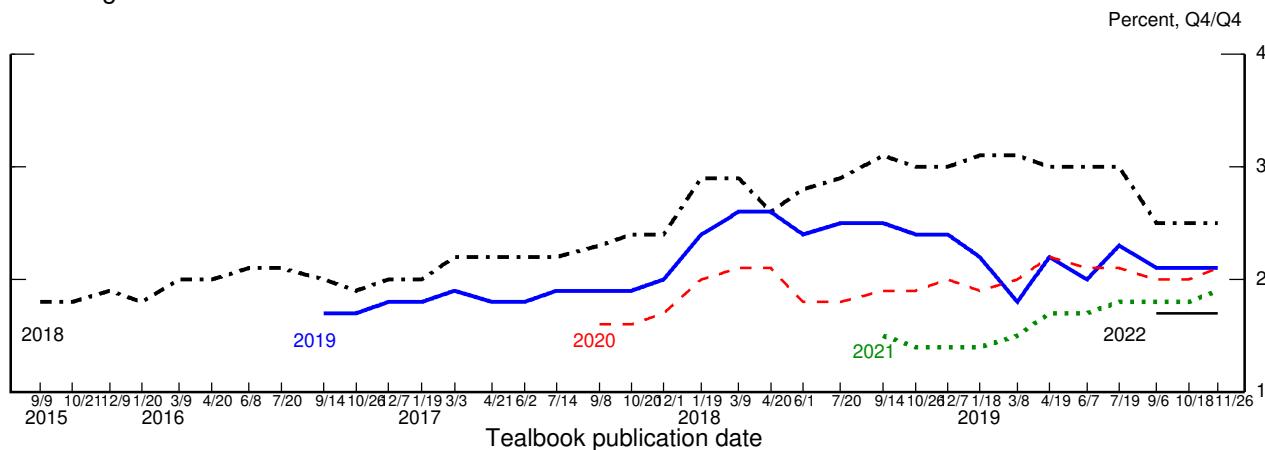
Interest Rates



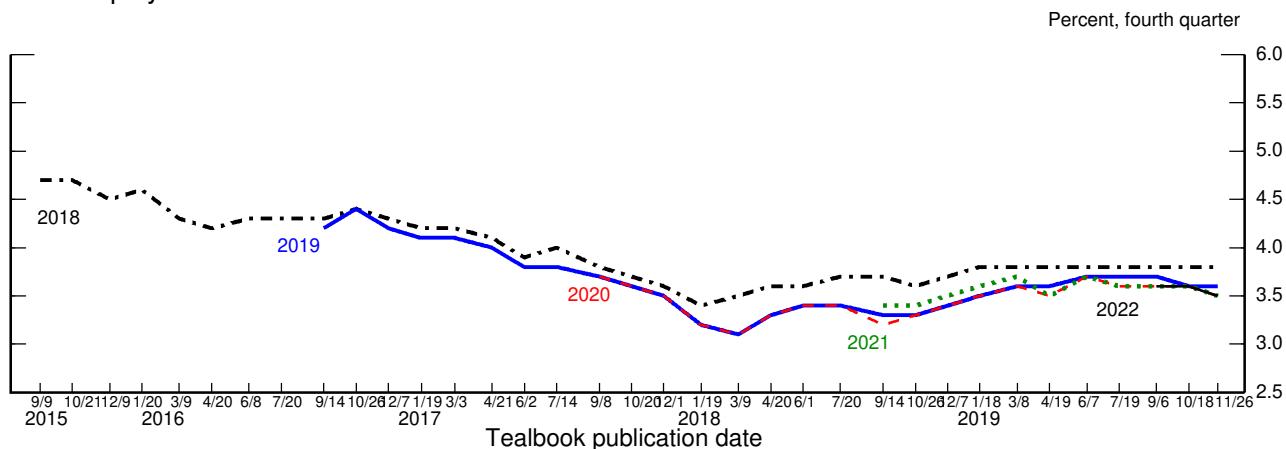
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

Evolution of the Staff Forecast

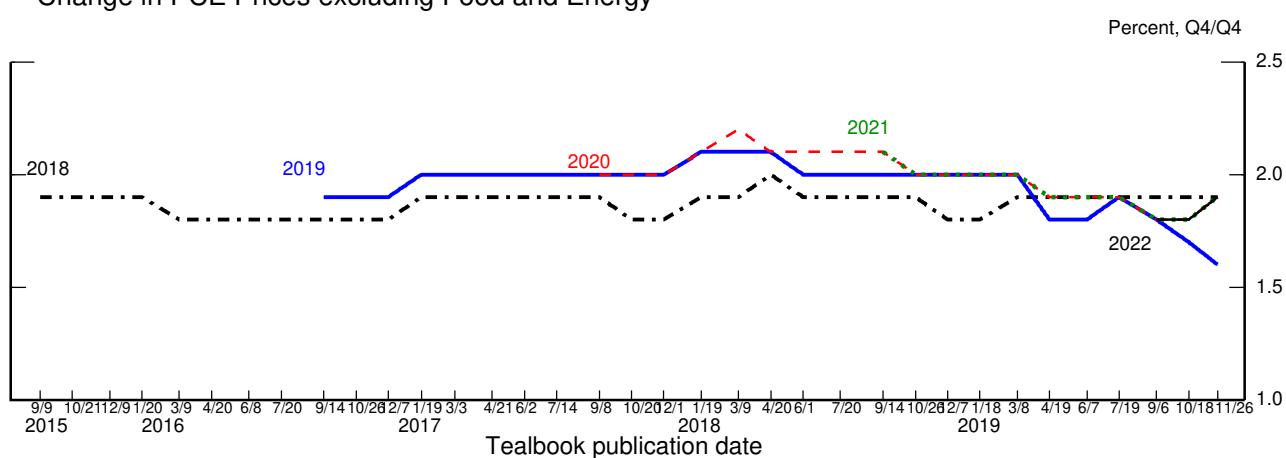
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



Manufacturing Recessions and the Global Economy

Global manufacturing output has been stagnating for almost one year, raising concerns that this sector's weakness may presage a broader downturn in economic activity. In this discussion, we review evidence of the extent to which weakness in manufacturing spills over to the broader economy or provides a warning signal of recession.

We first examine the historical correlation of manufacturing and services purchasing managers indexes (PMIs), survey-based indicators that provide early information on economic activity in the two sectors. Over the past 18 months, manufacturing PMIs for the United States and the foreign economy have declined, with both indexes falling to levels below 50 this year and thus indicating contraction (figures 1 and 2). In contrast, services PMIs, while also declining, have remained in expansionary territory. Looking at the relationship between manufacturing and services over the past two decades, we find that manufacturing PMIs help forecast services PMIs, such that a slowdown in manufacturing is generally followed by a slowdown in services. This finding would seem to justify concerns about manufacturing weakness spilling over to the broader economy. However, services also help forecast manufacturing, implying that if services PMIs continue to remain in the expansionary range, they may lift up manufacturing.¹ In several episodes, such as in late 2015 and early 2016, the manufacturing PMI indicated contraction, but the services PMI held up above the 50 threshold.

Another approach to addressing the risks to the broader economy posed by weakness in manufacturing is to examine whether declines in industrial production (IP)—which includes output of the manufacturing, mining, and utility industries—have historically heralded recessions. Table 1 reports changes in IP relative to its trend over the four quarters preceding each recession

Figure 1: U.S. PMIs

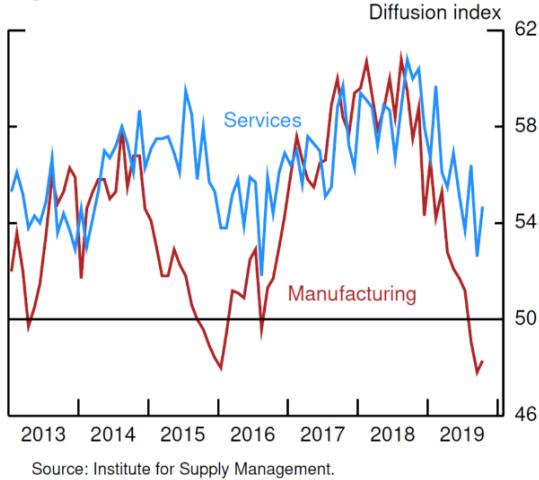
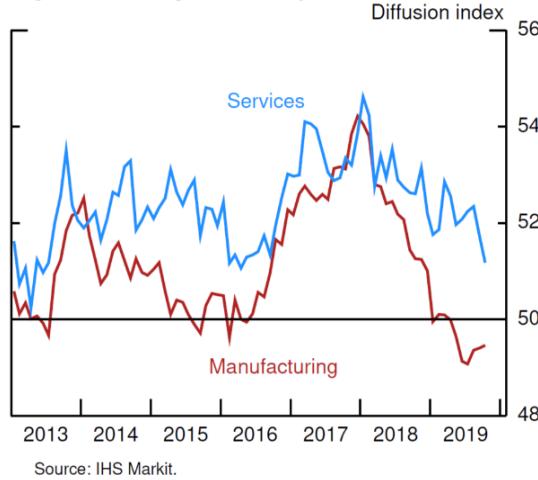


Figure 2: Foreign Economy PMIs



¹ Using both the U.S. and foreign economy PMI series over 2000:M1–2019:M10, the Granger-causality tests reject the null hypothesis that manufacturing does not Granger-cause services PMI with a p value lower than 5 percent at 4 and 6 lags. We find similar results for the null hypothesis that services do not Granger-cause manufacturing PMI. Thus, Granger causality appears to run in both directions.

since 1970, together with GDP growth relative to its trend during each recession.² Over the past 50 years, IP growth rates fell well below trend the year preceding each of the five recessions in the foreign economy and seven recessions in the United States, by 1.8 and 2.4 percentage points, on average, respectively (line 8). Given this evidence, the fact that over the past year IP growth has fallen 2.0 percentage points relative to trend in the United States and abroad points to elevated recession risks. That said, the foreign economy also had nine episodes and the U.S. economy had seven episodes during which IP growth fell considerably below trend, but no GDP recession followed. During these “false alarms,” IP growth rates were somewhat weaker, on average, than they were before the realized recessions (line 9).

Our assessment is that the recent weakness in manufacturing activity, though weighing on growth, will not tip the global economy into recession. In part, this view reflects the fact that other data have held up better, including consumption indicators and financial conditions. Indeed, recession prediction models—which use a broader range of information such as PMIs, IP, retail sales, and financial conditions—estimate that the probability of recession in the world economy over the next 12 months has increased in recent quarters but remains near its unconditional average of about 20 percent (figure 3).³ In our Tealbook forecast, we expect that manufacturing will gradually recover as global GDP growth picks up and trade tensions cool. This forecast is predicated on the view that, amid solid labor market conditions and accommodative monetary policy actions, household demand will be resilient and financial conditions will remain favorable. However, we cannot rule out less favorable outcomes.

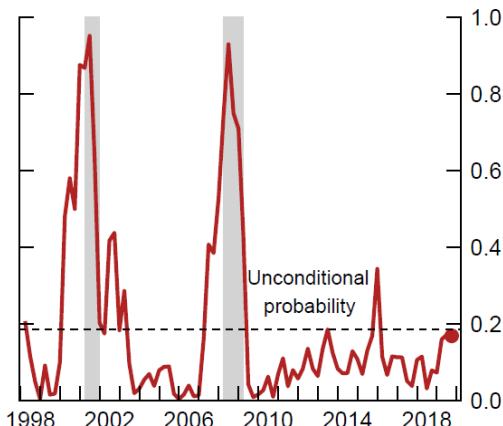
Table 1: IP and GDP Growth During Recession Episodes
(percentage point deviation from trend)

Recession episode	Foreign Economy		United States	
	IP, 1 year before	GDP	IP, 1 year before	GDP
1. 1970	-	-	-2.4	-2.9
2. 1974	-2.2	-4.6	-1.5	-5.6
3. 1980	-1.6	-1.6	-3.3	-3.2
4. 1982	-4.1	-5	-3.7	-5.5
5. 1990	-	-	-.8	-3.8
6. 2001	-.3	-1.1	-4.6	-3.3
7. 2008	-1.0	-6.6	-.7	-5.6
8. Recessions, average	-1.8	-2.9	-2.4	-4.3
9. “False alarms”	-2.5	0.0	-2.7	-.3

Note: Line 8 reports the average of lines 1–7. Line 9 reports the average for non-recession episodes, excluding the year of recovery from recessions, in which IP growth declined more than 2 percentage points relative to trend over the preceding four quarters.

Source: Staff calculations.

Figure 3: Estimated Probability of Recession in the World Economy over the Next 12 Months



Note: Shading indicates that countries representing 65 percent of world GDP are classified in recession.
Source: Staff calculations.

² Our sample covers 1972:M1–2019:M7 and includes data for Australia, Brazil, Canada, China, the euro area, India, Indonesia, Japan, Korea, Mexico, Russia, Spain, the United Kingdom, and the United States. We use time-varying GDP weights at purchasing-power-parity dollar values to construct global IP. IP and GDP trends are 10-year moving averages of these series. We define *global recessions* as periods in which 65 percent of countries are classified as in recession. For the United States, we follow the National Bureau of Economic Research classification.

³ The methodology follows Pablo Cuba-Borda, Andrea Raffo, and Alexander Mechanick (2018), “Monitoring the World Economy: A Global Conditions Index,” IFDP Notes (Washington: Board of Governors of the Federal Reserve System, June 15), <https://www.federalreserve.gov/econres/notes/ifdp-notes/monitoring-the-world-economy-a-global-conditions-index-20180615.htm>.

The Foreign GDP Outlook

Real GDP*

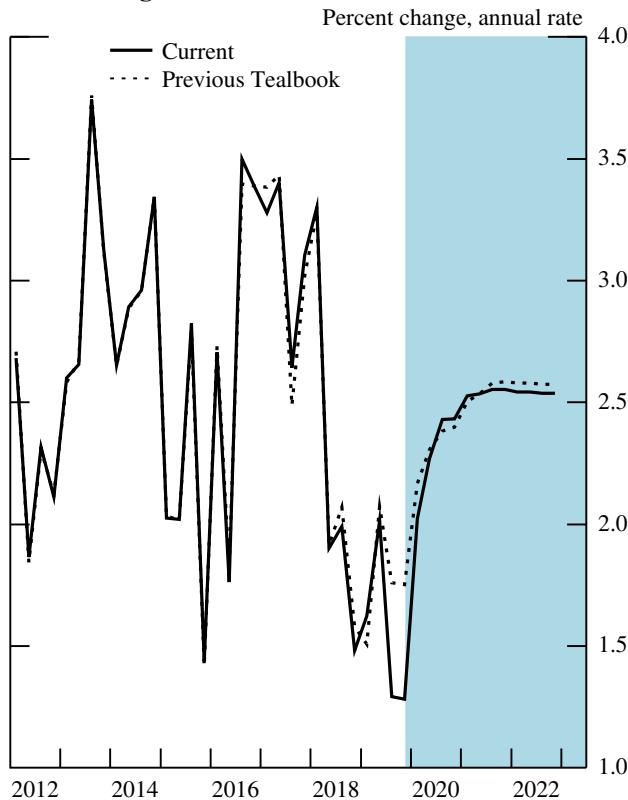
Percent change, annual rate**

	2018	2019				2020	2021	2022
		Q1	Q2	Q3	Q4			
1. Total foreign	2.2	1.6	2.0	1.3	1.3	2.3	2.5	2.5
<i>Previous Tealbook</i>	2.2	1.5	2.1	1.8	1.8	2.3	2.6	2.6
2. Advanced foreign economies	1.3	1.3	2.1	1.1	.8	1.5	1.7	1.7
<i>Previous Tealbook</i>	1.4	1.3	2.0	1.1	.7	1.4	1.7	1.7
3. Canada	1.6	.5	3.7	1.4	1.4	1.7	1.8	1.8
4. Euro area	1.2	1.7	.8	.9	.9	1.3	1.8	1.7
5. Japan	.3	2.0	1.8	.2	-2.0	1.0	.8	.8
6. United Kingdom	1.5	2.3	-.9	1.2	.1	.7	1.4	1.4
7. Emerging market economies	3.0	2.0	2.0	1.5	1.8	3.1	3.4	3.4
<i>Previous Tealbook</i>	3.1	1.7	2.1	2.4	2.7	3.2	3.4	3.4
8. China	6.4	7.3	5.5	5.4	5.7	5.6	5.7	5.6
9. Emerging Asia ex. China	3.3	2.3	2.6	.4	.8	3.5	3.4	3.4
10. Mexico	1.4	-.4	-.2	.1	.4	1.6	2.3	2.3
11. Brazil	1.1	-.3	1.8	1.5	2.3	2.3	2.8	2.8
<i>Memo</i>								
Emerging market economies ex. China	2.2	.7	1.2	.6	.9	2.5	2.8	2.8

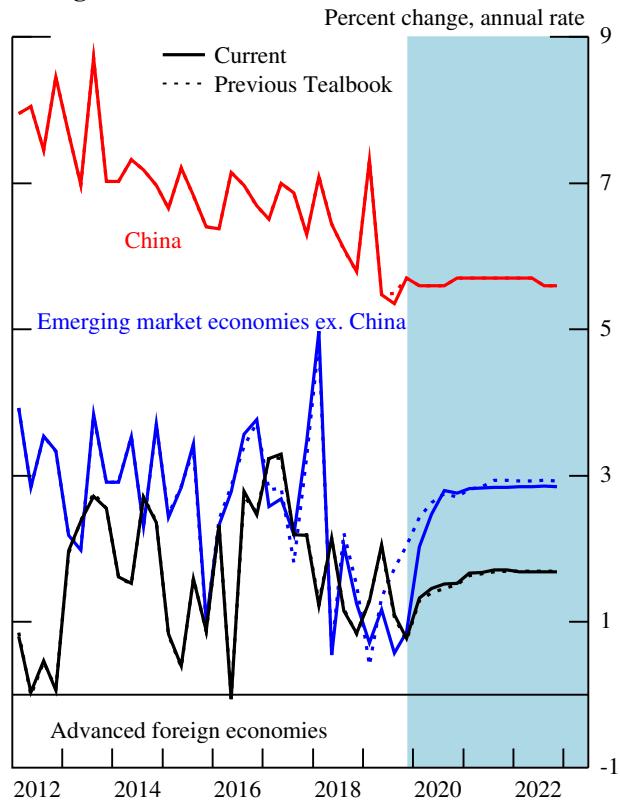
* GDP aggregates weighted by shares of U.S. merchandise exports.

** Annual data are Q4/Q4.

Total Foreign GDP



Foreign GDP



The Foreign Inflation Outlook

Consumer Prices*

Percent change, annual rate**

	2018	2019	Q1	Q2	Q3	Q4	2020	2021	2022
1. Total foreign	2.4	.8	3.3	2.3	3.3	3.3	2.2	2.3	2.3
<i>Previous Tealbook</i>	2.4	.8	3.3	2.3	2.6	2.6	2.3	2.3	2.3
2. Advanced foreign economies	1.7	.8	2.2	.9	1.3	1.3	1.4	1.5	1.6
<i>Previous Tealbook</i>	1.7	.8	2.1	.9	1.5	1.5	1.4	1.5	1.6
3. Canada	2.1	1.6	3.4	1.7	2.2	2.2	2.0	2.0	2.0
4. Euro area	1.9	.3	2.1	.7	1.1	1.1	1.2	1.4	1.6
5. Japan	.8	.9	.3	.3	1.1	1.1	.6	.8	1.0
6. United Kingdom	2.3	1.1	2.6	1.7	.7	.7	1.8	1.9	1.9
7. Emerging market economies	2.9	.8	4.1	3.2	4.6	4.6	2.8	2.8	2.8
<i>Previous Tealbook</i>	2.9	.8	4.1	3.2	3.3	3.3	2.9	2.8	2.8
8. China	2.2	.6	4.3	4.6	6.9	6.9	2.4	2.5	2.5
9. Emerging Asia ex. China	1.9	.2	3.1	1.2	2.3	2.3	2.7	2.7	2.7
10. Mexico	4.8	1.1	4.5	2.8	3.2	3.2	3.2	3.2	3.2
11. Brazil	4.1	2.9	5.2	2.2	1.8	1.8	3.8	3.7	3.5
<i>Memo</i>									
Emerging market economies ex. China	3.5	1.0	3.9	2.1	3.0	3.0	3.1	3.0	3.0

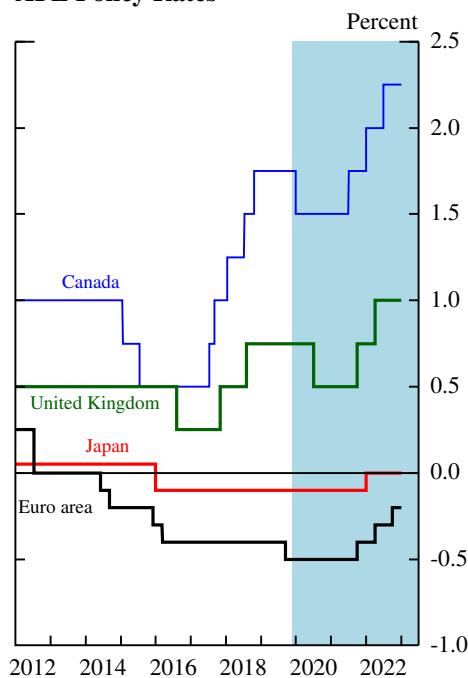
* CPI aggregates weighted by shares of U.S. non-oil imports.

** Annual data are Q4/Q4.

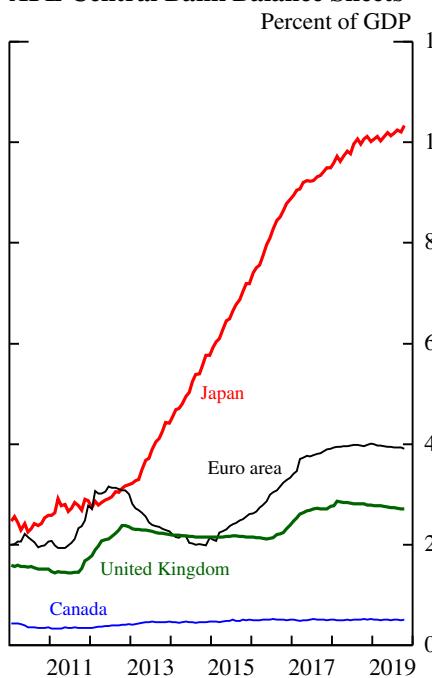
Int'l Econ Devel & Outlook

Foreign Monetary Policy

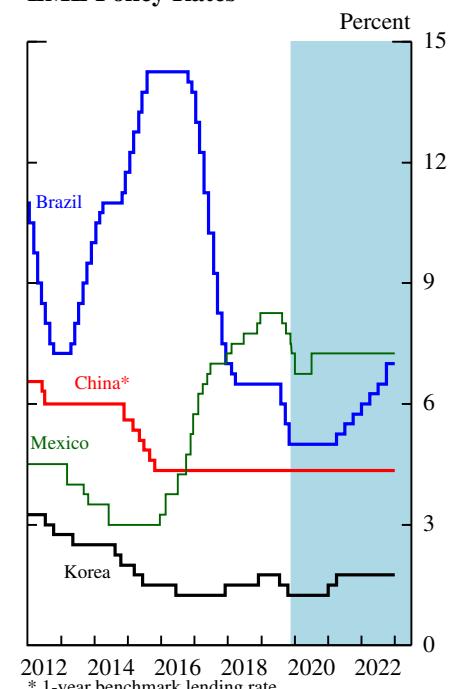
AFE Policy Rates



AFE Central Bank Balance Sheets

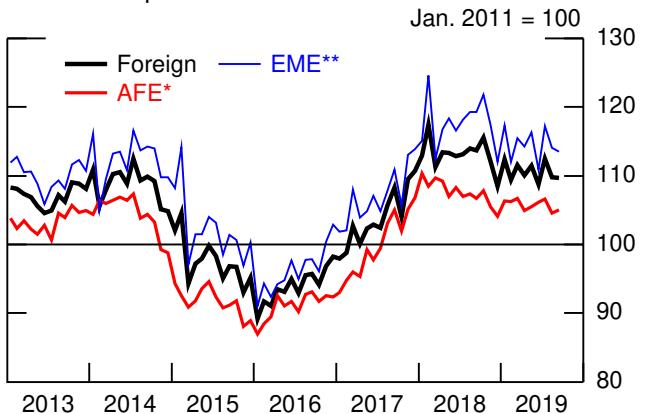


EME Policy Rates

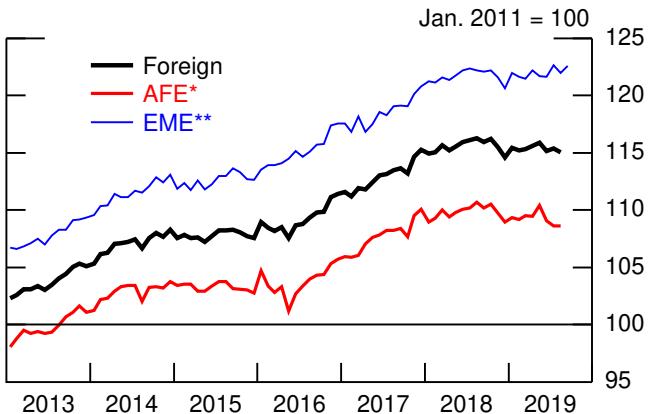


Recent Foreign Indicators

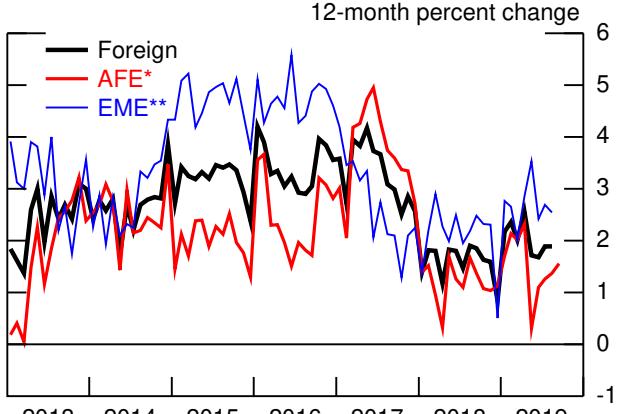
Int'l Econ Devel & Outlook

Nominal Exports

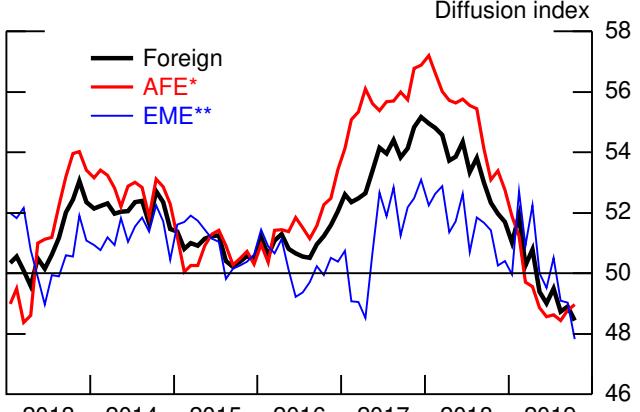
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Singapore, Taiwan, Thailand.

Industrial Production

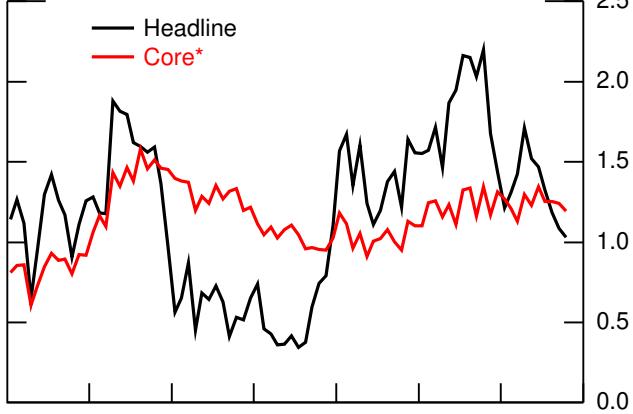
* Includes Canada, euro area, Japan, Sweden, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand.

Retail Sales

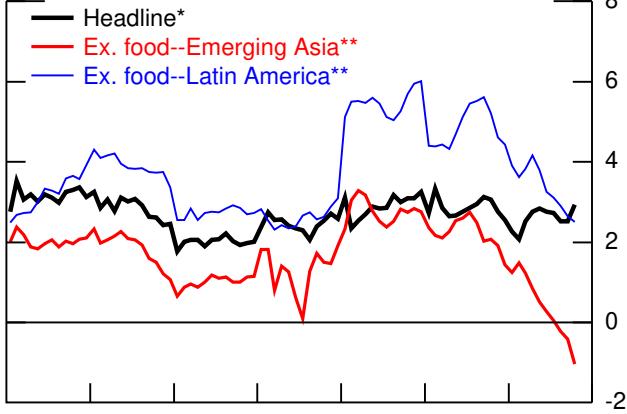
* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, Chile, China, Korea, Mexico, Singapore, Taiwan.

