

Prefatory Note

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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

October 26, 2018

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 October Tealbook projection for real GDP growth lies close to both the Blue Chip consensus forecast and the Survey of Professional Forecasters (SPF) median forecast for 2018; all three forecasts step down in 2019 and are within a narrow range. The staff's unemployment rate forecast is in line with the others in 2018 and a touch below the Blue Chip consensus in 2019. The staff projection for measures of price inflation are close to the Blue Chip consensus and SPF median forecasts in both 2018 and 2019.

Comparison of Tealbook and Outside Forecasts

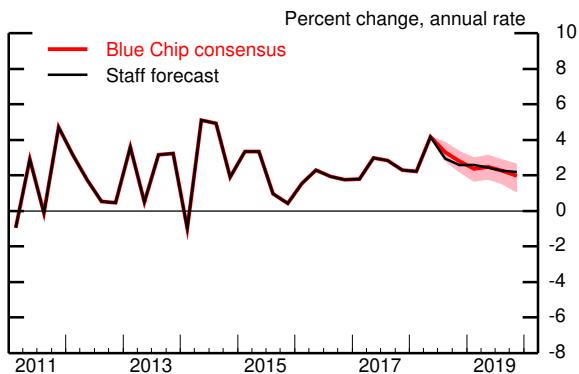
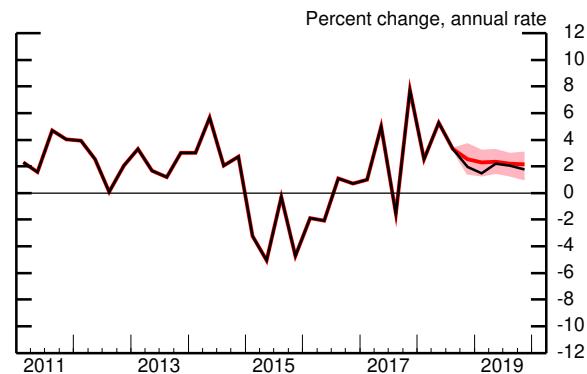
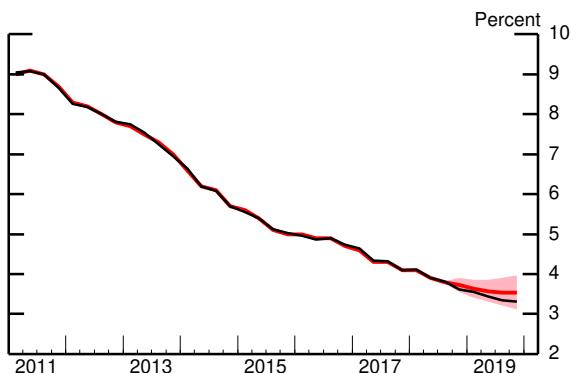
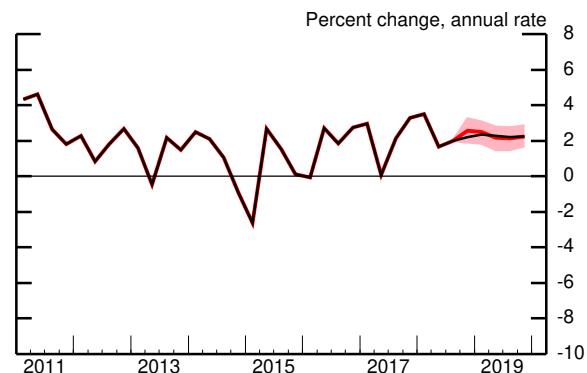
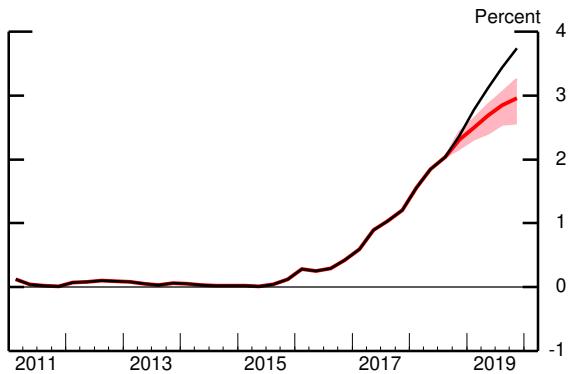
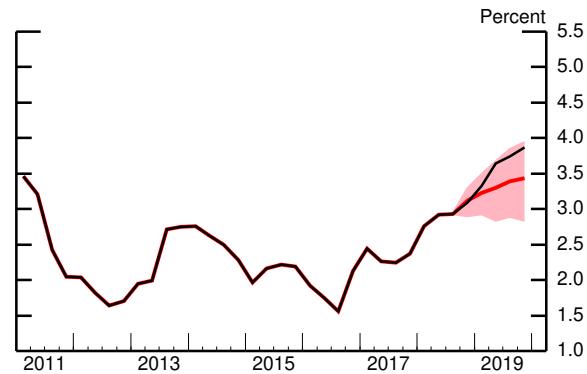
	2018	2019
GDP (Q4/Q4 percent change)		
October Tealbook	3.0	2.4
Blue Chip (10/10/18)	3.1	2.3
SPF median (08/10/18)	2.9	n.a.
Unemployment rate (Q4 level)		
October Tealbook	3.6	3.3
Blue Chip (10/10/18)	3.7	3.5
SPF median (08/10/18)	3.7	n.a.
CPI inflation (Q4/Q4 percent change)		
October Tealbook	2.3	2.3
Blue Chip (10/10/18)	2.5	2.3
SPF median (08/10/18)	2.4	2.3
PCE price inflation (Q4/Q4 percent change)		
October Tealbook	2.0	2.0
SPF median (08/10/18)	2.1	2.1
Core PCE price inflation (Q4/Q4 percent change)		
October Tealbook	1.9	2.0
SPF median (08/10/18)	2.0	2.1

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

n.a. Not available.

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

Tealbook Forecast Compared with Blue Chip

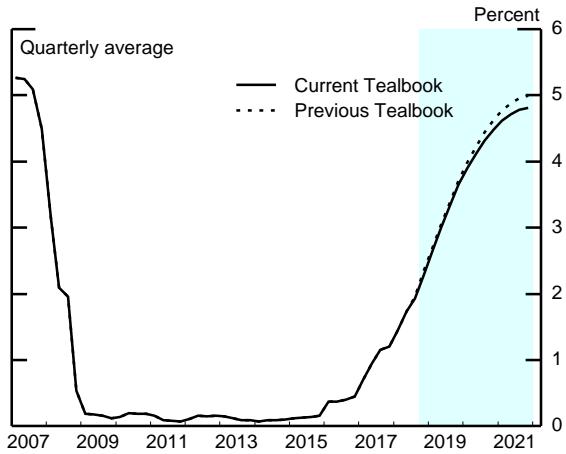
Real GDP**Industrial Production****Unemployment Rate****Consumer Price Index****Treasury Bill Rate****10-Year Treasury Yield**

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

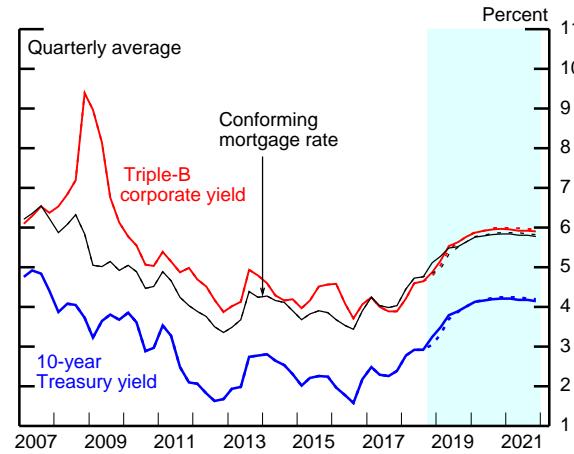
Note: The shaded area represents the area between the Blue Chip top 10 and bottom 10 averages.

Key Background Factors underlying the Baseline Staff Projection

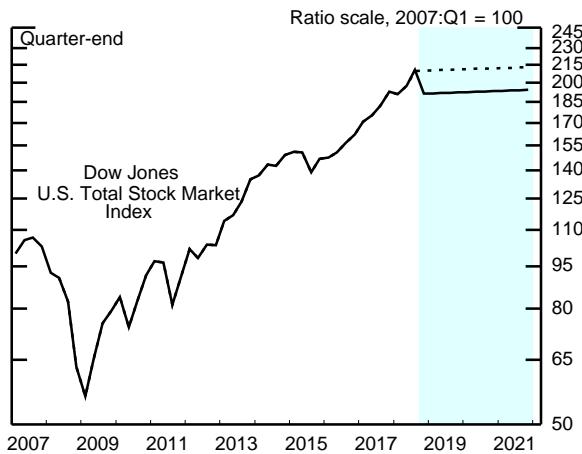
Federal Funds Rate



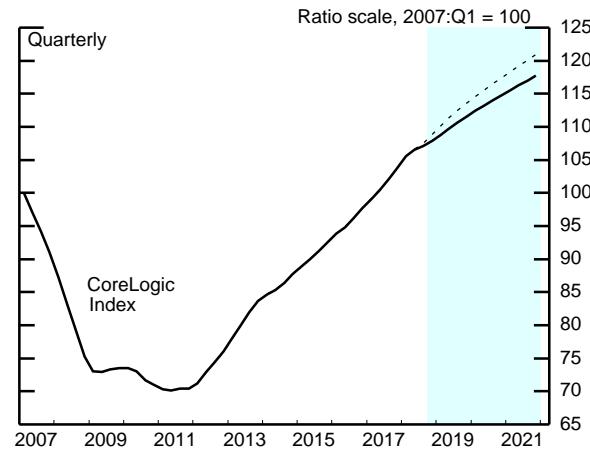
Long-Term Interest Rates



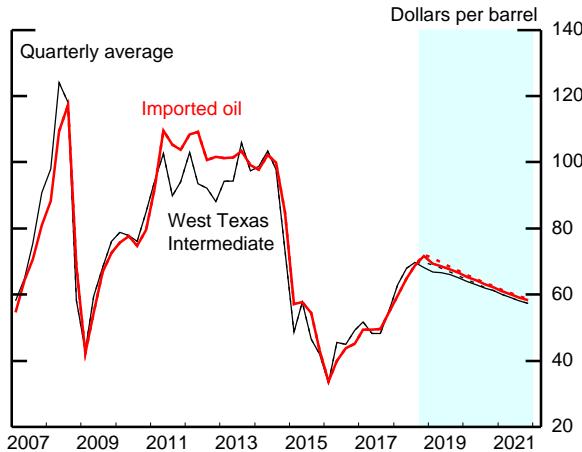
Equity Prices



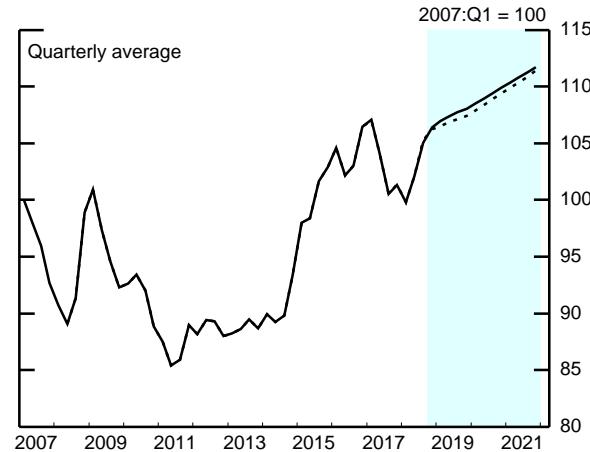
House Prices



Crude Oil Prices



Broad Real Dollar



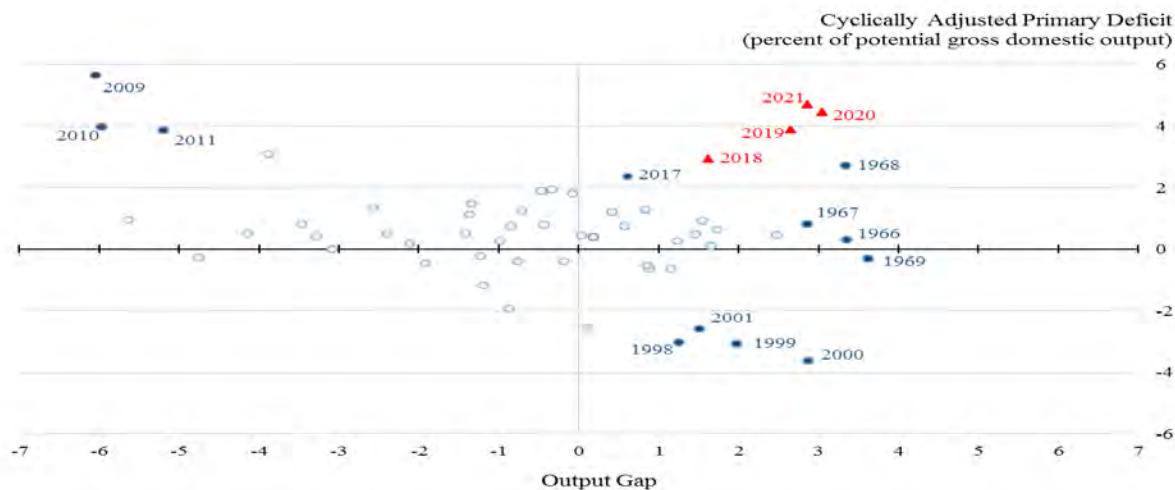
Fiscal Policy and the State of the Economy

The federal fiscal policy assumptions in the staff's baseline forecast yield primary budget deficits that average just under 3 percent of GDP between fiscal year (FY) 2018 and FY2021. Here we put these budget policies in historical perspective using two different measures—the cyclically adjusted primary (CAP) budget deficit and the staff's measure of fiscal impetus. During the FY2018 to FY2021 period, we expect that fiscal policy will result in relatively large deficits and will provide a modest boost to aggregate demand, both of which—especially the former—are atypical relative to the state of the business cycle.

The CAP deficit is often used to assess the sustainability of budget policies. The CAP deficit makes two adjustments to the total federal deficit. First, by focusing on the primary deficit, the CAP deficit excludes net interest payments associated with servicing existing government debt.¹ Second, the CAP deficit removes the transitory effects of the business cycle by estimating what the primary deficit would be if output were at its potential level.²

Figure 1 shows the historical relationship between the CAP deficit on the vertical axis and the output gap on the horizontal axis. The expected CAP deficits for FY2018 to FY2021 (red triangles) are outliers. Historically, when the output gap has been as large as staff projections for FY2018 to FY2021, the CAP deficit has been considerably smaller (as in FY1966 to FY1968) or the government has run a CAP surplus (as in FY1998 to FY2001). The last time the CAP deficit was roughly as large as staff projections for FY2018 to FY2021 was during the Great Recession, when the output gap was large and negative.

Figure 1: Cyclically Adjusted Primary Deficits and the Output Gap



Note: The figure displays data for FY1964 to FY2017 and staff estimates and projections for FY2018 to FY2021.

Source: Staff estimates.

¹ Persistently balancing the primary deficit implies a stable debt-to-GDP ratio if the pace of nominal GDP growth is equal to the average nominal rate of interest on the debt.

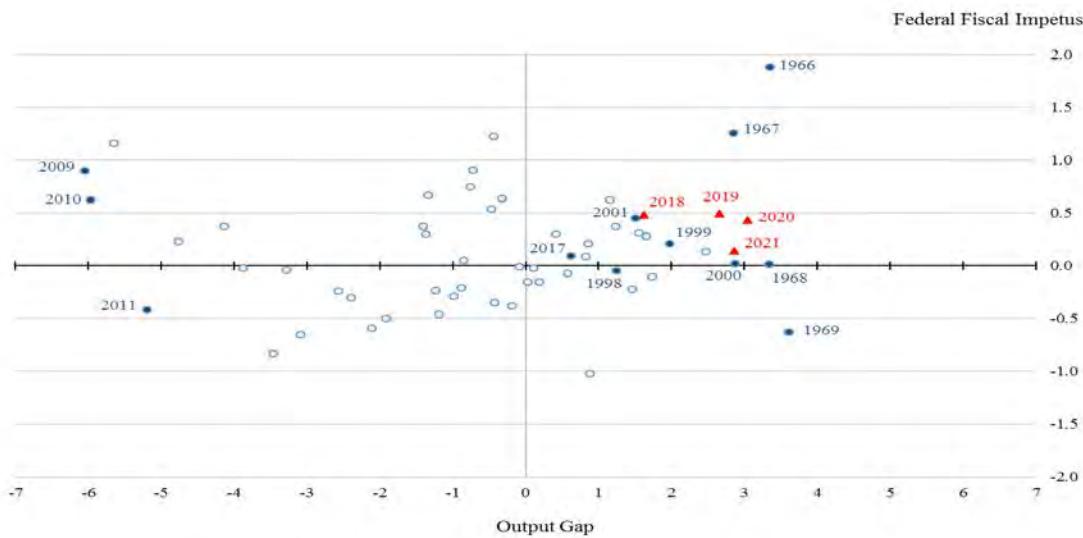
² The cyclically adjusted measure removes the deficit effects of automatic stabilizers (for example, lower taxes in response to reduced incomes or higher income-support payments triggered by a rise in unemployment) that operate when the economy is not at its potential level. This measure does not remove the effects of discretionary fiscal policy actions that are in response to the business cycle, such as a reduction in tax rates during a recession.

Further, the staff projects that the CAP deficit will increase while the output gap increases between FY2018 and FY2021. This pattern contrasts with the historical relationship, which, on average, implies that the CAP deficit decreases when the output gap increases.³

Growth in the CAP deficit beginning in FY2018 largely results from discretionary fiscal policy actions, specifically tax cuts from the Tax Cuts and Jobs Act (TCJA) and spending increases from the Bipartisan Budget Act (BBA 2018). The staff forecast assumes that elevated spending levels from the BBA 2018 remain in place beyond FY2019, growing with inflation each year (even though, under current law, appropriations are set to return to lower levels at the end of FY2019). Figure 2 illustrates how these policies affect aggregate demand. This figure shows fiscal impetus (FI), the first-round direct effect of discretionary fiscal policy actions on the growth of aggregate demand, on the vertical axis and the output gap on the horizontal axis. The FI projections imply that discretionary fiscal policy at the federal level will boost aggregate demand growth by roughly $\frac{1}{2}$ percentage point per year through FY2020 and then taper off in FY2021 when the tax and spending policies are fully phased in.

Because FI is measured in terms of aggregate demand growth, it is associated with changes in, rather than the level of, the CAP deficit. The magnitude of FI depends in part on the type of fiscal policy that drives the CAP deficit changes. The increase in projected CAP deficits for FY2018 to FY2021 results largely from the TCJA tax cuts. By comparison, historical CAP deficits in years with a comparable output gap, such as FY1966 and FY1967, resulted mainly from defense spending increases and growth in government transfers, which provide a relatively larger boost to aggregate demand compared to tax decreases.⁴

Figure 2: Fiscal Impetus and the Output Gap



Note: The figure displays data for FY1964 to FY2017 and staff estimates and projections for FY2018 to FY2021.
Source: Staff estimates.

³ Excluding FY2009 to FY2011 (which, if included, would make the relationship even more negative), a 1 percentage point increase in the output gap is associated with a 0.15 percentage point reduction in the CAP deficit.

⁴ Although a 1 percentage point increase in defense purchases (as a percent of GDP) increases aggregate demand by 1 percentage point, we estimate that a similarly sized tax cut will boost demand by only two-thirds that amount.