Manufacturing PMI

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

Consumer Prices: Advanced Foreign Economies
12-month percent change

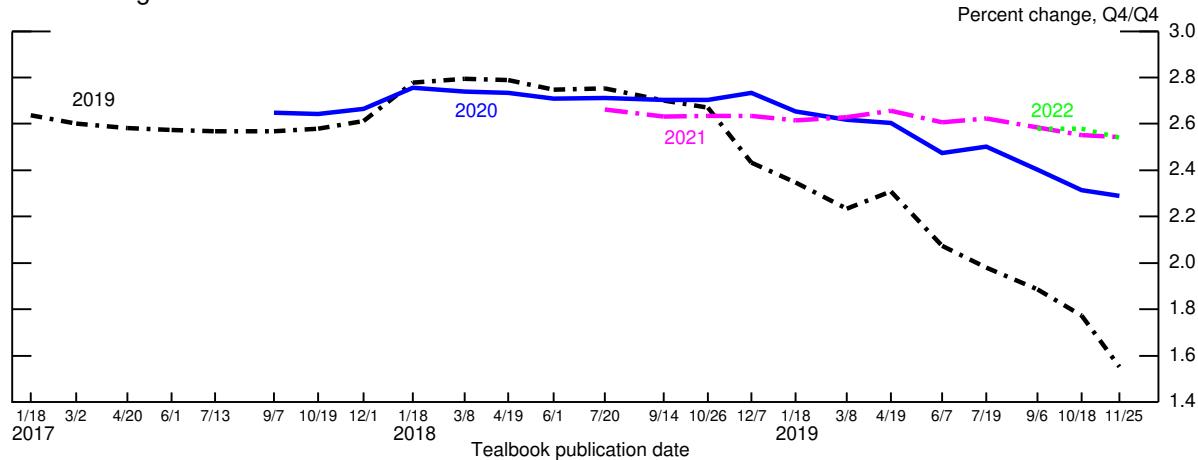
Note: Includes Canada, euro area, Japan, U.K.
* Excludes all food and energy; staff calculation.
Source: Haver Analytics.

Consumer Prices: Emerging Market Economies
12-month percent change

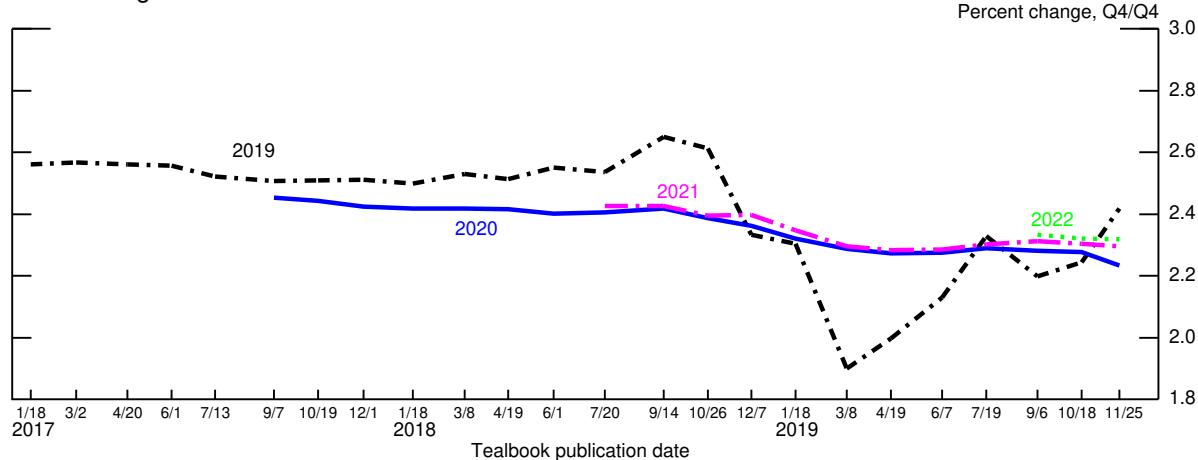
* Includes Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand.
** Excludes all food; staff calculation. Latin America excludes Argentina and Venezuela.

Evolution of Staff's International Forecast

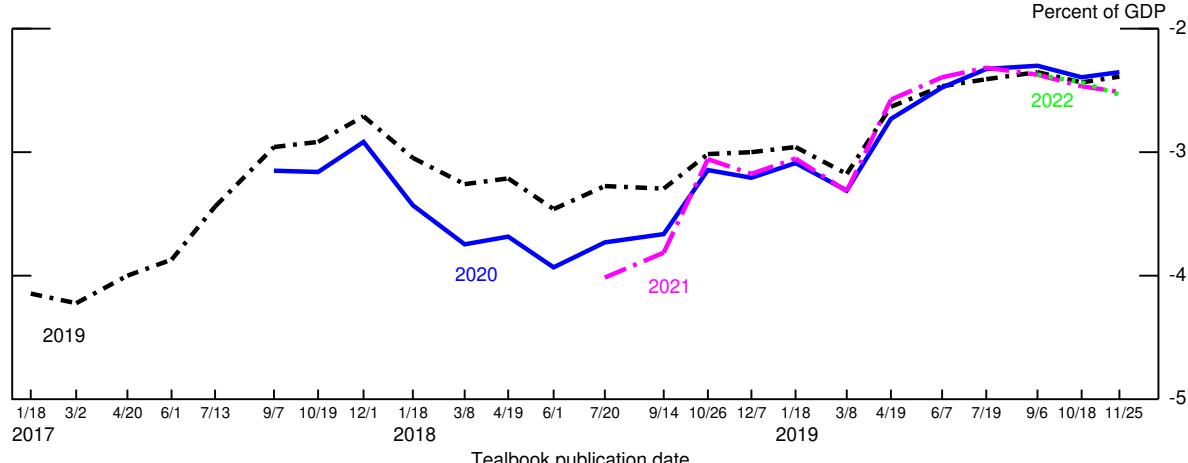
Total Foreign GDP



Total Foreign CPI



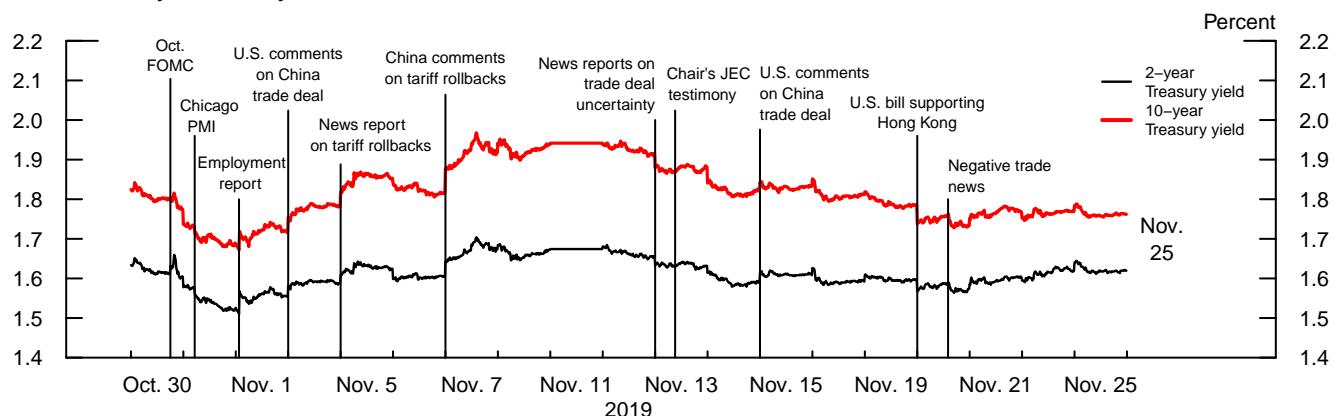
U.S. Current Account Balance



Int'l Econ Devel & Outlook

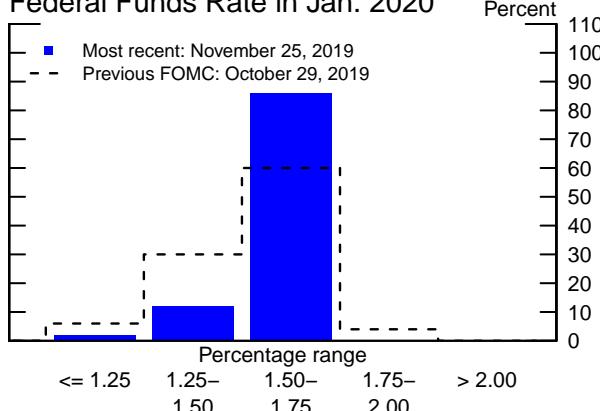
Policy Expectations and Treasury Yields

Intraday Treasury Yields



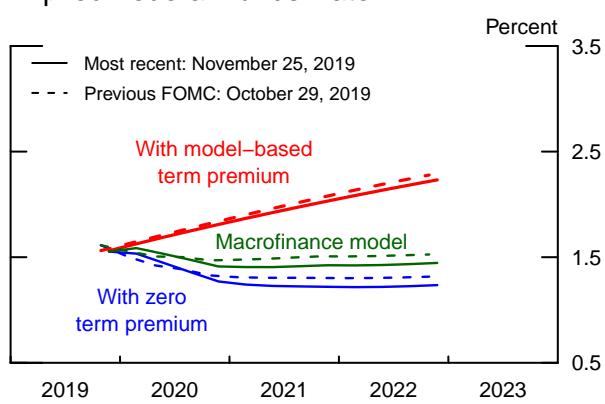
Note: Data are spaced at 5-minute intervals from 8:00 a.m. to 4:00 p.m.
Source: Bloomberg.

Market-Implied Probability Distribution of the Federal Funds Rate in Jan. 2020



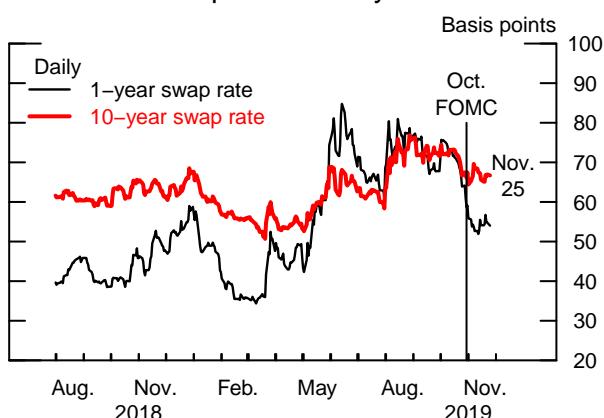
Note: Estimated from federal funds futures options; not adjusted for risk premiums.
Source: CME Group; Board staff calculations.

Implied Federal Funds Rate



Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of 0 basis points.
Model-based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premiums. Macrofinance model path is estimated using regressions of risk premiums on the covariances between real and nominal variables.
Source: Bloomberg; Board staff calculations.

Measures of Implied Volatility



Note: Implied volatility on the 1-year and 10-year swap rate 6 months ahead is derived from swaptions.
Source: Barclays.

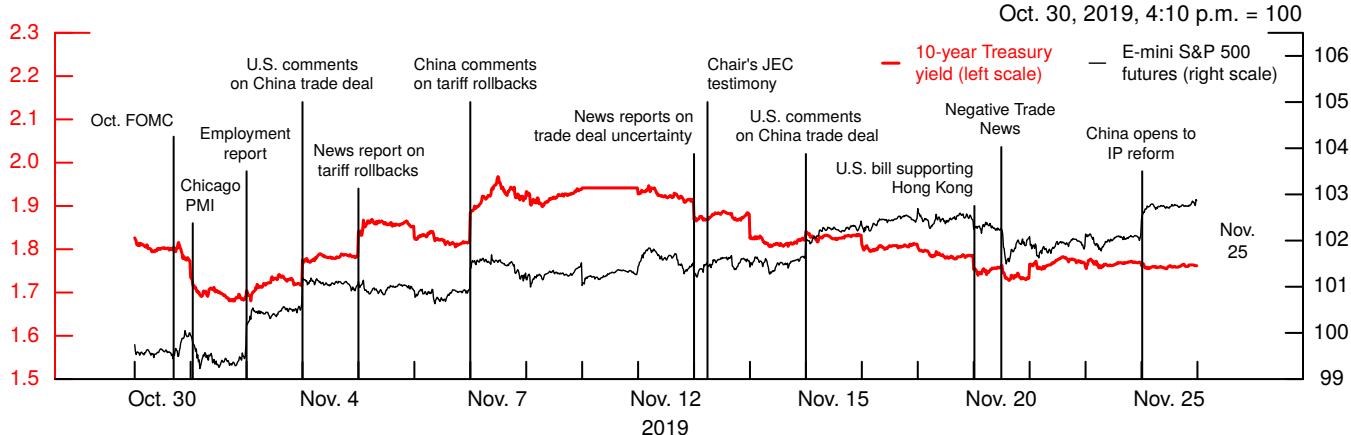
TIPS-Based Inflation Compensation



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

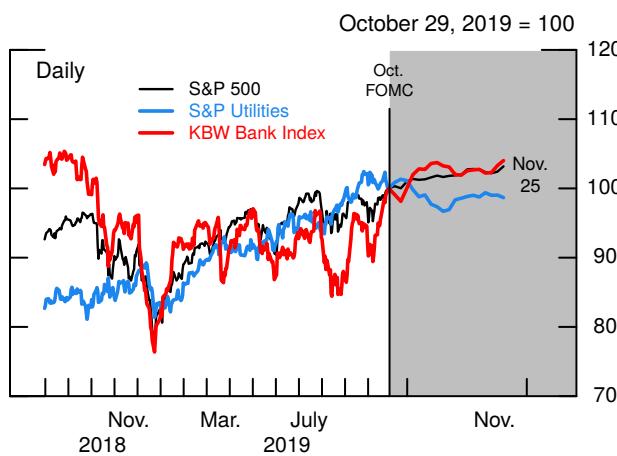
Corporate Asset Market Developments

Intraday S&P 500 Futures and 10-Year Treasury Yield



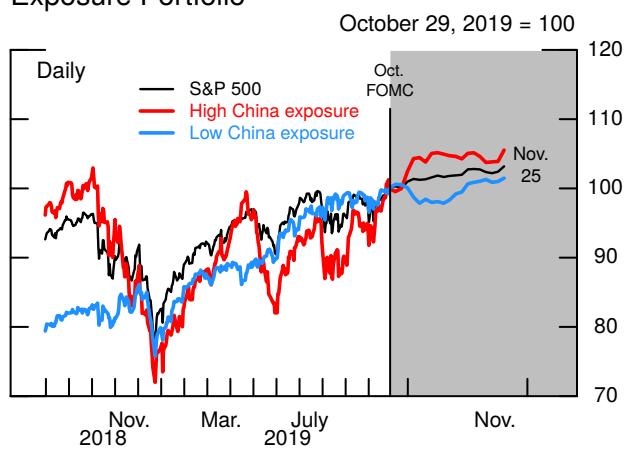
Note: Data are spaced at 5-minute intervals from 9:30 a.m. to 4:10 p.m.
Source: Bloomberg.

Selected S&P 500 Stock Price Indexes



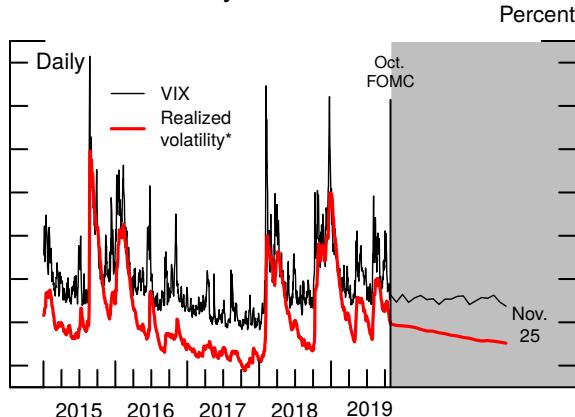
Note: The shaded gray area represents an expanded window focusing on the period following the previous FOMC meeting.
Source: Bloomberg.

S&P 500 Index and China Exposure Portfolio



Note: The shaded gray area represents an expanded window focusing on the period following the previous FOMC meeting. China exposure is measured based on Board staff calculations of stock price sensitivity to the ASHR China A-Shares exchange-traded fund.
Source: Bloomberg; Compustat; Yahoo Finance.

S&P 500 Volatility

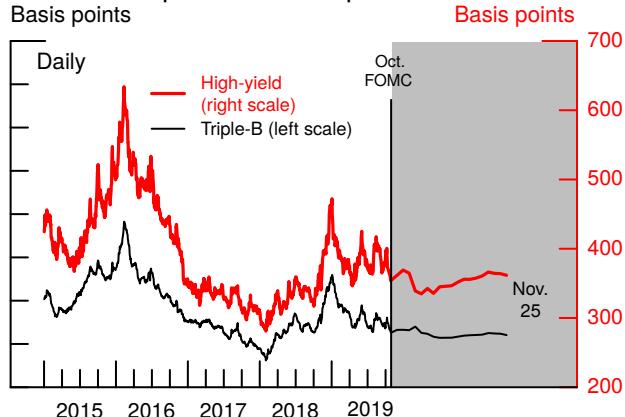


Note: The shaded gray area represents an expanded window focusing on the period following the previous FOMC meeting.

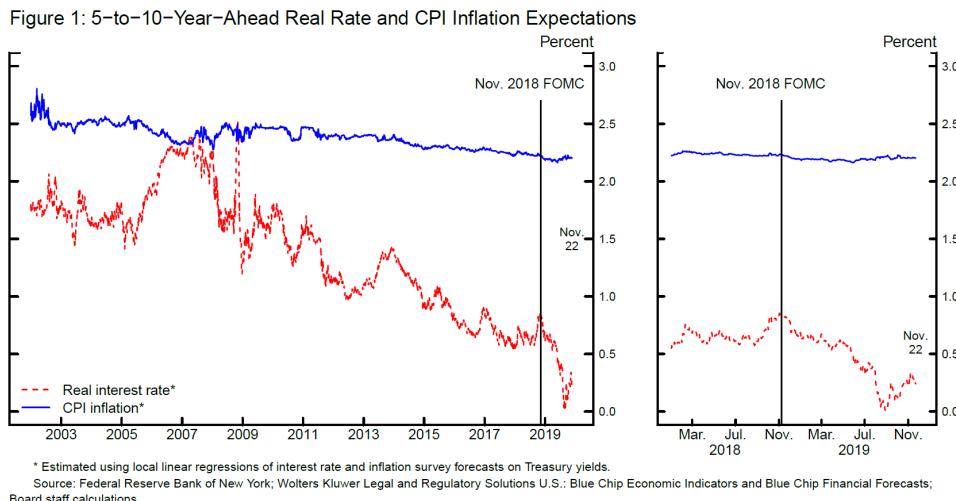
* 5-minute returns used in exponentially weighted moving average with 75 percent of weight distributed over the most recent 20 days.

Source: Bloomberg.

10-Year Corporate Bond Spreads



Note: The shaded gray area represents an expanded window focusing on the period following the previous FOMC meeting. Spreads over 10-year Treasury yield.
Source: Merrill Lynch; Federal Reserve Bank of New York; Board staff calculations.



0.8 percentage point on net. That decline followed a general downward trend since the Global Financial Crisis. Since August, the rate has risen about 0.2 percentage point as Treasury yields have recovered somewhat, and it currently stands at 0.2 percent. The average CPI inflation expectation (the solid blue line) from the regression-based approach is little changed, on net, since November 2018, at 2.2 percent.² However, it has edged down 0.2 percentage point since early 2014.

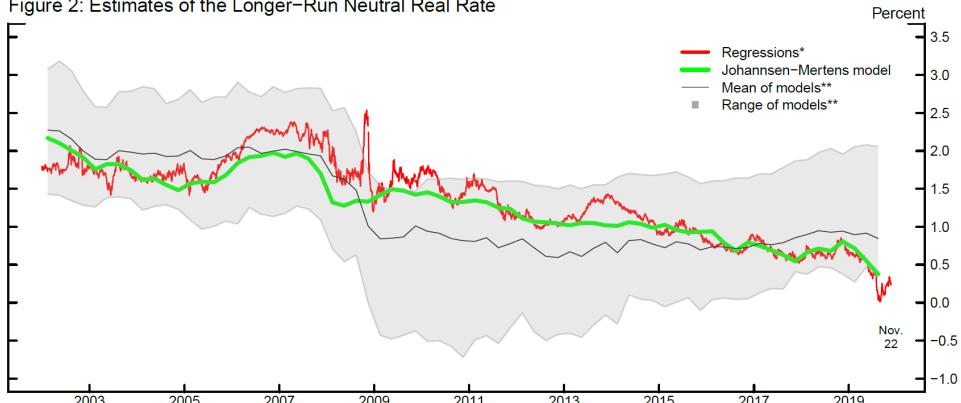
Another measure of long-horizon interest rate and CPI inflation expectations is provided by the staff's term structure model of Treasury yields.³ The term structure model also assumes that the part of survey forecasts that cannot be explained by the yield curve is measurement error. The principal differences compared with the regression approach are that the term structure model imposes theoretical restrictions and has less flexibility to explain variation in the surveys, so it can struggle at times to capture the broad movements in the surveys. Since November 2018, the term structure model points to a somewhat smaller decline in real interest rate expectations (0.3 percentage point) than the regressions and a somewhat larger decline in inflation expectations (0.2 percentage point).

As can be seen in the gray region in figure 2, estimates of the longer-run neutral real rate from eight models, as reported in the Monetary Policy Strategies (MPS) section, have also been low since the financial crisis. However, the average of

² This level of CPI inflation expectations corresponds to PCE inflation expectations slightly below 2 percent, based on the average historical spread between core CPI and PCE inflation.

³ The staff model is explained in Don Kim, Cait Walsh, and Min Wei (2019), "Tips from TIPS: Update and Discussions," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, May 21), <https://www.federalreserve.gov/econres/notes/feds-notes/tips-from-tips-update-and-discussions-20190521.htm>.

Figure 2: Estimates of the Longer-Run Neutral Real Rate



* Estimated using local linear regressions of interest rate and inflation survey forecasts on Treasury yields.

** Mean and range of quarterly point estimates from eight models reported in the Monetary Policy Strategies section: Christensen and Rudebusch (forthcoming), Del Negro and others (2017), Holston and others (2017), Johannsen and Mertens (2016), Kiley (2015), Laubach and Williams (2003), Lewis and Vazquez-Grande (2019), and Lubik and Matthes (2015). The final data point is 2019:Q3.

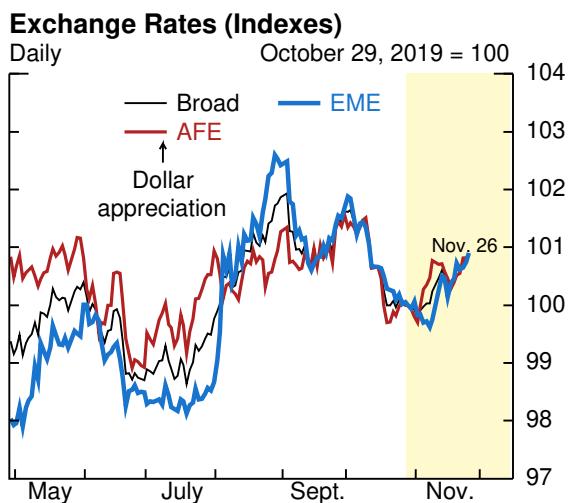
Source: Federal Reserve Bank of New York; Wolters Kluwer Legal and Regulatory Solutions U.S.: Blue Chip Economic Indicators and Blue Chip Financial Forecasts; Board staff calculations.

those estimates (the black line) declined sharply after the crisis and has since remained fairly flat, whereas the regression-based estimate has declined more steadily since the crisis. That difference may be because most of the models reported in the MPS section incorporate macroeconomic data such as real activity and inflation measures, whereas financial market participants may have been slower to take those data into account after the crisis. That said, there are also notable differences among the estimates from the models reported in the MPS section. For example, the model of Johannsen and Mertens (2016) (the green line) tracks the regression-based measure (the red line) relatively closely and both were at similarly low levels in the third quarter of 2019, which may be because both models capture the low levels of long-term Treasury yields.⁴

In conclusion, market participants' perceptions of the longer-run neutral real interest rate appear to have declined, on net, since November 2018, even as the average of the model-based estimates reported in the MPS section remained fairly flat. Evidence on long-horizon CPI inflation expectations since November 2018 is more mixed, although they may have edged down since 2014.

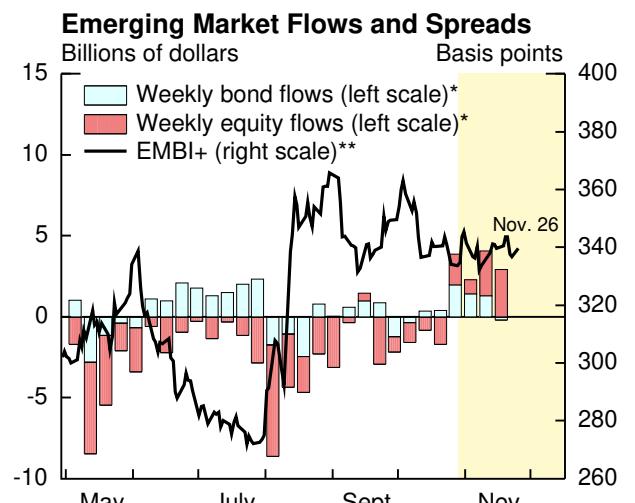
⁴ Benjamin K. Johannsen and Elmar Mertens (2016), "A Time Series Model of Interest Rates with the Effective Lower Bound," Finance and Economics Discussion Series 2016-033 (Washington: Board of Governors of the Federal Reserve System, April), <https://dx.doi.org/10.17016/FEDS.2016.033>.

Foreign Developments

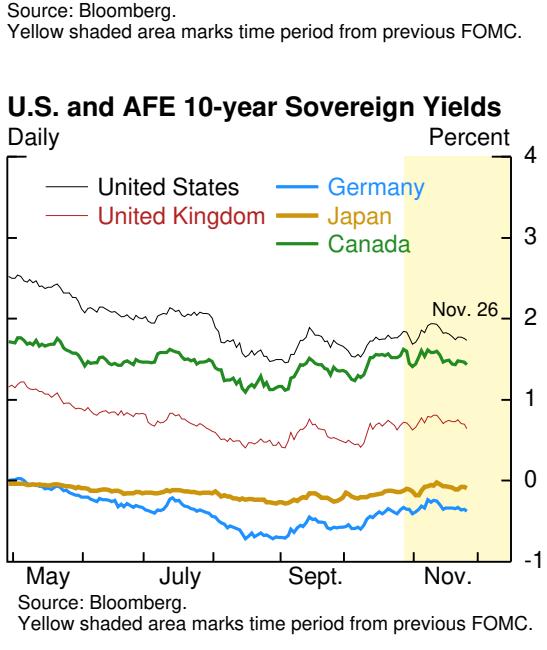
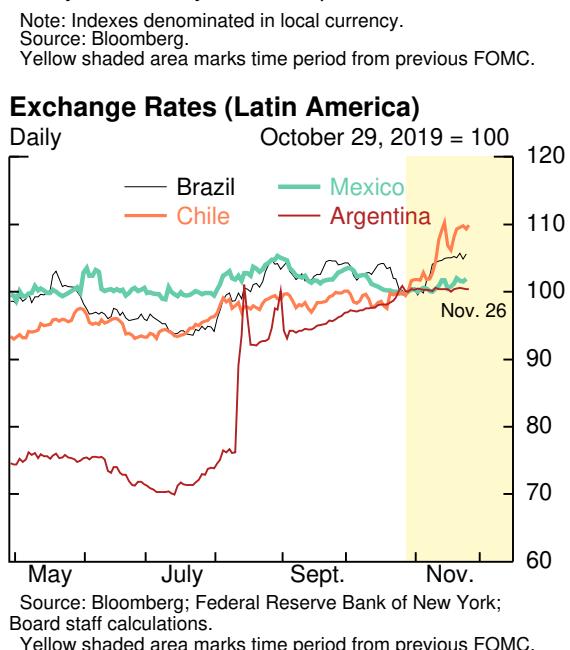
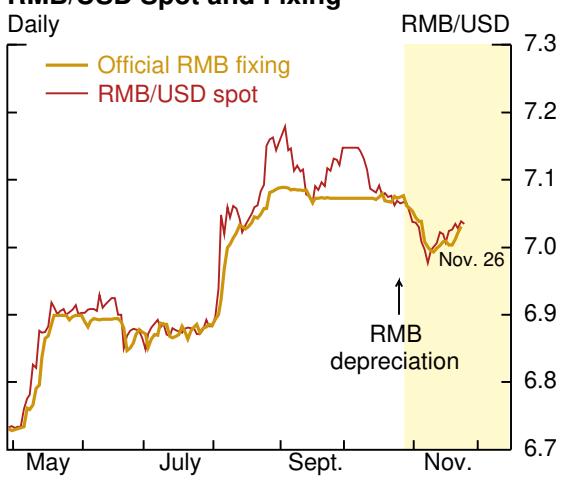
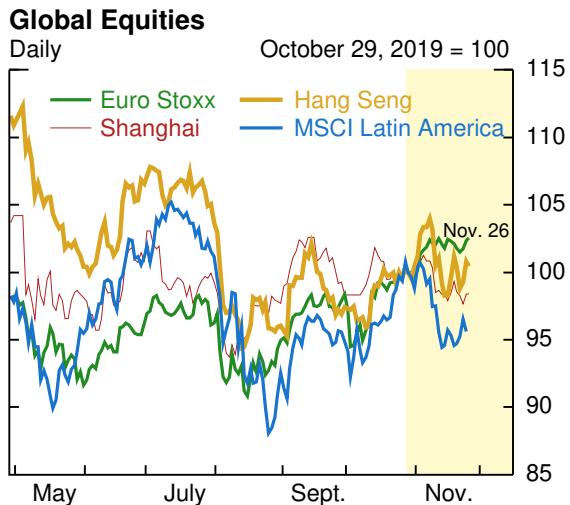


Note: Bloomberg; Federal Reserve Bank of New York;
Board staff calculations.

Yellow shaded area marks time period from previous FOMC.

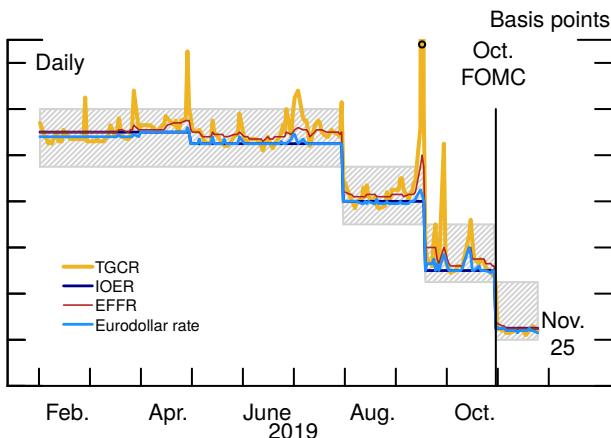


RMB/USD Spot and Fixing



Short-Term Funding Markets

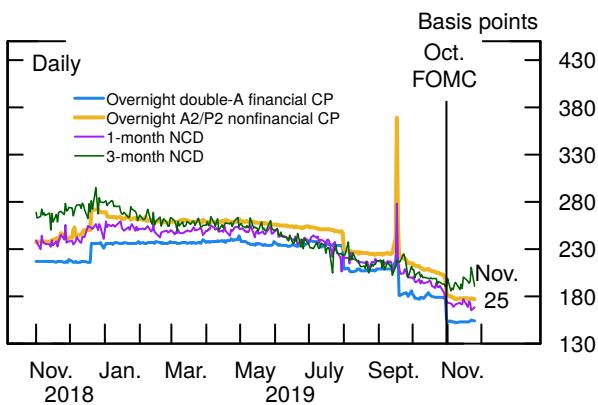
Selected Money Market Rates



Note: These data points are not shown: TGCR: Sept. 17 = 525 basis points. Shaded area is the target range for the federal funds rate. IOER is interest on excess reserves; TGCR is triparty general collateral rate; EFFR is effective federal funds rate.

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

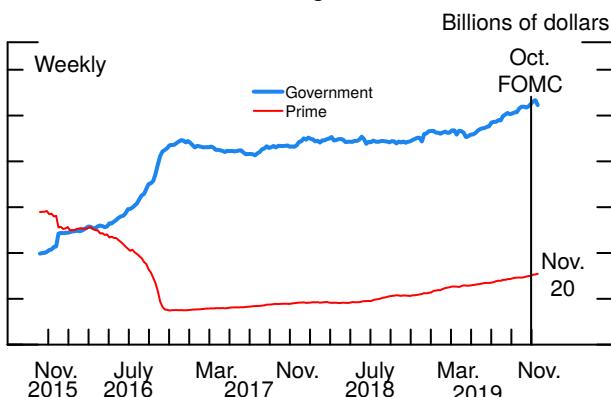
CP and NCD Rates



Note: CP is commercial paper; NCD is negotiable certificate of deposit.

Source: Depository Trust & Clearing Corporation.

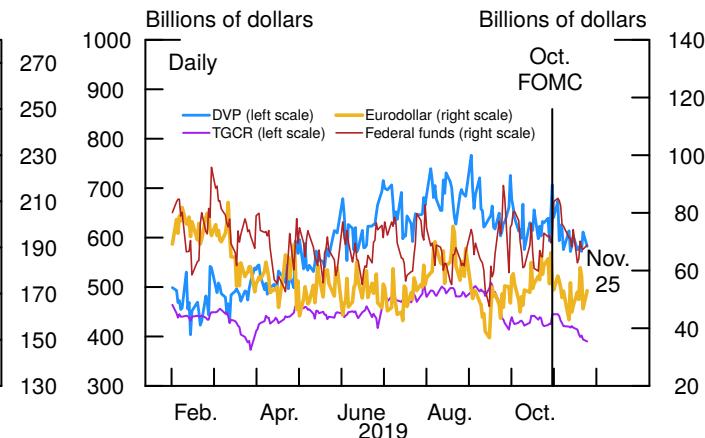
MMF Assets under Management



Note: MMF is money market fund. Data are updated every Thursday.

Source: Investment Company Institute.

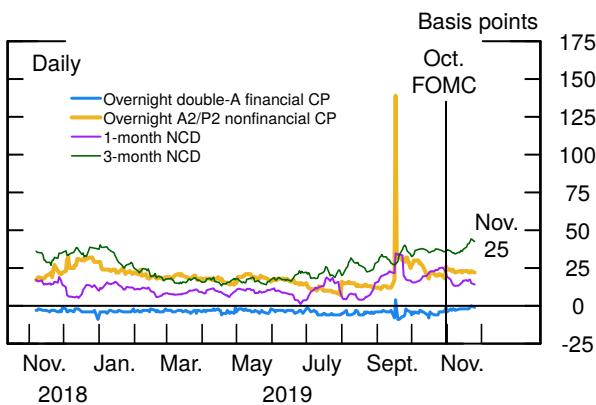
Selected Money Market Volumes



Note: DVP is delivery-versus-payment repurchase agreement; TGCR is triparty general collateral rate.

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

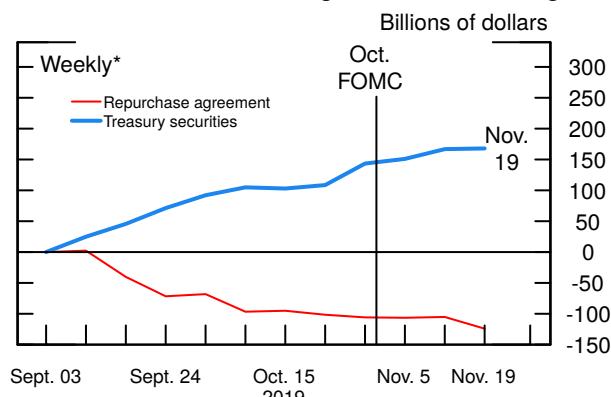
CP and NCD Spreads



Note: CP is commercial paper; NCD is negotiable certificate of deposit. Overnight CP spreads are to the effective federal funds rate and NCD spreads to the overnight index swap rate. NCD spreads are 5-day moving averages.

Source: Depository Trust & Clearing Corporation.

Recent Cumulative Changes in MMF Holdings



* Data are for holdings as of Tuesday of each week.

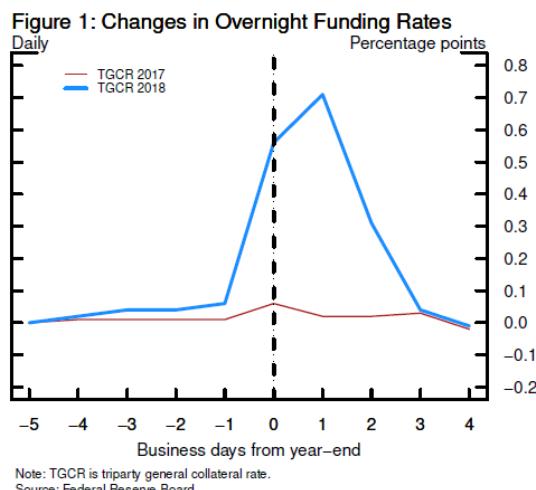
Source: iMoneyNet.

Year-End Effects in Short-Term Funding Markets in Recent Years

At recent year-ends, certain money market segments have exhibited unusual volatility and elevated funding costs, which have the potential to affect market functioning and credit provision. Historically, year-end effects have reflected a combination of factors, including balance sheet management (“window dressing”) for financial and regulatory reporting and the potential for coordination failures in these markets during the holidays, as well as special factors that vary from year to year.¹ Given the unexpected volatility in money markets in September 2019, there are heightened concerns about potential pressures going into the upcoming year-end, even as the Federal Reserve is providing additional liquidity.

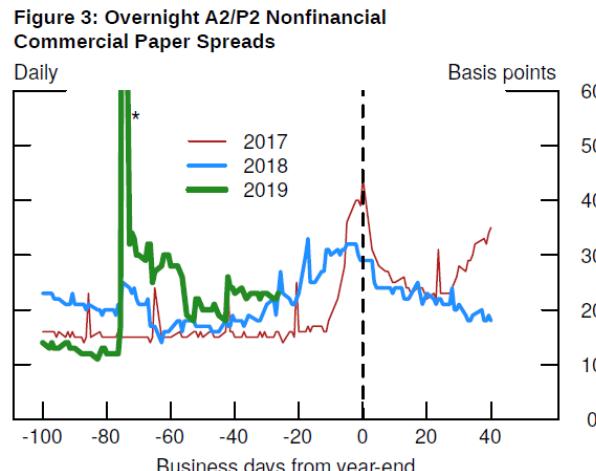
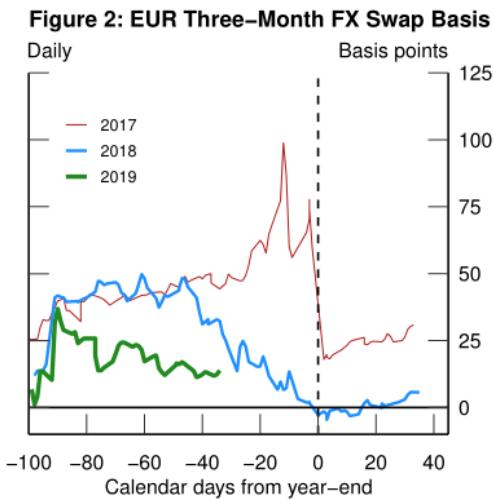
Year-end funding pressures materialized somewhat differently in 2017 and in 2018. For example, while Treasury GC repo rates moved little at the end of 2017, they spiked substantially—far more than anticipated—at the end of 2018 (figure 1), reportedly in part because of funding demands arising from a Treasury auction settlement on December 31. In contrast, three-month FX swap bases rose sharply at the end of 2017 but were more subdued at the end of 2018 (figure 2), perhaps as firms obtained funding early in anticipation of year-end pressures.² Other segments, such as markets for commercial paper (CP) and certificates of deposit (CDs), have exhibited more consistent behavior from year to year. Money market funds and other investors typically pull back from CP and CDs leading up to year-end, putting upward pressure on rates, particularly in A2/P2-rated CP (figure 3).

Market commentary indicates some money market participants are on edge heading into the end of 2019, in part because of concerns raised by the mid-September



¹ While money markets tend to exhibit such dynamics around other financial reporting dates, such as quarter-ends, the effects are typically more pronounced around year-ends.

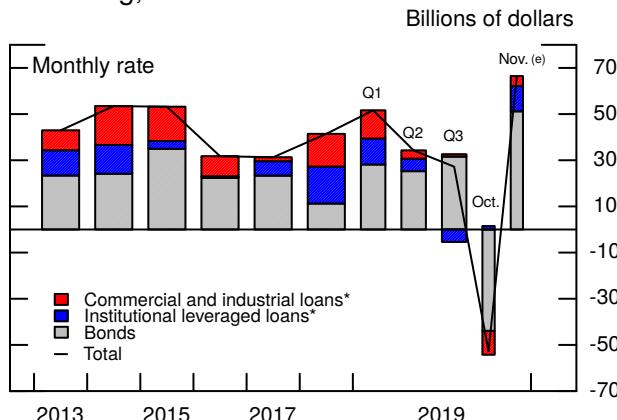
² EUR–USD and JPN–USD FX swap basis. The FX swap basis, usually calculated as the difference between the dollar funding cost via an FX swap and LIBOR, reflects the costliness of “offshore” dollar funding relative to the domestic money market.



volatility in these markets. Indeed, several of the factors that contributed to the volatility at the end of 2018 and in September of this year will be in play again. Dealer positions in Treasury securities remain elevated, and there will again be a sizable Treasury auction settlement on December 31. In addition, market participants have stated that regulatory constraints diminish their ability to supply dollar liquidity.

Market participants and the Federal Reserve have undertaken some extra preparations for this year-end amid the heightened uncertainty. For example, the share of nonfinancial CP that currently matures after year-end is about 15 percentage points higher than is typical at this time of year, and other segments of the CP and CD markets show slightly elevated shares of pre-funding. In addition, dealers have reportedly been more proactive than usual in pressing clients to seek alternative sources of funding at year-end. Finally, Federal Reserve open market operations—Treasury bill purchases and repo operations—will increase the availability of financing to securities dealers and help to maintain ample levels of reserves through year-end. The first operation offering term repo maturing beyond year-end was conducted on November 25 and was significantly oversubscribed. Market participants have noted that these operations have helped ease some concerns about year-end pressures.

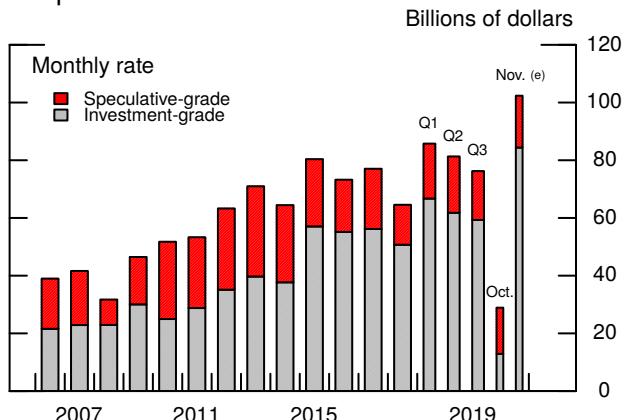
Thus far, we have seen only limited evidence of heightened year-end funding pressures. Anecdotal reports suggest term repo rates are slightly elevated compared with this time last year. In contrast, increases in three-month FX swap bases and three-month CD spreads have so far been smaller than is typical for this time of year. To be sure, the illiquidity of some term money markets limits their reliability in indicating pressures until closer to year-end. While issuers are being more proactive than usual in obtaining funding ahead of year-end, it is too early to predict the extent of potential year-end funding pressures.

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

* Period-end basis.

e Estimate.

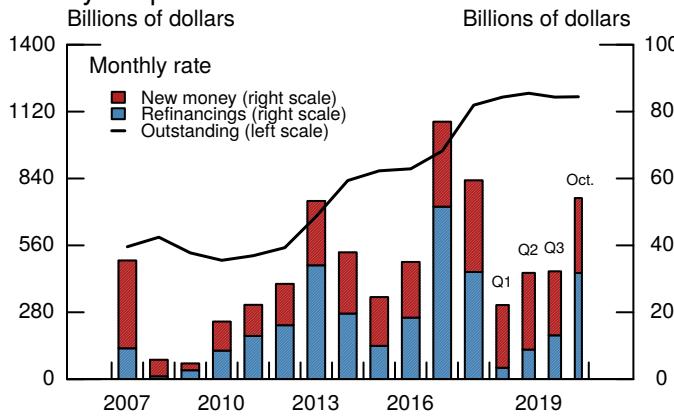
Source: Mergent Fixed Income Securities Database; Thomson Reuters LPC; Federal Reserve Board.

Gross Issuance of Nonfinancial Corporate Bonds

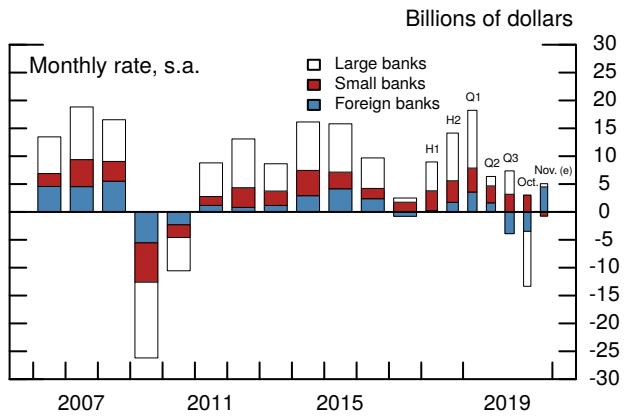
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.

e Estimate (month to date).

Source: Mergent Fixed Income Securities Database.

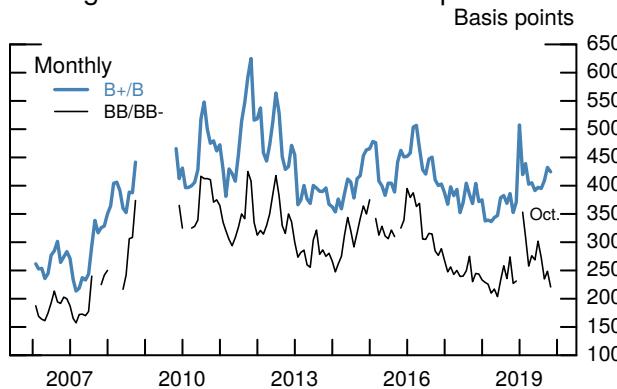
Institutional Leveraged Loan Issuance, by Purpose

Source: Thomson Reuters LPC LoanConnector.

Commercial and Industrial Loans

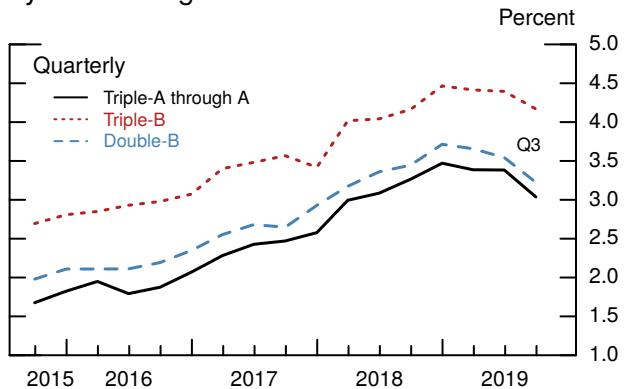
e Estimate.

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

Average New-Issue Institutional Spreads

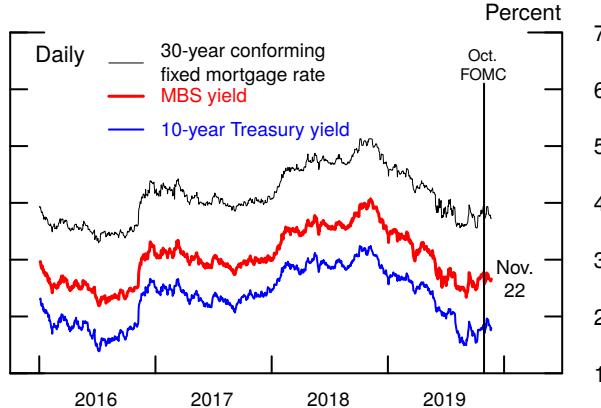
Note: Breaks in the series represent periods with no issuance. Spreads are calculated against 3-month LIBOR. The spreads do not include up-front fees.

Source: S&P LCD.

Weighted-Average Interest Rates for C&I Loans, by Risk Rating

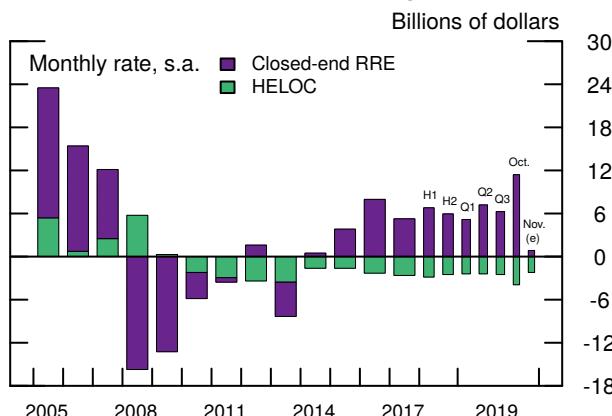
Note: With respect to newly originated commercial and industrial (C&I) loans and drawdowns.

Source: Federal Reserve Board Form FR Y-14Q, Capital Assessments and Stress Testing.

Mortgage Rate and MBS Yield

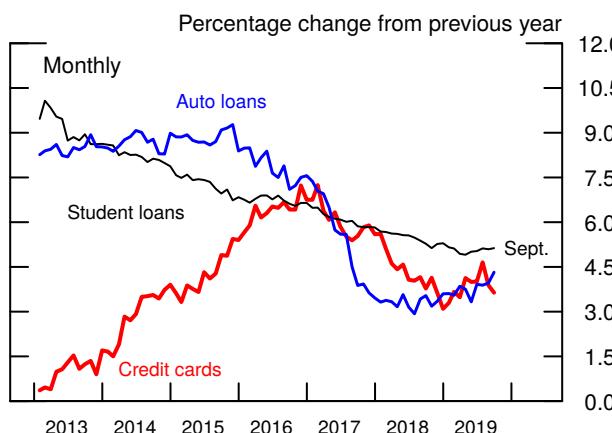
Note: Through May 31, 2019, the mortgage-backed securities (MBS) yield is the Fannie Mae 30-year current-coupon rate. From June 3, 2019, forward, the MBS yield is the uniform MBS 30-year current-coupon rate.

Source: For MBS yield, Barclays; for mortgage rate, LoanSifter; for Treasury yield, Federal Reserve Bank of New York and Federal Reserve Board staff calculations.

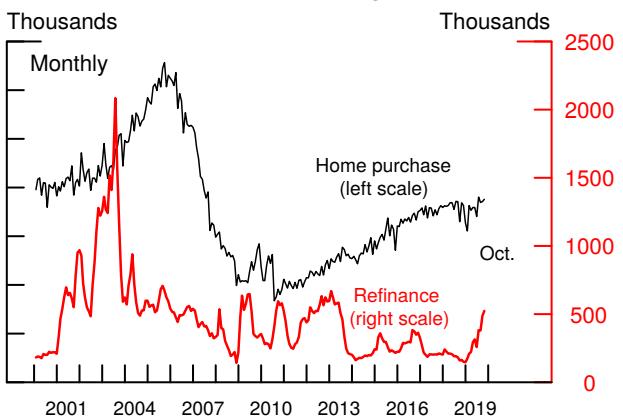
Residential Real Estate Lending

Note: RRE is residential real estate; HELOC is home equity line of credit.

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

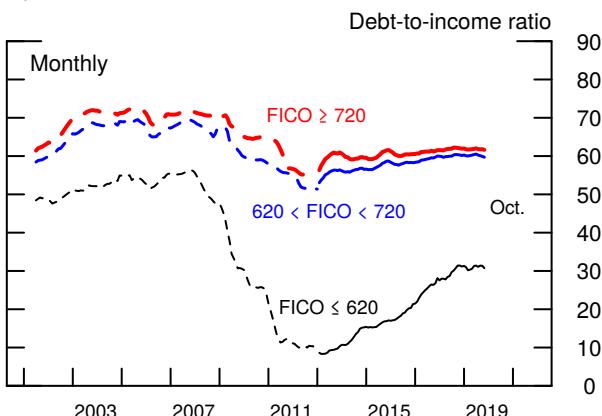
Consumer Credit

Source: Federal Reserve Board, Statistical Release G.19, "Consumer Credit."

Household Finance**Purchase and Refinance Originations**

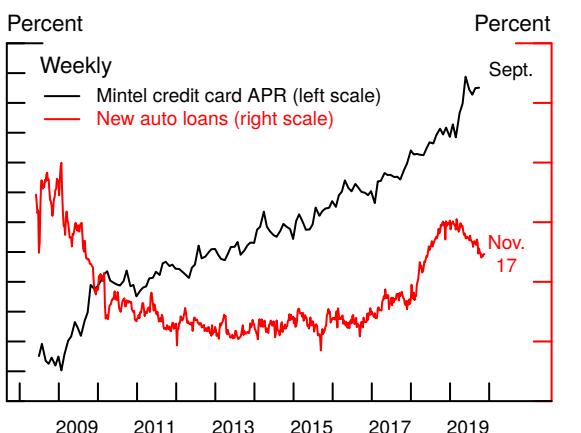
Note: The data are seasonally adjusted by Federal Reserve Board staff.

Source: For data before 2019, data reported under the Home Mortgage Disclosure Act of 1975; for values in 2019, Federal Reserve Board staff estimates.

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.

Consumer Interest Rates

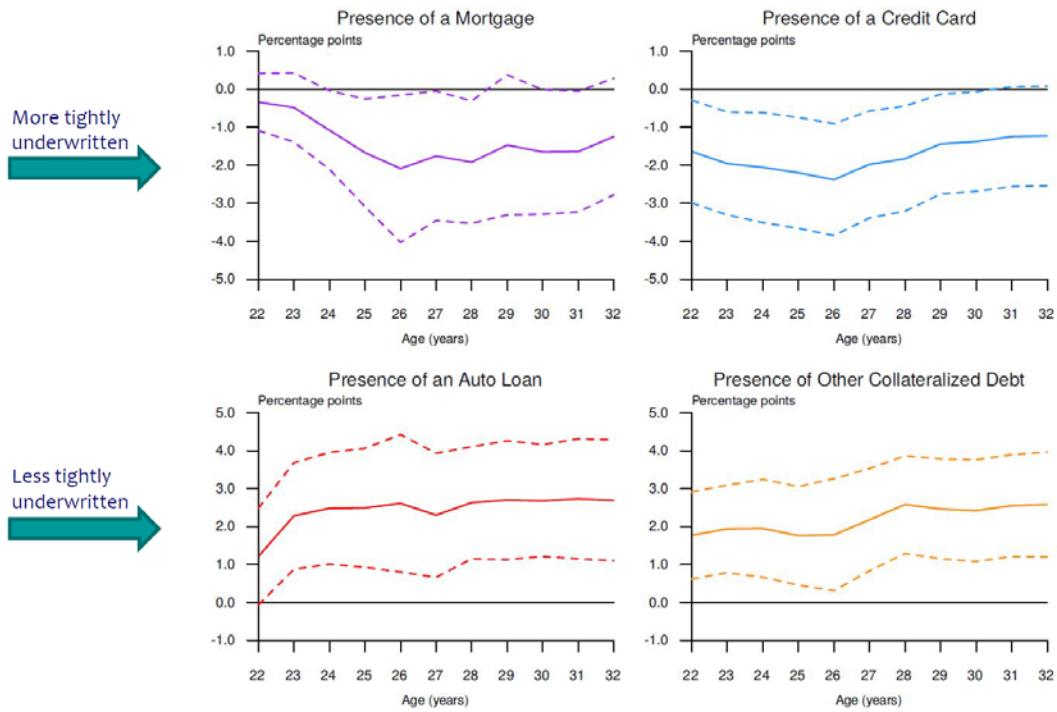
Note: Series are seasonally adjusted.

Source: Mintel data are reported monthly; J.D. Power.

left) and other collateralized consumer loans (bottom right), that is, loans secured by goods or an installment sales contract.⁵ For each type of debt, the solid lines represent the estimated effect, while the dashed lines show 90 percent confidence intervals. A 10 percent increase in early-life student loan borrowing reduces the age-specific probability of having a mortgage about 1.5 percentage points on average. The effect is also negative for credit cards and is of a similar size. In marked contrast, the same increase in student loans increases the probability of a person having an auto loan or other collateralized consumer debt about 2 to 2.5 percentage points on average. In additional analysis (not shown), we find that increased student loan debt causes a decline in limits on credit card accounts but an increase in the utilization rates of credit cards. This finding supports the premise that higher student debt could reduce the supply of credit available from credit cards but stimulates to some extent the demand for such credit.

In summary, our analysis suggests that increased student loan obligations result in differential effects on total borrowing by market segment by interacting differentially with the demand and supply of credit. In credit markets with more stringent underwriting, increasing student loan burdens can lead to a reduction in borrowing, likely because of a contraction in credit supply (that is, either through a reduction in entry to the credit market or through a reduction in credit limits). In contrast, in credit markets where underwriting is less tight, higher levels of student debt can lead to additional borrowing. As such, the ready availability of credit in these markets mitigates any potential contractionary effect that student loan debt service might have on borrowers' spending.

Effect of a 10 Percent Increase in Early Life Student Debt, by Age



⁵ For example, these debts are used to finance furniture and household appliances. These loans have an average maturity of one to three years, and the average loan size is about \$3,000.

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.”