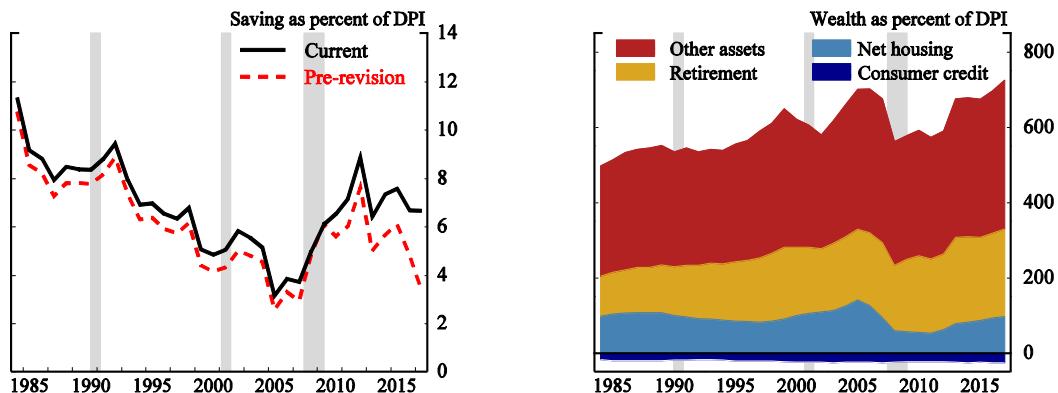
Household Wealth and the Personal Saving Rate

The NIPA personal saving rate (left panel of figure 1) is now reported to have remained elevated over the past few years rather than falling back toward pre-recession levels, as was estimated prior to the recent BEA comprehensive revision. The right panel of figure 1 shows why this persistently high saving rate may be a puzzle: Growth of household wealth relative to income should be pushing the saving rate down.¹ Here we explore whether trends in the composition and distribution of household wealth might currently be holding down aggregate consumption and raising the saving rate. We focus on differences in borrowing and spending behavior across age and wealth groups as well as the extent to which net saving (or more importantly, net dissaving) in particular balance sheet categories has led to movements in the overall saving rate.

The four net worth components we focus on are consumer credit, owner-occupied housing, retirement accounts, and the residual, labeled “other assets.” Consumer credit includes nonhousing liabilities such as credit card, vehicle, and student loans. Owner-occupied housing wealth (or net housing) is the market value of housing less mortgage debt outstanding. Retirement accounts include traditional defined benefit pensions and account-type 401(k), 403(b), and IRA plans. The residual other assets are mostly closely held businesses and financial assets like stocks and bonds that are held outside of retirement accounts.

The evolving composition of wealth in the right panel of figure 1 is associated with a shifting distribution of wealth across types of households. The Board’s Survey of Consumer Finances (SCF) finds that the share of wealth held by households with a head aged 55 or older increased from 53 percent in 1989 to 71 percent by 2016. In addition, the share of wealth held by the top wealth quartile increased from 80 percent to 85 percent for both the young and old.²

Figure 1: Saving and Wealth Relative to Income



Note: Grey shaded areas indicate recession periods as dated by the National Bureau of Economic Research (NBER).
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis; Financial Accounts of the United States.

¹ For additional staff perspective on the effect of wealth on saving and consumption, see Aditya Aladangady and Laura Feiveson (2018), “A Not-So-Great Recovery in Consumption: What is Holding Back Household Spending?” FEDS Notes (Washington: Board of Governors of the Federal Reserve System, March 8), <https://www.federalreserve.gov/econres/notes/feds-notes/what-is-holding-back-household-spending-20180308.htm>.

² The concept of wealth used here includes an estimate of defined benefit pensions. See Sebastian Devlin-Foltz, Alice Henriques, and John Sabelhaus (2016), “Is the U.S. Retirement System Contributing to Rising Wealth Inequality?” Russell Sage Foundation Journal of the Social Sciences, vol. 2 (November), pp. 59–85.

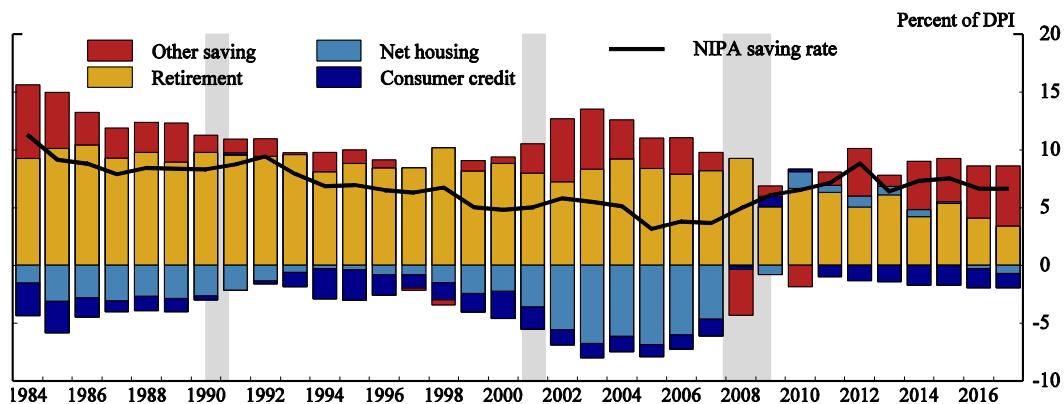
In order to shed light on movements in the saving rate over time, figure 2 presents annual changes in the different components of wealth from figure 1 after stripping out the relevant capital gains from each balance sheet category.

Figure 2 shows that net saving in retirement accounts has fallen in the past decade, from about 10 percent of disposable income in the 1980s and '90s to less than 5 percent in recent years. The downward trend in net retirement account saving is attributable to aging, as benefit payments and withdrawals are rising as a share of income, while new contributions relative to income are little changed.³ However, in recent years, the decline in net retirement saving has been mostly offset by increased saving in business and financial assets outside of retirement accounts, which are held even more disproportionately at the top of the wealth distribution. If older and wealthier households are less likely to spend out of their wealth than the younger and less wealthy, this tendency may help explain why the saving rate has remained elevated despite overall rising wealth relative to income.

Figure 2 also highlights the important role of housing in accounting for movements in the saving rate over the past two decades. In the lead up to the financial crisis, NIPA saving dipped as households increased mortgage debt much more than they invested in new housing. More recently, net saving in owner-occupied housing has moved up and hovered near zero, as net mortgage borrowing and net residential investment have both remained low.

The pre-recession housing-related dissaving is generally associated with younger and less wealthy households. Those families borrowed extensively against housing to finance consumption or to invest in more housing, and those behaviors have fundamentally changed in the past decade. Younger and less wealthy households now carry more consumer debt and are less likely to have entered into owning homes and stocks, and one downstream effect is that they have not benefited from the rebound in asset prices.⁴ Regardless of whether mortgage demand or supply has shifted, it is unlikely that we will return to the rates of housing dissaving observed in the pre-recession period.

Figure 2: Balance Sheet Decomposition of NIPA Personal Saving



Note: Grey shaded areas indicate recession periods as dated by the National Bureau of Economic Research (NBER).
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis; Financial Accounts of the United States.

³ The continued rise in retirement assets relative to income shown in figure 1 is increasingly due to capital gains and not retirement account saving in the conventional NIPA sense.

⁴ For a discussion of wealth distribution trends in recent years, see Lisa J. Dettling, Joanne W. Hsu, and Elizabeth Llanes (2018), "A Wealthless Recovery? Asset Ownership and the Uneven Recovery from the Great Recession," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, September 13), <https://www.federalreserve.gov/econres/notes/feds-notes/asset-ownership-and-the-uneven-recovery-from-the-great-recession-20180913.htm>.

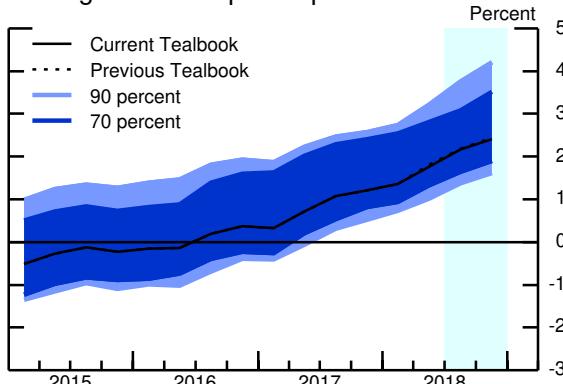
Cyclical Position of the U.S. Economy: Near-Term Perspective

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

Measure	2016	2017	2018	2018 Q2	2018 Q3	2018 Q4
Output gap¹	.4	1.2	2.4	1.8	2.2	2.4
Previous Tealbook	.4	1.2	2.4	1.8	2.2	2.4
Real GDP	1.9	2.5	3.0	4.2	2.9	2.6
Previous Tealbook	1.9	2.5	3.1	4.7	3.0	2.5
Measurement error in GDP	-.3	.0	.1	.9	-.4	.0
Previous Tealbook	-.3	.0	.2	1.2	-.2	-.2
Potential output	1.6	1.6	1.7	1.7	1.7	1.7
Previous Tealbook	1.6	1.6	1.7	1.7	1.7	1.7

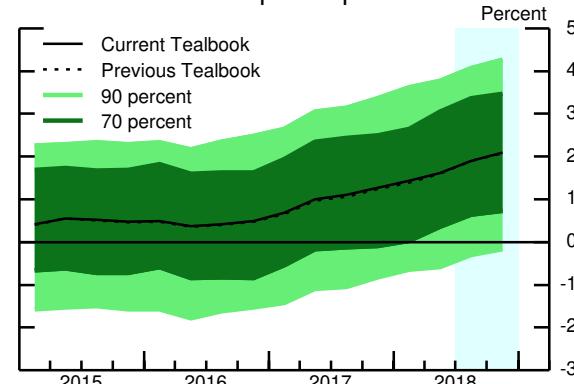
Note: The output gap is the percent difference between actual and potential output; a negative number indicates that the economy is operating below potential. The change in the output gap is equal to real GDP growth less the contribution of measurement error less the growth rate of potential output.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

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

Judgmental Output Gap

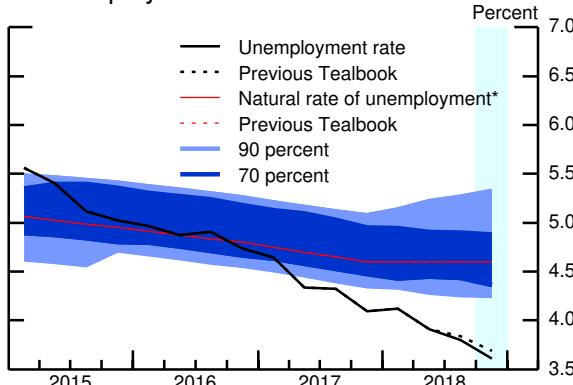
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.

Source: Various macroeconomic data; staff assumptions.

Model-Based Output Gap

Note: Shaded regions denote model-computed uncertainty bands.

Source: Various macroeconomic data; staff assumptions.

Unemployment Rate

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

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

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

Core PCE Price Inflation

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

Summary of the Near-Term Outlook for GDP

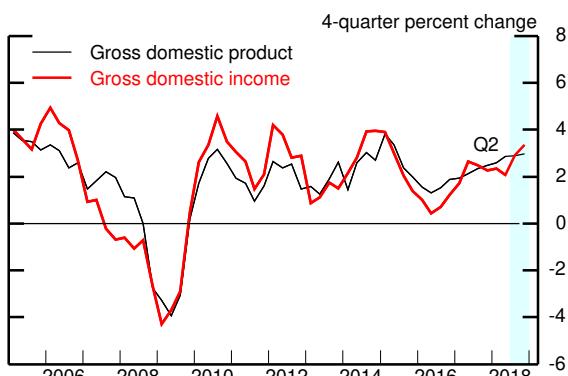
(Percent change at annual rate except as noted)

Measure	2018:H1		2018:Q3		2018:Q4	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	3.4	3.2	3.0	2.9	2.5	2.6
Private domestic final purchases	3.3	3.1	2.8	3.0	3.4	3.3
Personal consumption expenditures	2.3	2.1	2.9	3.2	2.7	2.7
Residential investment	-2.6	-2.4	-2.1	-5.2	-.2	-1.3
Nonres. private fixed investment	10.2	10.1	3.7	4.0	7.9	7.6
Government purchases	2.0	2.0	1.1	2.1	1.6	1.8
<i>Contributions to change in real GDP</i>						
Inventory investment ¹	-.3	-.5	1.2	1.8	-.3	-.4
Net exports ¹	.6	.6	-.8	-1.8	-.3	-.1

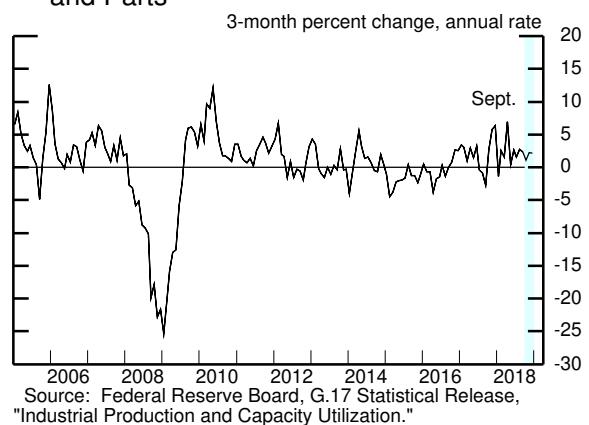
1. Percentage points.

Recent Nonfinancial Developments (1)

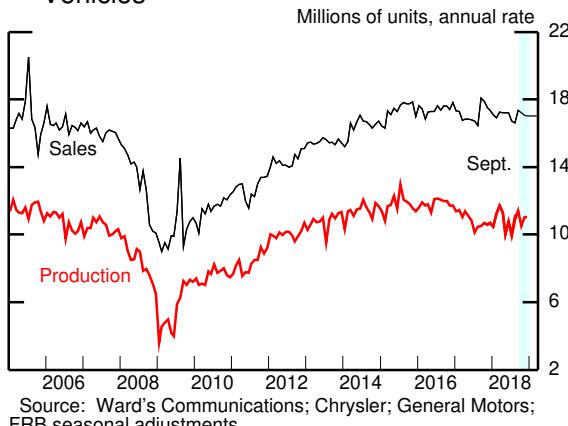
Real GDP and GDI



Manufacturing IP ex. Motor Vehicles and Parts



Sales and Production of Light Motor Vehicles

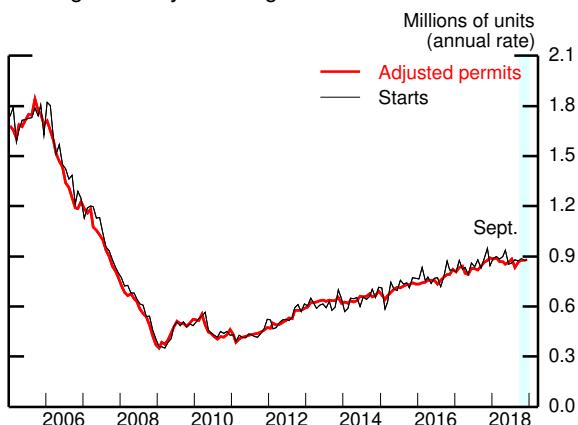


Real PCE Growth



Recent Nonfinancial Developments (2)

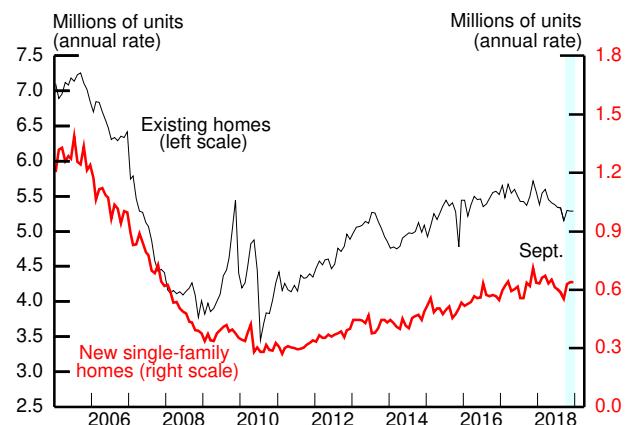
Single-Family Housing Starts and Permits



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

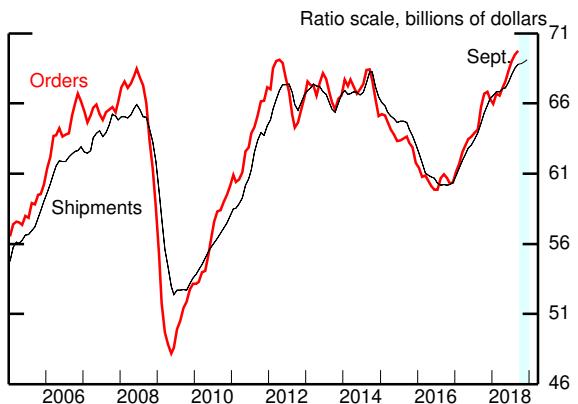
Source: U.S. Census Bureau.

Home Sales



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

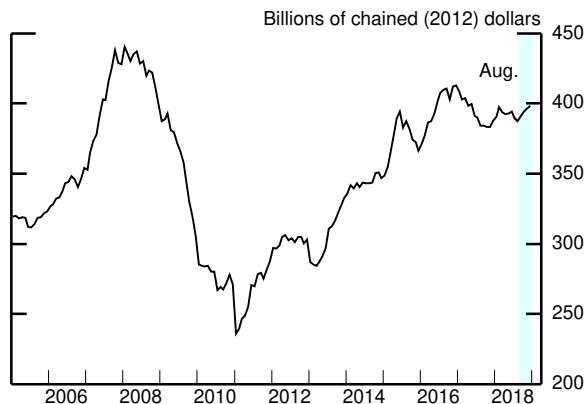
Nondefense Capital Goods ex. Aircraft



Note: Data are 3-month moving averages.

Source: U.S. Census Bureau.

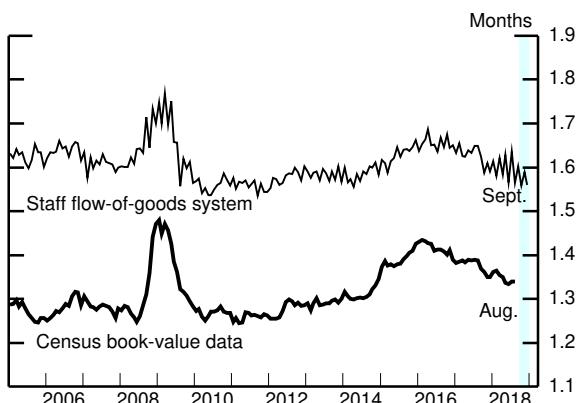
Nonresidential Construction Put in Place



Note: Nominal CPIP deflated by BEA prices through 2018:Q2 and by the staff's estimated deflator thereafter.

Source: U.S. Census Bureau.

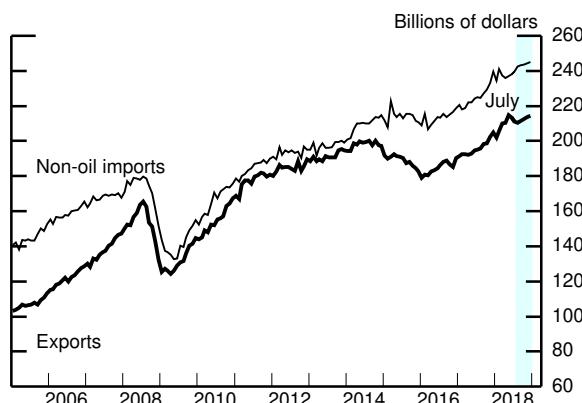
Inventory Ratios



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.

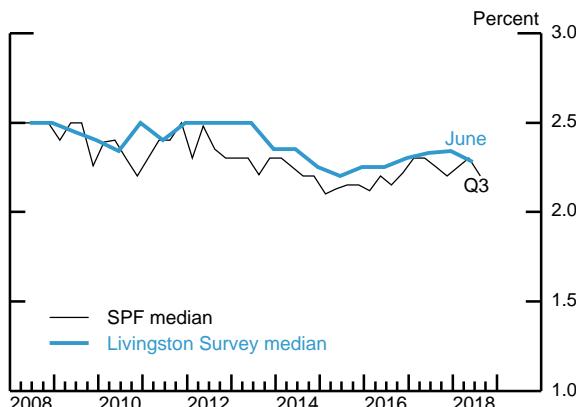
Federal Reserve System Nowcasts of 2018:Q3 Real GDP Growth
 (Percent change at annual rate from previous quarter)

Federal Reserve Entity	Type of model	Nowcast as of Oct. 24, 2018
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	3.1
New York	• Factor-augmented autoregressive model combination • Factor-augmented autoregressive model combination, financial factors only • Dynamic factor model	2.2 1.9 2.1
Cleveland	• Bayesian regressions with stochastic volatility • Tracking model	2.9 3.0
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	3.7
Chicago	• Dynamic factor models • Bayesian VARs	4.4 3.1
St. Louis	• Dynamic factor models • News index model • Let-the-data-decide regressions	2.2 4.4 2.8
Kansas City	• Accounting-based tracking estimate	2.3
Board of Governors	• Board staff's forecast (judgmental tracking model) ¹ • Monthly dynamic factor models (DFM-45) • Mixed-frequency dynamic factor model (DFM-BM)	3.0 3.7 2.4
Memo: Median of Federal Reserve System nowcasts		3.0

¹ The October Tealbook forecast, finalized on October 25, 2018, is 2.9 percent.