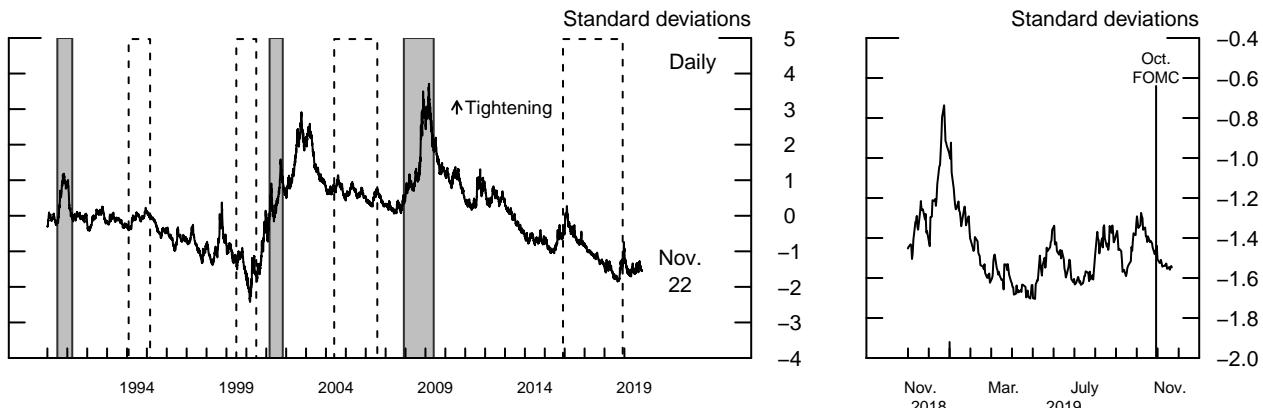
Overview of Selected FCIs

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

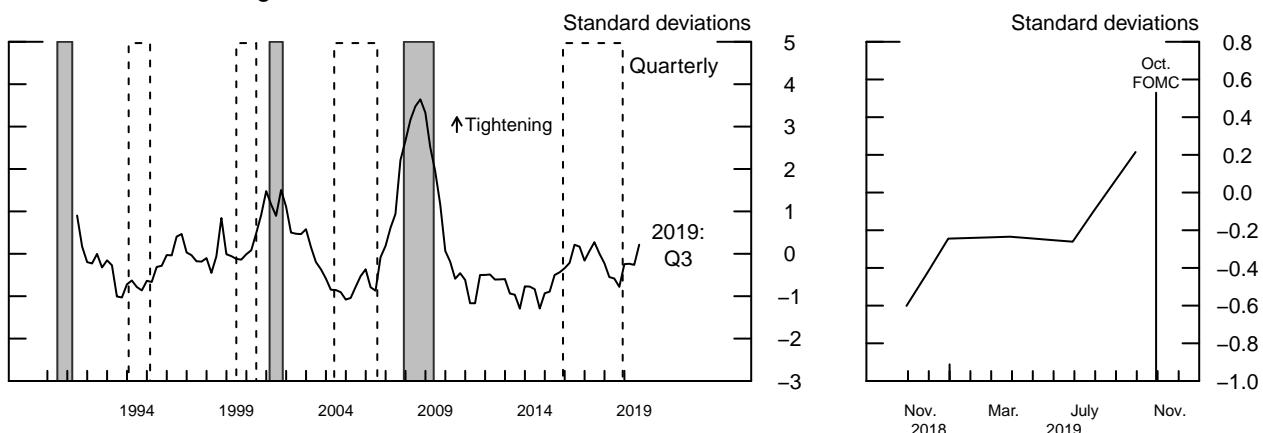
Staff FCI for Nonfinancial Corporations



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

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

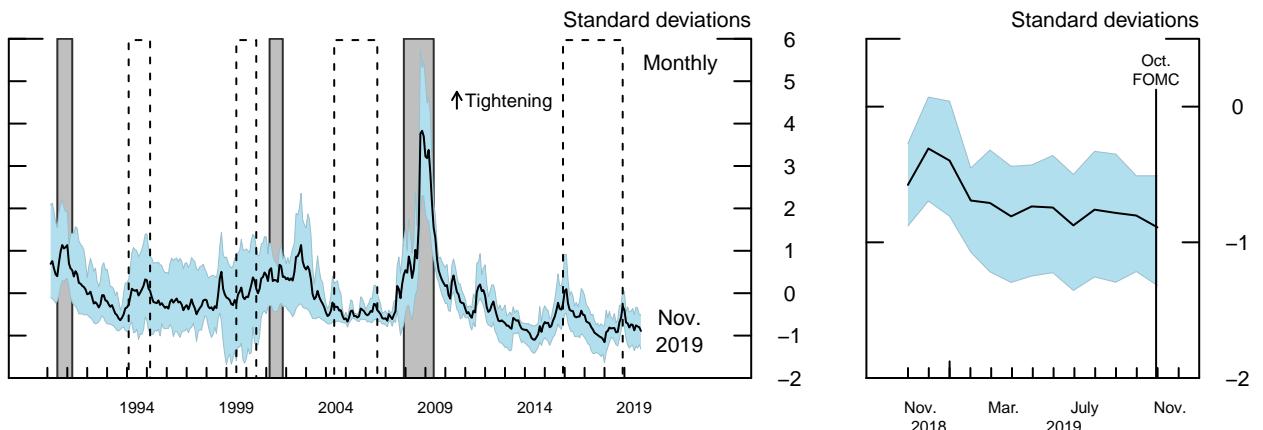
SLOOS Bank Lending Standards Index



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

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

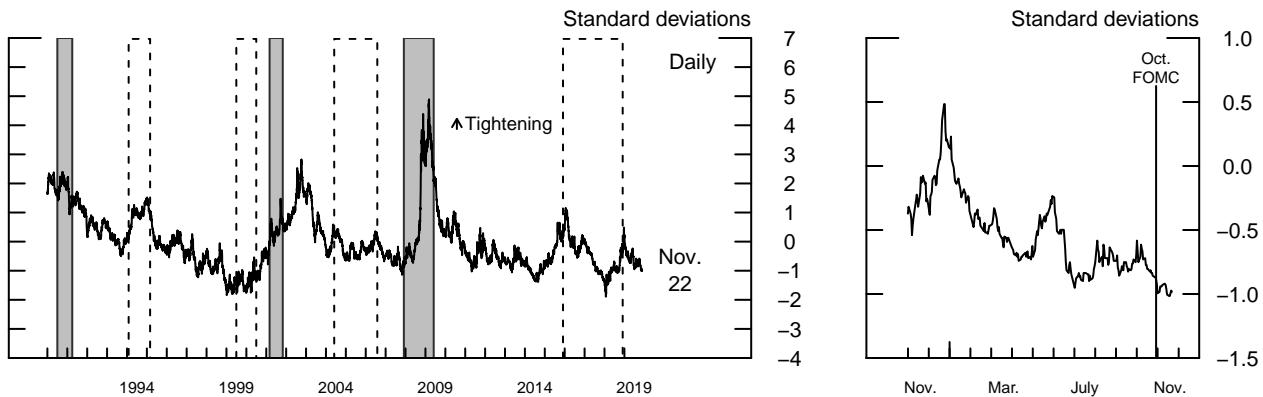
Mean and Range of External FCIs



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

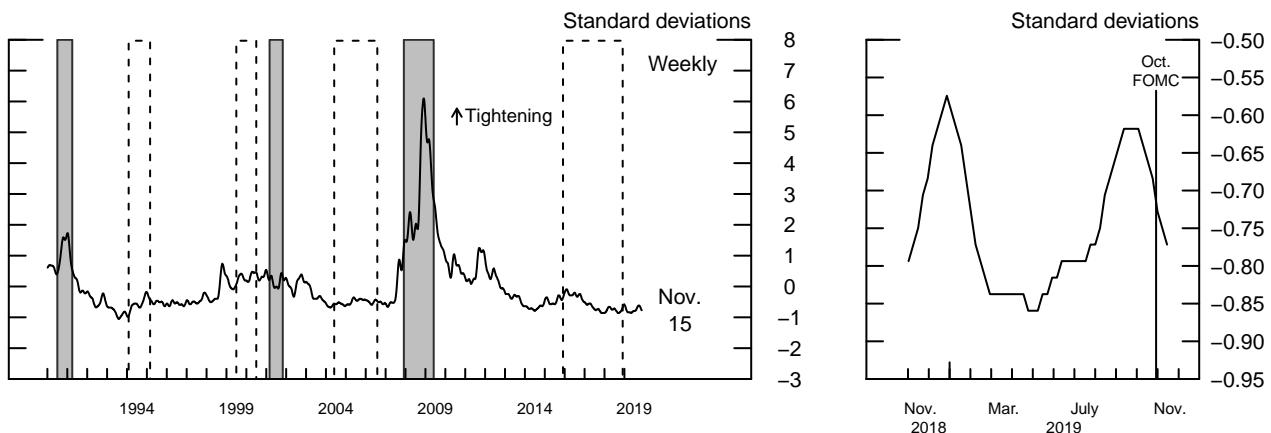
Source: Bloomberg; Federal Reserve Banks of Chicago, St. Louis, and Kansas City.

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

Selected Financial Conditions Indexes (continued)**Goldman Sachs FCI**

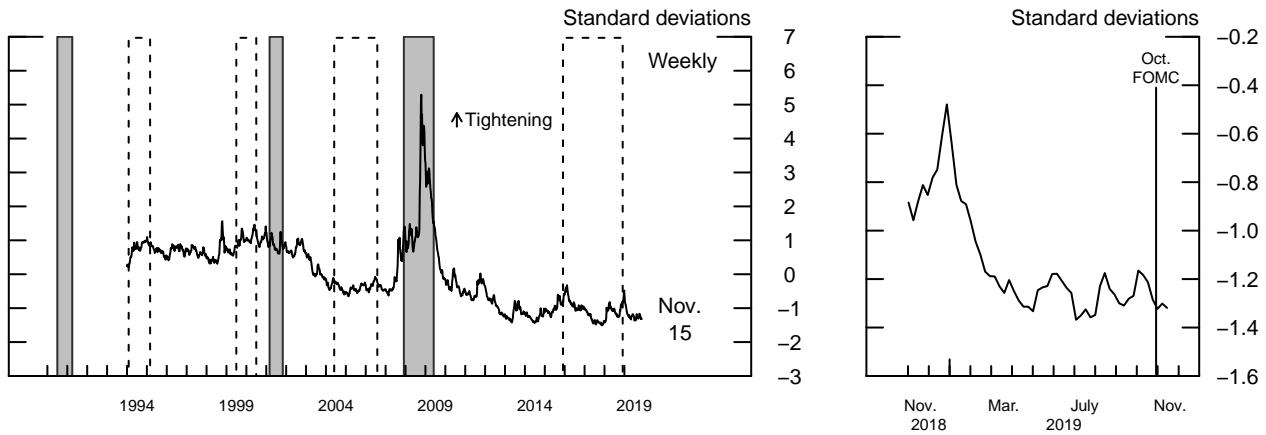
Note: The index is a weighted average of 5 financial variables: the federal funds rate, the 10-year Treasury yield, the triple-B yield spreads to Treasury, the S&P price-to-earnings ratio, and the broad value of the U.S. dollar. Weights are pinned down by the contribution of each financial variable on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

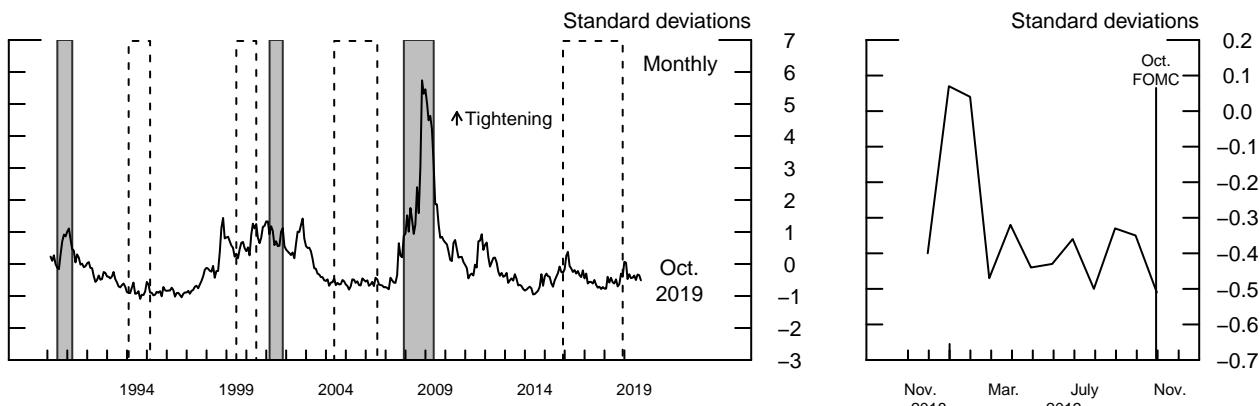
Note: The index is the principal component of 18 variables, including short- and long-term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, breakeven inflation rate, and the S&P 500 index.

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 (continued)

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.

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	.04	.04	.01	.02
Previous Tealbook	.05	.09	.05	.09
<i>Between 1 3/4 and 2 1/4 percent</i>				
Current Tealbook	.24	.23	.41	.21
Previous Tealbook	.20	.23	.36	.24
<i>Less than 1 percent</i>				
Current Tealbook	.19	.18	.02	.28
Previous Tealbook	.25	.16	.00	.14

Probability of Unemployment Events

(4 quarters ahead)

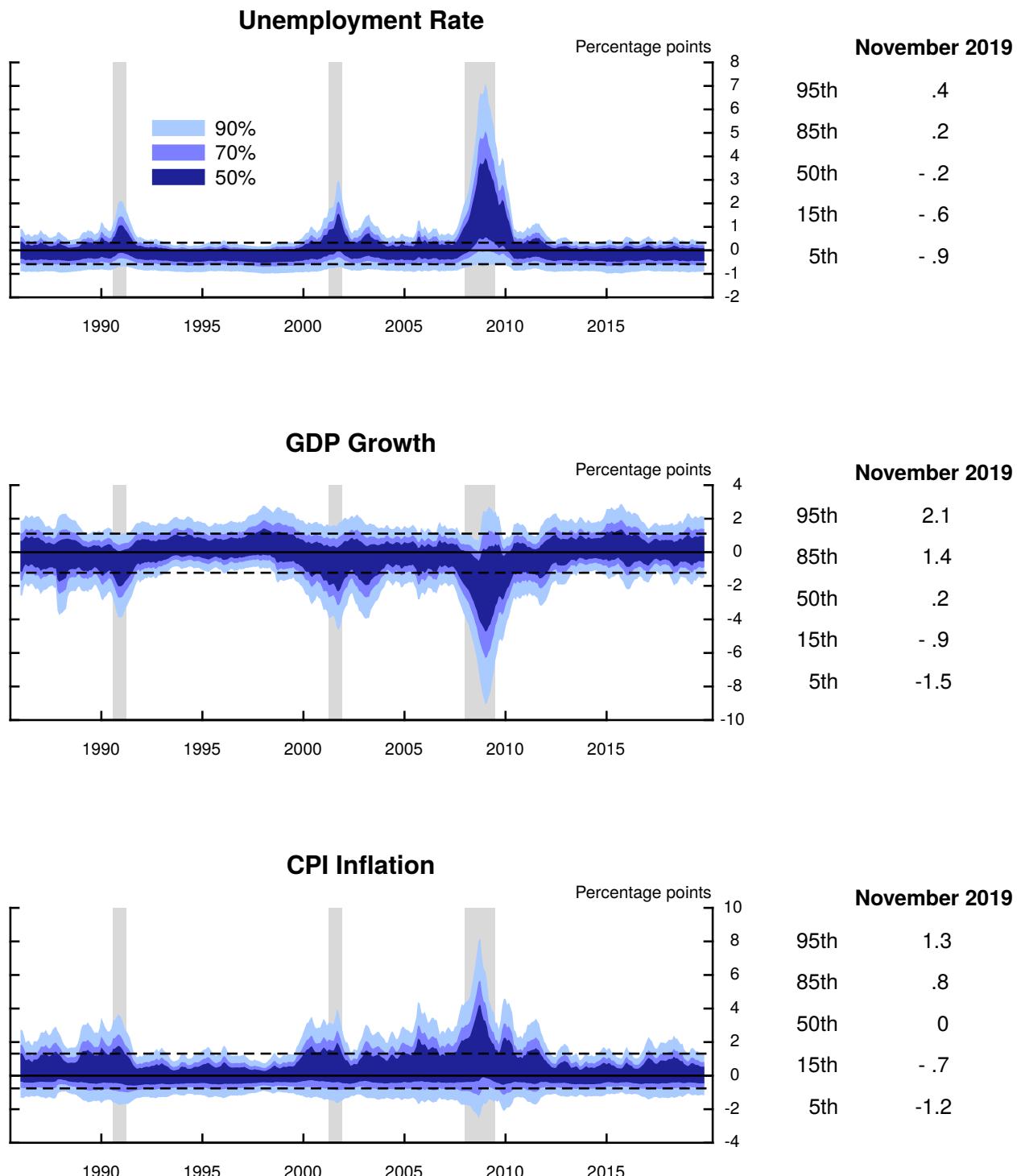
Probability that the unemployment rate will . . .	Staff	FRB/US	EDO	BVAR
<i>Increase by 1 percentage point</i>				
Current Tealbook	.03	.03	.23	.04
Previous Tealbook	.04	.09	.23	.02
<i>Decrease by 1 percentage point</i>				
Current Tealbook	.05	.03	.00	.07
Previous Tealbook	.08	.03	.00	.14

Probability of Recession Over Next 4 Quarters

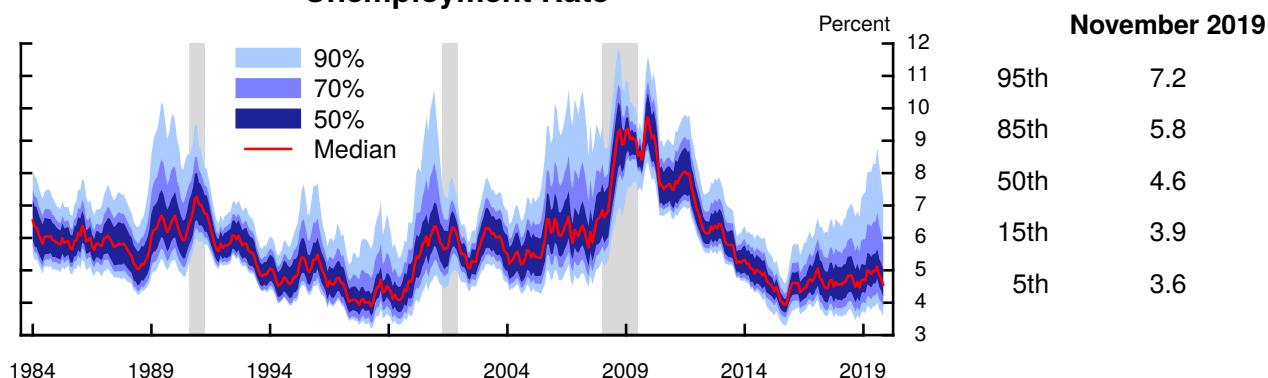
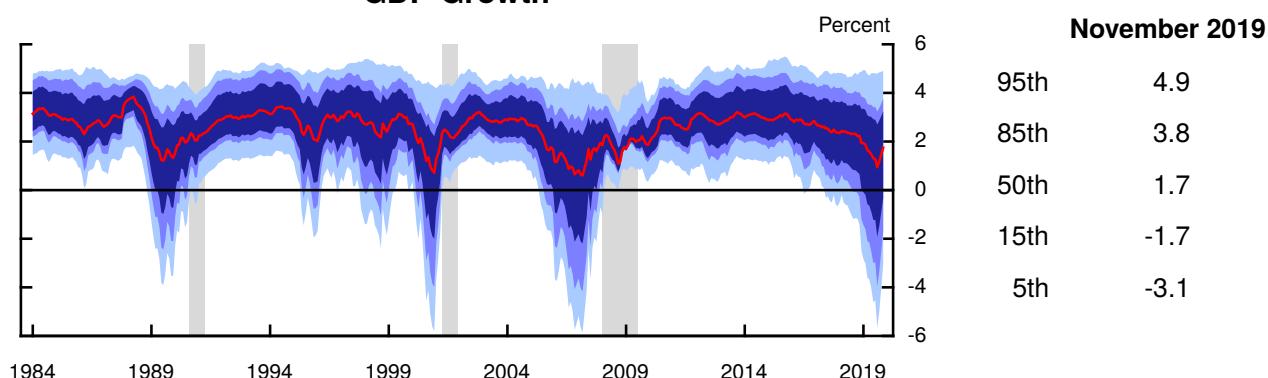
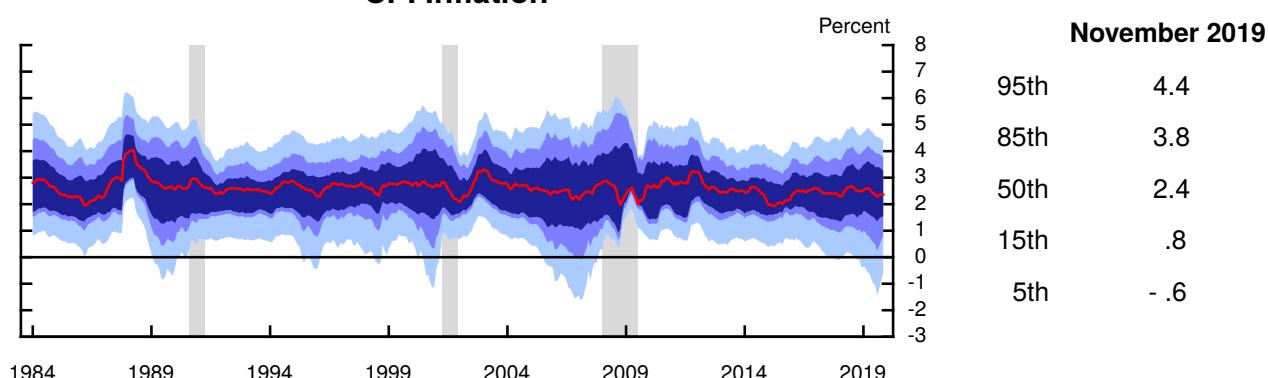
Probability of transitioning into or remaining in a recession	Staff	FRB/US	MAF	Term Spread	Unconditional
Current Tealbook	.07	.08	.08	.49	.23
Previous Tealbook	.09	.10	.22	.57	.23

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 “MAF” estimate uses a model averaging framework 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.

Time-Varying Macroeconomic Risk 1 Year Ahead



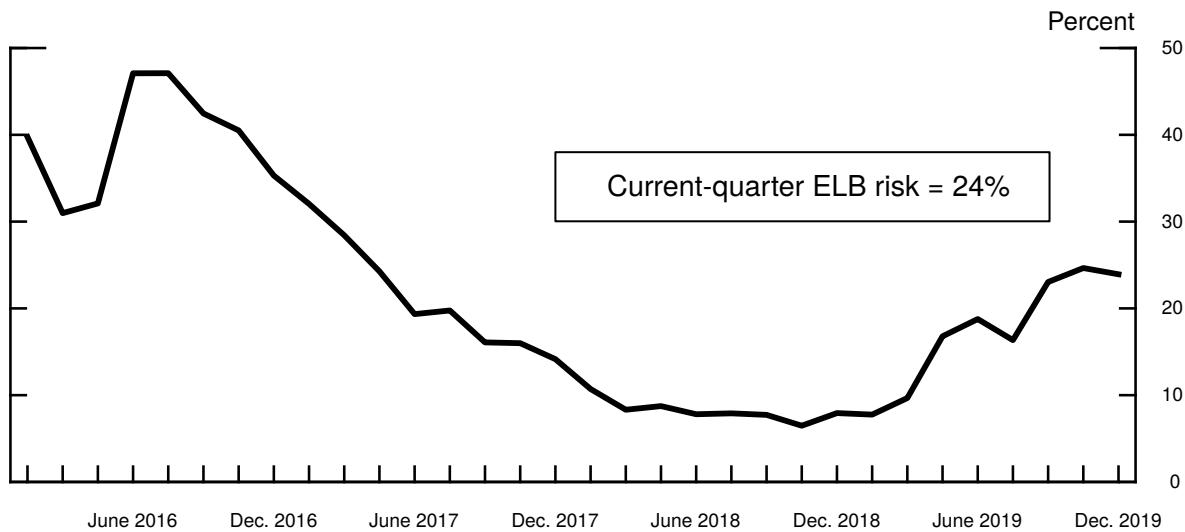
Note: The exhibit shows estimates of quantiles of the distribution of errors for 4-quarter-ahead staff forecasts. The estimates are conditioned on indicators of real activity, inflation, financial market strain, and the volatility of high-frequency macroeconomic indicators. The tables show selected quantiles 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.

Conditional Distributions of Macroeconomic Variables 2 Years Ahead**Unemployment Rate****GDP Growth****CPI Inflation**

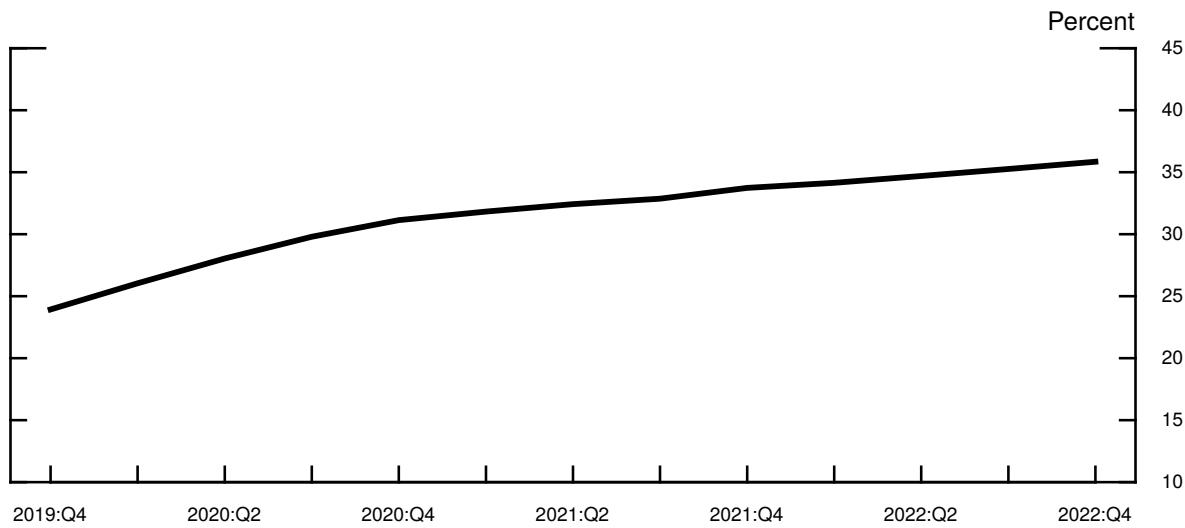
Note: The exhibit shows estimates of quantiles of the conditional distribution of the respective macro variables 2 years ahead. The estimates are conditioned on indicators of real activity, inflation, financial market strain, the volatility of high-frequency macroeconomic indicators, and a term-spread-based recession probability. The tables show selected quantiles of the predictive distributions for the respective variables as of the current Tealbook. 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	2024-25
	H2					
<i>Real GDP</i>						
Tealbook baseline and extension	1.7	2.1	1.9	1.7	1.5	1.4
Weaker labor demand	1.7	1.8	1.8	1.8	1.6	1.5
Positive hysteresis	1.7	2.3	2.1	2.0	1.8	1.5
Lower long-run equilibrium FF rate	1.7	1.9	1.8	1.5	1.1	.9
Stronger demand	1.7	3.1	2.4	2.1	1.8	1.5
Foreign slowdown	1.7	1.4	1.4	1.7	1.7	1.6
Easing of trade tensions	1.7	2.5	2.0	1.6	1.4	1.3
<i>Unemployment rate¹</i>						
Tealbook baseline and extension	3.6	3.5	3.5	3.5	3.6	3.9
Weaker labor demand	3.6	3.8	3.9	3.9	4.0	4.2
Positive hysteresis	3.6	3.5	3.4	3.3	3.4	3.7
Lower long-run equilibrium FF rate	3.6	3.5	3.4	3.3	3.4	3.8
Stronger demand	3.6	3.2	3.0	3.0	3.0	3.5
Foreign slowdown	3.6	3.7	3.9	4.0	4.0	4.2
Easing of trade tensions	3.6	3.4	3.2	3.3	3.4	3.8
<i>Total PCE prices</i>						
Tealbook baseline and extension	1.5	1.7	1.9	1.9	1.9	2.0
Weaker labor demand	1.5	1.7	1.7	1.7	1.7	1.7
Positive hysteresis	1.5	1.7	1.9	1.9	1.9	1.9
Lower long-run equilibrium FF rate	1.5	1.8	2.0	2.0	2.0	2.0
Stronger demand	1.5	1.7	1.9	1.9	2.0	2.1
Foreign slowdown	1.5	1.1	1.5	1.7	1.8	1.9
Easing of trade tensions	1.5	1.9	1.9	1.9	1.9	1.9
<i>Core PCE prices</i>						
Tealbook baseline and extension	1.8	1.9	1.9	1.9	1.9	2.0
Weaker labor demand	1.8	1.8	1.8	1.7	1.7	1.7
Positive hysteresis	1.8	1.9	1.9	1.9	1.9	1.9
Lower long-run equilibrium FF rate	1.8	2.0	2.0	2.0	2.0	2.0
Stronger demand	1.8	1.9	1.9	1.9	2.0	2.1
Foreign slowdown	1.8	1.4	1.5	1.7	1.8	1.9
Easing of trade tensions	1.8	2.0	2.0	1.9	1.9	1.9
<i>Federal funds rate¹</i>						
Tealbook baseline and extension	1.6	2.0	2.3	2.5	2.6	2.6
Weaker labor demand	1.6	1.9	2.0	2.0	2.0	2.0
Positive hysteresis	1.6	2.0	2.3	2.5	2.5	2.5
Lower long-run equilibrium FF rate	1.6	1.9	2.1	2.2	2.3	2.3
Stronger demand	1.6	2.1	2.5	2.7	2.9	3.0
Foreign slowdown	1.6	1.5	1.3	1.6	1.8	2.1
Easing of trade tensions	1.6	2.2	2.6	2.7	2.7	2.6

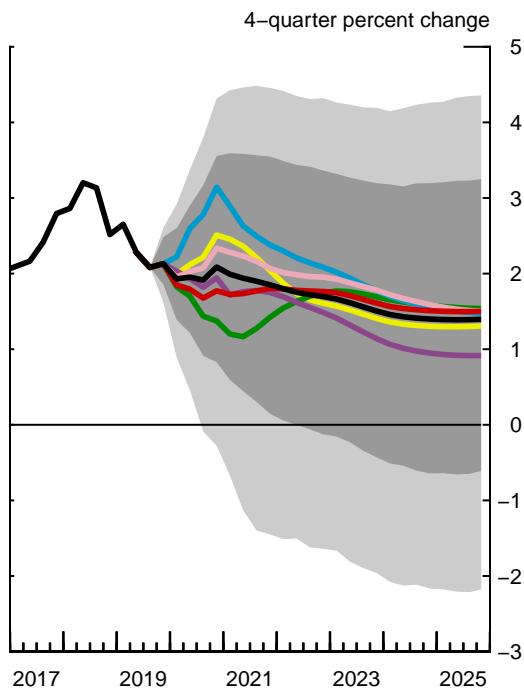
1. Percent, average for the final quarter of the period.

Forecast Confidence Intervals and Alternative Scenarios

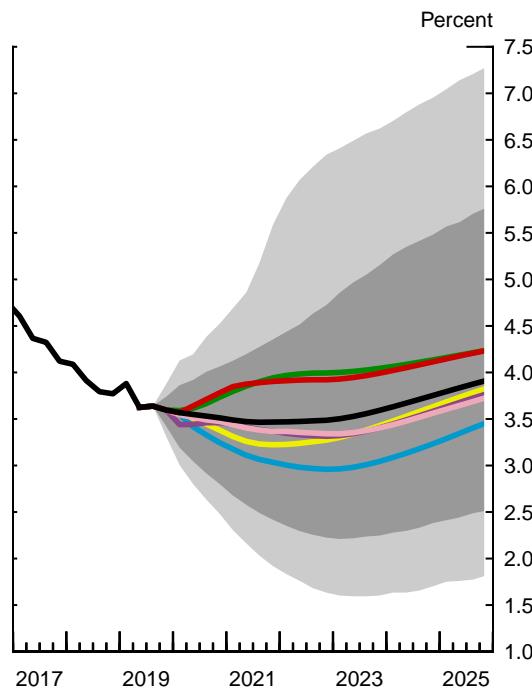
Confidence Intervals Based on FRB/US Stochastic Simulations*

- Tealbook baseline and extension
- Lower long-run equilibrium FF rate
- Foreign slowdown
- Weaker labor demand
- Stronger demand
- Easing of trade tensions
- Positive hysteresis

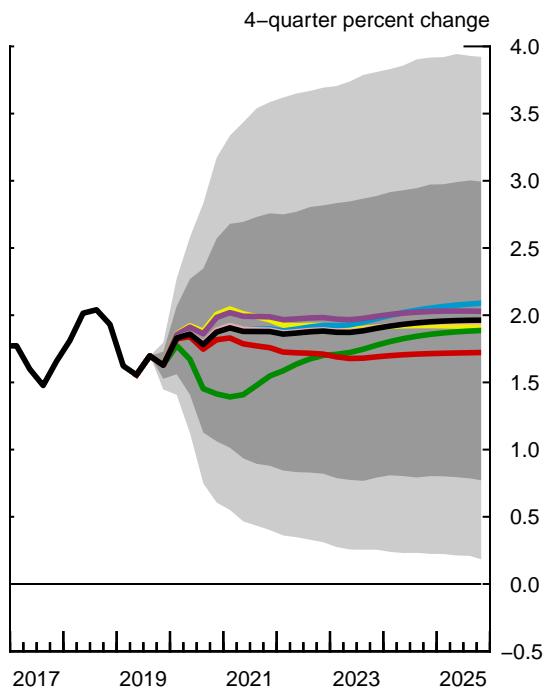
Real GDP



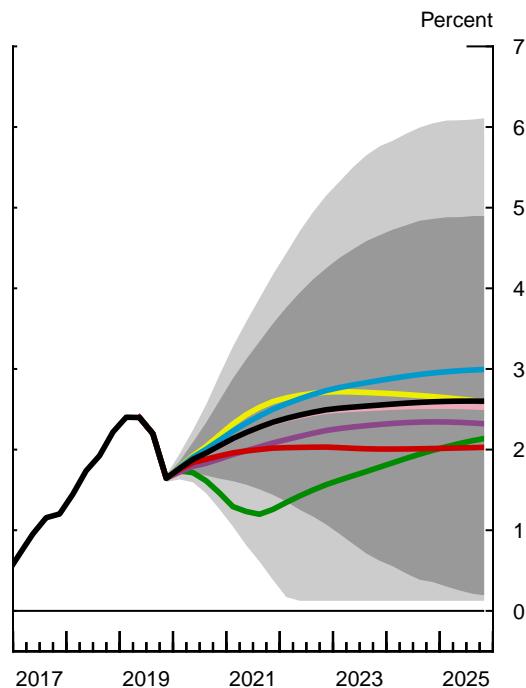
Unemployment Rate



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.

Alternative Model Forecasts

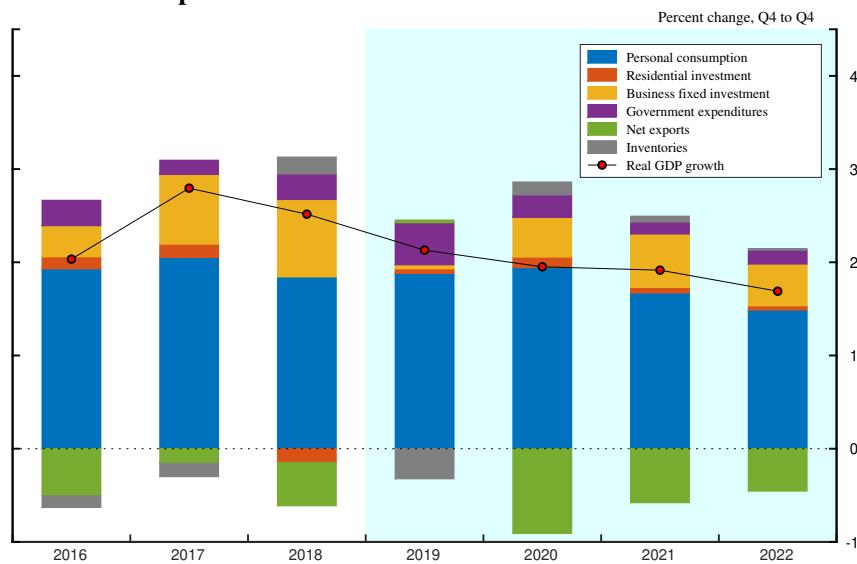
(Percent change, Q4 to Q4, except as noted)

Measure and projection	2019		2020		2021		2022	
	Previous Tealbook	Current Tealbook						
<i>Real GDP</i>								
Staff	2.1	2.1	2.0	2.1	1.8	1.9	1.7	1.7
FRB/US	2.1	2.1	1.7	2.0	1.6	1.9	1.4	1.7
EDO ¹	2.3	2.1	1.7	1.6	1.9	1.7	2.4	2.2
<i>Unemployment rate²</i>								
Staff	3.6	3.6	3.6	3.5	3.6	3.5	3.6	3.5
FRB/US	3.6	3.6	3.9	3.7	4.2	3.8	4.4	4.1
EDO ¹	3.9	3.8	4.4	4.3	4.8	4.7	5.0	5.0
<i>Total PCE prices</i>								
Staff	1.4	1.5	1.7	1.7	1.8	1.9	1.8	1.9
FRB/US	1.5	1.5	1.9	1.8	2.0	2.1	2.0	2.0
EDO ¹	1.7	1.4	2.6	2.2	2.5	2.5	2.3	2.4
<i>Core PCE prices</i>								
Staff	1.7	1.6	1.8	1.9	1.8	1.9	1.8	1.9
FRB/US	1.8	1.6	2.1	1.9	2.1	2.1	2.0	2.0
EDO ¹	1.9	1.6	2.6	2.2	2.5	2.5	2.3	2.4
<i>Federal funds rate²</i>								
Staff	1.9	1.6	2.2	2.0	2.4	2.3	2.5	2.5
FRB/US	2.4	1.6	2.6	2.0	2.7	2.4	2.6	2.6
EDO ¹	2.7	1.6	3.7	3.0	4.0	3.6	4.1	3.9

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

2. Percent, average for Q4.

Decomposition of FRB/US Real GDP Growth Forecast



Note: Shading represents the projection period.

Source: Staff calculations.

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

Risks & Uncertainty

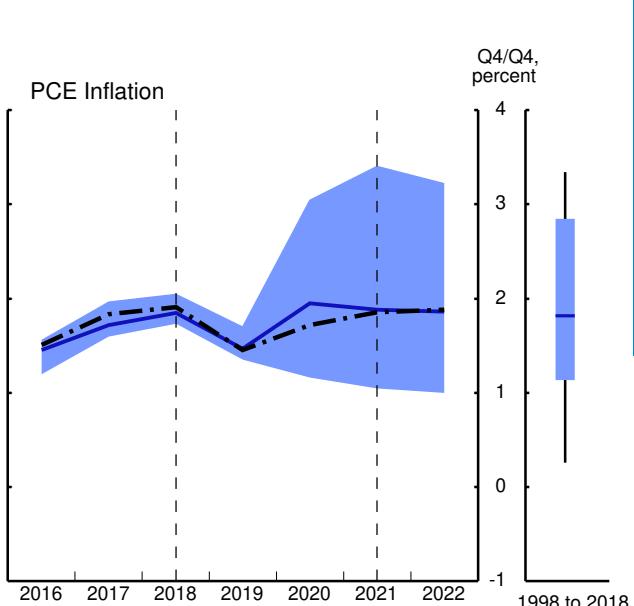
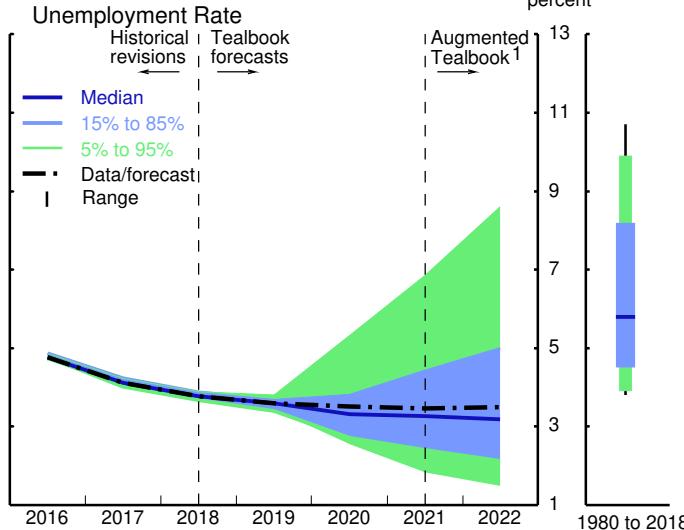
Measure	2019	2020	2021	2022	2023	2024	2025
<i>Real GDP</i> (percent change, Q4 to Q4)							
Projection	2.1	2.1	1.9	1.7	1.5	1.4	1.4
Confidence interval							
Tealbook forecast errors	1.5–3.0	.9–3.9	-.1–3.6	-.5–3.2
FRB/US stochastic simulations	1.9–2.5	.8–3.6	.1–3.5	-.1–3.4	-.4–3.2	-.6–3.2	-.6–3.3
<i>Civilian unemployment rate</i> (percent, Q4)							
Projection	3.6	3.5	3.5	3.5	3.6	3.8	3.9
Confidence interval							
Tealbook forecast errors	3.4–3.7	2.7–3.8	2.4–4.4	2.1–5.0
FRB/US stochastic simulations	3.4–3.7	2.8–4.1	2.4–4.4	2.2–4.7	2.2–5.2	2.4–5.5	2.5–5.8
<i>PCE prices, total</i> (percent change, Q4 to Q4)							
Projection	1.5	1.7	1.9	1.9	1.9	2.0	2.0
Confidence interval							
Tealbook forecast errors	1.3–1.7	1.2–3.0	1.0–3.4	1.0–3.2
FRB/US stochastic simulations	1.3–1.6	.8–2.5	.8–2.9	.7–2.9	.7–3.0	.7–3.1	.7–3.1
<i>PCE prices excluding food and energy</i> (percent change, Q4 to Q4)							
Projection	1.6	1.9	1.9	1.9	1.9	2.0	2.0
Confidence interval							
Tealbook forecast errors	1.5–1.9	1.5–2.4	1.3–2.7
FRB/US stochastic simulations	1.5–1.7	1.1–2.6	.9–2.8	.8–2.8	.8–2.9	.8–3.0	.8–3.0
<i>Federal funds rate</i> (percent, Q4)							
Projection	1.6	2.0	2.3	2.5	2.6	2.6	2.6
Confidence interval							
FRB/US stochastic simulations	1.6–1.7	1.6–2.6	1.4–3.6	1.1–4.3	.6–4.7	.4–4.9	.2–4.9

Note: Shocks underlying FRB/US stochastic simulations are randomly drawn from the 1969–2018 set of model equation residuals. Intervals derived from Tealbook forecast errors are based on projections made from 1980 to 2018 for real GDP and unemployment and from 1998 to 2018 for PCE prices. The intervals for real GDP, unemployment, and total PCE prices are extended into 2022 using information from the Blue Chip survey and forecasts from the CBO and CEA.

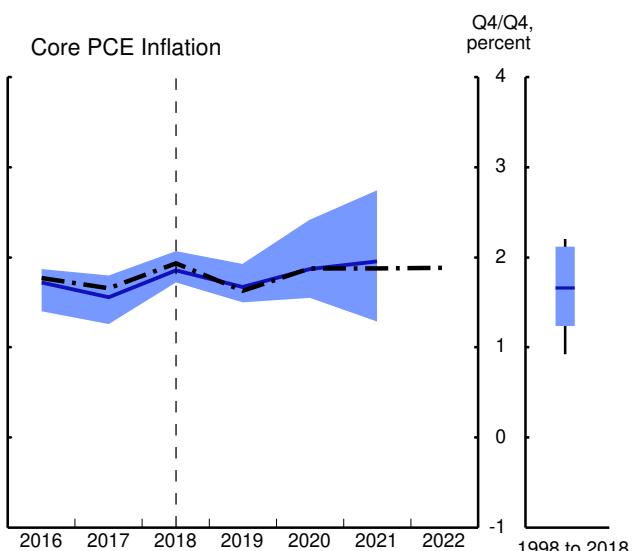
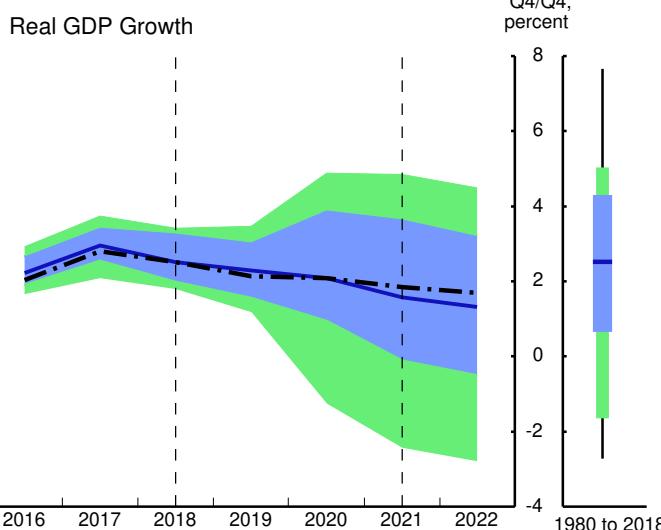
... Not applicable.

Prediction Intervals Derived from Historical Tealbook Forecast Errors

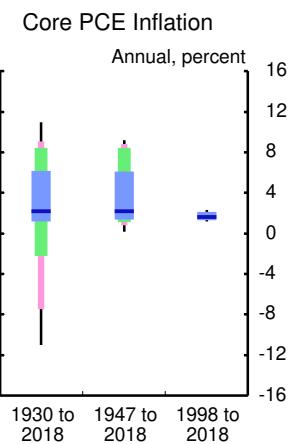
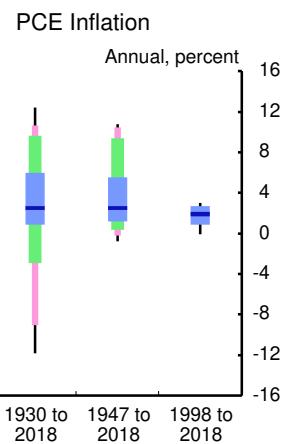
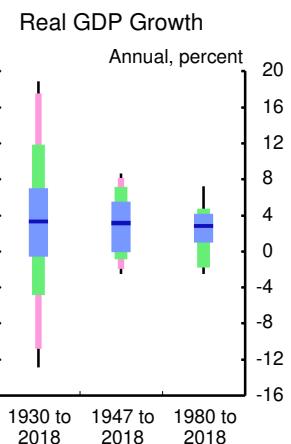
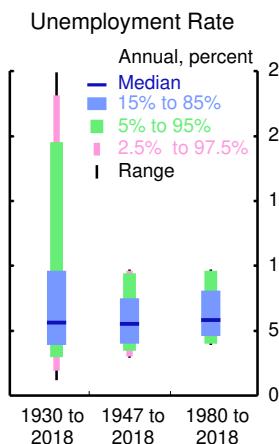
Forecast Error Percentiles



Risks & Uncertainty



Historical Distributions



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

1. Augmented Tealbook prediction intervals use 2- and 3-year-ahead forecast errors from Blue Chip, CBO, and CEA to extend the Tealbook prediction intervals through 2022.

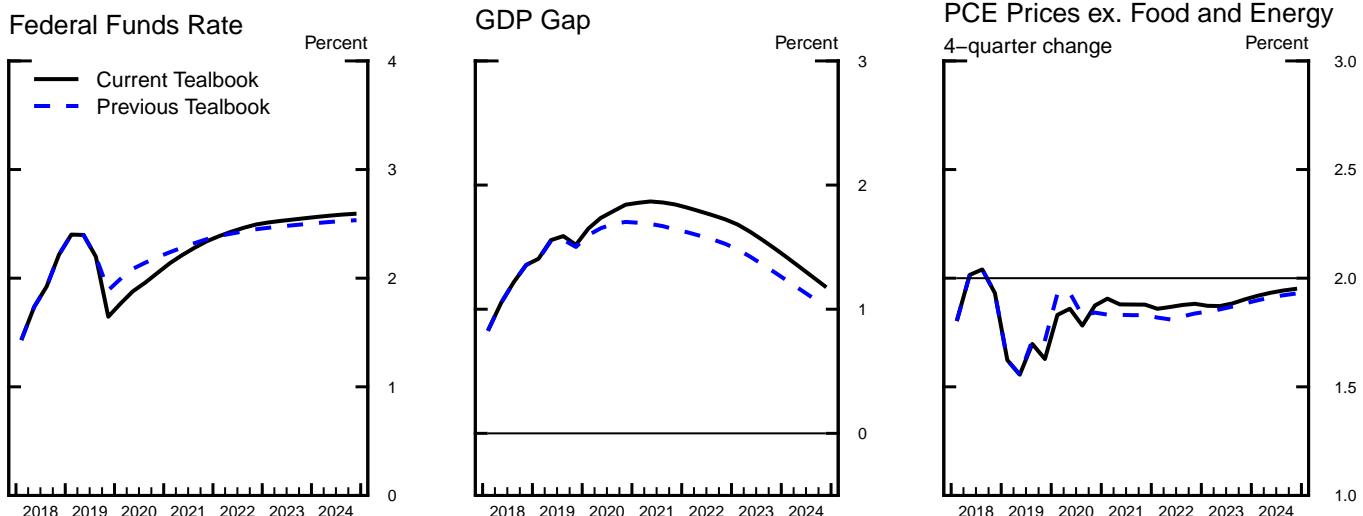
Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Simple Policy Rules

	(Percent)	<u>2020:Q1</u>	<u>2020:Q2</u>
Inertial Taylor (1999) rule	1.98	2.28	
<i>Previous Tealbook</i>	2.63	...	
Taylor (1993) rule	3.05	3.13	
<i>Previous Tealbook</i>	3.16	...	
First-difference rule	1.74	1.80	
<i>Previous Tealbook</i>	2.20	...	
Flexible price-level targeting rule	1.43	1.25	
<i>Previous Tealbook</i>	1.66	...	
<i>Addendum:</i>			
Tealbook baseline	1.77	1.88	

... Not applicable.

Key Elements of the Staff Projection



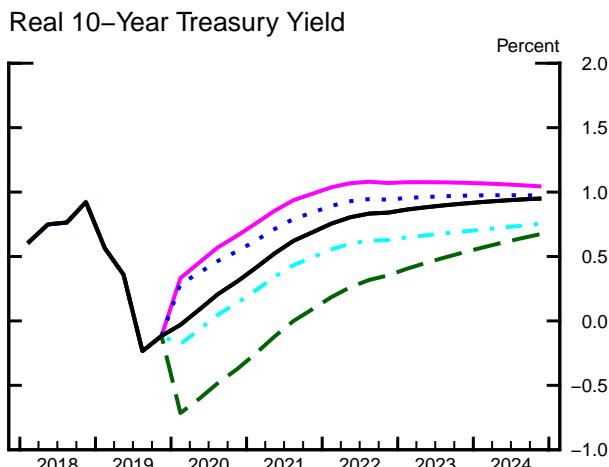
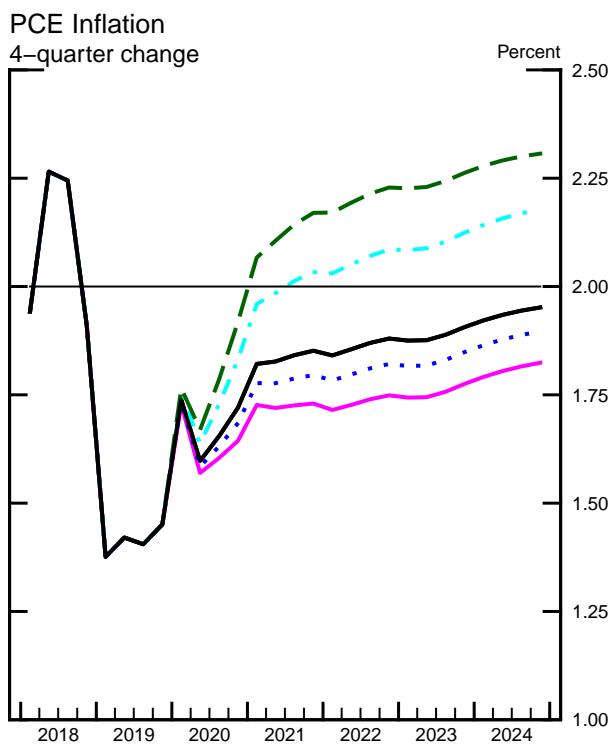
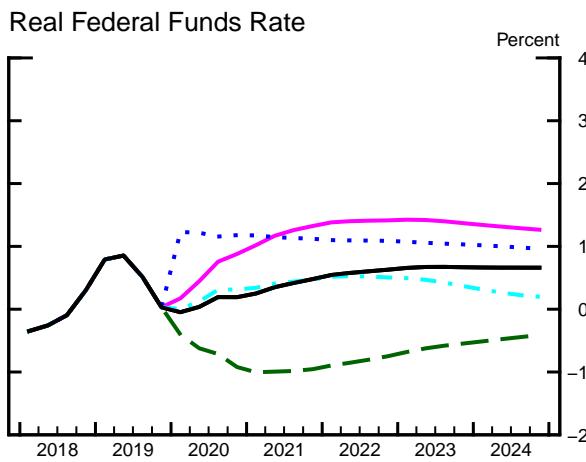
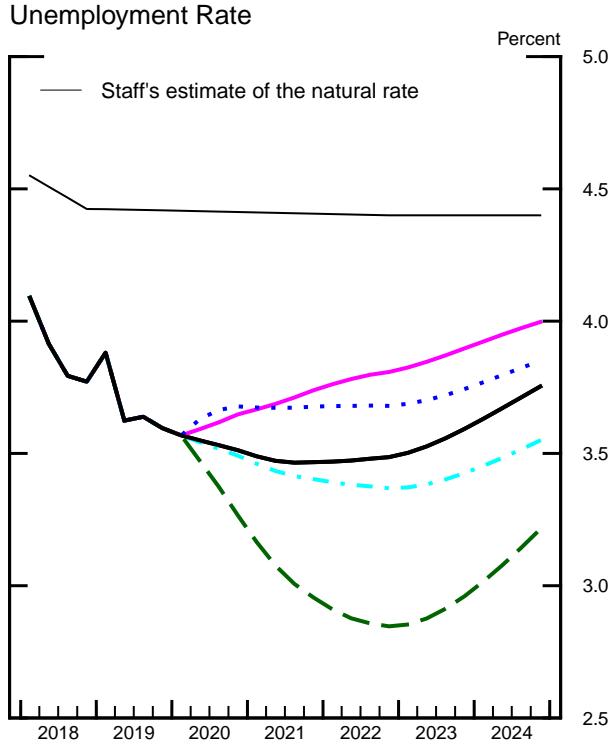
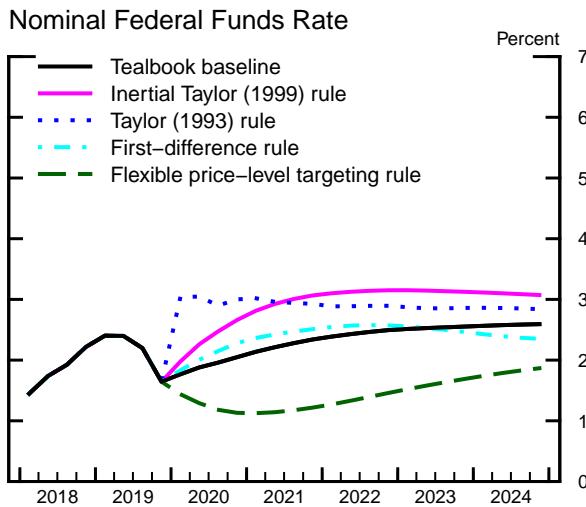
A Medium-Term Notion of the Equilibrium Real Federal Funds Rate¹

	(Percent)	Current Value	Previous Tealbook
Tealbook baseline			
FRB/US r^*	1.27	1.28	
Average projected real federal funds rate	.30	.41	
SEP-consistent baseline			
FRB/US r^*	.33	.33	
Average projected real federal funds rate	.06	.06	

1. 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 September 2019 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

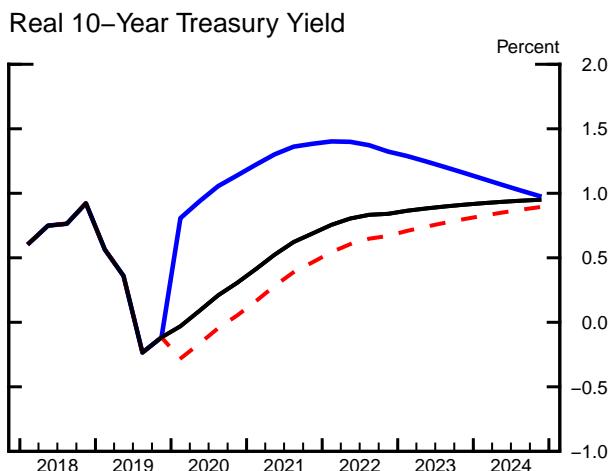
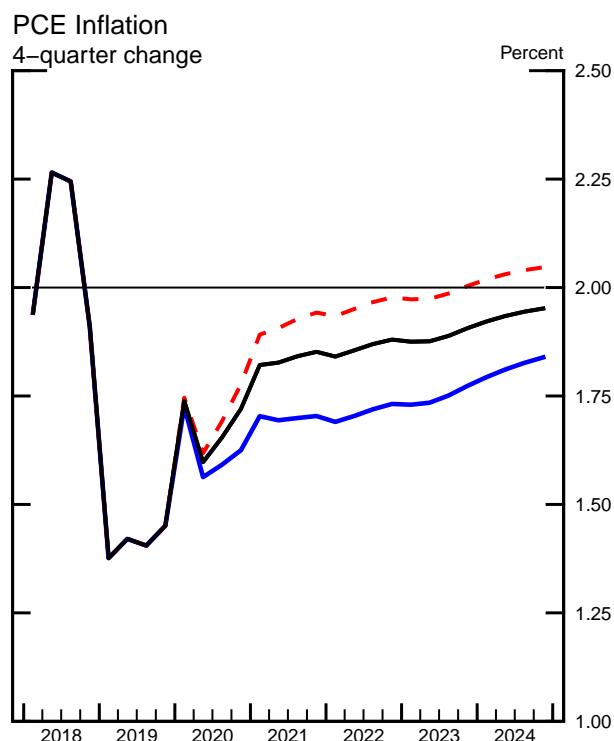
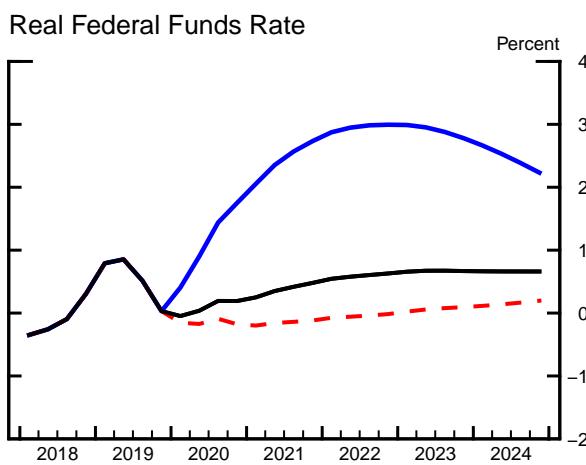
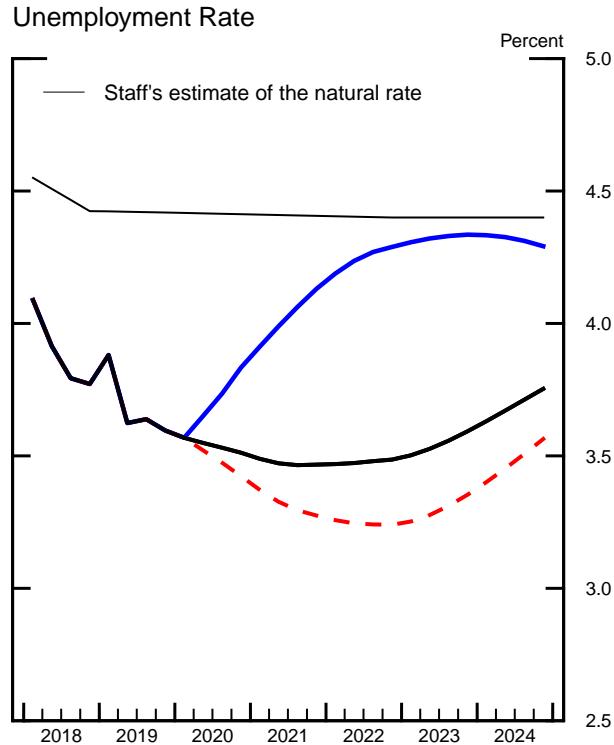
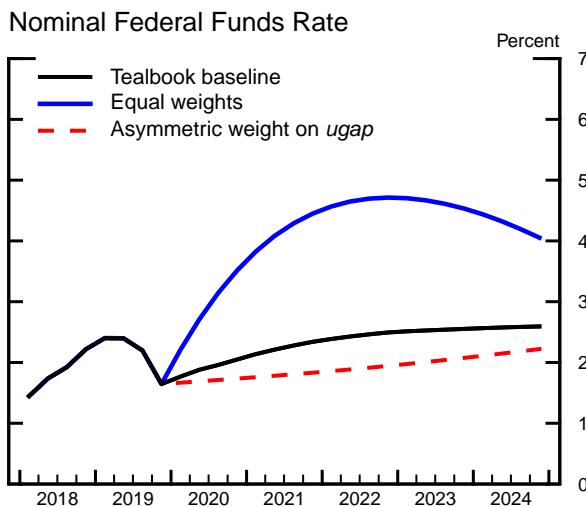
Monetary Policy Strategies



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.