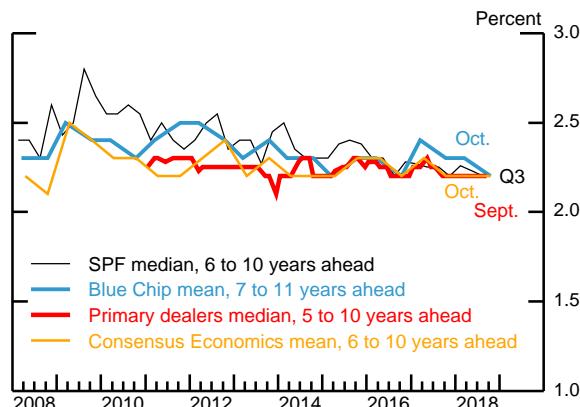
Survey Measures of Longer-Term Inflation Expectations

CPI Next 10 Years



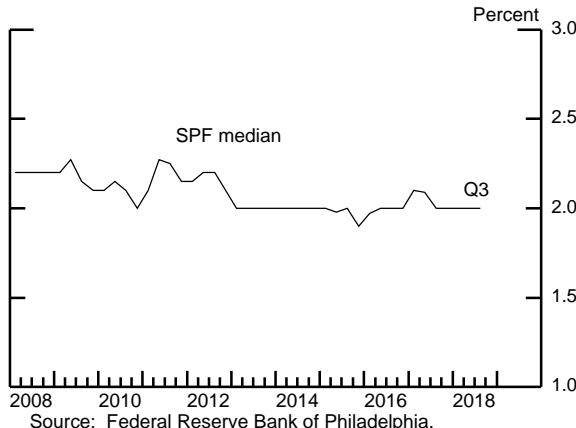
Note: SPF is Survey of Professional Forecasters.
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations



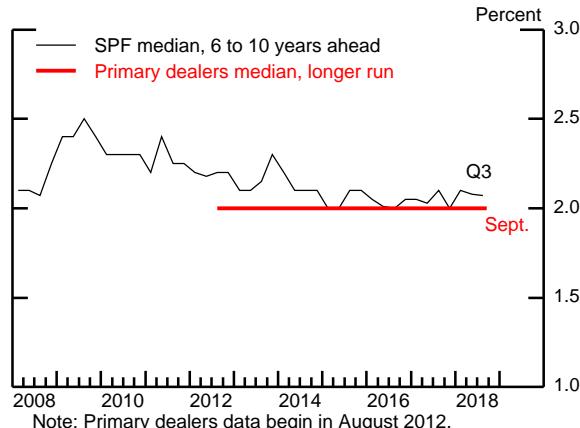
Source: Federal Reserve Bank of Philadelphia; Blue Chip Economic Indicators; Federal Reserve Bank of New York; Consensus Economics.

PCE Next 10 Years



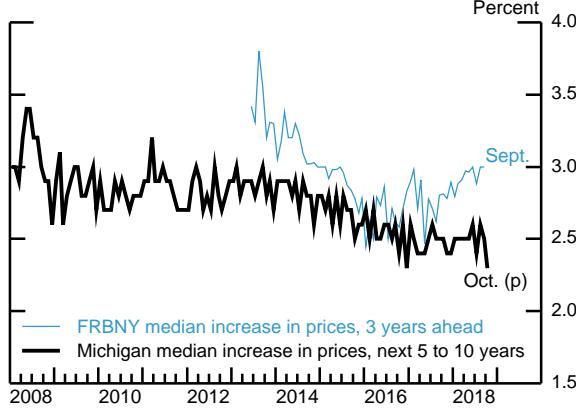
Source: Federal Reserve Bank of Philadelphia.

PCE Forward Expectations



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

Surveys of Consumers

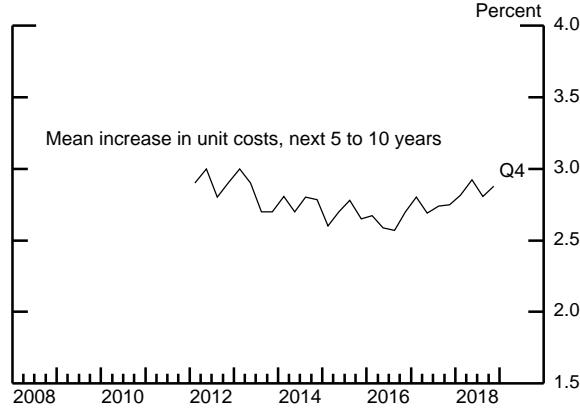


Note: Federal Reserve Bank of New York (FRBNY) Survey of Consumer Expectations reports expected 12-month inflation rate 3 years from the current survey date. FRBNY data begin in June 2013.

(p) Preliminary.

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

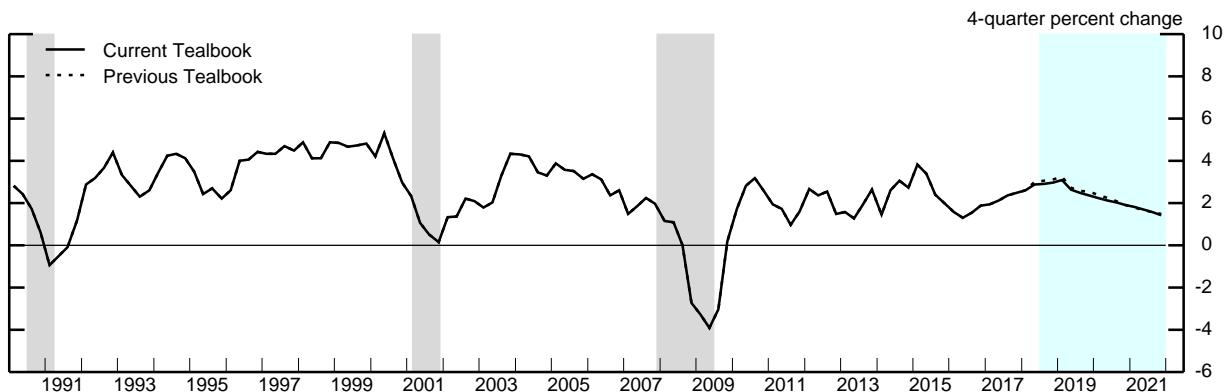
Survey of Business Inflation Expectations



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)

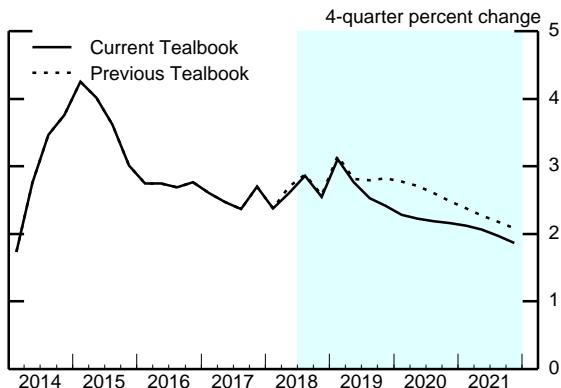
Measure	2017	2018		2018	2019	2020	2021
		H1	H2				
Real GDP		2.5	3.2	2.8	3.0	2.4	1.9
Previous Tealbook		2.5	3.4	2.8	3.1	2.5	1.9
Final sales		2.6	3.7	2.1	2.9	2.4	1.9
Previous Tealbook		2.6	3.8	2.3	3.0	2.5	1.9
Personal consumption expenditures		2.7	2.1	3.0	2.5	2.4	2.2
Previous Tealbook		2.7	2.3	2.8	2.6	2.8	2.5
Residential investment		3.8	-2.4	-3.3	-2.8	.5	.4
Previous Tealbook		3.8	-2.6	-1.2	-1.9	3.4	.4
Nonresidential structures		2.9	14.2	-.7	6.5	2.6	-.3
Previous Tealbook		2.9	14.1	3.9	8.9	2.5	.0
Equipment and intangibles		7.3	8.9	7.8	8.4	3.9	2.0
Previous Tealbook		7.3	9.1	6.4	7.7	4.2	2.2
Federal purchases		1.3	3.1	2.5	2.8	3.1	2.9
Previous Tealbook		1.3	3.2	2.5	2.8	3.1	2.8
State and local purchases		-.5	1.4	1.6	1.5	1.2	1.0
Previous Tealbook		-.5	1.3	.7	1.0	1.0	1.0
Exports		4.7	6.4	.3	3.3	2.5	2.9
Previous Tealbook		4.7	6.2	1.3	3.7	2.9	2.8
Imports		5.4	1.2	6.5	3.8	2.6	3.0
Previous Tealbook		5.4	1.2	4.7	3.0	4.8	4.2
Contributions to change in real GDP (percentage points)							
Inventory change		-.1	-.5	.7	.1	.0	.0
Previous Tealbook		-.1	-.3	.4	.1	.0	.0
Net exports		-.2	.6	-.9	-.2	-.1	-.1
Previous Tealbook		-.2	.6	-.5	.0	-.4	-.3

Real GDP

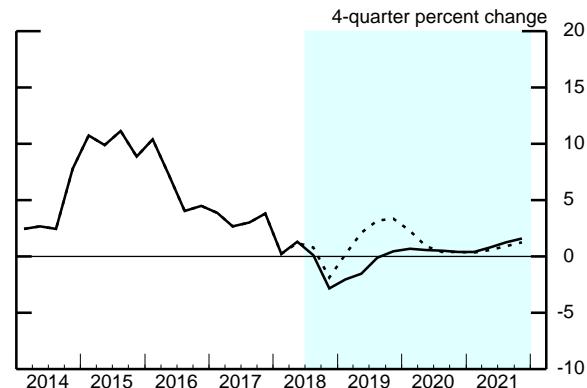
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
 Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Components of Final Demand

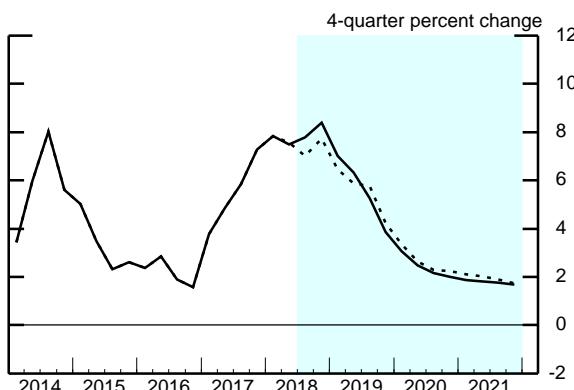
Personal Consumption Expenditures



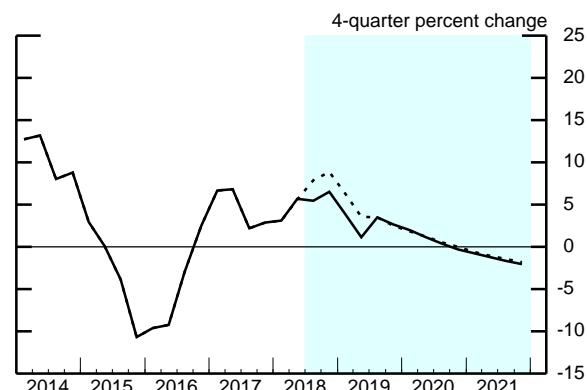
Residential Investment



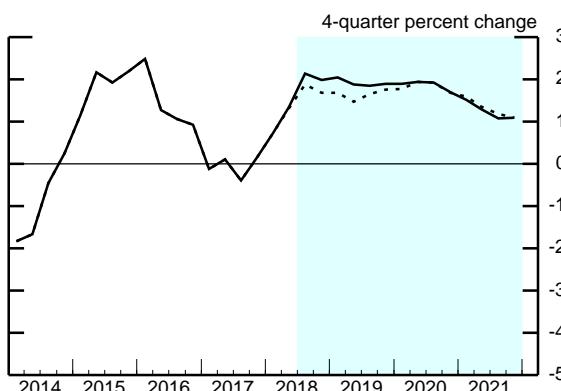
Equipment and Intangibles



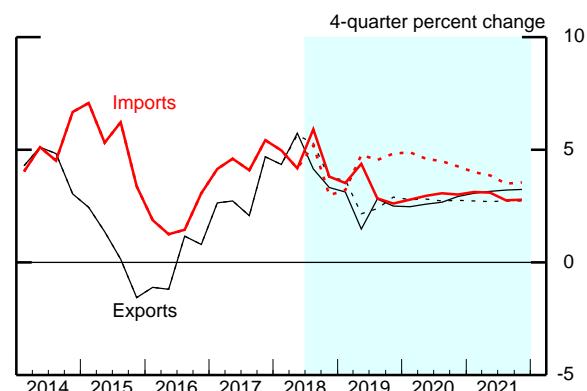
Nonresidential Structures



Government Consumption and Investment



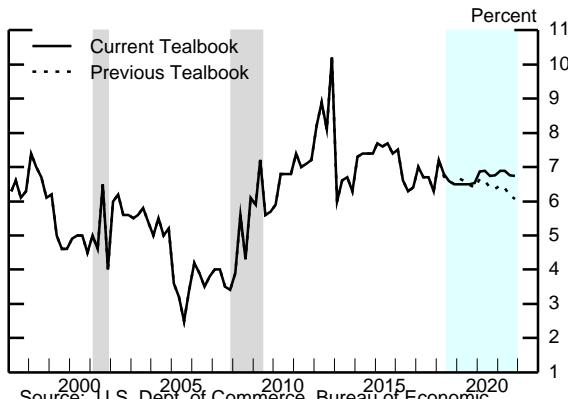
Exports and Imports



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

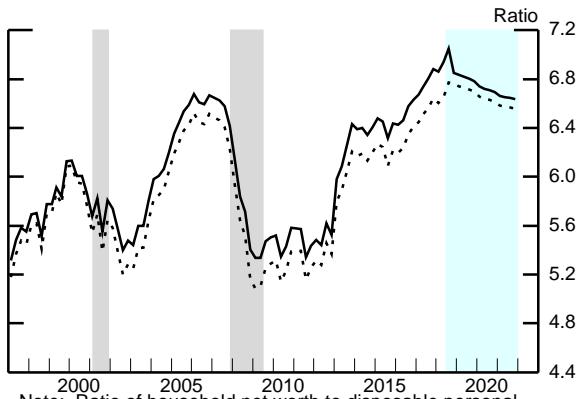
Aspects of the Medium-Term Projection

Personal Saving Rate



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

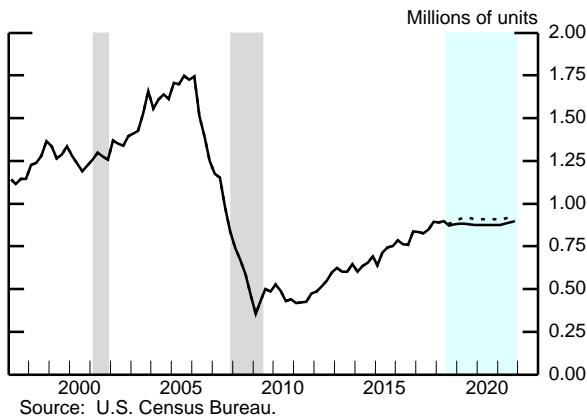
Wealth-to-Income Ratio



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

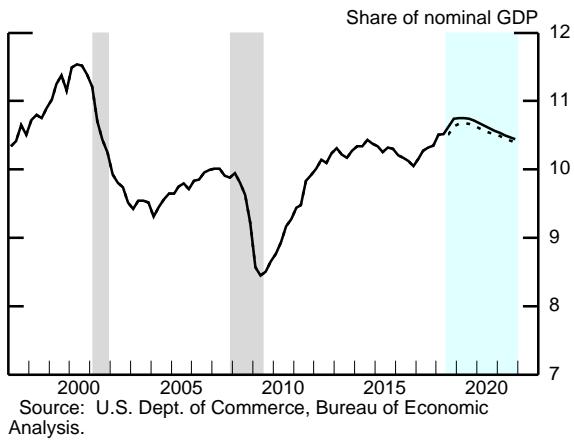
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Single-Family Housing Starts



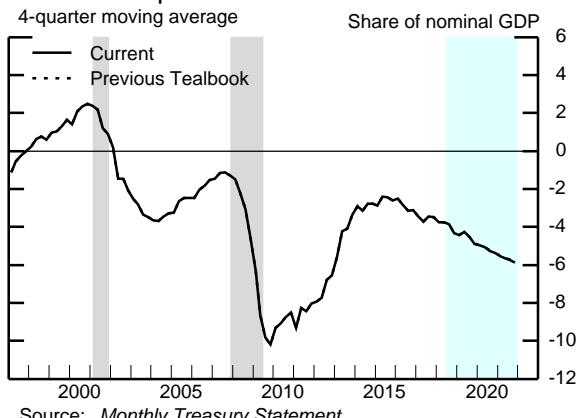
Source: U.S. Census Bureau.

Equipment and Intangibles Spending



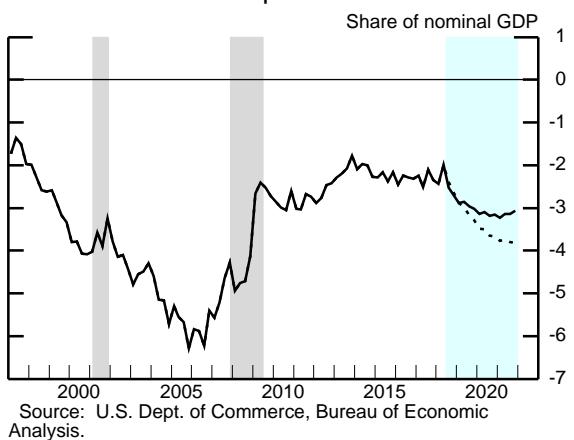
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Federal Surplus/Deficit



Source: Monthly Treasury Statement.

Current Account Surplus/Deficit

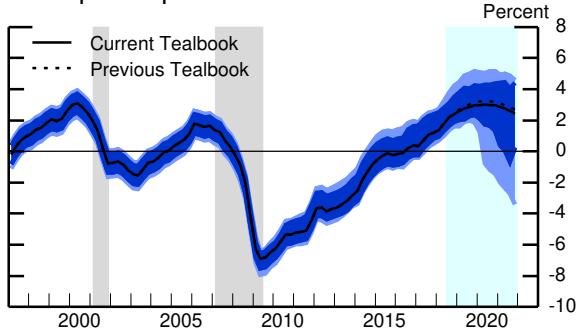


Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

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

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

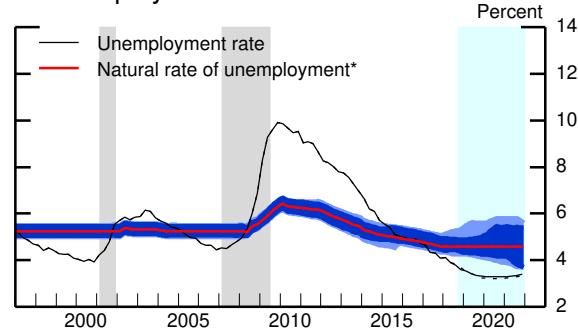
Output Gap



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

Source: Various macroeconomic data; staff assumptions.

Unemployment Rate

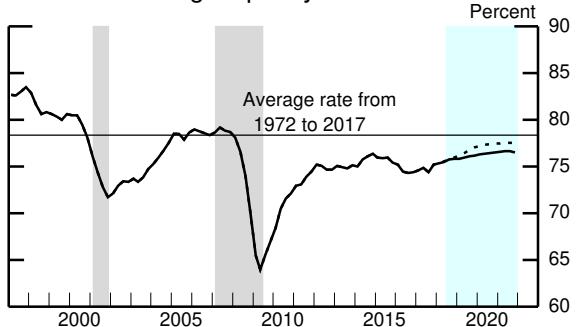


Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the natural rate.

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

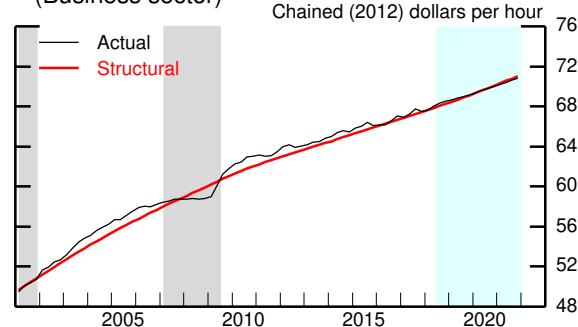
Source: Various macroeconomic data; staff assumptions.