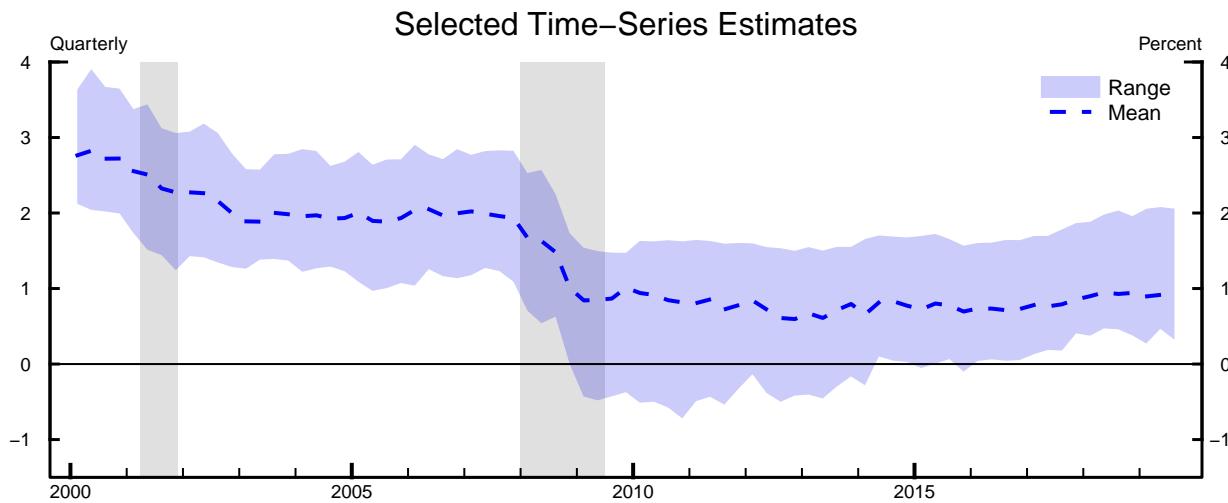
Optimal Control Simulations under Commitment

Monetary Policy Strategies

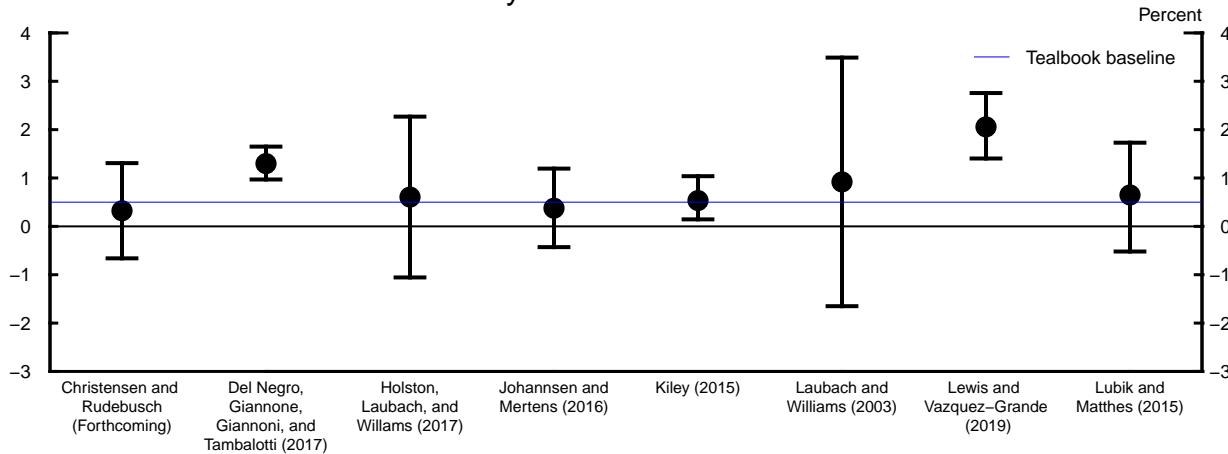


Note: Each set of lines corresponds to an optimal control policy under commitment in which policymakers minimize a discounted weighted sum of squared deviations of 4-quarter headline PCE inflation from the Committee's 2 percent objective, of squared deviations of the unemployment rate from the staff's 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.

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



68 Percent Uncertainty Bands around Latest Point Estimates



Longer-Run Values from Selected Forecasters

	<u>Release Date</u>	<u>Percent</u>
Tealbook baseline	Nov. 2019	.50
Median SEP	Sept. 2019	.50
Median Survey of Primary Dealers	Oct. 2019	.50
Median Blue Chip (6-to-10-year)	Oct. 2019	.29
Congressional Budget Office (10-year)	Aug. 2019	.74

The latest time-series estimates are for 2019:Q3. The shaded vertical areas in the top panel are NBER recessions. 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	2019	2020	2021	2022	2023	2024
<i>Nominal federal funds rate¹</i>						
Inertial Taylor (1999)	1.6	2.7	3.1	3.2	3.1	3.1
Taylor (1993)	1.6	3.0	2.9	2.9	2.9	2.8
First-difference	1.6	2.3	2.5	2.6	2.5	2.4
Flexible price-level targeting	1.6	1.1	1.2	1.5	1.7	1.9
Extended Tealbook baseline	1.6	2.0	2.3	2.5	2.6	2.6
<i>Real GDP</i>						
Inertial Taylor (1999)	2.1	1.8	1.5	1.6	1.5	1.5
Taylor (1993)	2.1	1.8	1.7	1.7	1.6	1.5
First-difference	2.1	2.2	2.0	1.8	1.6	1.5
Flexible price-level targeting	2.1	2.6	2.5	2.0	1.5	1.3
Extended Tealbook baseline	2.1	2.1	1.9	1.7	1.5	1.4
<i>Unemployment rate¹</i>						
Inertial Taylor (1999)	3.6	3.6	3.7	3.8	3.9	4.0
Taylor (1993)	3.6	3.7	3.7	3.7	3.7	3.8
First-difference	3.6	3.5	3.4	3.4	3.4	3.5
Flexible price-level targeting	3.6	3.3	3.0	2.8	3.0	3.2
Extended Tealbook baseline	3.6	3.5	3.5	3.5	3.6	3.8
<i>Total PCE prices</i>						
Inertial Taylor (1999)	1.5	1.6	1.7	1.7	1.8	1.8
Taylor (1993)	1.5	1.7	1.8	1.8	1.8	1.9
First-difference	1.5	1.8	2.0	2.1	2.1	2.2
Flexible price-level targeting	1.5	1.9	2.2	2.2	2.3	2.3
Extended Tealbook baseline	1.5	1.7	1.9	1.9	1.9	2.0
<i>Core PCE prices</i>						
Inertial Taylor (1999)	1.6	1.8	1.8	1.8	1.8	1.8
Taylor (1993)	1.6	1.8	1.8	1.8	1.8	1.9
First-difference	1.6	2.0	2.1	2.1	2.1	2.2
Flexible price-level targeting	1.6	2.1	2.2	2.2	2.3	2.3
Extended Tealbook baseline	1.6	1.9	1.9	1.9	1.9	2.0

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				2021	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
<i>Nominal federal funds rate¹</i>								
Inertial Taylor (1999)	2.2	1.6	2.0	2.3	2.5	2.7	2.8	2.9
Taylor (1993)	2.2	1.6	3.0	3.0	2.9	3.0	3.0	3.0
First-difference	2.2	1.6	1.8	2.0	2.1	2.3	2.4	2.4
Flexible price-level targeting	2.2	1.6	1.4	1.3	1.2	1.1	1.1	1.1
Extended Tealbook baseline	2.2	1.6	1.8	1.9	2.0	2.0	2.1	2.2
<i>Real GDP</i>								
Inertial Taylor (1999)	2.1	2.1	1.9	1.9	1.7	1.8	1.6	1.6
Taylor (1993)	2.1	2.1	1.9	1.8	1.7	1.8	1.6	1.7
First-difference	2.1	2.1	1.9	2.0	2.0	2.2	2.1	2.0
Flexible price-level targeting	2.1	2.1	1.9	2.1	2.3	2.6	2.7	2.7
Extended Tealbook baseline	2.1	2.1	1.9	2.0	1.9	2.1	2.0	1.9
<i>Unemployment rate¹</i>								
Inertial Taylor (1999)	3.6	3.6	3.6	3.6	3.6	3.6	3.7	3.7
Taylor (1993)	3.6	3.6	3.6	3.6	3.7	3.7	3.7	3.7
First-difference	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.4
Flexible price-level targeting	3.6	3.6	3.6	3.5	3.4	3.3	3.2	3.1
Extended Tealbook baseline	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.5
<i>Total PCE prices</i>								
Inertial Taylor (1999)	1.4	1.5	1.7	1.6	1.6	1.6	1.7	1.7
Taylor (1993)	1.4	1.5	1.7	1.6	1.6	1.7	1.8	1.8
First-difference	1.4	1.5	1.8	1.6	1.7	1.8	2.0	2.0
Flexible price-level targeting	1.4	1.5	1.8	1.7	1.8	1.9	2.1	2.1
Extended Tealbook baseline	1.4	1.5	1.7	1.6	1.7	1.7	1.8	1.8
<i>Core PCE prices</i>								
Inertial Taylor (1999)	1.7	1.6	1.8	1.8	1.7	1.8	1.8	1.8
Taylor (1993)	1.7	1.6	1.8	1.8	1.8	1.8	1.9	1.8
First-difference	1.7	1.6	1.8	1.9	1.9	2.0	2.0	2.0
Flexible price-level targeting	1.7	1.6	1.9	1.9	1.9	2.1	2.2	2.2
Extended Tealbook baseline	1.7	1.6	1.8	1.9	1.8	1.9	1.9	1.9

1. Percent, average for the quarter.

Outcomes of Optimal Control Simulations under Commitment

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

Outcome and strategy	2019	2020	2021	2022	2023	2024
<i>Nominal federal funds rate¹</i>						
Equal weights	1.6	3.5	4.4	4.7	4.5	4.1
Asymmetric weight on <i>ugap</i>	1.6	1.7	1.8	1.9	2.1	2.2
Extended Tealbook baseline	1.6	2.0	2.3	2.5	2.6	2.6
<i>Real GDP</i>						
Equal weights	2.1	1.4	1.1	1.4	1.6	1.8
Asymmetric weight on <i>ugap</i>	2.1	2.3	2.1	1.8	1.5	1.3
Extended Tealbook baseline	2.1	2.1	1.9	1.7	1.5	1.4
<i>Unemployment rate¹</i>						
Equal weights	3.6	3.8	4.1	4.3	4.3	4.3
Asymmetric weight on <i>ugap</i>	3.6	3.4	3.3	3.2	3.4	3.6
Extended Tealbook baseline	3.6	3.5	3.5	3.5	3.6	3.8
<i>Total PCE prices</i>						
Equal weights	1.5	1.6	1.7	1.7	1.8	1.8
Asymmetric weight on <i>ugap</i>	1.5	1.8	1.9	2.0	2.0	2.0
Extended Tealbook baseline	1.5	1.7	1.9	1.9	1.9	2.0
<i>Core PCE prices</i>						
Equal weights	1.6	1.8	1.7	1.7	1.8	1.8
Asymmetric weight on <i>ugap</i>	1.6	1.9	2.0	2.0	2.0	2.0
Extended Tealbook baseline	1.6	1.9	1.9	1.9	1.9	2.0

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				2021	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
<i>Nominal federal funds rate¹</i>								
Equal weights	2.2	1.6	2.2	2.7	3.1	3.5	3.8	4.1
Asymmetric weight on ugap	2.2	1.6	1.7	1.7	1.7	1.7	1.8	1.8
Extended Tealbook baseline	2.2	1.6	1.8	1.9	2.0	2.0	2.1	2.2
<i>Real GDP</i>								
Equal weights	2.1	2.1	1.9	1.7	1.5	1.4	1.1	1.0
Asymmetric weight on ugap	2.1	2.1	1.9	2.0	2.0	2.3	2.3	2.2
Extended Tealbook baseline	2.1	2.1	1.9	2.0	1.9	2.1	2.0	1.9
<i>Unemployment rate¹</i>								
Equal weights	3.6	3.6	3.6	3.7	3.7	3.8	3.9	4.0
Asymmetric weight on ugap	3.6	3.6	3.6	3.5	3.5	3.4	3.4	3.3
Extended Tealbook baseline	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.5
<i>Total PCE prices</i>								
Equal weights	1.4	1.5	1.7	1.6	1.6	1.6	1.7	1.7
Asymmetric weight on ugap	1.4	1.5	1.7	1.6	1.7	1.8	1.9	1.9
Extended Tealbook baseline	1.4	1.5	1.7	1.6	1.7	1.7	1.8	1.8
<i>Core PCE prices</i>								
Equal weights	1.7	1.6	1.8	1.8	1.7	1.8	1.8	1.7
Asymmetric weight on ugap	1.7	1.6	1.8	1.9	1.8	1.9	2.0	2.0
Extended Tealbook baseline	1.7	1.6	1.8	1.9	1.8	1.9	1.9	1.9

1. Percent, average for the quarter.

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

Interval	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate ¹	
	10/18/19	11/25/19	10/18/19	11/25/19	10/18/19	11/25/19	10/18/19	11/25/19	10/18/19	11/25/19
<i>Quarterly</i>										
2019:Q1	3.9	3.9	3.1	3.1	.4	.4	1.1	1.1	3.9	3.9
Q2	4.7	4.7	2.0	2.0	2.4	2.4	1.9	1.9	3.6	3.6
Q3	3.7	3.8	1.7	2.1	1.6	1.5	2.2	2.1	3.6	3.6
Q4	3.3	2.8	1.6	1.3	1.4	1.5	1.7	1.5	3.6	3.6
2020:Q1	3.7	3.7	2.2	2.3	1.5	1.5	1.9	1.9	3.6	3.6
Q2	4.1	4.2	2.0	2.1	1.7	1.8	1.9	2.0	3.6	3.5
Q3	3.9	3.9	1.9	2.0	1.7	1.7	1.8	1.8	3.6	3.5
Q4	3.7	3.9	1.8	2.0	1.8	1.8	1.8	1.8	3.6	3.5
2021:Q1	3.7	3.9	1.8	1.9	1.8	1.9	1.9	2.0	3.6	3.5
Q2	3.9	4.0	1.8	1.9	1.8	1.8	1.9	1.9	3.6	3.5
Q3	3.7	3.8	1.8	1.8	1.8	1.8	1.8	1.8	3.6	3.5
Q4	3.6	3.7	1.8	1.8	1.8	1.8	1.8	1.8	3.6	3.5
<i>Two-quarter²</i>										
2019:Q2	4.3	4.3	2.6	2.6	1.4	1.4	1.5	1.5	-.2	-.2
Q4	3.5	3.3	1.6	1.7	1.5	1.5	2.0	1.8	.0	.0
2020:Q2	3.9	4.0	2.1	2.2	1.6	1.7	1.9	1.9	.0	-.1
Q4	3.8	3.9	1.9	2.0	1.7	1.8	1.8	1.8	.0	.0
2021:Q2	3.8	3.9	1.8	1.9	1.8	1.9	1.9	1.9	.0	.0
Q4	3.7	3.7	1.8	1.8	1.8	1.8	1.8	1.8	.0	.0
<i>Four-quarter³</i>										
2018:Q4	4.9	4.9	2.5	2.5	1.9	1.9	1.9	1.9	-.3	-.3
2019:Q4	3.9	3.8	2.1	2.1	1.4	1.5	1.7	1.6	-.2	-.2
2020:Q4	3.9	3.9	2.0	2.1	1.7	1.7	1.8	1.9	.0	-.1
2021:Q4	3.8	3.8	1.8	1.9	1.8	1.9	1.8	1.9	.0	.0
2022:Q4	3.7	3.7	1.7	1.7	1.8	1.9	1.8	1.9	.0	.0
<i>Annual</i>										
2018	5.4	5.4	2.9	2.9	2.1	2.1	1.9	1.9	3.9	3.9
2019	4.1	4.1	2.2	2.3	1.4	1.4	1.7	1.6	3.7	3.7
2020	3.8	3.7	1.9	2.0	1.7	1.7	1.9	1.8	3.6	3.5
2021	3.8	3.9	1.8	1.9	1.8	1.8	1.8	1.9	3.6	3.5
2022	3.7	3.7	1.7	1.7	1.8	1.9	1.8	1.9	3.6	3.5

1. Level, except for two-quarter and four-quarter intervals.

2. Percent change from two quarters earlier; for unemployment rate, change is in percentage points.

3. Percent change from four quarters earlier; for unemployment rate, change is in percentage points.

Greensheets

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

Item	2019			2020				2021				2019 ¹	2020 ¹	2021 ¹	2022 ¹
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Real GDP	2.0	2.1	1.3	2.3	2.1	2.0	2.0	1.9	1.9	1.8	1.8	2.1	2.1	1.9	1.7
<i>Previous Tealbook</i>	2.0	1.7	1.6	2.2	2.0	1.9	1.8	1.8	1.8	1.8	1.8	2.1	2.0	1.8	1.7
Final sales	3.0	2.1	1.7	2.5	2.4	2.2	2.3	2.0	2.0	1.8	1.6	2.3	2.4	1.9	1.7
<i>Previous Tealbook</i>	3.0	1.8	1.8	2.4	2.4	1.9	2.2	2.1	2.0	1.7	1.6	2.3	2.2	1.8	1.6
Priv. dom. final purch.	3.3	2.3	1.9	2.1	2.6	2.6	2.6	2.3	2.2	2.0	1.9	2.3	2.5	2.1	1.8
<i>Previous Tealbook</i>	3.3	2.1	2.1	2.0	2.5	2.4	2.4	2.3	2.2	2.0	1.8	2.3	2.3	2.1	1.8
Personal cons. expend.	4.6	3.0	2.1	2.4	2.5	2.6	2.6	2.4	2.4	2.3	2.3	2.7	2.6	2.4	2.3
<i>Previous Tealbook</i>	4.6	2.8	2.3	2.4	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.7	2.5	2.4	2.3
Durables	13.0	7.3	2.4	3.3	5.0	5.1	5.2	5.0	5.0	5.0	5.0	5.6	4.6	5.0	5.0
Nondurables	6.5	4.1	2.7	3.3	3.1	3.0	2.9	2.5	2.4	2.5	2.4	3.8	3.1	2.5	2.5
Services	2.8	2.1	1.9	2.0	2.0	2.1	2.2	2.0	2.0	1.9	1.9	1.9	2.1	2.0	1.8
Residential investment	-3.0	4.6	5.9	7.2	6.8	2.4	-.6	-2.7	-2.7	-3.3	-3.4	1.6	3.9	-3.0	-3.7
<i>Previous Tealbook</i>	-3.0	4.8	5.8	7.3	7.3	3.1	.9	-1.7	-2.8	-3.2	-3.8	1.6	4.6	-2.9	-3.8
Nonres. priv. fixed invest.	-1.0	-2.0	-.1	-.9	1.8	2.4	3.1	3.4	2.6	2.0	1.4	.3	1.6	2.3	1.1
<i>Previous Tealbook</i>	-1.0	-2.1	-.2	-1.3	1.0	1.6	2.7	2.9	2.8	1.7	1.0	.3	1.0	2.1	.9
Equipment & intangibles	2.1	1.5	1.8	.6	2.6	3.5	4.2	4.5	3.4	2.8	2.0	2.5	2.7	3.2	1.9
<i>Previous Tealbook</i>	2.1	1.0	1.0	-.5	2.0	2.6	3.8	3.9	3.8	2.6	1.7	2.1	2.0	3.0	1.7
Nonres. structures	-11.1	-13.6	-7.0	-6.5	-1.1	-1.4	-.9	-.8	-.6	-.8	-1.1	-7.2	-2.5	-.8	-1.8
<i>Previous Tealbook</i>	-11.1	-12.6	-4.2	-4.0	-2.8	-2.2	-1.4	-.9	-1.2	-1.3	-1.6	-6.2	-2.6	-1.3	-2.1
Net exports ²	-981	-989	-994	-973	-980	-994	-996	-1001	-1005	-1011	-1024	-977	-986	-1010	-1037
<i>Previous Tealbook²</i>	-981	-998	-1005	-991	-999	-1017	-1012	-1012	-1012	-1025	-1036	-982	-1005	-1021	-1045
Exports	-5.7	.7	-1.1	5.0	1.7	2.0	2.4	2.8	3.3	3.4	3.5	-.6	2.7	3.3	3.5
Imports	.0	1.5	-.2	1.0	2.0	3.1	1.9	2.5	2.8	3.1	4.1	-.1	2.0	3.1	3.2
Gov't. cons. & invest.	4.8	1.6	.8	1.8	1.5	1.0	.9	.4	.9	.8	.8	2.5	1.3	.7	.8
<i>Previous Tealbook</i>	4.8	1.3	.9	2.0	2.4	.6	.5	.4	.9	.8	.9	2.5	1.4	.7	.9
Federal	8.3	3.4	1.4	3.1	2.3	1.0	.6	-.7	.5	.3	.5	3.8	1.7	.2	.4
Defense	3.3	2.2	1.6	3.5	2.1	1.4	.7	.1	.3	.4	.0	3.7	1.9	.2	.6
Nonddefense	16.1	5.2	1.0	2.5	2.6	.5	.4	-1.9	.9	.2	1.3	3.9	1.5	.1	.2
State & local	2.7	.4	.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.8	1.0	1.0	1.1
Change in priv. inventories ²	69	75	55	41	26	16	-.3	-8	-14	-14	-4	79	20	-10	3
<i>Previous Tealbook²</i>	69	66	55	45	20	23	1	-11	-24	-18	-8	76	22	-15	7

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	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Real GDP <i>Previous Tealbook</i>	2.6 2.6	2.9 2.9	1.9 1.9	2.0 2.0	2.8 2.8	2.5 2.5	2.1 2.1	2.1 2.0	1.9 1.8	1.7 1.7
Final sales <i>Previous Tealbook</i>	2.0 2.0	3.2 3.2	1.8 1.8	2.2 2.2	2.9 2.9	2.2 2.2	2.3 2.3	2.4 2.2	1.9 1.8	1.7 1.6
Priv. dom. final purch. <i>Previous Tealbook</i>	2.6 2.6	4.5 4.5	2.5 2.5	2.8 2.8	3.4 3.4	2.8 2.8	2.3 2.3	2.5 2.3	2.1 2.1	1.8 1.8
Personal cons. expend. <i>Previous Tealbook</i>	1.9 1.9	3.8 3.8	2.9 2.9	2.8 2.8	2.9 2.9	2.6 2.6	2.7 2.7	2.6 2.5	2.4 2.4	2.3 2.3
Durables	5.0	9.2	5.8	7.3	7.7	3.8	5.6	4.6	5.0	5.0
Nondurables	2.8	3.2	2.8	1.8	3.7	2.5	3.8	3.1	2.5	2.5
Services	1.1	3.2	2.5	2.4	2.0	2.5	1.9	2.1	2.0	1.8
Residential investment <i>Previous Tealbook</i>	7.1 7.1	7.7 7.7	9.1 9.1	3.9 3.9	4.2 4.2	-4.4 -4.4	1.6 1.6	3.9 4.6	-3.0 -2.9	-3.7 -3.8
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	5.4 5.4	6.9 6.9	-.9 -.9	2.4 2.4	5.4 5.4	5.9 5.9	.3 .3	1.6 1.0	2.3 2.1	1.1 .9
Equipment & intangibles <i>Previous Tealbook</i>	5.1 5.1	6.1 6.1	2.3 2.3	1.9 1.9	6.6 6.6	6.8 6.8	2.5 2.1	2.7 2.0	3.2 3.0	1.9 1.7
Nonres. structures <i>Previous Tealbook</i>	6.7 6.7	9.3 9.3	-10.9 -10.9	4.3 4.3	1.5 1.5	2.6 2.6	-7.2 -6.2	-2.5 -2.6	-.8 -1.3	-1.8 -2.1
Net exports ¹ <i>Previous Tealbook¹</i>	-533 -533	-577 -577	-722 -722	-784 -784	-850 -850	-920 -920	-977 -982	-986 -1005	-1010 -1021	-1037 -1045
Exports	6.0	2.9	-1.5	1.1	5.5	.4	-.6	2.7	3.3	3.5
Imports	3.0	6.5	3.2	3.4	5.6	3.2	-.1	2.0	3.1	3.2
Gov't. cons. & invest. <i>Previous Tealbook</i>	-2.4 -2.4	.3 .3	2.3 2.3	1.5 1.5	.8 .8	1.5 1.5	2.5 2.5	1.3 1.4	.7 .7	.8 .9
Federal	-6.1	-1.1	1.1	.1	1.7	2.7	3.8	1.7	.2	.4
Defense	-6.5	-3.4	-.4	-.8	1.9	4.0	3.7	1.9	.2	.6
Nondefense	-5.5	2.7	3.4	1.5	1.4	.7	3.9	1.5	.1	.2
State & local	.2	1.2	3.0	2.3	.4	.9	1.8	1.0	1.0	1.1
Change in priv. inventories ¹ <i>Previous Tealbook¹</i>	109 109	86 86	132 132	23 23	32 32	48 48	79 76	20 22	-10 -15	3 7

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	2019			2020				2021				2019 ¹	2020 ¹	2021 ¹	2022 ¹
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Real GDP <i>Previous Tealbook</i>	2.0	2.1	1.3	2.3	2.1	2.0	2.0	1.9	1.9	1.8	1.8	2.1	2.1	1.9	1.7
	2.0	1.7	1.6	2.2	2.0	1.9	1.8	1.8	1.8	1.8	1.8	2.1	2.0	1.8	1.7
Final sales <i>Previous Tealbook</i>	2.9	2.1	1.7	2.5	2.4	2.2	2.3	2.0	2.0	1.8	1.6	2.3	2.4	1.9	1.7
	2.9	1.7	1.8	2.3	2.4	1.9	2.2	2.1	2.0	1.7	1.6	2.3	2.2	1.8	1.6
Priv. dom. final purch. <i>Previous Tealbook</i>	2.8	1.9	1.6	1.8	2.2	2.2	2.2	2.0	1.9	1.7	1.6	1.9	2.1	1.8	1.6
	2.8	1.8	1.8	1.7	2.1	2.0	2.0	1.9	1.9	1.7	1.6	1.9	2.0	1.8	1.5
Personal cons. expend. <i>Previous Tealbook</i>	3.0	2.0	1.4	1.7	1.7	1.8	1.8	1.6	1.6	1.6	1.6	1.8	1.7	1.6	1.6
	3.0	1.9	1.6	1.6	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.8	1.7	1.6	1.6
Durables	.9	.5	.2	.2	.3	.4	.4	.3	.3	.3	.3	.4	.3	.3	.3
Nondurables	.9	.6	.4	.5	.4	.4	.4	.3	.3	.4	.3	.5	.4	.3	.3
Services	1.3	1.0	.9	1.0	.9	1.0	1.0	1.0	1.0	.9	.9	.9	1.0	.9	.9
Residential investment <i>Previous Tealbook</i>	-.1	.2	.2	.3	.3	.1	.0	-.1	-.1	-.1	-.1	.1	.1	-.1	-.1
	-.1	.2	.2	.3	.3	.1	.0	-.1	-.1	-.1	-.1	.1	.2	-.1	-.1
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	-.1	-.3	.0	-.1	.2	.3	.4	.4	.3	.3	.2	.0	.2	.3	.1
	-.1	-.3	.0	-.2	.1	.2	.4	.4	.4	.2	.1	.0	.1	.3	.1
Equipment & intangibles <i>Previous Tealbook</i>	.2	.2	.2	.1	.3	.4	.4	.5	.4	.3	.2	.3	.3	.3	.2
	.2	.1	.1	-.1	.2	.3	.4	.4	.4	.3	.2	.2	.2	.3	.2
Nonres. structures <i>Previous Tealbook</i>	-.4	-.4	-.2	-.2	.0	.0	.0	.0	.0	.0	.0	-.2	-.1	.0	.0
	-.4	-.4	-.1	-.1	-.1	-.1	-.0	.0	.0	.0	.0	-.2	-.1	.0	-.1
Net exports <i>Previous Tealbook</i>	-.7	-.1	-.1	.4	-.1	-.2	.0	.0	.0	-.1	-.2	-.1	.0	-.1	-.1
	-.7	-.3	-.1	.3	-.1	-.3	.1	.0	.0	-.2	-.1	-.1	.0	-.1	.0
Exports	-.7	.1	-.1	.6	.2	.2	.3	.3	.4	.4	.4	-.1	.3	.4	.4
Imports	.0	-.2	.0	-.1	-.3	-.4	-.3	-.4	-.4	-.4	-.6	.0	-.3	-.4	-.4
Gov't. cons. & invest. <i>Previous Tealbook</i>	.8	.3	.1	.3	.3	.2	.2	.1	.2	.1	.1	.4	.2	.1	.1
	.8	.2	.2	.4	.4	.1	.1	.1	.2	.1	.1	.4	.2	.1	.2
Federal	.5	.2	.1	.2	.2	.1	.0	.0	.0	.0	.0	.2	.1	.0	.0
Defense	.1	.1	.1	.1	.1	.1	.0	.0	.0	.0	.0	.1	.1	.0	.0
Nondefense	.4	.1	.0	.1	.1	.0	.0	-.1	.0	.0	.0	.1	.0	.0	.0
State & local	.3	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.2	.1	.1	.1
Change in priv. inventories <i>Previous Tealbook</i>	-.9	.1	-.4	-.2	-.3	-.2	-.4	-.1	-.1	.0	.2	-.2	-.3	.0	.0
	-.9	-.1	-.2	-.2	-.4	.1	-.4	-.2	-.2	.1	.2	-.2	-.2	.0	.1

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

Class II FOMC – Restricted (FR)

Authorized for Public Release

November 26, 2019

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

Item	2019			2020				2021				2019 ¹	2020 ¹	2021 ¹	2022 ¹
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
GDP chain-wt. price index <i>Previous Tealbook</i>	2.4 2.4	1.7 2.1	1.5 1.7	1.4 1.5	2.1 2.0	1.9 1.9	1.8 1.9	1.9 1.9	2.0 2.1	1.9 1.9	1.9 1.8	1.7 1.8	1.8 1.8	1.9 1.9	2.0 2.0
PCE chain-wt. price index <i>Previous Tealbook</i>	2.4 2.4	1.5 1.6	1.5 1.4	1.5 1.5	1.8 1.7	1.7 1.7	1.8 1.8	1.9 1.8	1.8 1.8	1.8 1.8	1.8 1.8	1.5 1.4	1.7 1.7	1.9 1.8	1.9 1.8
Energy <i>Previous Tealbook</i>	18.4 18.4	-8.2 -8.2	3.2 -4.8	-7.0 -8.1	-2.6 -2.2	-1.1 -.9	-.5 -.3	.2 .4	.3 .5	.4 .5	.6 .7	-1.7 -3.6	-2.8 -2.9	.4 .5	1.0 1.1
Food <i>Previous Tealbook</i>	.6 .6	-.5 -.4	1.3 1.2	2.3 2.3	2.3 2.3	2.3 2.3	2.3 2.3	2.3 2.3	2.3 2.3	2.3 2.3	2.3 2.3	1.1 1.1	2.3 2.3	2.3 2.3	2.3 2.3
Ex. food & energy <i>Previous Tealbook</i>	1.9 1.9	2.1 2.2	1.5 1.7	1.9 1.9	2.0 1.8	1.8 1.8	1.8 1.8	2.0 1.9	1.9 1.9	1.8 1.8	1.8 1.8	1.6 1.7	1.9 1.8	1.9 1.8	1.9 1.8
Ex. food & energy, market based <i>Previous Tealbook</i>	1.4 1.4	1.9 1.9	1.5 1.6	1.8 1.8	1.8 1.7	1.7 1.7	1.7 1.7	1.8 1.7	1.7 1.7	1.7 1.6	1.7 1.7	1.6 1.7	1.7 1.7	1.7 1.7	1.7 1.7
CPI <i>Previous Tealbook</i>	2.9 2.9	1.8 1.8	2.3 1.7	1.6 1.6	2.0 2.0	2.1 2.1	2.1 2.1	2.3 2.2	2.2 2.2	2.2 2.2	2.2 2.2	2.0 1.8	2.0 2.0	2.2 2.2	2.3 2.3
Ex. food & energy <i>Previous Tealbook</i>	1.8 1.8	3.0 3.0	2.1 2.3	2.2 2.3	2.4 2.3	2.3 2.3	2.3 2.3	2.4 2.3	2.3 2.3	2.3 2.3	2.3 2.3	2.3 2.3	2.3 2.3	2.3 2.3	2.4 2.3
ECI, hourly compensation ² <i>Previous Tealbook²</i>	2.1 2.1	3.3 2.8	2.8 2.8	2.7 2.7	2.7 2.7	2.7 2.7	2.7 2.7	2.7 2.7	2.7 2.7	2.7 2.6	2.7 2.6	2.7 2.7	2.7 2.7	2.7 2.7	2.7 2.6
Business sector															
Output per hour <i>Previous Tealbook</i>	2.8 2.6	-.1 -.4	-.6 .0	1.4 1.4	1.4 1.2	1.2 1.3	1.3 1.3	1.4 1.3	1.3 1.3	1.4 1.3	1.3 1.3	1.4 1.4	1.3 1.3	1.3 1.3	1.4 1.4
Compensation per hour <i>Previous Tealbook</i>	5.2 5.2	3.3 3.1	2.3 2.4	3.5 3.3	3.6 3.7	3.7 3.7	3.7 3.7	3.6 3.6	3.6 3.6	3.6 3.5	3.6 3.5	5.0 5.0	3.6 3.6	3.6 3.5	3.6 3.4
Unit labor costs <i>Previous Tealbook</i>	2.3 2.5	3.3 3.5	2.9 2.4	2.1 1.9	2.2 2.5	2.5 2.4	2.4 2.4	2.2 2.3	2.3 2.2	2.2 2.2	2.3 2.2	3.6 3.5	2.3 2.3	2.3 2.2	2.2 2.0
Core goods imports chain-wt. price index ³ <i>Previous Tealbook³</i>	-.6 -.6	-.9 -1.0	-.5 .4	1.1 1.0	1.0 1.1	.8 .9	.9 .9	1.1 1.0	1.0 1.0	.9 .9	1.0 1.0	-.9 -.7	1.0 1.0	1.0 1.0	.9 .9

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

2. Private-industry workers.

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

Greensheets**Changes in Prices and Costs**

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

Item	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
GDP chain-wt. price index <i>Previous Tealbook</i>	1.8 1.8	1.5 1.5	.9 .9	1.5 1.5	2.0 2.0	2.3 2.3	1.7 1.8	1.8 1.8	1.9 1.9	2.0 2.0
PCE chain-wt. price index <i>Previous Tealbook</i>	1.2 1.2	1.1 1.1	.3 .3	1.5 1.5	1.8 1.8	1.9 1.9	1.5 1.4	1.7 1.7	1.9 1.8	1.9 1.8
Energy <i>Previous Tealbook</i>	-2.9 -2.9	-7.1 -7.1	-16.4 -16.4	2.0 2.0	8.0 8.0	3.9 3.9	-1.7 -3.6	-2.8 -2.9	.4 .5	1.0 1.1
Food <i>Previous Tealbook</i>	.7 .7	2.8 2.8	.3 .3	-1.8 -1.8	.7 .7	.5 .5	1.1 1.1	2.3 2.3	2.3 2.3	2.3 2.3
Ex. food & energy <i>Previous Tealbook</i>	1.6 1.6	1.5 1.5	1.2 1.2	1.8 1.8	1.7 1.7	1.9 1.9	1.6 1.7	1.9 1.8	1.9 1.8	1.9 1.8
Ex. food & energy, market based <i>Previous Tealbook</i>	1.1 1.1	1.1 1.1	1.1 1.1	1.4 1.4	1.2 1.2	1.7 1.7	1.6 1.7	1.7 1.7	1.7 1.7	1.7 1.7
CPI <i>Previous Tealbook</i>	1.2 1.2	1.2 1.2	.4 .4	1.8 1.8	2.1 2.1	2.2 2.2	2.0 1.8	2.0 2.0	2.2 2.2	2.3 2.3
Ex. food & energy <i>Previous Tealbook</i>	1.7 1.7	1.7 1.7	2.0 2.0	2.2 2.2	1.8 1.8	2.2 2.2	2.3 2.3	2.3 2.3	2.3 2.3	2.4 2.3
ECI, hourly compensation ¹ <i>Previous Tealbook¹</i>	2.0 2.0	2.3 2.3	1.9 1.9	2.2 2.2	2.6 2.6	3.0 3.0	2.7 2.6	2.7 2.7	2.7 2.7	2.7 2.6
Business sector										
Output per hour <i>Previous Tealbook</i>	1.8 1.8	.3 .3	.6 .6	1.4 1.4	1.1 1.1	1.1 1.1	1.4 1.4	1.3 1.3	1.3 1.3	1.4 1.4
Compensation per hour <i>Previous Tealbook</i>	-.2 -.2	3.0 3.0	2.3 2.3	2.2 2.2	3.7 3.7	2.1 2.1	5.0 5.0	3.6 3.6	3.6 3.5	3.6 3.4
Unit labor costs <i>Previous Tealbook</i>	-2.0 -2.0	2.7 2.7	1.7 1.7	.8 .8	2.6 2.6	1.0 1.0	3.6 3.5	2.3 2.3	2.3 2.2	2.2 2.0
Core goods imports chain-wt. price index ² <i>Previous Tealbook²</i>	-2.2 -2.2	-.4 -.4	-4.3 -4.3	-.9 -.9	.9 .9	.2 .2	-.9 -.7	1.0 1.0	1.0 1.0	.9 .9

1. Private-industry workers.

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

Other Macroeconomic Indicators

Item	2019			2020				2021				2019 ¹	2020 ¹	2021 ¹	2022 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	152	188	156	162	210	30	120	110	100	90	80	168	130	95	74	
Unemployment rate ³	3.6	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	
<i>Previous Tealbook³</i>	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	
Natural rate of unemployment ³	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
<i>Previous Tealbook³</i>	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
Employment-to-Population Ratio ³	60.6	60.8	60.9	60.9	60.8	60.8	60.8	60.8	60.7	60.7	60.7	60.9	60.8	60.7	60.4	
Employment-to-Population Trend ³	60.1	60.1	60.1	60.0	60.0	60.0	59.9	59.9	59.9	59.8	59.8	60.1	59.9	59.8	59.6	
Output gap ⁴	1.6	1.6	1.5	1.6	1.7	1.8	1.8	1.9	1.9	1.9	1.8	1.5	1.8	1.8	1.7	
<i>Previous Tealbook⁴</i>	1.5	1.6	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.5	1.7	1.6	1.5	
Industrial production ⁵	-2.3	1.4	.0	3.2	1.4	.7	.5	1.2	1.0	.9	1.0	-.7	1.4	1.0	.8	
<i>Previous Tealbook⁵</i>	-2.2	1.2	1.2	1.6	1.3	1.0	.7	1.2	1.0	1.1	1.0	-.4	1.1	1.1	.8	
Manufacturing industr. prod. ⁵	-3.3	1.1	-.5	2.9	1.1	.9	1.0	.9	1.0	.9	1.0	-1.1	1.5	.9	.8	
<i>Previous Tealbook⁵</i>	-3.2	1.1	.3	1.9	1.2	1.0	.9	.8	.9	1.2	1.0	-.9	1.2	1.0	.8	
Capacity utilization rate - mfg. ³	75.5	75.4	75.1	75.5	75.6	75.7	75.8	75.9	76.1	76.2	76.3	75.1	75.8	76.3	76.9	
<i>Previous Tealbook³</i>	75.5	75.5	75.2	75.5	75.6	75.7	75.8	75.9	76.0	76.2	76.3	75.2	75.8	76.3	77.0	
Housing starts ⁶	1.3	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.3	1.2	
Light motor vehicle sales ⁶	17.0	17.0	16.8	16.9	16.9	16.9	16.9	16.8	16.8	16.8	16.8	16.9	16.9	16.8	16.6	
<i>Income and saving</i>																
Nominal GDP ⁵	4.7	3.8	2.8	3.7	4.2	3.9	3.9	3.9	4.0	3.8	3.7	3.8	3.9	3.8	3.7	
Real disposable pers. income ⁵	2.4	3.1	2.5	2.9	1.6	1.7	2.0	2.6	1.7	1.6	1.7	3.1	2.0	1.9	2.0	
<i>Previous Tealbook⁵</i>	2.4	3.1	2.3	2.6	1.9	1.5	2.0	2.7	1.7	1.5	1.7	3.1	2.0	1.9	2.1	
Personal saving rate ³	8.0	8.1	8.2	8.3	8.1	7.9	7.8	7.8	7.7	7.5	7.3	8.2	7.8	7.3	7.1	
<i>Previous Tealbook³</i>	8.0	8.1	8.1	8.2	8.0	7.8	7.7	7.8	7.7	7.5	7.3	8.1	7.7	7.3	7.2	
Corporate profits ⁷	16.0	6.0	-1.9	2.5	3.7	1.8	-1.4	2.2	.9	1.6	.2	.8	1.6	1.2	2.9	
Profit share of GNP ³	9.6	9.7	9.6	9.5	9.5	9.5	9.4	9.3	9.3	9.2	9.2	9.6	9.4	9.2	9.1	
Gross national saving rate ³	18.1	18.2	18.1	18.0	18.1	18.0	17.9	17.8	17.8	17.7	17.6	18.1	17.9	17.6	17.3	
Net national saving rate ³	2.6	3.0	2.8	2.8	2.8	2.7	2.5	2.4	2.3	2.2	2.0	2.8	2.5	2.0	1.5	

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.

Authorized for Public Release

November 26, 2019

Greensheets

Other Macroeconomic Indicators

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

Item	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<i>Employment and production</i>										
Nonfarm payroll employment ¹	192	251	227	193	179	223	168	130	95	74
Unemployment rate ²	7.0	5.7	5.0	4.8	4.1	3.8	3.6	3.5	3.5	3.5
<i>Previous Tealbook</i> ²	7.0	5.7	5.0	4.8	4.1	3.8	3.6	3.6	3.6	3.6
Natural rate of unemployment ²	5.4	5.1	4.9	4.8	4.6	4.4	4.4	4.4	4.4	4.4
<i>Previous Tealbook</i> ²	5.4	5.1	4.9	4.8	4.6	4.4	4.4	4.4	4.4	4.4
Employment-to-Population Ratio ²	58.5	59.3	59.4	59.8	60.2	60.6	60.9	60.8	60.7	60.4
Employment-to-Population Trend ²	60.4	60.3	60.2	60.2	60.2	60.2	60.1	59.9	59.8	59.6
Output gap ³	-3.0	-1.0	-.5	-.3	.6	1.4	1.5	1.8	1.8	1.7
<i>Previous Tealbook</i> ³	-3.0	-1.0	-.5	-.3	.6	1.4	1.5	1.7	1.6	1.5
Industrial production	2.3	3.4	-3.4	-.3	3.6	4.0	-.7	1.4	1.0	.8
<i>Previous Tealbook</i>	2.3	3.4	-3.4	-.3	3.6	4.0	-.4	1.1	1.1	.8
Manufacturing industr. prod.	1.1	1.4	-1.7	.3	2.5	2.2	-1.1	1.5	.9	.8
<i>Previous Tealbook</i>	1.1	1.4	-1.7	.3	2.5	2.2	-.9	1.2	1.0	.8
Capacity utilization rate - mfg. ²	74.5	75.8	74.9	74.2	75.8	77.0	75.1	75.8	76.3	76.9
<i>Previous Tealbook</i> ²	74.5	75.8	74.9	74.2	75.8	77.0	75.2	75.8	76.3	77.0
Housing starts ⁴	.9	1.0	1.1	1.2	1.2	1.2	1.3	1.4	1.3	1.2
Light motor vehicle sales ⁴	15.5	16.5	17.4	17.5	17.1	17.2	16.9	16.9	16.8	16.6
<i>Income and saving</i>										
Nominal GDP	4.4	4.5	2.8	3.5	4.9	4.9	3.8	3.9	3.8	3.7
Real disposable pers. income	-2.5	5.3	3.0	1.6	3.4	3.9	3.1	2.0	1.9	2.0
<i>Previous Tealbook</i>	-2.5	5.3	3.0	1.6	3.4	3.9	3.1	2.0	1.9	2.1
Personal saving rate ²	6.3	7.5	7.5	6.5	6.8	7.8	8.2	7.8	7.3	7.1
<i>Previous Tealbook</i> ²	6.3	7.5	7.5	6.5	6.8	7.8	8.1	7.7	7.3	7.2
Corporate profits ⁵	3.9	6.7	-10.8	3.3	-.6	4.2	.8	1.6	1.2	2.9
Profit share of GNP ²	11.8	12.1	10.5	10.5	9.9	9.9	9.6	9.4	9.2	9.1
Gross national saving rate ²	19.2	20.3	19.6	18.1	18.0	17.9	18.1	17.9	17.6	17.3
Net national saving rate ²	4.0	5.3	4.5	2.7	2.7	2.4	2.8	2.5	2.0	1.5

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	2017	2018	2019	2020	2021	2022	2019		2020				
							Q3	Q4	Q1	Q2			
Unified federal budget¹							Nominal dollars, billions						
Receipts	3,316	3,330	3,462	3,714	3,859	4,031	853	793	802	1,236			
Outlays	3,982	4,109	4,447	4,590	4,828	5,159	1,091	1,157	1,171	1,156			
Surplus/deficit	-665	-779	-984	-876	-970	-1,128	-237	-364	-369	80			
Surplus/deficit	-3.5	-3.8	-4.6	-4.0	-4.2	-4.8	-4.5	-6.8	-6.8	1.5			
<i>Previous Tealbook</i>	-3.5	-3.8	-4.6	-4.1	-4.3	-4.8	-4.2	-6.5	-7.1	1.1			
Primary surplus/deficit	-2.1	-2.2	-2.9	-2.3	-2.5	-2.9	-3.2	-4.9	-5.1	3.6			
Net interest	1.4	1.6	1.8	1.7	1.7	1.9	1.3	1.9	1.7	2.1			
Cyclically adjusted surplus/deficit	-3.5	-4.2	-5.3	-4.8	-5.1	-5.6	-5.2	-7.5	-7.6	.6			
Federal debt held by public	76.0	77.5	79.2	80.8	81.6	83.7	79.2	80.3	81.3	80.3			
Government in the NIPA²							Real percent change, annual rate						
Purchases	.8	1.5	2.5	1.3	.7	.8	1.6	.8	1.8	1.5			
Consumption	.6	1.6	2.1	.9	.4	.5	2.0	.9	1.4	1.2			
Investment	2.0	1.5	4.4	2.9	2.0	2.0	.0	.7	3.7	3.0			
State and local construction	-1.8	-1.5	4.4	1.0	1.0	1.0	-7.0	-4.0	1.0	1.0			
Real disposable personal income	3.5	3.9	3.1	2.0	1.9	2.0	3.1	2.5	2.9	1.6			
Contribution from transfers ³	.2	.4	1.1	.5	.6	.8	.6	.3	1.1	.3			
Contribution from taxes ³	-.9	.4	-.9	-.5	-.5	-.6	.2	.0	-.5	-.5			
Government employment							Average net change in monthly payrolls, thousands						
Federal	-2	0	3	0	1	1	9	-5	23	76			
State and local	9	8	12	9	9	9	29	11	9	9			
Fiscal indicators²							Percentage point contribution to change in real GDP, annual rate						
Fiscal effect (FE) ⁴	.2	.4	.9	.6	.4	.4	.7	.5	.7	.7			
Discretionary policy actions (FI)	.3	.6	.7	.4	.1	.1	.5	.4	.5	.5			
<i>Previous Tealbook</i>	.3	.6	.7	.4	.1	.2	.5	.4	.6	.6			
Federal purchases	.1	.2	.2	.1	.0	.0	.2	.1	.2	.2			
State and local purchases	.0	.1	.2	.1	.1	.1	.1	.1	.1	.1			
Taxes and transfers	.1	.3	.3	.2	.0	.0	.2	.2	.2	.2			
Cyclical	-.1	-.1	-.1	.0	.0	.0	-.1	-.1	-.1	-.1			
Other	.0	-.1	.3	.2	.3	.2	.3	.2	.2	.2			

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

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

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

4. The FE measure captures the total contribution of the government sector to the growth of 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											
	2019				2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP¹												
Total foreign	1.6	2.0	1.3	1.3	2.0	2.3	2.4	2.4	2.5	2.5	2.6	2.6
<i>Previous Tealbook</i>	1.5	2.1	1.8	1.8	2.2	2.3	2.4	2.4	2.5	2.5	2.6	2.6
Advanced foreign economies	1.3	2.1	1.1	.8	1.3	1.5	1.5	1.5	1.7	1.7	1.7	1.7
Canada	.5	3.7	1.4	1.4	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8
Japan	2.0	1.8	.2	-2.0	1.1	1.2	1.0	.8	.8	.8	.8	.8
United Kingdom	2.3	-.9	1.2	.1	.6	.7	.8	.8	1.4	1.4	1.4	1.4
Euro area	1.7	.8	.9	.9	1.1	1.3	1.3	1.5	1.7	1.8	1.8	1.8
Germany	1.9	-1.0	.3	.5	1.1	1.2	1.2	1.4	1.5	1.6	1.5	1.5
Emerging market economies	2.0	2.0	1.5	1.8	2.7	3.1	3.3	3.3	3.4	3.4	3.4	3.4
Asia	4.2	3.7	2.3	2.7	4.1	4.4	4.5	4.4	4.3	4.3	4.3	4.3
Korea	-1.5	4.2	1.6	2.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
China	7.3	5.5	5.4	5.7	5.6	5.6	5.6	5.7	5.7	5.7	5.7	5.7
Latin America	-.2	.3	.3	.7	1.2	1.6	2.1	2.1	2.3	2.4	2.4	2.4
Mexico	-.4	-.2	.1	.4	1.0	1.5	2.0	2.0	2.2	2.3	2.3	2.3
Brazil	-.3	1.8	1.5	2.3	2.0	2.3	2.5	2.6	2.8	2.8	2.8	2.8
Addendum												
Emerging market economies ex. China	.7	1.2	.6	.9	2.0	2.5	2.8	2.8	2.8	2.8	2.8	2.8
Consumer prices²												
Total foreign	.8	3.3	2.3	3.3	2.4	2.0	2.3	2.3	2.3	2.3	2.3	2.3
<i>Previous Tealbook</i>	.8	3.3	2.3	2.6	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3
Advanced foreign economies	.8	2.2	.9	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.6
Canada	1.6	3.4	1.7	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0
Japan	.9	.3	.3	1.1	.7	.5	.6	.6	.7	.8	.8	.9
United Kingdom	1.1	2.6	1.7	.7	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9
Euro area	.3	2.1	.7	1.1	1.1	1.2	1.2	1.3	1.4	1.4	1.4	1.5
Germany	.2	2.5	.3	1.6	1.7	1.7	1.8	1.8	1.9	2.0	2.1	2.1
Emerging market economies	.8	4.1	3.2	4.6	3.1	2.4	2.8	2.8	2.8	2.8	2.8	2.8
Asia	.4	3.9	3.2	5.1	3.0	1.9	2.6	2.6	2.6	2.6	2.6	2.6
Korea	-3.3	2.7	-.6	2.9	1.3	2.0	2.1	2.1	2.1	2.1	2.1	2.1
China	.6	4.3	4.6	6.9	3.2	1.4	2.5	2.5	2.5	2.5	2.5	2.5
Latin America	1.7	4.9	3.3	3.7	3.6	3.5	3.4	3.4	3.4	3.3	3.3	3.3
Mexico	1.1	4.5	2.8	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Brazil	2.9	5.2	2.2	1.8	3.8	3.8	3.8	3.8	3.7	3.7	3.7	3.7
Addendum												
Emerging market economies ex. China	1.0	3.9	2.1	3.0	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0

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	2013	2014	2015	2016	2017	2018	Projected			
							2019	2020	2021	2022
Real GDP¹										
Total foreign	3.0	3.0	2.1	2.8	3.1	2.2	1.6	2.3	2.5	2.5
<i>Previous Tealbook</i>	3.0	3.0	2.1	2.8	3.1	2.2	1.8	2.3	2.6	2.6
Advanced foreign economies	2.4	2.0	.9	1.9	2.7	1.3	1.3	1.5	1.7	1.7
Canada	3.4	2.8	-.4	1.8	2.9	1.6	1.8	1.7	1.8	1.8
Japan	2.8	-.4	1.0	1.2	2.4	.3	.5	1.0	.8	.8
United Kingdom	2.7	2.5	2.4	1.8	1.6	1.5	.7	.7	1.4	1.4
Euro area	.7	1.6	2.0	2.1	3.0	1.2	1.1	1.3	1.8	1.7
Germany	1.5	2.3	1.3	1.9	3.4	.6	.4	1.2	1.5	1.6
Emerging market economies	3.6	3.9	3.2	3.8	3.5	3.0	1.8	3.1	3.4	3.4
Asia	5.4	5.1	4.6	5.1	5.2	4.4	3.2	4.3	4.3	4.3
Korea	3.7	2.6	3.4	2.7	2.8	3.0	1.6	2.4	2.4	2.3
China	7.6	7.1	6.8	6.8	6.7	6.4	6.0	5.6	5.7	5.6
Latin America	1.7	2.8	1.9	2.5	1.8	1.3	.3	1.8	2.4	2.4
Mexico	1.2	3.4	2.8	3.3	1.6	1.4	.0	1.6	2.3	2.3
Brazil	2.6	-.2	-5.5	-2.3	2.2	1.1	1.3	2.3	2.8	2.8
Addendum										
Emerging market economies ex. China	2.7	3.1	2.4	3.1	2.7	2.2	.8	2.5	2.8	2.8
Consumer prices²										
Total foreign	2.4	2.0	1.4	1.9	2.5	2.4	2.4	2.2	2.3	2.3
<i>Previous Tealbook</i>	2.4	2.0	1.4	1.9	2.5	2.4	2.2	2.3	2.3	2.3
Advanced foreign economies	1.0	1.2	.5	.9	1.5	1.7	1.3	1.4	1.5	1.6
Canada	1.0	2.0	1.3	1.4	1.8	2.1	2.2	2.0	2.0	2.0
Japan	1.4	2.6	.1	.3	.6	.8	.6	.6	.8	1.0
United Kingdom	2.1	.9	.1	1.2	3.0	2.3	1.5	1.8	1.9	1.9
Euro area	.8	.2	.3	.7	1.4	1.9	1.0	1.2	1.4	1.6
Germany	1.4	.4	.5	1.0	1.6	2.1	1.1	1.7	2.0	2.0
Emerging market economies	3.4	2.6	2.0	2.6	3.2	2.9	3.2	2.8	2.8	2.8
Asia	3.2	1.8	1.5	2.1	2.0	2.1	3.1	2.5	2.6	2.6
Korea	1.1	1.0	.9	1.4	1.4	1.8	.4	1.8	2.1	2.1
China	2.9	1.5	1.4	2.1	1.8	2.2	4.1	2.4	2.5	2.5
Latin America	4.0	4.7	3.2	4.0	6.4	5.1	3.4	3.5	3.3	3.2
Mexico	3.6	4.2	2.3	3.3	6.6	4.8	2.9	3.2	3.2	3.2
Brazil	5.8	6.5	10.4	7.1	2.8	4.1	3.0	3.8	3.7	3.5
Addendum										
Emerging market economies ex. China	3.8	3.5	2.4	3.0	4.2	3.5	2.5	3.1	3.0	3.0

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

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

U.S. Current Account												
<i>Quarterly Data</i>												
	2019				Projected				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<i>Billions of dollars, s.a.a.r.</i>												
U.S. current account balance	-544.8	-512.8	-493.7	-518.9	-509.9	-494.0	-514.2	-530.6	-545.0	-538.0	-553.3	-588.3
<i>Previous Tealbook</i>	-544.8	-512.8	-502.0	-529.0	-525.1	-511.9	-537.2	-540.9	-547.5	-534.6	-553.0	-577.5
Current account as percent of GDP	-2.6	-2.4	-2.3	-2.4	-2.3	-2.2	-2.3	-2.4	-2.4	-2.3	-2.4	-2.5
<i>Previous Tealbook</i>	-2.6	-2.4	-2.3	-2.4	-2.4	-2.3	-2.4	-2.4	-2.4	-2.3	-2.4	-2.5
Net goods & services	-625.9	-653.3	-646.1	-645.8	-632.4	-626.7	-633.9	-636.2	-642.8	-637.3	-639.0	-653.0
Investment income, net	240.4	283.4	299.3	283.4	277.3	275.3	266.6	262.2	252.6	241.8	232.6	221.4
Direct, net	312.9	346.1	364.4	354.3	364.2	372.4	372.5	378.5	379.5	379.8	382.9	383.9
Portfolio, net	-72.5	-62.7	-65.1	-70.9	-86.9	-97.1	-105.9	-116.3	-126.9	-138.1	-150.3	-162.5
Other income and transfers, net	-159.3	-142.8	-146.9	-156.6	-154.8	-142.5	-146.9	-156.6	-154.8	-142.5	-146.9	-156.6
<i>Annual Data</i>												
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022		Projected
<i>Billions of dollars</i>												
U.S. current account balance	-348.8	-365.2	-407.8	-428.3	-439.6	-491.0	-517.5	-512.2	-556.2	-600.5		
<i>Previous Tealbook</i>	-348.8	-365.2	-407.8	-428.3	-439.6	-491.0	-522.2	-528.8	-553.2	-578.3		
Current account as percent of GDP	-2.1	-2.1	-2.2	-2.3	-2.3	-2.4	-2.4	-2.3	-2.4	-2.5		
<i>Previous Tealbook</i>	-2.1	-2.1	-2.2	-2.3	-2.3	-2.4	-2.4	-2.4	-2.4	-2.4		
Net goods & services	-461.1	-489.6	-498.5	-503.0	-550.1	-627.7	-642.8	-632.3	-643.0	-657.6		
Investment income, net	215.4	228.9	214.7	211.1	238.7	266.9	276.6	270.4	237.1	207.4		
Direct, net	283.3	284.2	284.6	278.0	304.0	330.3	344.4	371.9	381.5	397.6		
Portfolio, net	-67.9	-55.3	-70.0	-66.9	-65.3	-63.4	-67.8	-101.5	-144.4	-190.3		
Other income and transfers, net	-103.1	-104.6	-123.9	-136.4	-128.2	-130.2	-151.4	-150.2	-150.2	-150.2		

Class I FOMC – Restricted Controlled (FR)

Report to the FOMC on Economic Conditions and Monetary Policy

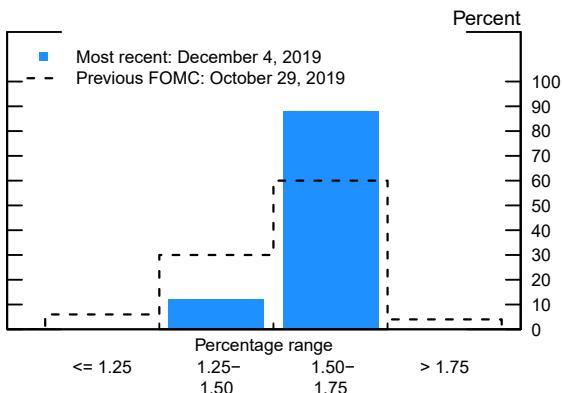


Book B Monetary Policy Alternatives

December 5, 2019

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

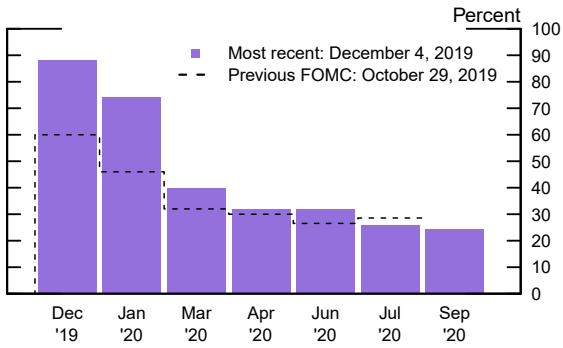
Figure 1: Market-Implied Probability Distribution of the Federal Funds Rate After December FOMC



Note: Estimated from federal funds futures options, not adjusted for risk premiums. The distribution for January 2020 is used to provide a read on the distribution following the December FOMC meeting.