Manufacturing Capacity Utilization Rate



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

Actual and Structural Labor Productivity (Business sector)



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

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

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

Measure	1974-95	1996-2000	2001-07	2008-10	2011-16	2017	2018	2019	2020	2021
Potential output	3.1	3.6	2.7	1.9	1.4	1.6	1.7	1.8	1.9	1.9
Previous Tealbook	3.1	3.6	2.7	1.9	1.4	1.6	1.7	1.8	1.9	1.9
<i>Selected contributions</i> ¹										
Structural labor productivity ²	1.7	2.9	2.7	1.8	1.2	1.2	1.2	1.3	1.4	1.4
Previous Tealbook	1.7	2.9	2.7	1.8	1.2	1.2	1.2	1.3	1.4	1.4
Capital deepening	.7	1.4	1.0	.5	.8	.7	.7	.8	.7	.6
Multifactor productivity	.8	1.1	1.4	1.1	.2	.3	.3	.3	.5	.6
Structural hours	1.5	1.3	.8	.4	.4	.3	.7	.6	.6	.5
Previous Tealbook	1.5	1.3	.8	.4	.4	.3	.7	.6	.6	.5
Labor force participation	.4	-.1	-.2	-.5	-.5	-.3	-.3	-.2	-.2	-.2
Previous Tealbook	.4	-.1	-.2	-.5	-.5	-.3	-.3	-.2	-.2	-.2
Memo:										
Output gap ³	-1.2	2.5	.3	-5.3	.4	1.2	2.4	3.0	2.9	2.4
Previous Tealbook	-1.2	2.5	.3	-5.3	.4	1.2	2.4	3.2	3.2	2.7

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	2017	2018		2018	2019	2020	2021
		H1	H2				
Nonfarm payroll employment ¹ Previous Tealbook	183 183	218 218	196 183	207 200	168 177	121 129	82 85
Private employment ¹ Previous Tealbook	180 180	215 215	182 179	198 197	157 166	111 119	72 75
Labor force participation rate ² Previous Tealbook	62.7 62.7	62.8 62.8	62.8 62.8	62.8 62.8	62.8 62.9	62.8 62.8	62.5 62.6
Civilian unemployment rate ² Previous Tealbook	4.1 4.1	3.9 3.9	3.6 3.7	3.6 3.7	3.3 3.3	3.3 3.2	3.4 3.4
Employment to population ratio ² Previous Tealbook	60.1 60.1	60.4 60.4	60.5 60.5	60.5 60.5	60.7 60.8	60.7 60.8	60.4 60.5

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	2017	2018		2018	2019	2020	2021
		H1	H2				
<i>Percent change at annual rate from final quarter of preceding period</i>							
PCE chain-weighted price index Previous Tealbook	1.8 1.8	2.2 2.2	1.7 1.8	2.0 2.0	2.0 1.9	1.9 2.0	1.9 2.0
Food and beverages Previous Tealbook	.7 .7	.7 .7	.9 1.3	.8 1.0	2.5 2.4	2.6 2.6	2.3 2.3
Energy Previous Tealbook	8.1 8.1	6.5 6.5	4.4 6.4	5.4 6.5	-.2 -.5	-1.1 -1.2	-1.0 -.8
Excluding food and energy Previous Tealbook	1.6 1.6	2.1 2.1	1.7 1.6	1.9 1.9	2.0 2.0	2.0 2.1	2.0 2.1
Prices of core goods imports ¹ Previous Tealbook	1.1 1.1	1.6 1.6	-1.6 -1.5	.0 .0	.6 .6	.8 .8	.7 .7
	Sept. 2018 ²	Oct. 2018 ²	Nov. 2018 ²	Dec. 2018 ²	Jan. 2019 ²	Feb. 2019 ²	Mar. 2019 ²
<i>12-month percent change</i>							
PCE chain-weighted price index Previous Tealbook	2.0 2.0	2.0 2.0	1.9 2.0	1.9 2.0	1.8 ...	1.8 ...	2.0 ...
Excluding food and energy Previous Tealbook	1.9 1.9	1.9 1.8	1.9 1.9	1.9 1.9	1.9 ...	1.9 ...	1.9 ...

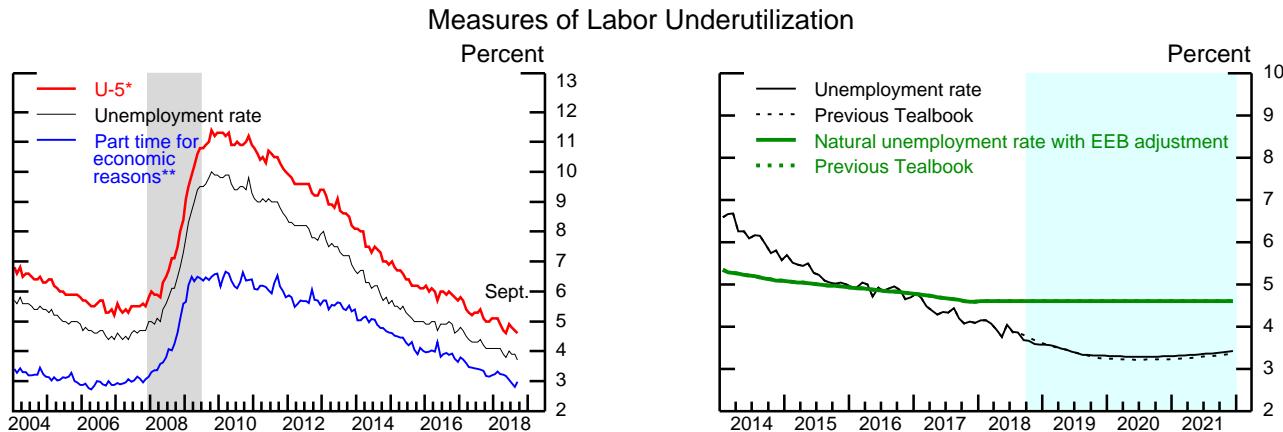
... Not applicable.

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

2. Staff Forecast.

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

Labor Market Developments and Outlook (1)

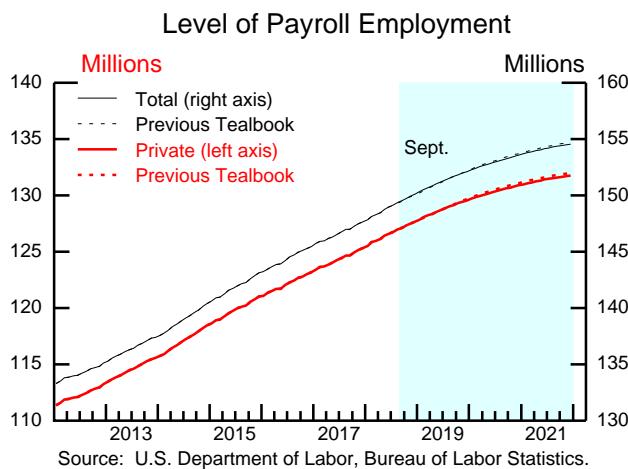


* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.

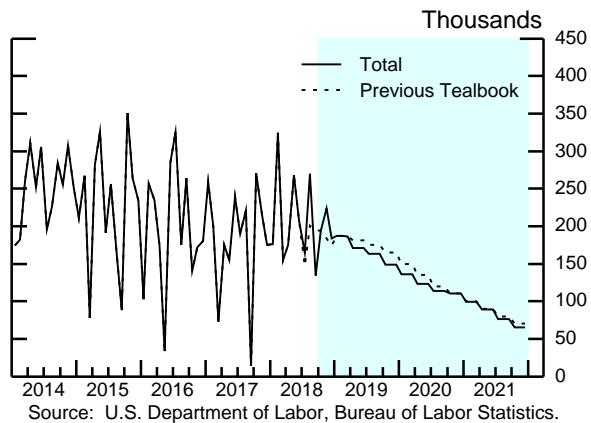
** Percent of Current Population Survey employment.

EEB Extended and emergency unemployment benefits.

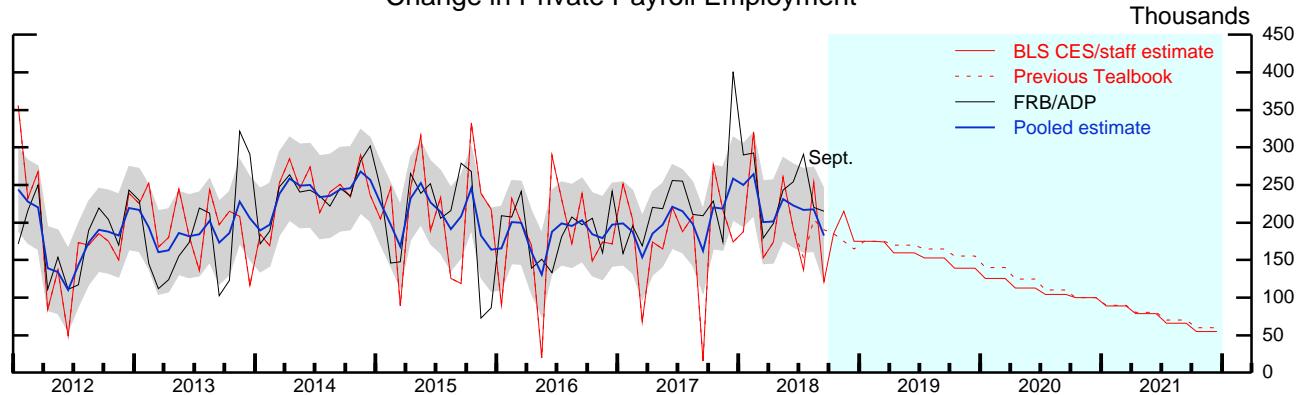
Source: U.S. Department of Labor, Bureau of Labor Statistics.



Change in Total Payroll Employment



Change in Private Payroll Employment

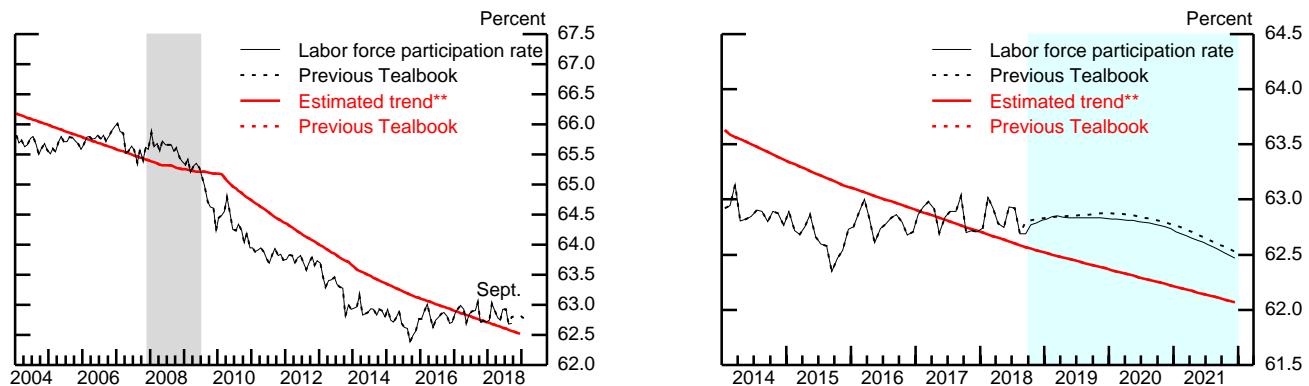


Source: U.S. Department of Labor, Bureau of Labor Statistics; staff calculations using microdata from ADP.

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)

Labor Force Participation Rate*

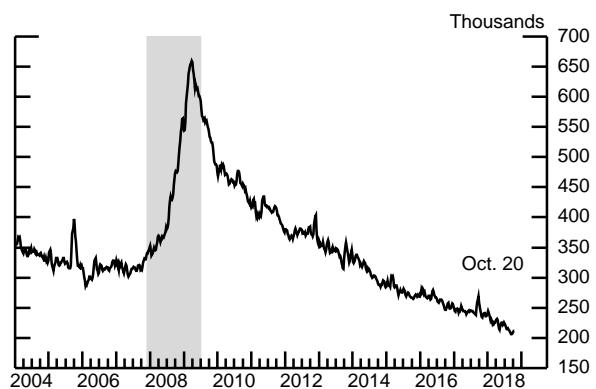


* Published data adjusted by staff to account for changes in population weights.

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

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

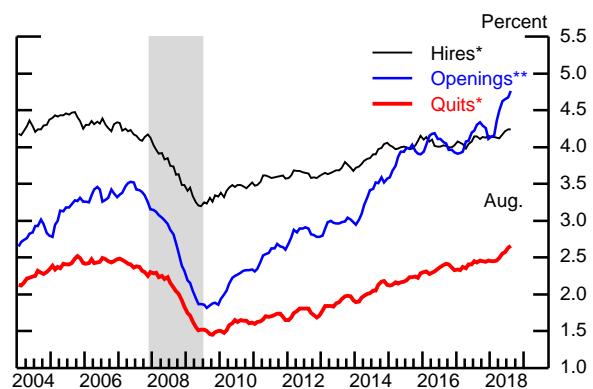
Initial Unemployment Insurance Claims*



* 4-week moving average.

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

Hires, Quits, and Job Openings

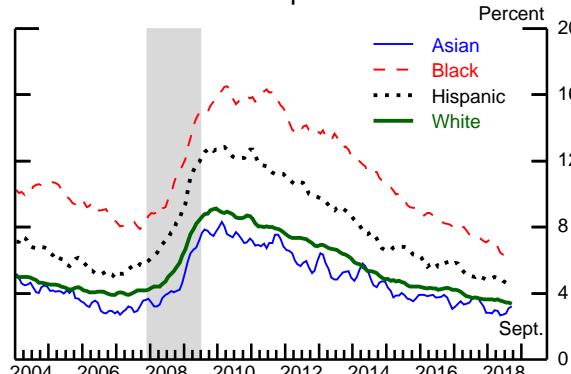


* Percent of private nonfarm payroll employment, 3-month moving average.

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

Source: Job Openings and Labor Turnover Survey.

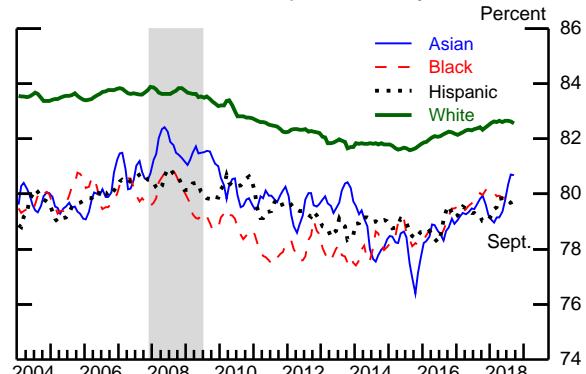
Unemployment Rate by Racial/Ethnic Group



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

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

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



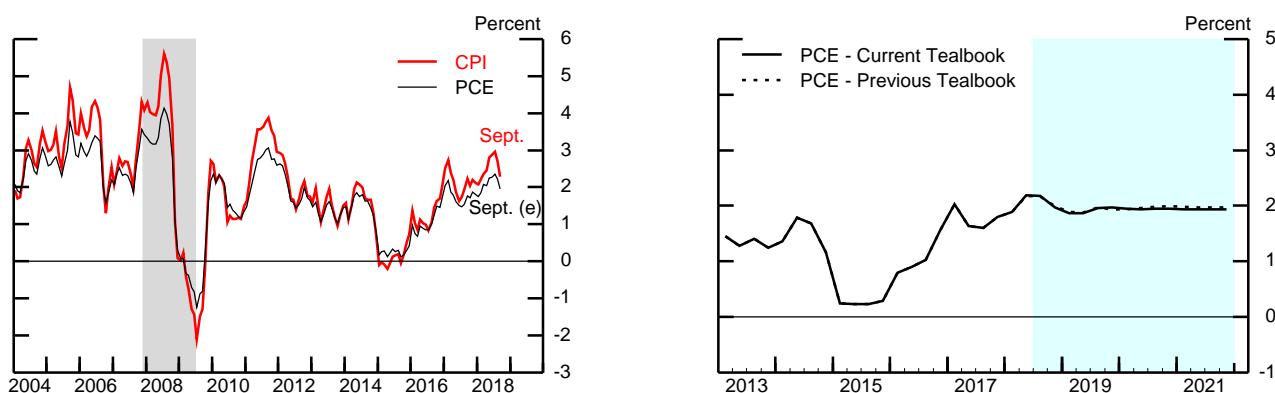
Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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

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

Inflation Developments and Outlook (1)

(Percent change from year-earlier period)

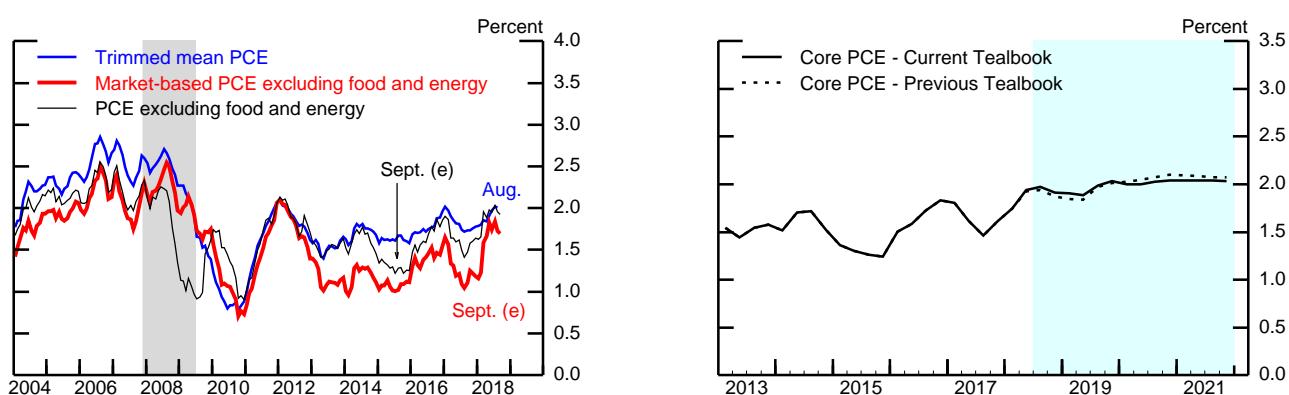
Headline Consumer Price Inflation



Note: PCE prices from July to September 2018 are staff estimates (e).

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

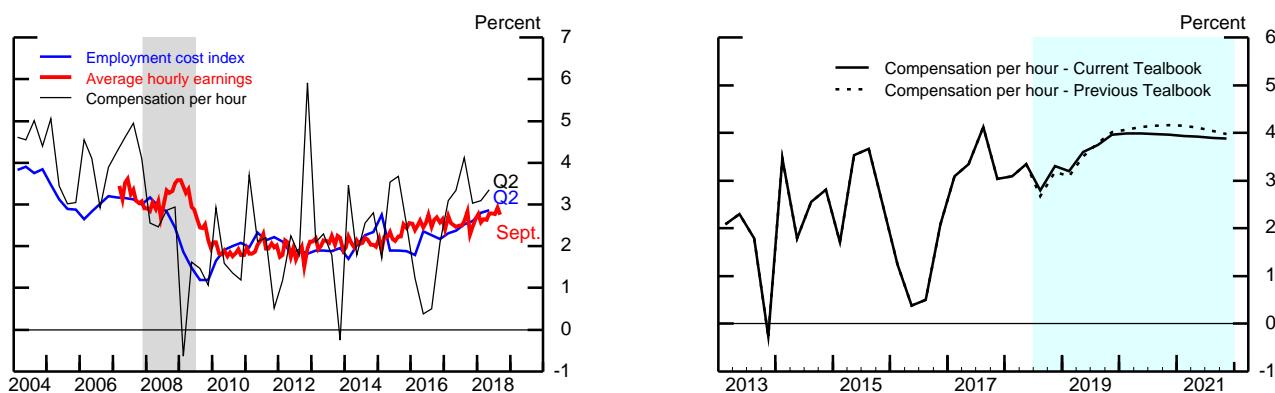
Measures of Underlying PCE Price Inflation



Note: Core PCE prices from July to September 2018 are staff estimates (e).