Source: CME Group; Board staff calculations.

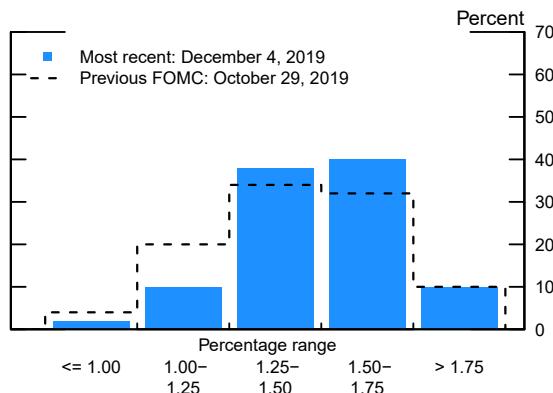
Figure 3: Market-Implied Probability of the Federal Funds Rate Falling in the Current Target Range



Note: Shows the probabilities of the federal funds rate falling between 1.50 percent and 1.75 percent after each FOMC meeting. Estimated from federal funds futures options, not adjusted for risk premiums.

Source: CME Group; Board staff calculations.

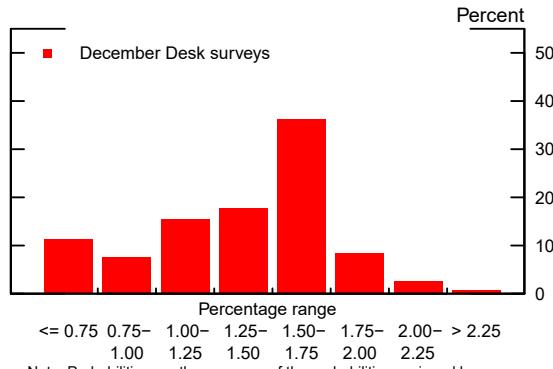
Figure 2: Market-Implied Probability Distribution of the Federal Funds Rate After March FOMC



Note: Estimated from federal funds futures options, not adjusted for risk premiums. The distribution for April 2020 is used to provide a read on the distribution following the March FOMC meeting.

Source: CME Group; Board staff calculations.

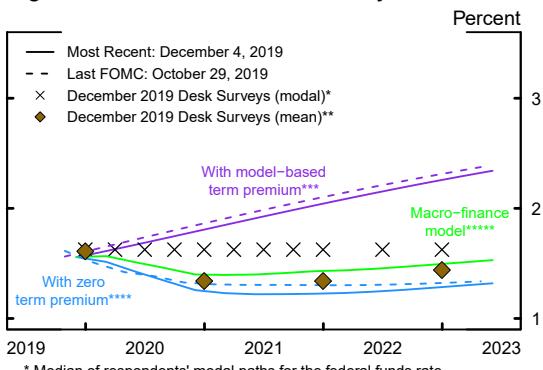
Figure 4: Desk Surveys Probability Distribution of the Federal Funds Rate, Year-End 2020



Note: Probabilities are the averages of the probabilities assigned by respondents to the Survey of Market Participants and Survey of Primary Dealers to different ranges of the federal funds rate at the end of 2020.

Source: FRBNY

Figure 5: Federal Funds Rate Projections



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

** Estimated from respondents' unconditional year-end probability distributions.

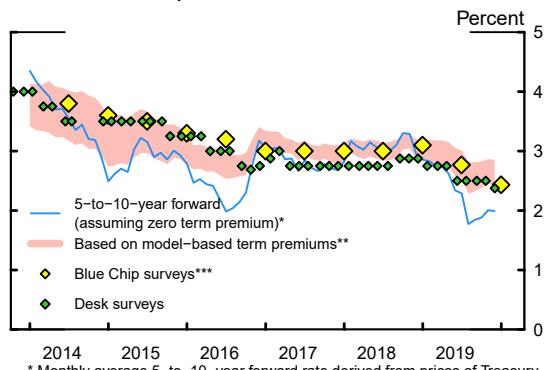
*** Adjusting for premiums using a term structure model maintained by Board staff.

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

***** Macro-finance model path is estimated by averaging over regressions of term premiums on covariances between real and nominal variables based on Dierckx and Carl (2019).

Source: Bloomberg; Federal Reserve Board staff estimates; FRBNY.

Figure 6: 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 four alternative model-based term premium estimates using Kim and Wright (2005), D'Amico, Kim, and Wei (2018), Kim and Priebsch (2019), and Meldrum (2019).

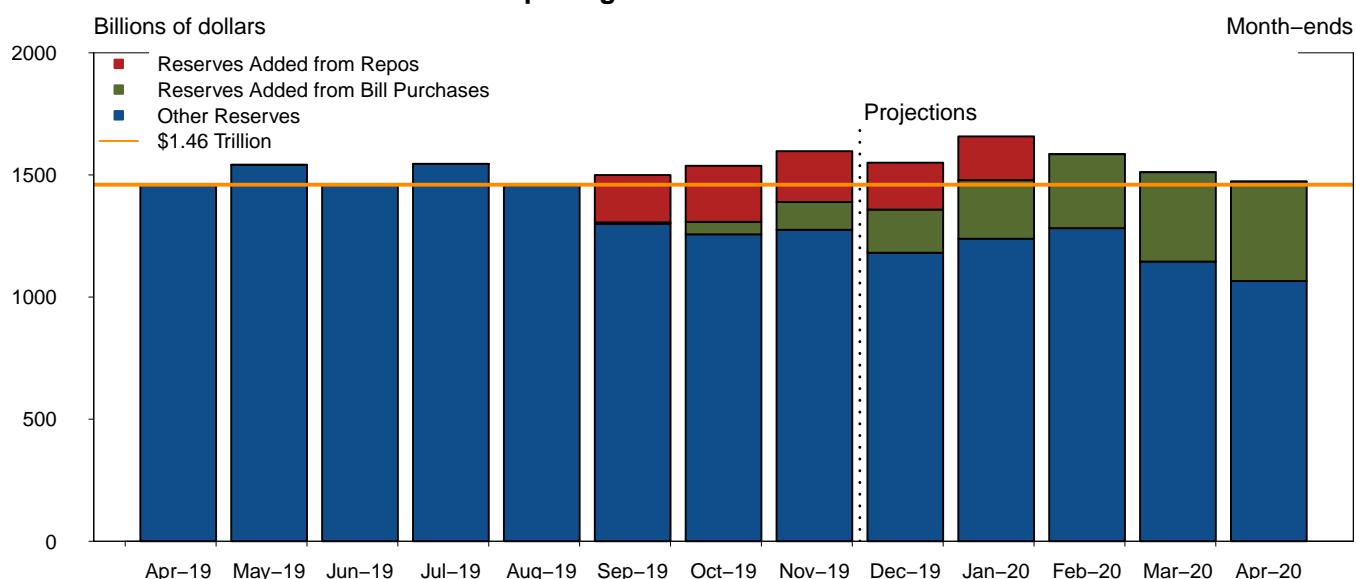
*** Most recent long-run survey value is from the December 2019 Blue Chip survey.

Note: Forward rates and term structure model estimates for December 2019 are based on values through December 4.

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

SOMA Open Market Operations and Their Near-Term Effect on Reserve Balances

Decomposing the Path of Reserve Balances

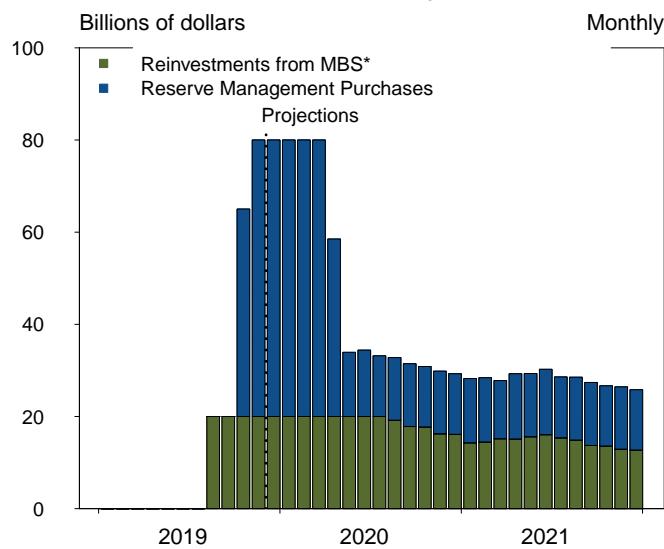


Balance Sheet & Income

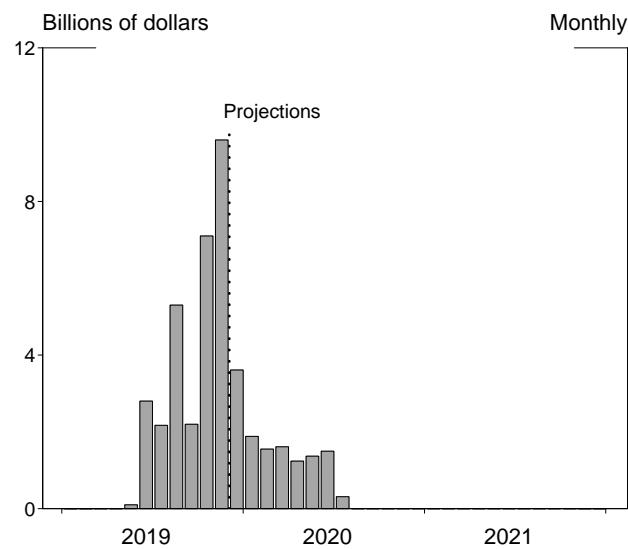
Reinvestments from Agency Securities*

Date	Reserve Management Purchases of Treasury Securities		to Treasury Securities		to Agency MBS	
	Period	Since Oct 2019	Period	Since Aug 2019	Period	Since Aug 2019
2019: October	45.0	45.0	20.0	60.0	7.1	14.6
2019: November	60.0	105.0	20.0	80.0	9.6	24.2
2019: December	60.0	165.0	20.0	100.0	3.6	27.8
2020:Q1	180.0	345.0	60.0	160.0	5.0	32.9
2019	165.0	165.0	100.0	100.0	32.9	27.8
2020	327.2	492.2	227.0	327.0	9.5	37.3
2021	163.1	655.2	173.6	500.6	0.0	37.3
2022	164.3	819.5	142.6	643.2	0.0	37.3

Purchases of Treasury Securities



MBS Reinvestments*



* Principal payments from holdings of agency securities below \$20 billion per month are reinvested into Treasury securities, while those above are reinvested into agency MBS.

Federal Reserve Balance Sheet
Month-end Projections – December Tealbook
(Billions of dollars)

	Historical*			Projections				
	Aug 2014	Sep 2017	Nov 2019	Dec 2019	Dec 2020	Dec 2022	Dec 2025	Dec 2030
Total assets	4,416	4,460	4,063	4,126	4,262	4,579	5,087	6,004
Selected assets								
Loans and other credit extensions**	2	6	0	0	0	0	0	0
Securities held outright	4,157	4,240	3,675	3,745	4,082	4,417	4,947	5,892
U.S. Treasury securities	2,437	2,465	2,249	2,339	2,896	3,548	4,403	5,663
Agency debt securities	42	7	2	2	2	2	2	2
Agency mortgage-backed securities	1,678	1,768	1,424	1,404	1,183	867	542	226
Unamortized premiums	209	162	126	125	115	96	73	44
Unamortized discounts	-19	-14	-13	-13	-11	-10	-9	-7
Total other assets	66	66	276	268	76	76	76	76
Total liabilities	4,360	4,419	4,024	4,086	4,222	4,536	5,037	5,941
Selected liabilities								
Federal Reserve notes in circulation	1,249	1,533	1,745	1,754	1,862	2,050	2,280	2,690
Reverse repurchase agreements	277	432	285	299	310	334	372	438
Deposits with Federal Reserve Banks	2,825	2,447	1,987	2,029	2,045	2,147	2,380	2,807
Reserve balances held by depository institutions	2,762	2,190	1,551	1,550	1,576	1,642	1,818	2,143
U.S. Treasury, General Account	49	176	371	413	401	432	480	566
Other deposits	15	82	65	66	69	74	82	97
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	43	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; November 2019 is the most recent historical value

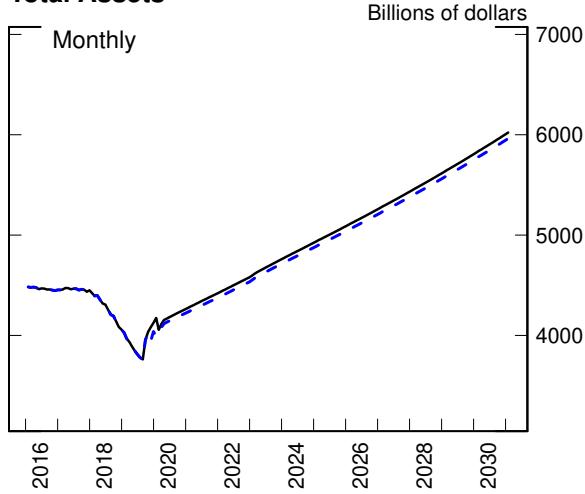
**Loans and other credit extensions includes discount window credit; central bank liquidity swaps; and net portfolio holdings of Maiden Lane LLC.

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

Total Assets and Selected Balance Sheet Items

— December Tealbook baseline - - - October Tealbook baseline

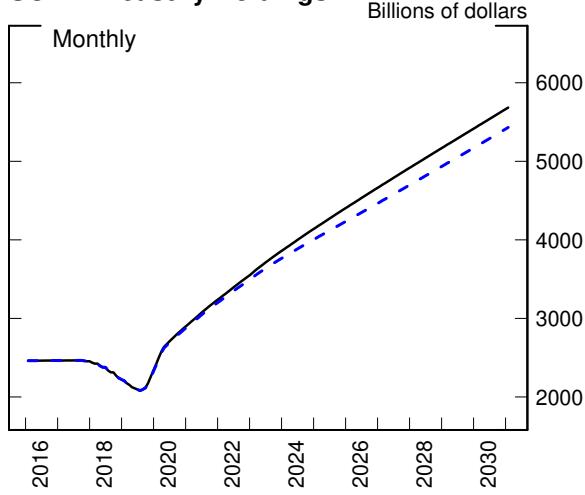
Total Assets



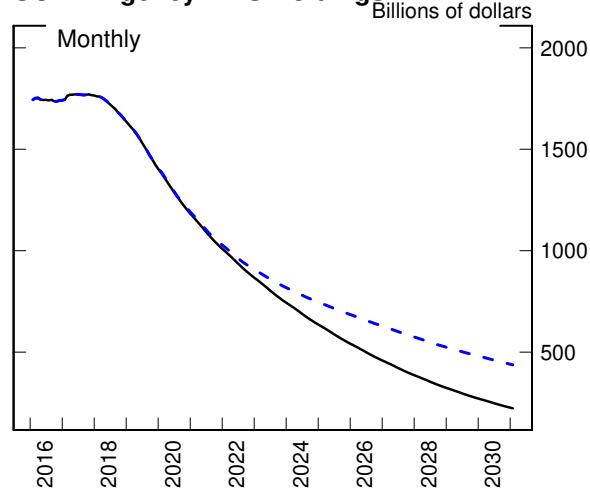
Reserve Balances



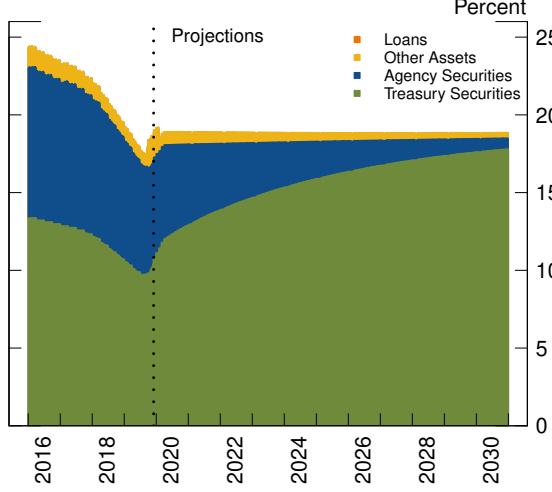
SOMA Treasury Holdings



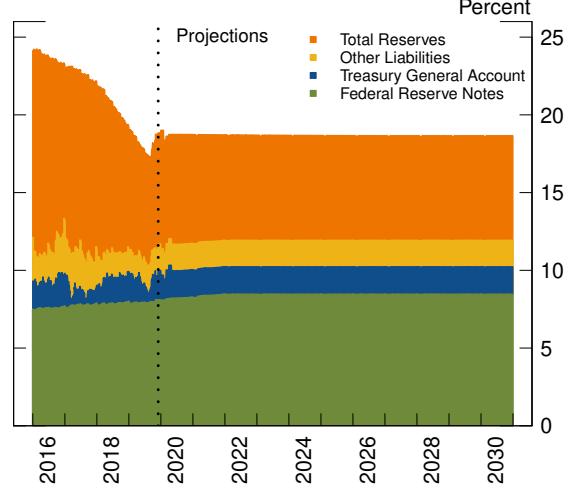
SOMA Agency MBS Holdings



Assets as a Percent of GDP



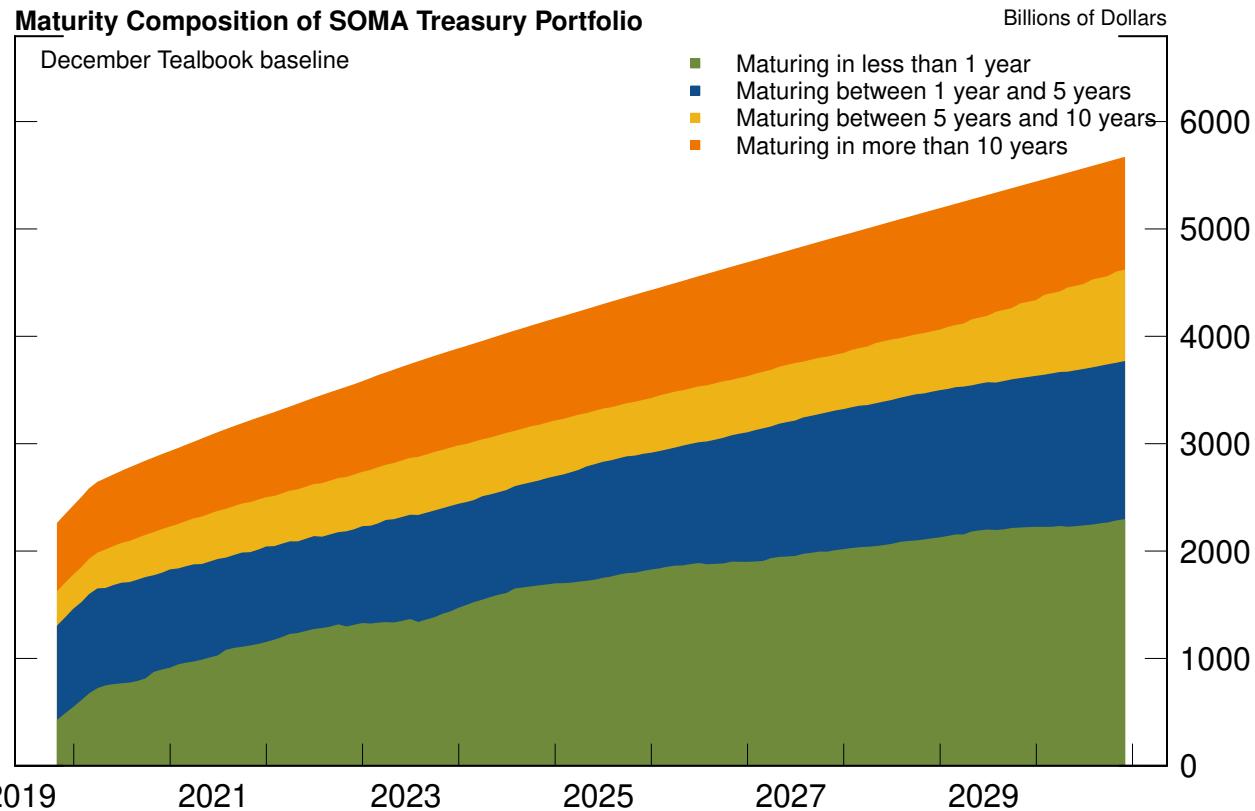
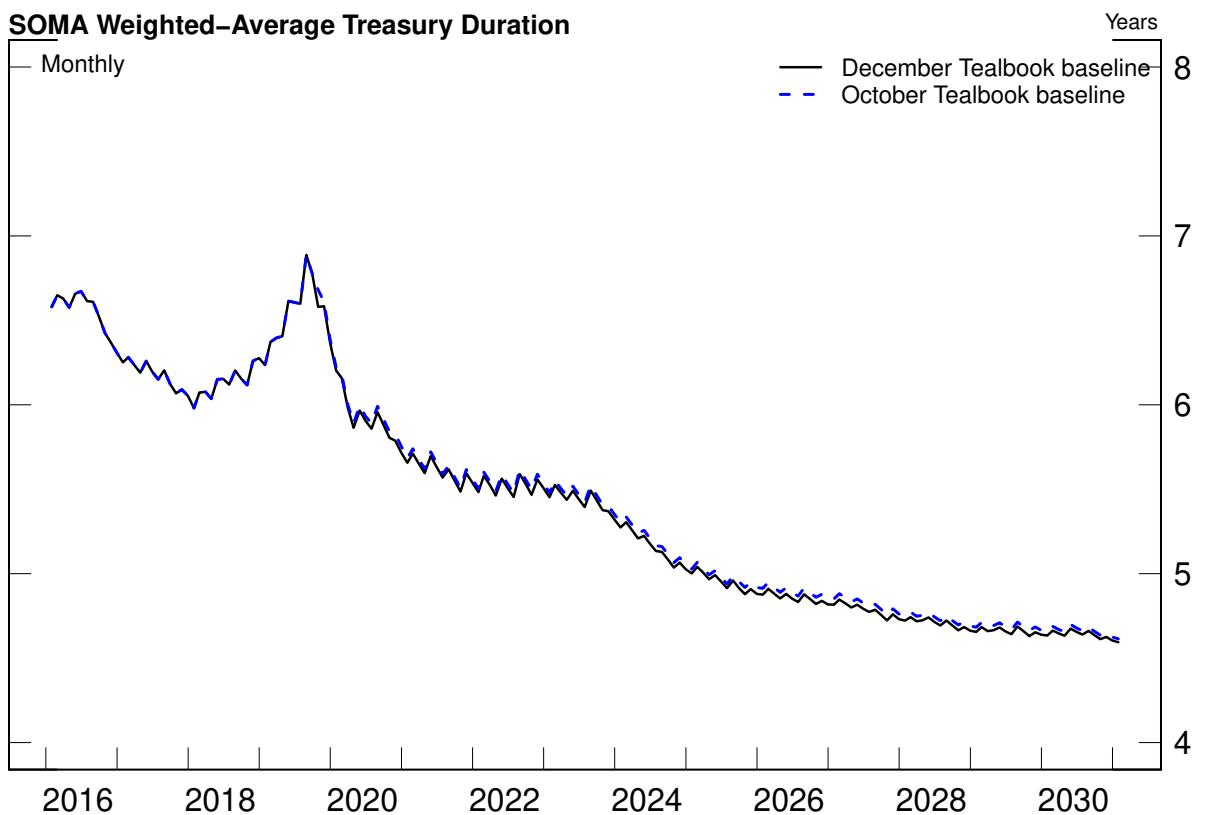
Liabilities as a Percent of GDP



Balance Sheet & Income

Projections for the Characteristics of SOMA Treasury Securities Holdings

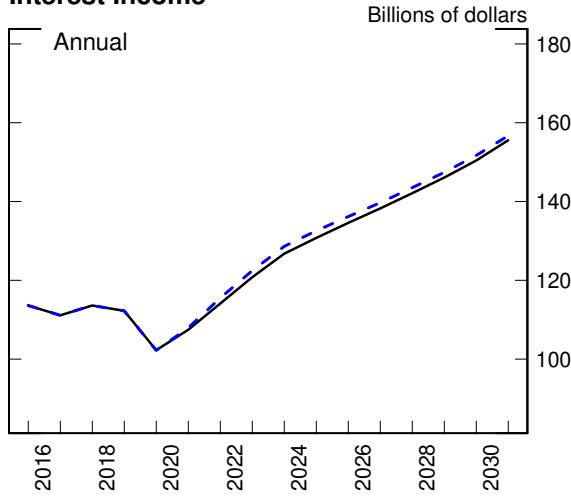
Balance Sheet & Income



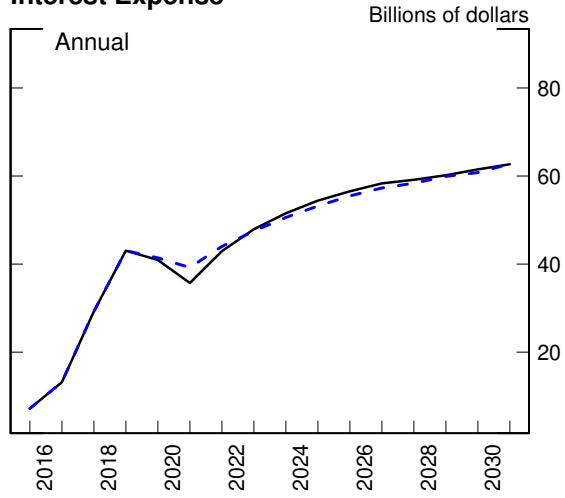
Income Projections

— December Tealbook baseline - - - October Tealbook baseline

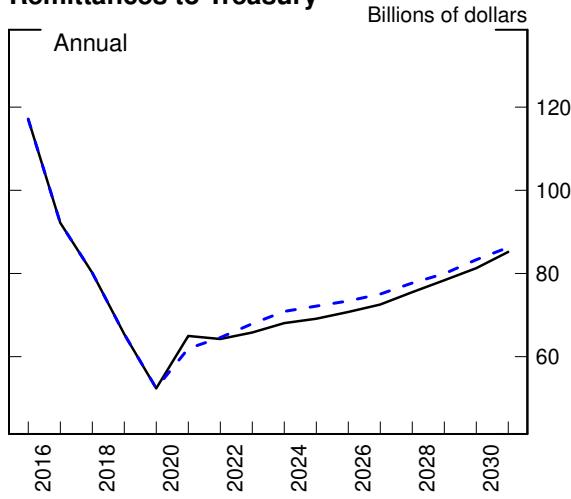
Interest Income



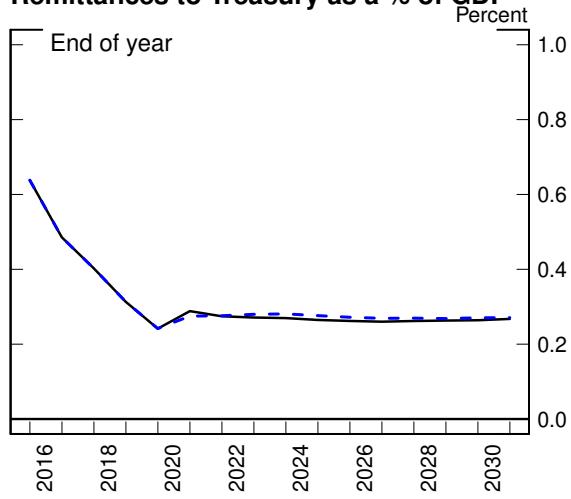
Interest Expense



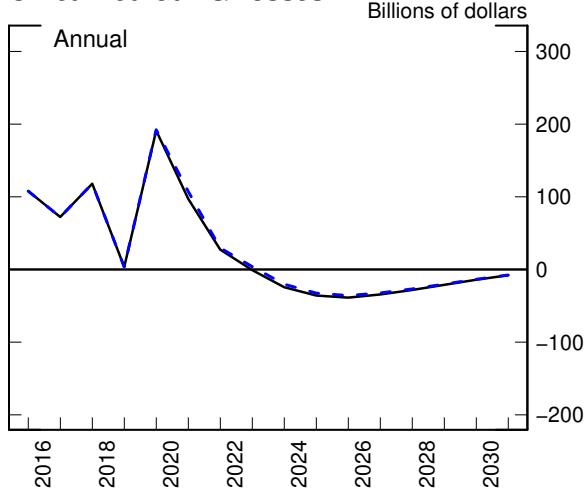
Remittances to Treasury



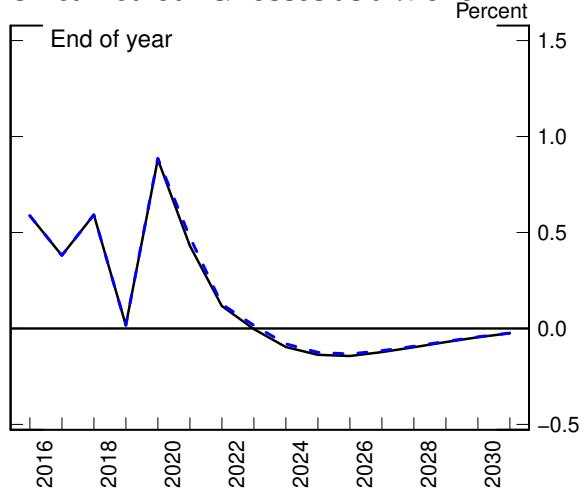
Remittances to Treasury as a % of GDP



Unrealized Gains/Losses



Unrealized Gains/Losses as a % of GDP



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

Date	December Tealbook	October Tealbook
Quarterly Averages		
2019:Q4	-136	-137
2020:Q1	-135	-136
Q2	-134	-135
Q3	-133	-135
Q4	-132	-134
2021:Q4	-129	-131
2022:Q4	-126	-128
2023:Q4	-122	-124
2024:Q4	-119	-122
2025:Q4	-117	-120
2026:Q4	-116	-118
2027:Q4	-114	-116
2028:Q4	-113	-115
2029:Q4	-111	-113
2030:Q4	-110	-111