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

Labor Cost Growth



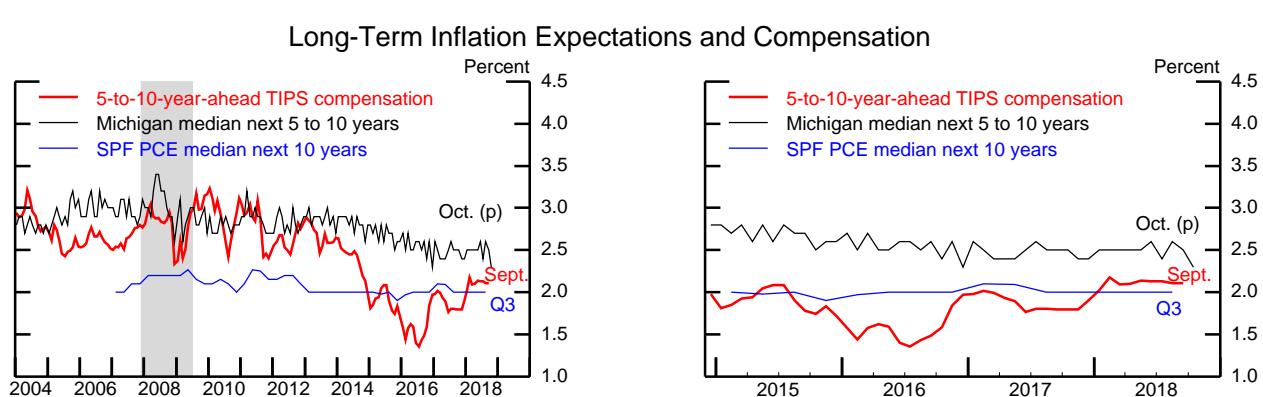
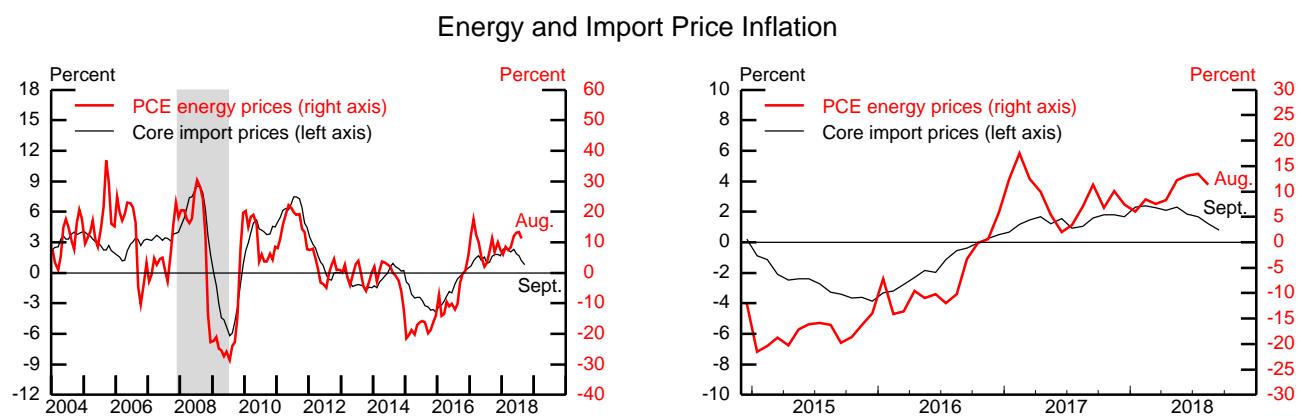
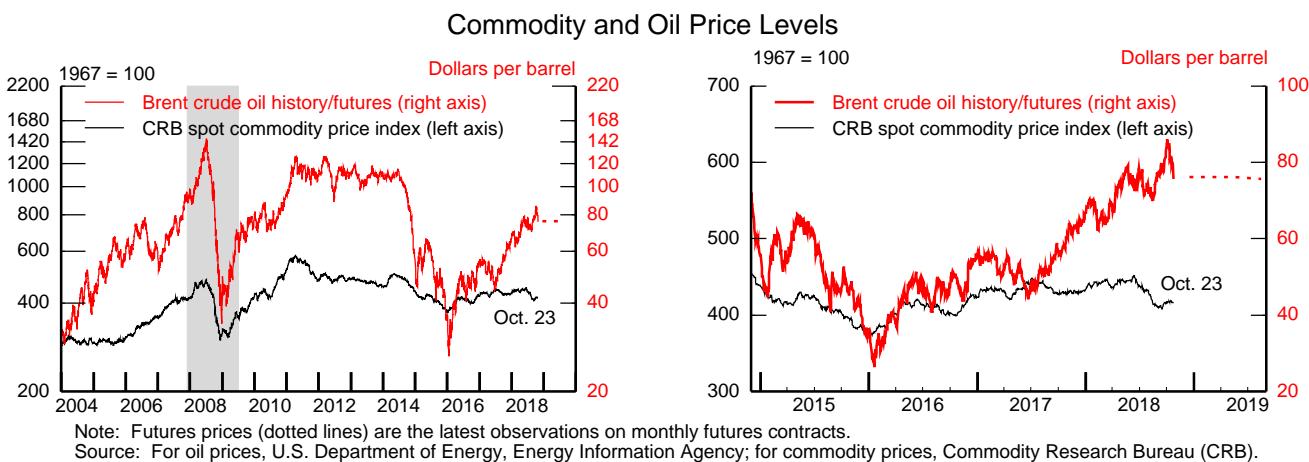
Note: Compensation per hour is for the business sector. Average hourly earnings are for the private nonfarm sector. The employment cost index is for the private sector.

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

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

Inflation Developments and Outlook (2)

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



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

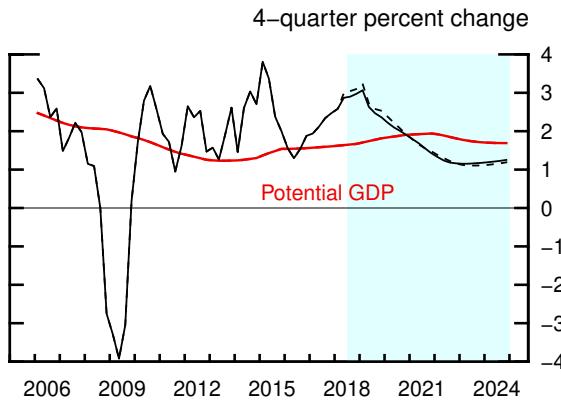
The Long-Term Outlook

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

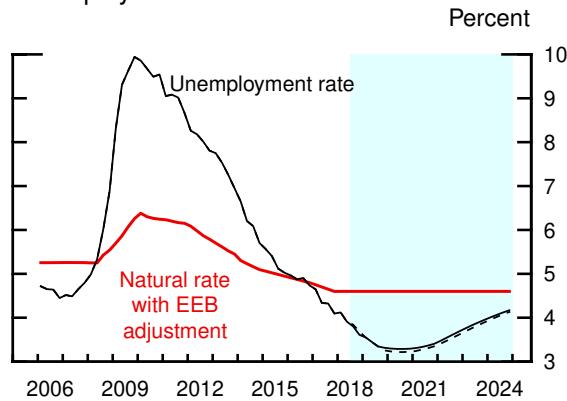
Measure	2018	2019	2020	2021	2022	2023	2024	Longer run
Real GDP Previous Tealbook	3.0 3.1	2.4 2.5	1.9 1.9	1.4 1.5	1.2 1.2	1.2 1.1	1.3 1.2	1.7 1.7
Civilian unemployment rate ¹ Previous Tealbook	3.6 3.7	3.3 3.3	3.3 3.2	3.4 3.3	3.7 3.6	4.0 3.9	4.2 4.1	4.6 4.6
PCE prices, total Previous Tealbook	2.0 2.0	2.0 1.9	1.9 2.0	1.9 2.0	2.0 2.0	2.1 2.1	2.1 2.1	2.0 2.0
Core PCE prices Previous Tealbook	1.9 1.9	2.0 2.0	2.0 2.1	2.0 2.1	2.1 2.1	2.1 2.1	2.1 2.1	2.0 2.0
Federal funds rate ¹ Previous Tealbook	2.29 2.35	3.65 3.71	4.49 4.63	4.81 5.00	4.67 4.90	4.34 4.57	3.96 4.16	2.50 2.50
10-year Treasury yield ¹ Previous Tealbook	3.2 3.1	4.0 4.0	4.2 4.3	4.2 4.2	4.0 4.1	3.9 3.9	3.8 3.8	3.4 3.4

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

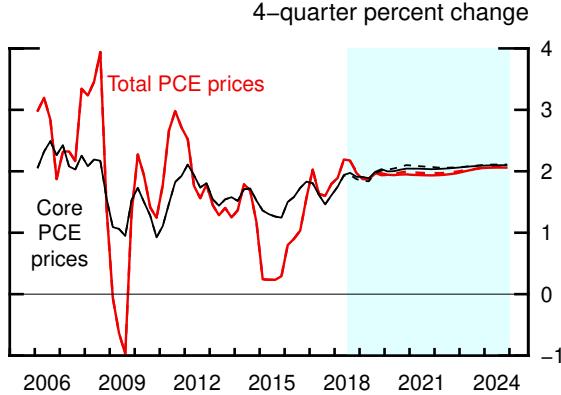
Real GDP



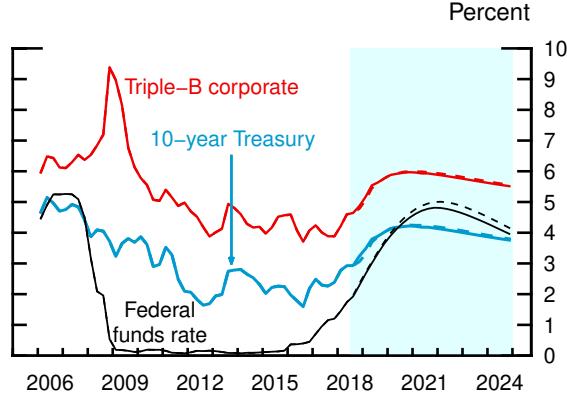
Unemployment Rate



PCE Prices



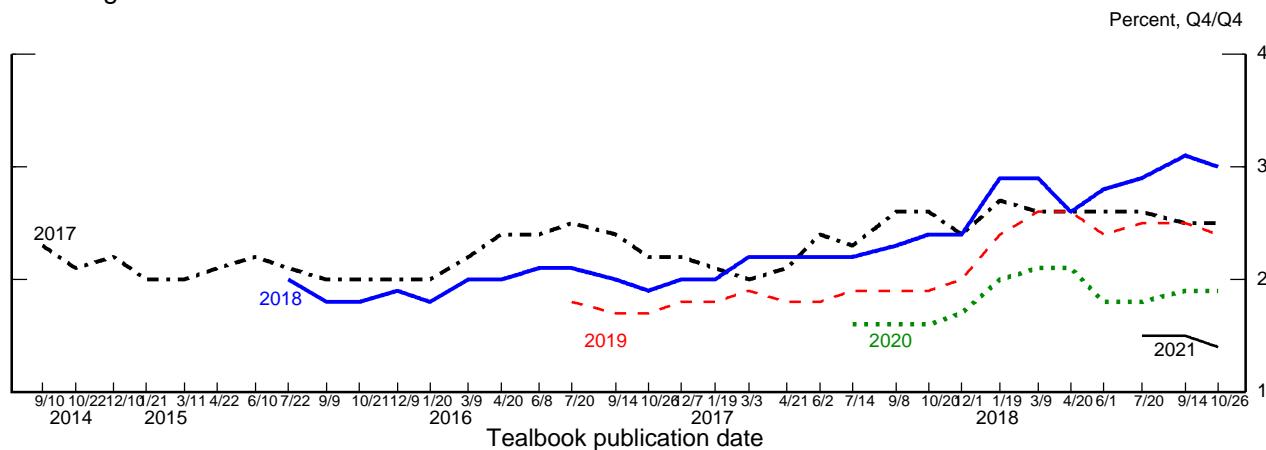
Interest Rates



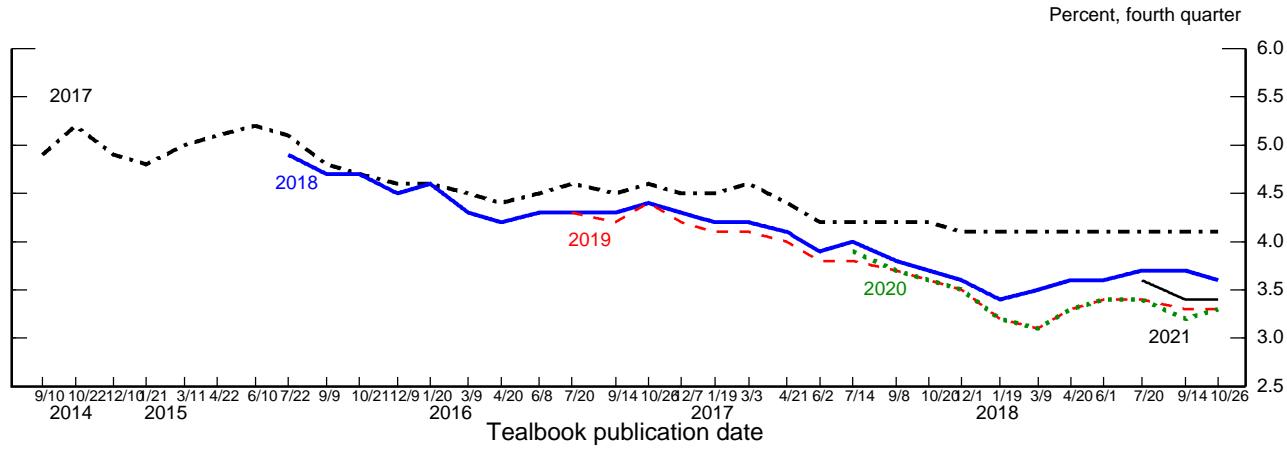
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

Evolution of the Staff Forecast

Change in Real GDP



Unemployment Rate



The Foreign GDP Outlook

Real GDP*

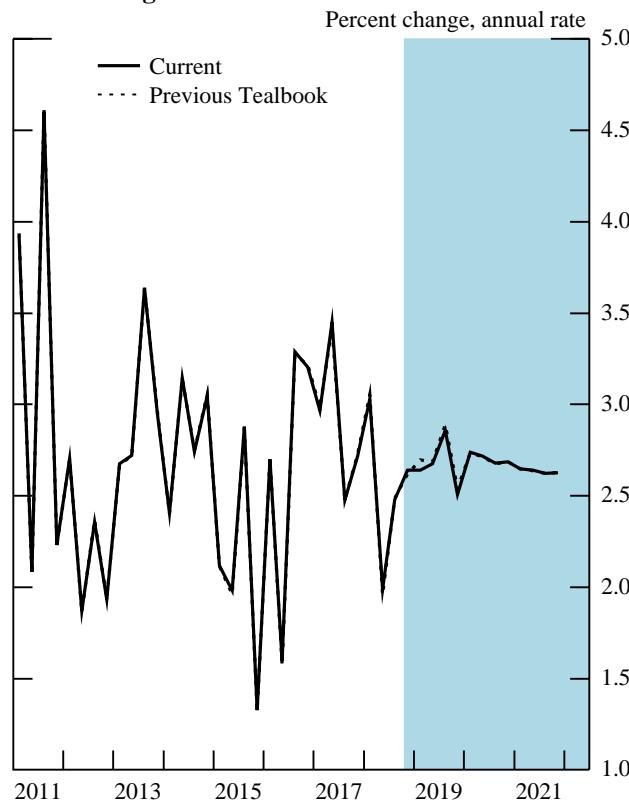
Percent change, annual rate

	2017	2018				2019	2020	2021
		Q1	Q2	Q3	Q4			
1. Total Foreign	2.9	3.0	2.0	2.5	2.6	2.7	2.7	2.6
Previous Tealbook	2.9	3.1	2.0	2.5	2.6	2.7	2.7	2.6
2. Advanced Foreign Economies	2.6	1.3	2.5	1.9	1.9	1.7	1.7	1.7
Previous Tealbook	2.6	1.4	2.4	1.7	1.7	1.7	1.7	1.7
3. Canada	3.0	1.4	2.9	2.2	2.5	2.1	1.8	1.8
4. Euro Area	2.7	1.6	1.8	1.6	1.5	1.4	1.6	1.6
5. Japan	2.0	-.9	3.0	.7	.5	.1	.8	.8
6. United Kingdom	1.4	.4	1.6	2.5	1.6	1.6	1.7	1.6
7. Emerging Market Economies	3.2	4.7	1.5	3.1	3.4	3.7	3.7	3.6
Previous Tealbook	3.2	4.7	1.6	3.3	3.5	3.7	3.7	3.6
8. China	6.8	7.2	6.5	5.9	6.3	6.1	5.9	5.7
9. Emerging Asia ex. China	4.2	5.6	2.5	3.5	3.8	3.7	3.7	3.5
10. Mexico	1.6	4.0	-.6	2.1	2.6	2.8	2.9	2.9
11. Brazil	2.1	.6	.7	4.0	2.3	2.6	2.8	2.8

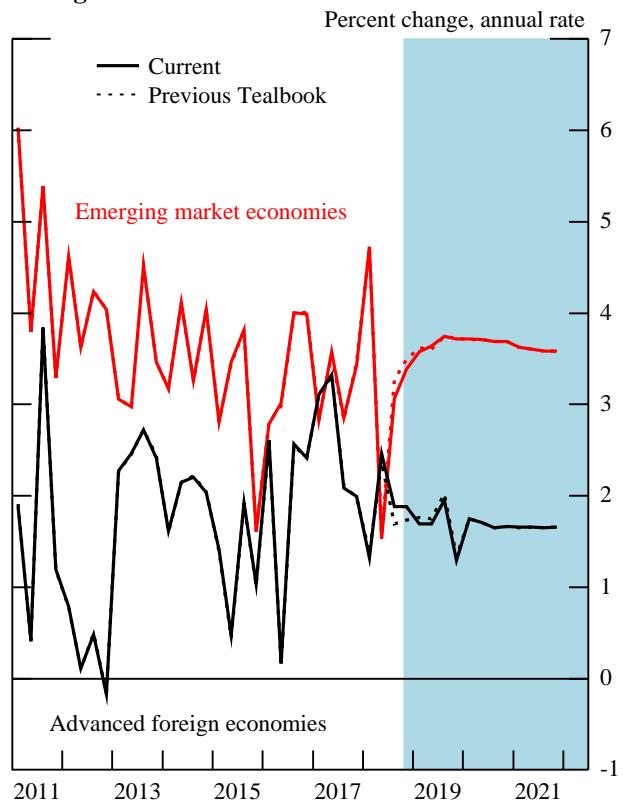
* GDP aggregates weighted by shares of U.S. merchandise exports.

Int'l Econ Devel & Outlook

Total Foreign GDP



Foreign GDP



The Foreign Inflation Outlook

Consumer Prices*

Percent change, annual rate

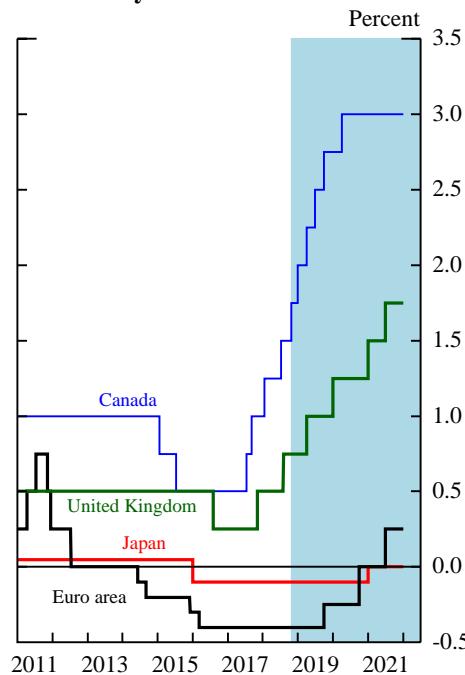
	2017	2018				2019	2020	2021
		Q1	Q2	Q3	Q4			
1. Total Foreign Previous Tealbook	2.6 2.6	2.6 2.7	1.7 1.7	3.7 3.5	2.9 2.7	2.6 2.7	2.4 2.4	2.4 2.4
2. Advanced Foreign Economies Previous Tealbook	1.5 1.5	2.6 2.6	1.0 1.0	2.5 2.3	2.1 1.8	1.9 1.9	1.7 1.7	1.7 1.7
3. Canada	1.8	3.6	1.1	2.6	2.4	2.3	2.1	2.0
4. Euro Area	1.4	2.0	2.2	2.5	2.3	1.5	1.5	1.7
5. Japan	.6	2.5	-2.3	2.7	1.2	2.3	1.0	1.1
6. United Kingdom	3.0	2.4	2.0	2.9	2.4	2.3	2.2	2.1
7. Emerging Market Economies Previous Tealbook	3.4 3.4	2.7 2.7	2.2 2.2	4.6 4.4	3.5 3.3	3.1 3.2	2.9 3.0	2.9 2.9
8. China	1.8	1.5	.7	4.1	2.9	2.5	2.5	2.5
9. Emerging Asia ex. China	2.3	2.2	1.4	1.5	2.4	2.8	2.8	2.8
10. Mexico	6.6	4.1	3.8	6.8	3.9	3.4	3.2	3.2
11. Brazil	2.8	3.1	4.3	6.6	4.0	4.3	4.3	4.3

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

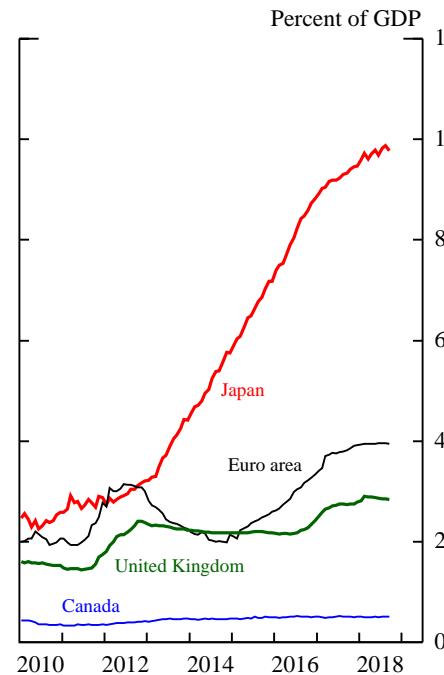
Int'l Econ Devel & Outlook

Foreign Monetary Policy

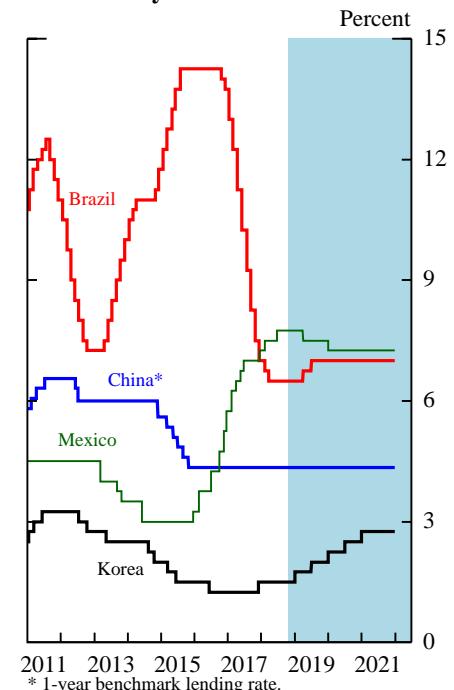
AFE Policy Rates



AFE Central Bank Balance Sheets

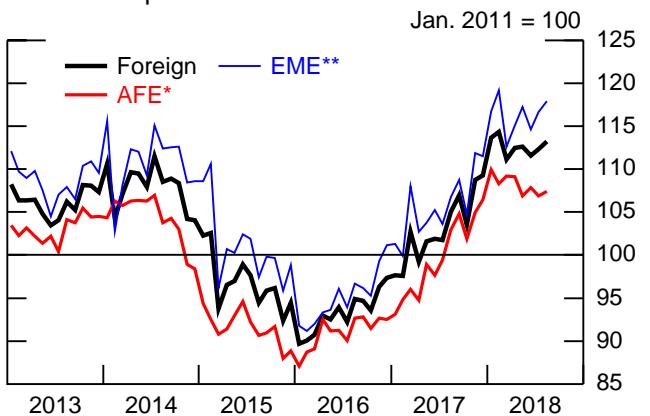


EME Policy Rates



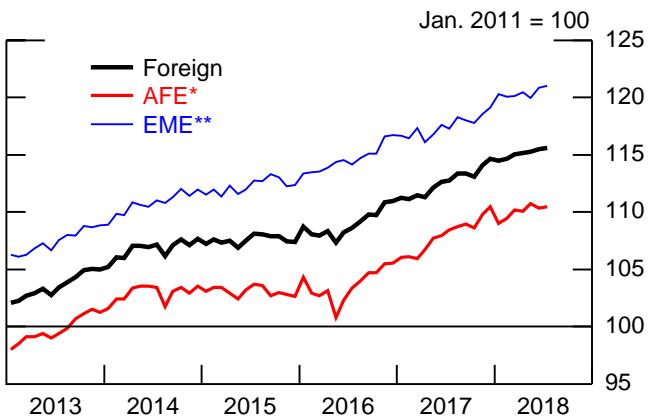
Recent Foreign Indicators

Nominal Exports



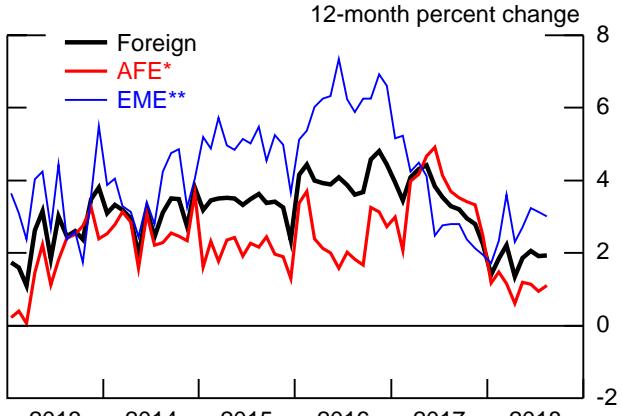
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Singapore, Taiwan, Thailand.

Industrial Production



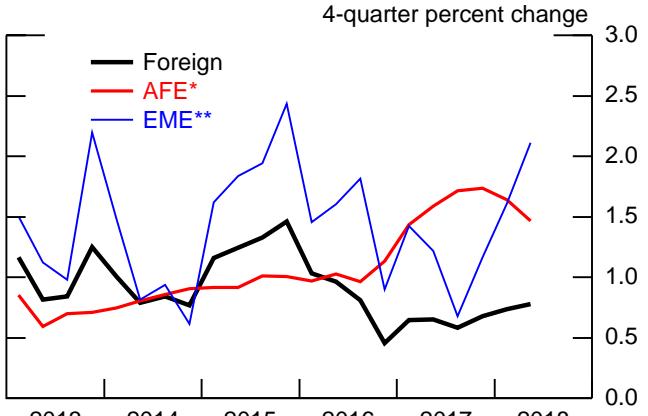
* Includes Canada, euro area, Japan, Sweden, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand.

Retail Sales



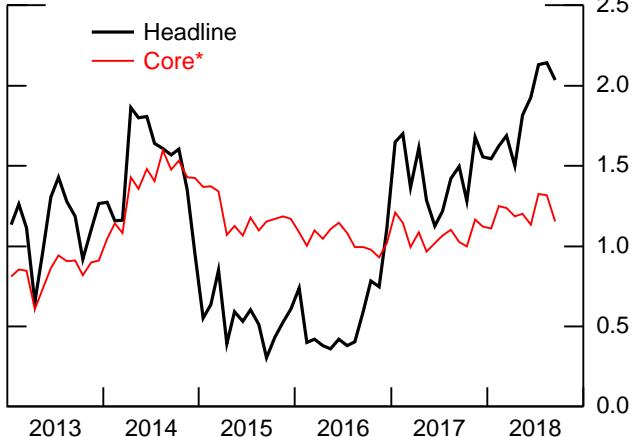
* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, Chile, China, Korea, Mexico, Singapore, Taiwan.

Employment



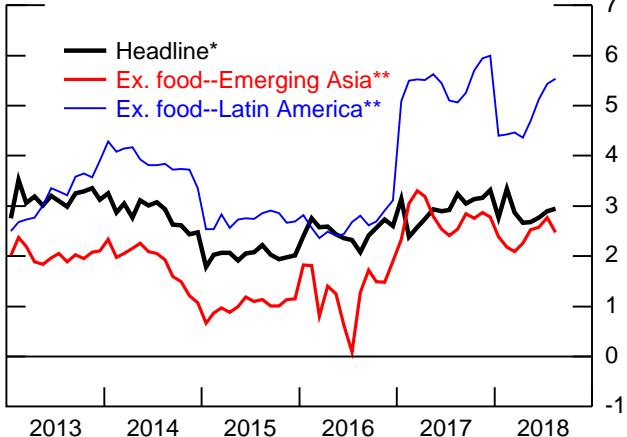
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Chile, Colombia, Hong Kong, Israel, Korea, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand, Turkey.

Consumer Prices: Advanced Foreign Economies



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

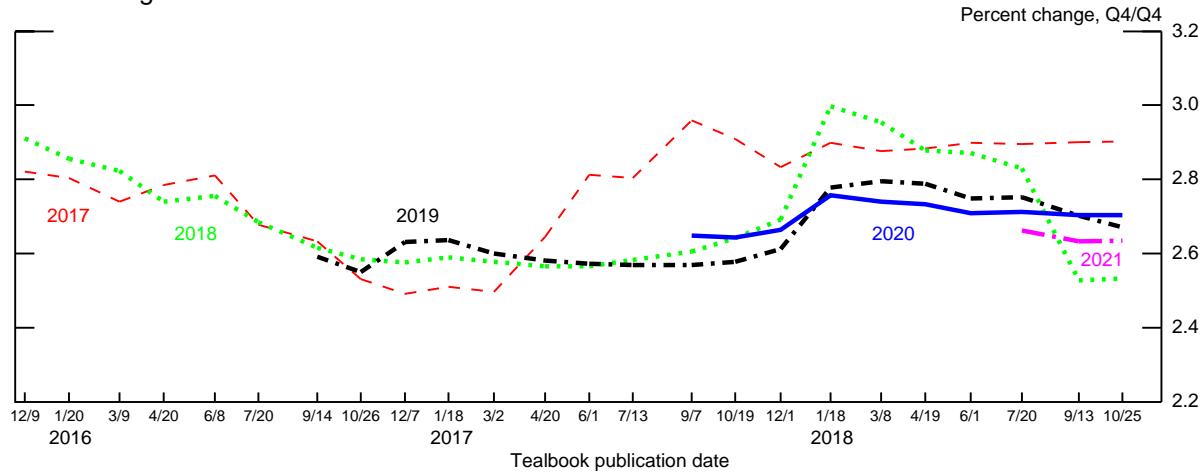
Consumer Prices: Emerging Market Economies



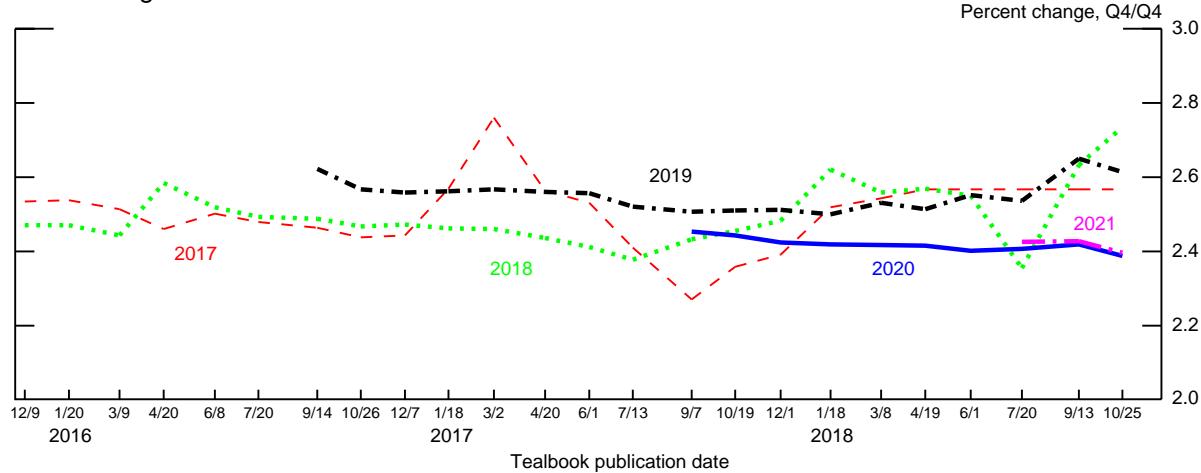
* Includes Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand.
** Excludes all food; staff calculation. Latin America excludes Argentina and Venezuela.

Evolution of Staff's International Forecast

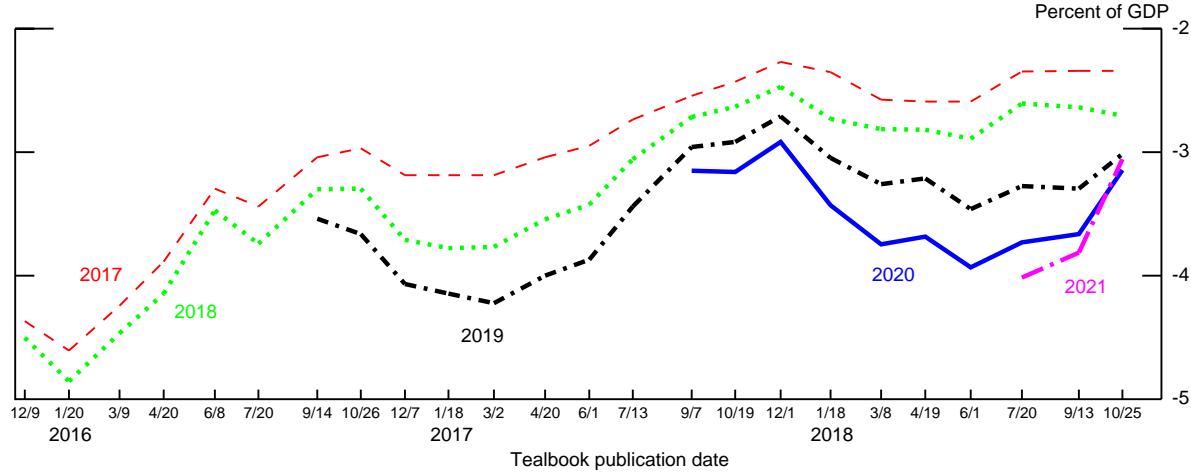
Total Foreign GDP



Total Foreign CPI



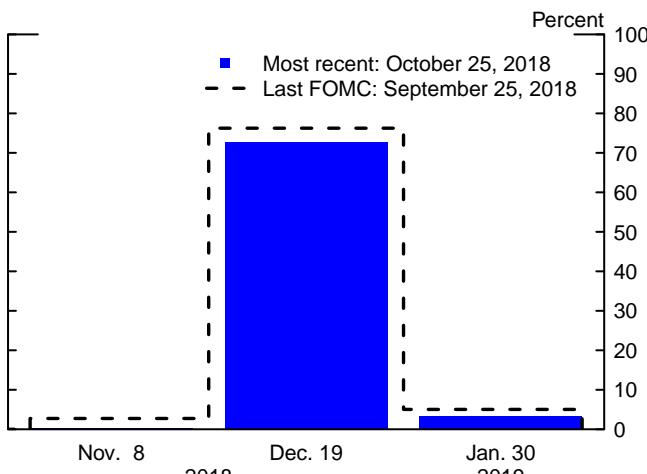
U.S. Current Account Balance



Int'l Econ Devel & Outlook

Policy Expectations and Treasury Yields

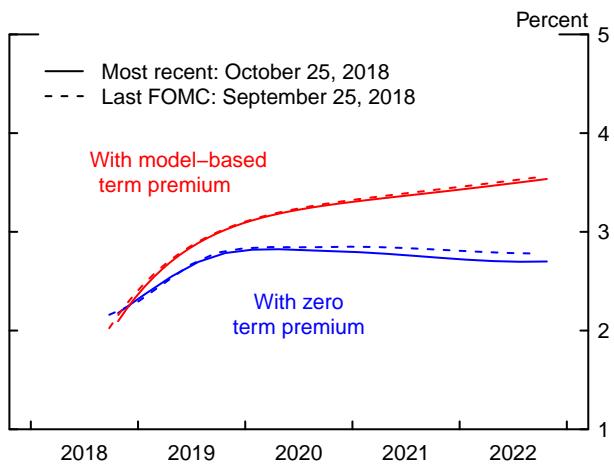
Market-Implied Probability of Rate Increase



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

Source: CME Group; Federal Reserve Board staff estimates.

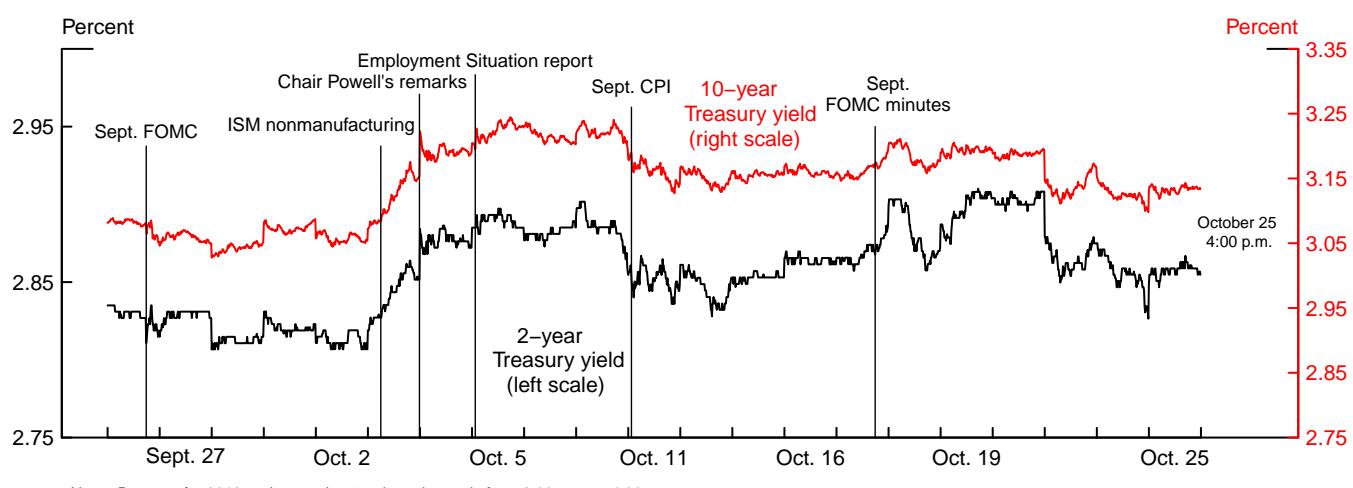
Implied Federal Funds Rate



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

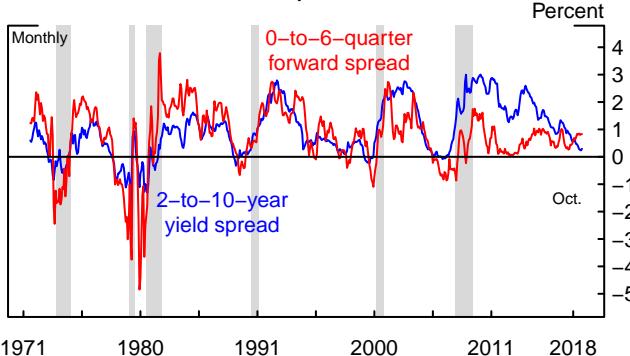
Source: Bloomberg; Federal Reserve Board staff estimates.

Selected Interest Rates



Note: Data are for 2018 and spaced at 5-minute intervals from 8:00 a.m. to 4:00 p.m.
Source: Bloomberg.

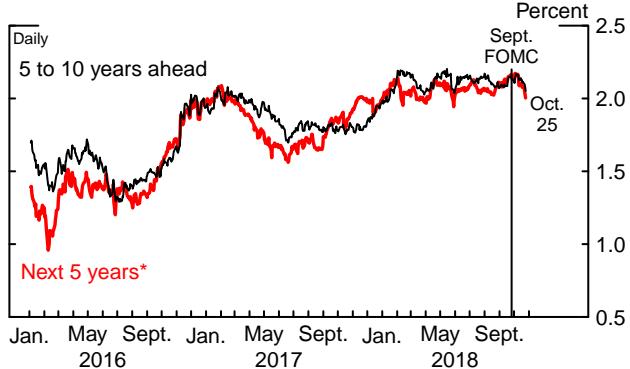
Long-Term Yield Spread and Near-Term Forward Spread



Note: The 0-to-6-quarter forward spread is the difference between the 3-month yield and the implied forward rate between 6 and 7 quarters ahead based on a smoothed Treasury yield curve. Data are monthly averages. Data for October 2018 based on values through October 25th.

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

TIPS-Based Inflation Compensation



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

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

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

Recent Developments in Corporate Financial Investments

Nonfinancial firms (hereafter, firms) have substantially increased their holdings of financial assets over recent years. Since the first quarter of 2011, the total financial assets of the 10 firms with the largest financial investment portfolios have nearly doubled, to \$800 billion; these assets have grown from about one-third to almost one-half of total assets (table).¹ This growth suggests that the investment decisions of firms could have a substantial effect on the markets in which they invest. In this discussion, we explore recent changes in firms' financial investment strategies following the Tax Cuts and Jobs Act (TCJA).

When managing their financial assets, firms typically report that they prioritize capital preservation and liquidity over risk-adjusted return and thus prefer to hold portfolios of high-quality, short-duration securities. That said, firms with the largest portfolios appear to hold a relatively wide range of financial securities and products. For example, the top 10 firms have sizable positions in long-term corporate bonds (greater than one year) while holding relatively little in short-term investments, such as CP, CDs, and MMFs (figure 1). Moreover, these firms have historically held a large fraction of their financial assets in offshore accounts. For instance, just before the passage of the TCJA, three-fourths of the top 10 firms' financial assets were held offshore.²

While firms are still evaluating the longer-term implications of the TCJA, recent data suggest three emerging trends in how they might be restructuring their financial asset holdings.

Table: Top 10 Corporate Holders of Financial Assets

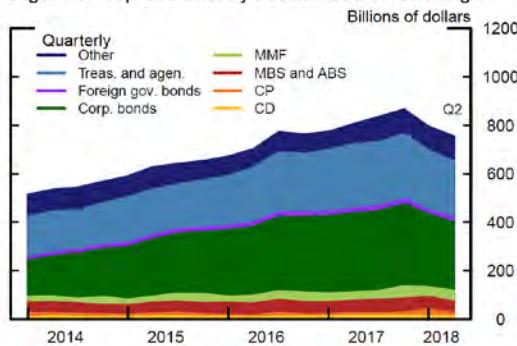
	Q1:2011	Q2:2018
Total assets (dollars, billions)	1,543	1,943
Financial assets (dollars, billions)	434	809
Financial assets as % of total assets	28	42
Total assets as % of GDP	10	10
% of cash held offshore	59	79*
Financial assets of all nonfinancial corporations (dollars, billions)	2,896	4,054
% of financial assets held by top 10	15	20

Note: The sample of the top 10 nonfinancial firms is as of Q2:2018 and is measured by the amount of financial assets (cash, cash equivalents, and marketable securities).

*This value is based on the most recently reported data for each firm. All firms in the sample stopped reporting this information in late 2017 or early 2018.

Source: Bloomberg; SEC filings; Federal Reserve Board, Z.1 Statistical Release, "Financial Accounts of the United States."

Figure 1: Top 10 Firms by Financial Asset Holdings



Note: For historical comparison, the sample of the top 10 nonfinancial firms in this exhibit is as of Q1:2018 and is measured by the amount of financial assets (cash, cash equivalents, and marketable securities). Data are through Q2:2018.

Source: SEC filings

¹ The management of firms' excess cash is part of their treasury functions, and these investors are typically referred to as "corporate cash managers."

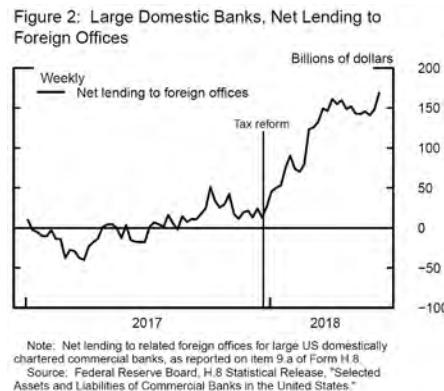
² Estimates are based on SEC filings as of late 2017 and early 2018. Firms in our sample have since stopped reporting the size of their offshore holdings.

First, the TCJA reduced the incentive for firms to keep sizable holdings of financial assets offshore. Consistent with this development, we observe a substantial drawdown in the combined financial asset holdings of the largest 10 firms since the passage of tax reform (figure 1).³

Second, in light of the TCJA, firms are likely to treat their onshore and offshore financial asset holdings as close substitutes and as a result may demand higher liquidity in their offshore accounts. It is unclear how this will affect firms' offshore holdings of short-term money market instruments, given the offsetting effects of (1) a reduction in overall financial asset holdings and (2) a composition shift into more liquid investments. In any case, firms may reduce their illiquid financial investments, such as corporate bonds, abroad. Indeed, the reduction in the top 10 firms' financial asset holdings has been concentrated in U.S. Treasury securities and long-term corporate bonds, both of which fell 15 percent over the first two quarters of 2018.⁴ The reduction in corporate bond holdings has coincided with an increase in trading of U.S. investment-grade corporate bonds between dealers and their foreign affiliates. Such trading increased by 5 percent and 20 percent year-on-year in the first and second quarters of 2018, respectively, consistent with dealers intermediating the rebalancing of firms' more illiquid offshore holdings.

Finally, foreign offices of domestic banks appear to have become more reliant on their home offices for funding, as large U.S. banks' net lending to their foreign offices has increased substantially (figure 2). This increase in lending may in part reflect banks' needs to replace offshore funding they previously received from firms, which may have been significant when all firms are considered.

Going forward, we intend to monitor changes in firms' financial asset management. Their sizable holdings of financial assets, unique investment objectives, and status as counterparties to large financial firms are likely to have ongoing implications for a range of financial markets.

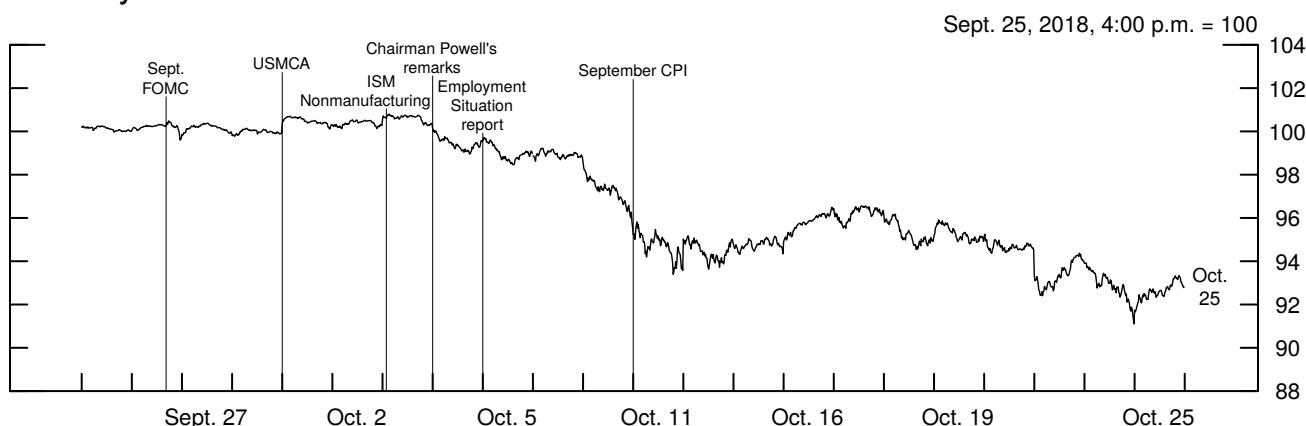


³ The July Tealbook box “U.S. Corporations’ Repatriation of Offshore Profits” discusses how U.S. nonfinancial firms with large holdings of cash abroad appeared to deploy those funds after the passage of the TCJA.

⁴ Investments in short-term instruments also dropped 15 percent over the same period, but those investments represent a significantly smaller portion of their aggregate holdings.

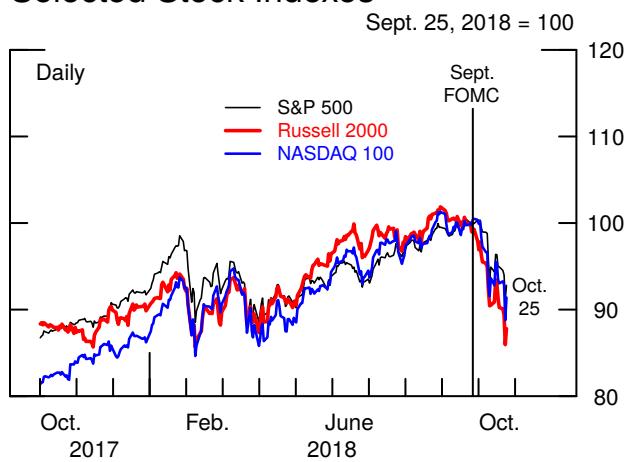
Corporate Asset Market Developments

Intraday S&P 500 Index



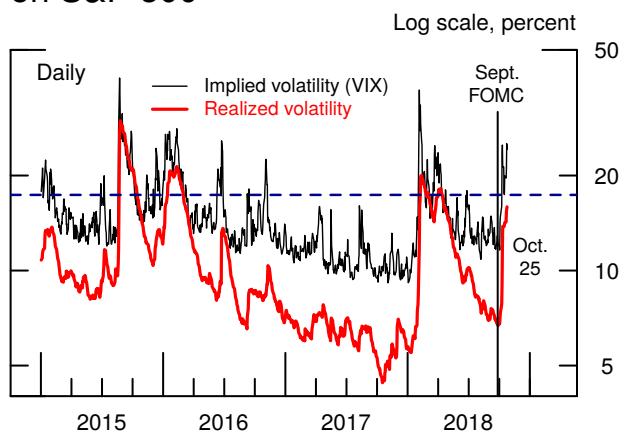
Note: Data are for 2018 and spaced at 5-minute intervals from 9:30 a.m. to 4:10 p.m.
Source: Bloomberg.

Selected Stock Indexes



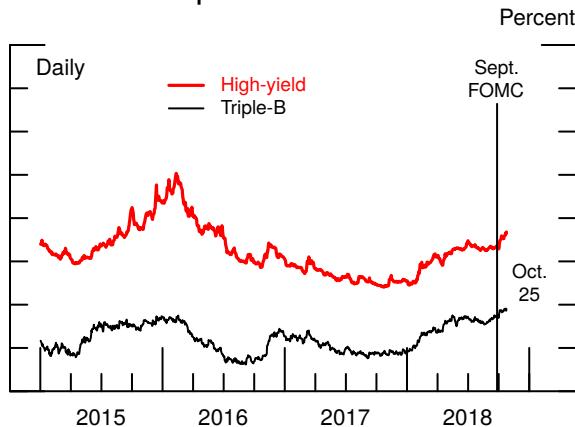
Source: Bloomberg.

Implied and Realized Volatilities on S&P 500



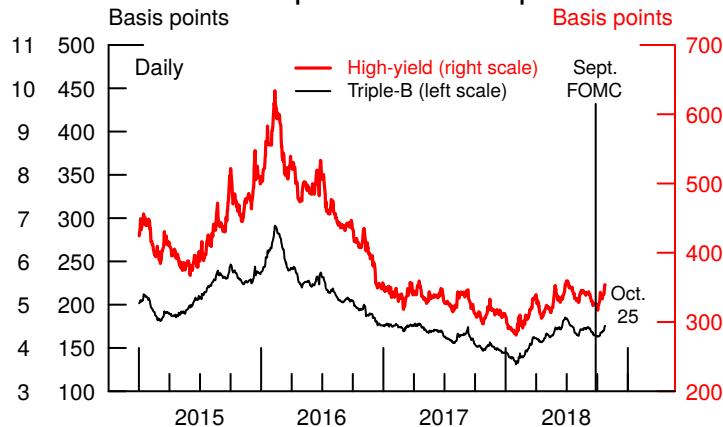
Note: Dashed line represents the historical median of VIX.
Source: Chicago Board Options Exchange; Bloomberg.

10-Year Corporate Bond Yields



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

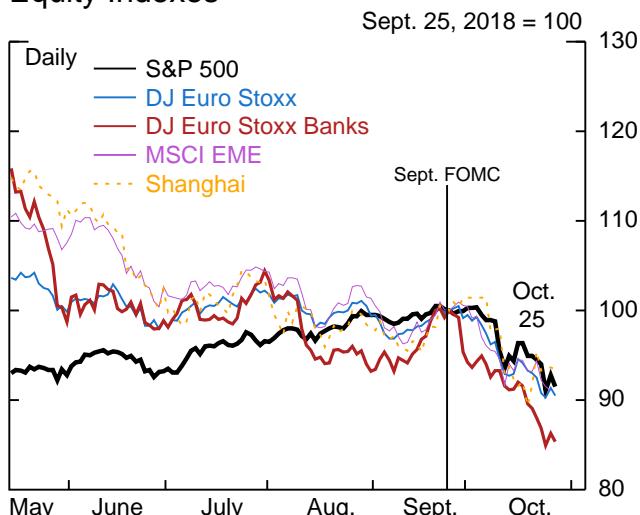
10-Year Corporate Bond Spreads



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

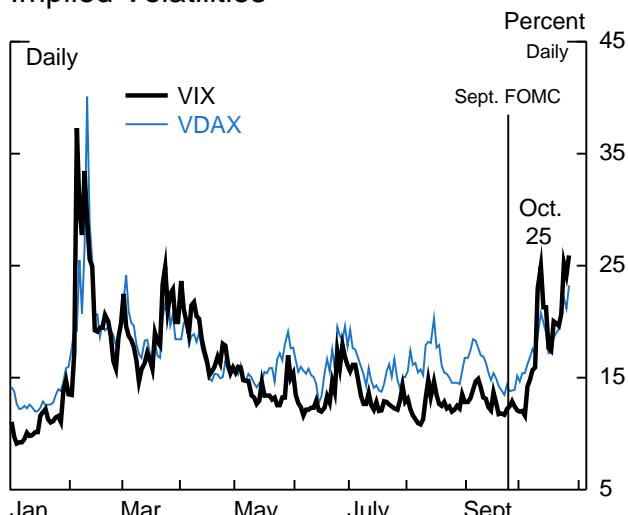
Foreign Developments

Equity Indexes



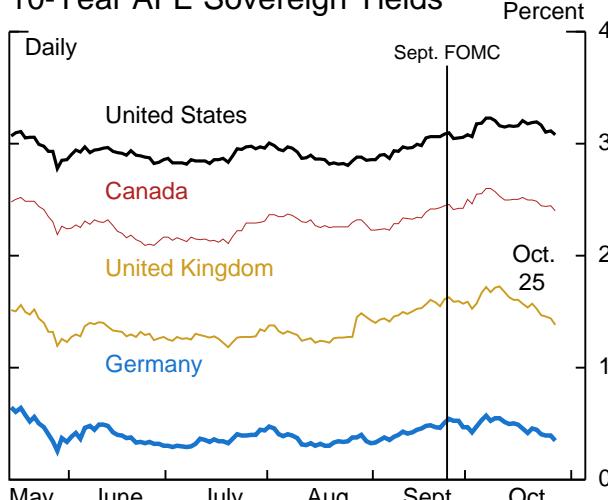
Note: Indexes denominated in local currency.
Source: Bloomberg.

Implied Volatilities



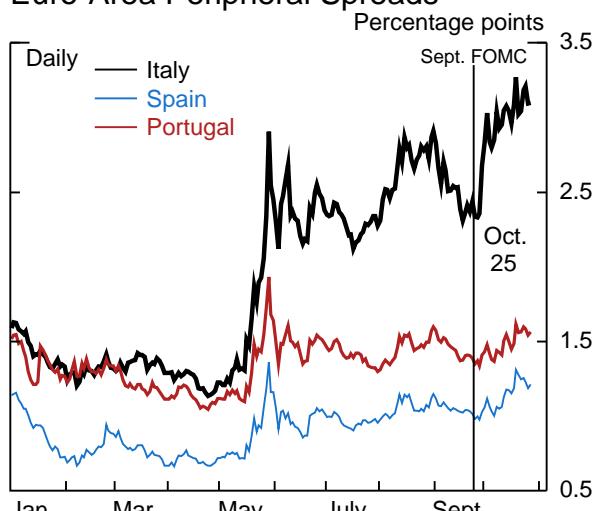
Source: Bloomberg; Haver.

10-Year AFE Sovereign Yields



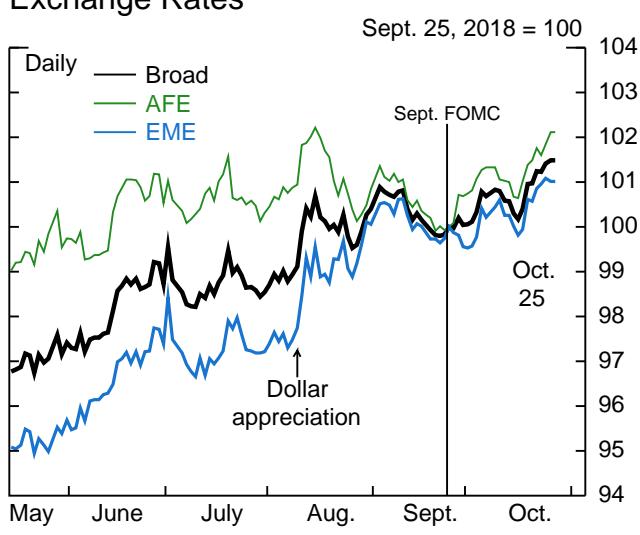
Source: Bloomberg.

Euro-Area Peripheral Spreads



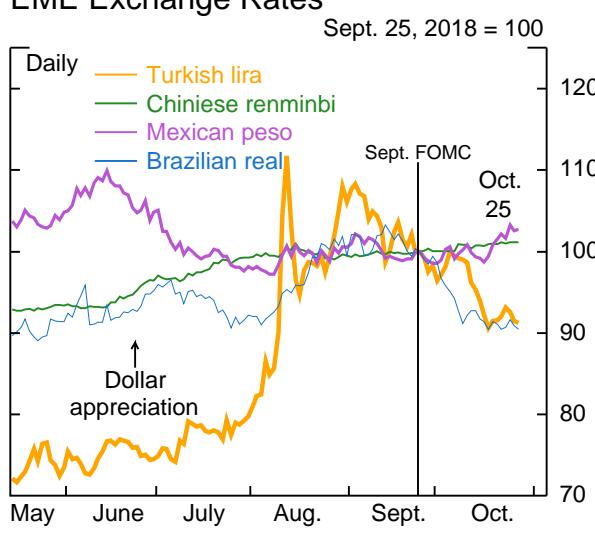
Source: Bloomberg.

Exchange Rates



Source: Bloomberg.

EME Exchange Rates



Source: Bloomberg.

Recent Developments in Offshore Dollar Funding Markets

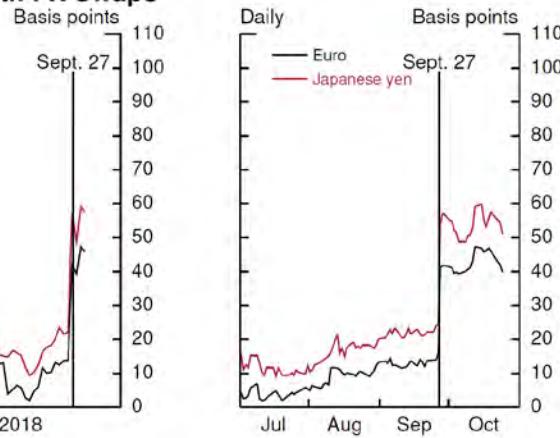
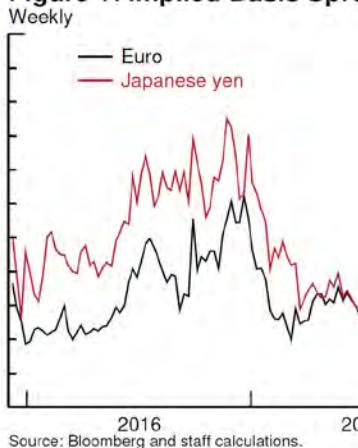
Market participants outside the United States can obtain dollar funding by exchanging foreign currency for dollars in the FX swap market or, if available to them, by borrowing dollars directly.¹ The difference in annualized costs between the two funding sources is the FX swap basis, typically quoted using LIBOR as a borrowing cost. In a frictionless world, the FX swap basis should be close to zero (as implied by “covered interest rate parity”), but dollar funding via the FX swap market has been more costly since the Global Financial Crisis (GFC).

For much of this year, however, the FX swap basis has been at its lowest level since the GFC, reflecting generally benign conditions in offshore dollar funding markets. One factor behind the low basis has been the flatter Treasury yield curve, which has likely reduced demand for dollar funding and hedging via FX swaps.²

On September 27, however, the first day that a new three-month FX swap contract would mature after the end of 2018, the three-month FX swap basis jumped 20 to 30 basis points in most major currencies (figure 1). There were no concurrent jumps in domestic dollar funding markets, such as the commercial paper market.

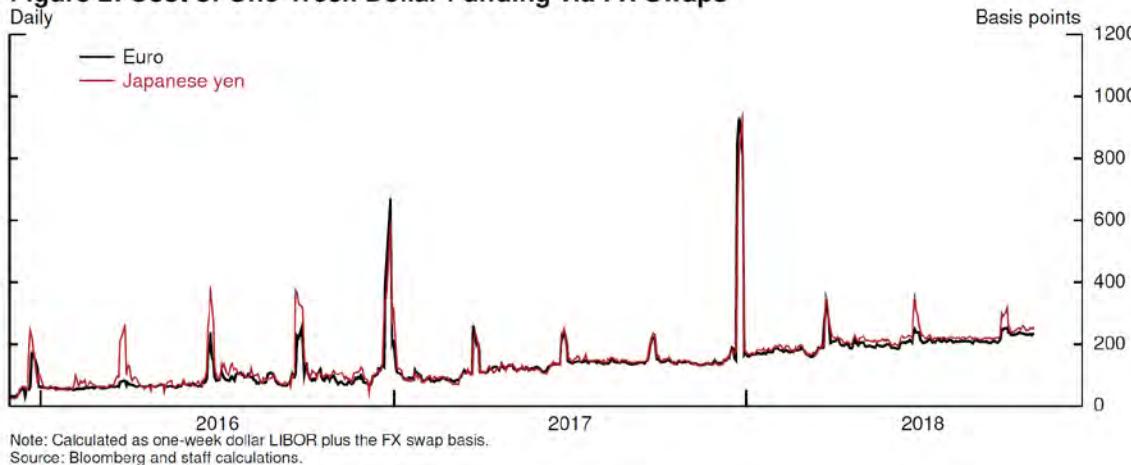
A discrete jump in the three-month FX basis also occurred in recent years when the contract first spanned the year-end. But the increase this year was larger, although it began from a lower level. This year’s increase has raised concerns about an outsized spike at the end of 2018 in the cost of shorter-tenor dollar funding via FX swaps, perhaps even larger than the substantial spike that occurred last year (figure 2). It could also mean, however, that sensitized by last year’s experience, more market participants are obtaining their dollar funding earlier.

Figure 1: Implied Basis Spreads from 3-month FX Swaps



¹ In an FX swap transaction, an investor buys dollars with foreign currency in a spot transaction while at the same time agreeing with the seller on a date and a forward exchange rate to reverse the transaction.

² Foreign investors often use dollar funding obtained via short-maturity FX swaps (and therefore hedged against FX risk for that maturity) to invest in longer-term dollar-denominated securities. A flatter Treasury yield curve reduces the return on that strategy.

Figure 2: Cost of One-Week Dollar Funding via FX Swaps

An important factor explaining the spike in the basis at the end of 2017 was a temporary pullback from the FX swap market by several large banks, including U.S. institutions, that are important intermediaries and providers of dollar funding. The pullback reportedly reflected balance sheet constraints driven by concerns over capital requirements based on year-end reporting. Among these concerns is that of being placed in a higher global systemically important bank (G-SIB) surcharge bucket.³

FX swaps on the books of banks potentially affect all five risk categories used to calculate the G-SIB surcharge scores. Specifically, besides increasing the size of the balance sheet, FX swap transactions are conducted over the counter, are usually cross-jurisdictional, often involve other financial institutions as counterparties, and may have the dollar leg funded in the wholesale market. In addition, many FX swap contracts have very short maturities, which means they can quickly roll off the books of dealers. Thus, FX swap activity may be a prime target for a sudden year-end pullback by institutions acutely concerned about capital requirements.

The substantial spike in the FX basis currently priced by FX swap markets for the year-end reflects the high probability that some market participants will pay very high dollar funding costs for a short period at that time. We note, however, that previous year-end spikes have not resulted in widespread stresses in offshore dollar funding markets or been accompanied by unusual sales of U.S. assets, as most market participants likely anticipated such events. Of course, the cost of being prepared is the higher basis paid even now on contracts spanning the year-end, with the burden falling on counterparties swapping foreign currency liquidity for dollar liquidity.

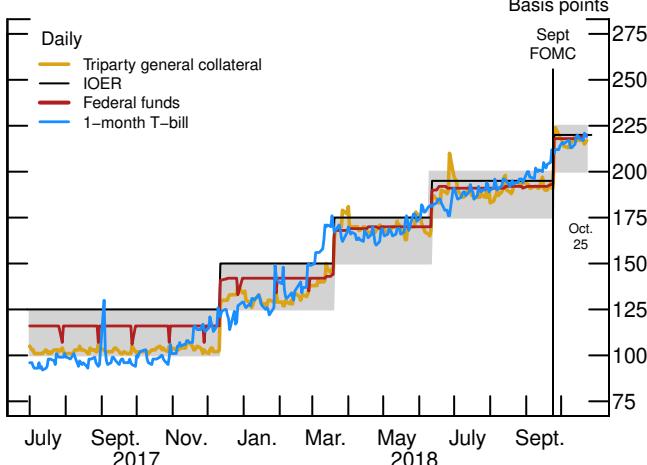
Finally, as with previous year-end spikes in the FX basis, we expect to see an associated rise in draws from our central bank dollar swap lines at the European Central Bank and the Bank of Japan. But these draws will likely again be far smaller than those seen in the GFC or the European Sovereign Debt Crisis.⁴

³ G-SIB reporting is based on pure year-end readings for banks in continental Europe, while for U.S. and U.K. banks, for certain items, “year-end” reporting is based on a Q4 daily average or an average of the three month-ends in Q4.

⁴ At the end of 2017, draws from our central bank swap lines peaked at \$11.9 billion at the European Central Bank and \$160 million at the Bank of Japan.

Short-Term Funding Markets

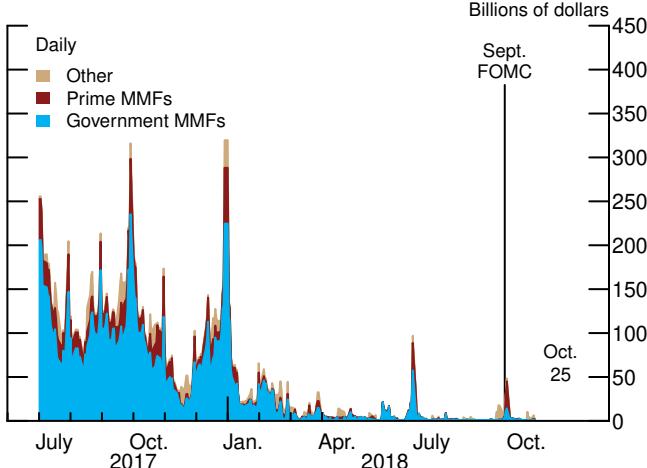
Selected Money Market Rates



Note: Federal funds rate is a weighted median, and shaded area is the target range for the federal funds rate. IOER is interest on excess reserves.

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

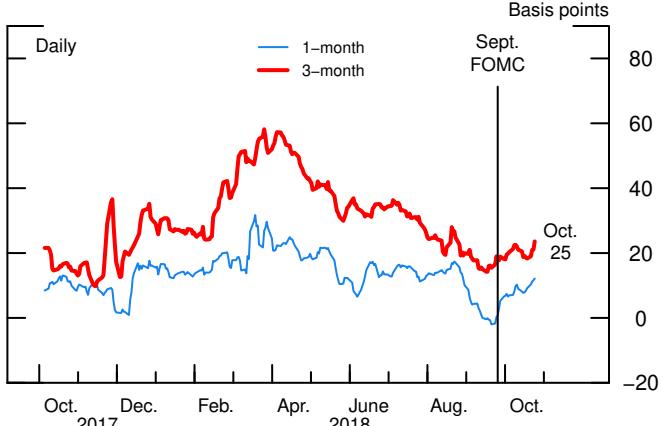
ON RRP, Take-Up by Type



Note: ON RRP is overnight reverse repurchase agreement; MMF is money market fund.

Source: Federal Reserve Bank of New York.

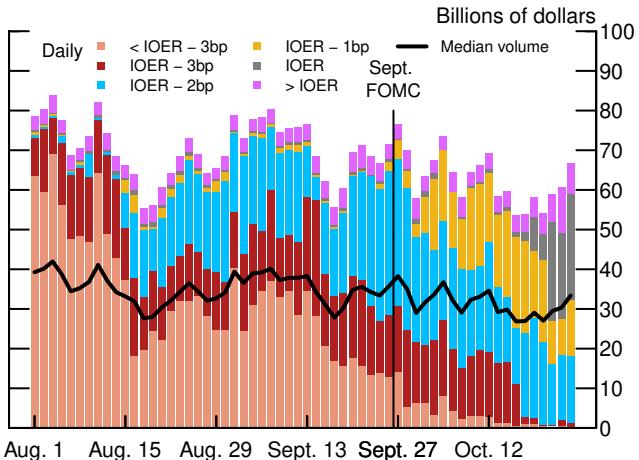
CD Spreads to OIS



Note: Certificate of deposit (CD) rates are a 5-day moving average.

Source: Depository Trust & Clearing Corporation.

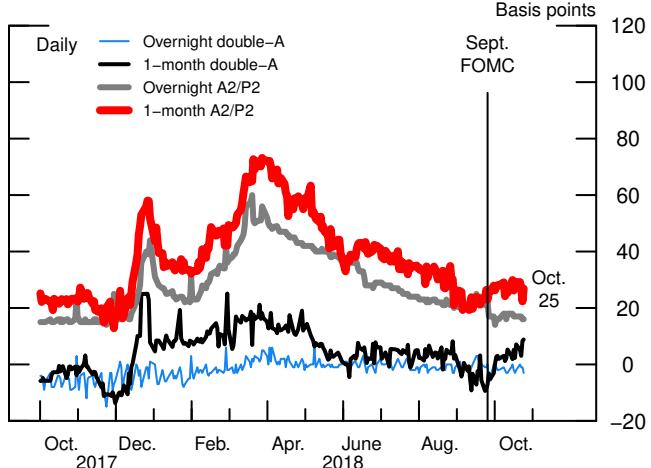
Distribution of Fed Funds Rate across Trades



Note: IOER is interest on excess reserves.

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

Nonfinancial CP Spreads

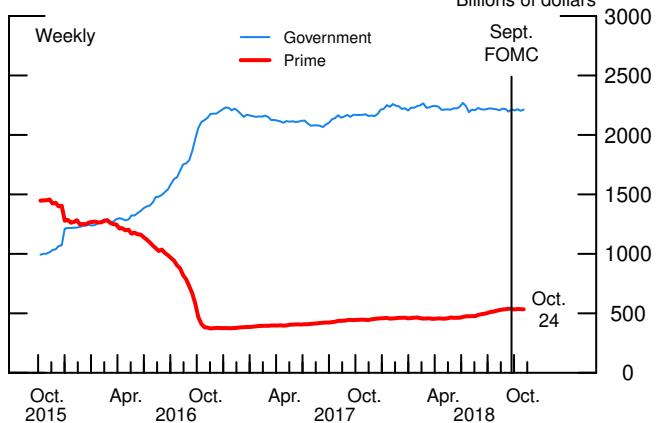


Note: Overnight commercial paper (CP) spreads are to federal funds rate.

1-month CP spreads are to the overnight index swap rate (OIS).

Source: Depository Trust & Clearing Corporation.

Prime and Government MMF Assets under Management

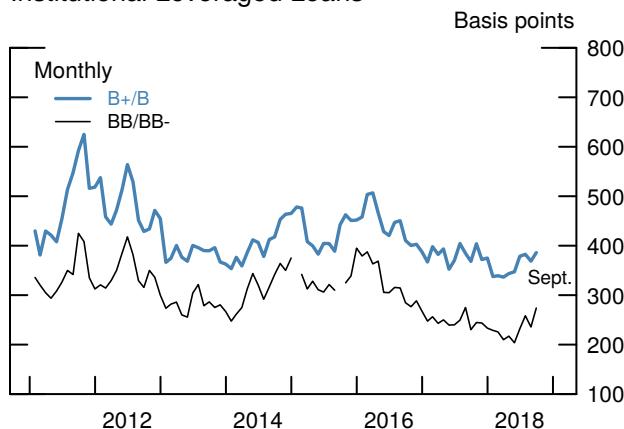


Note: MMF is money market fund.

Source: Investment Company Institute.

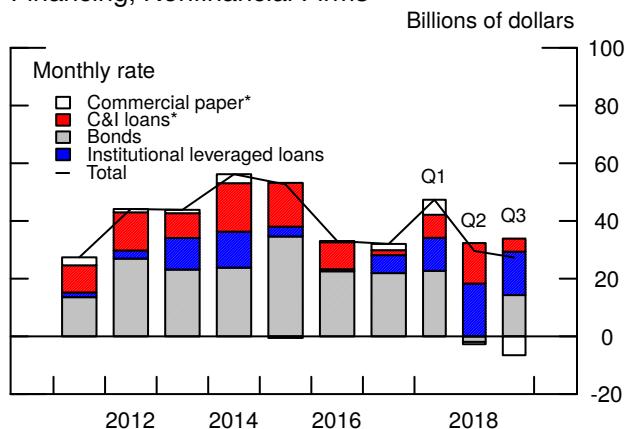
Business Finance

Average Spreads of New-Issue Institutional Leveraged Loans



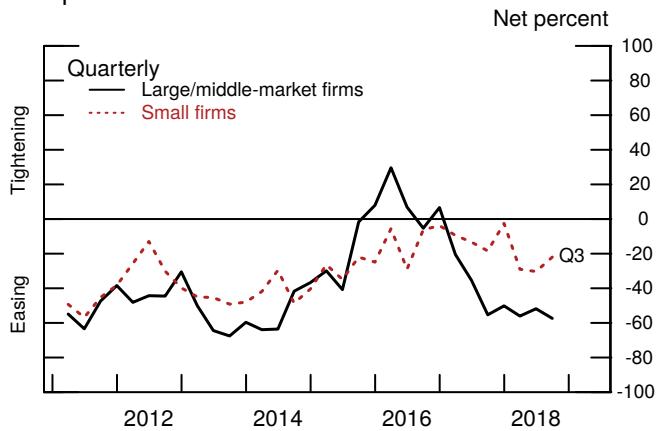
Note: Breaks in the series represent periods with no issuance. Spreads are calculated against 3-month LIBOR. The spreads do not include up-front fees.
Source: S&P LCD.

Selected Components of Net Debt Financing, Nonfinancial Firms



Source: Mergent Fixed Income Securities Database; Thomson Reuters LPC; Federal Reserve Board; Depository Trust & Clearing Corporation.

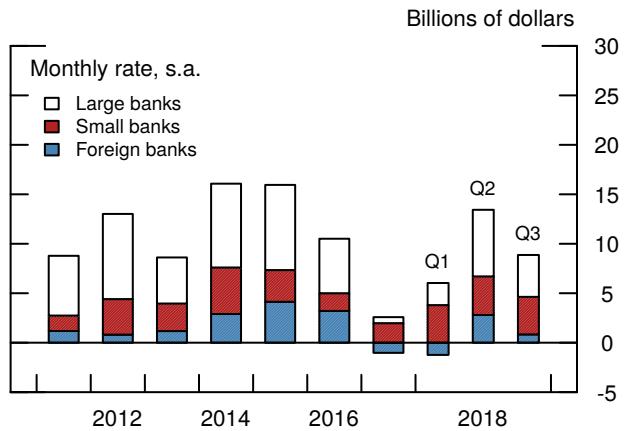
C&I Loan Terms: Changes in Loan Spreads



Note: Plotted are the net percentage of banks reporting increasing spreads on C&I loans. Banks' responses are weighted by the outstanding amount of C&I loans on their balance sheets at the end of the previous quarter.

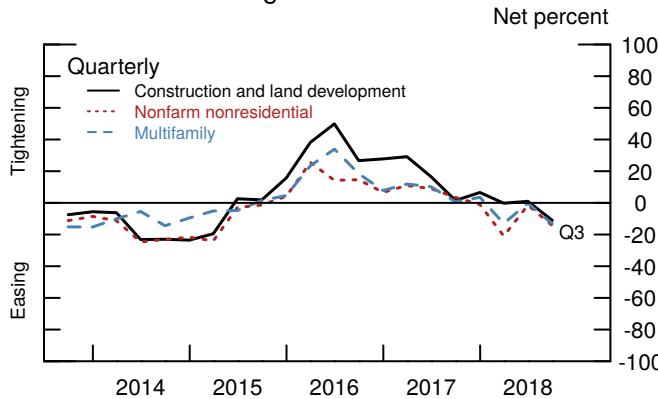
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

C&I Loans



Note: Large banks are defined as the largest 25 banks by assets.
Source: 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.

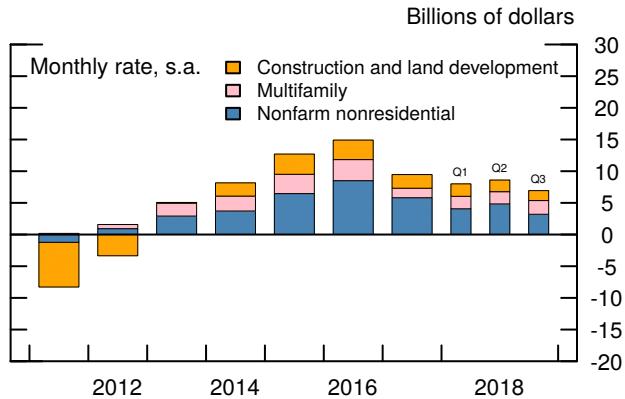
CRE Loans: Changes in Standards



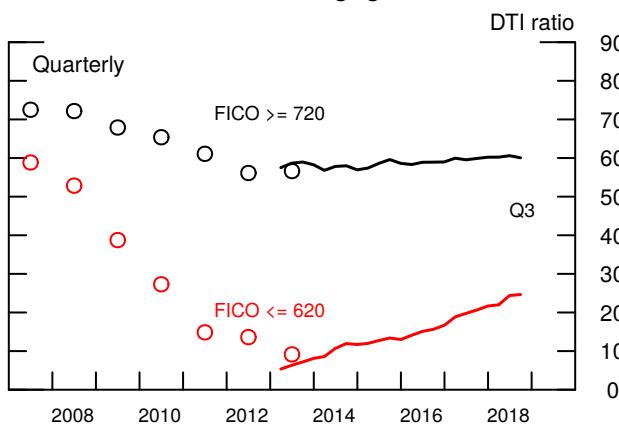
Note: Plotted are the net percentage of banks reporting tighter standards on CRE loans. Banks' responses are weighted by the outstanding amount of CRE loans on their balance sheets at the end of previous quarter.

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

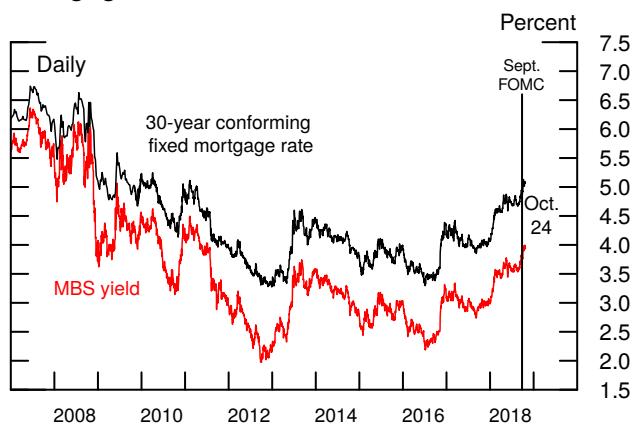
CRE Loans



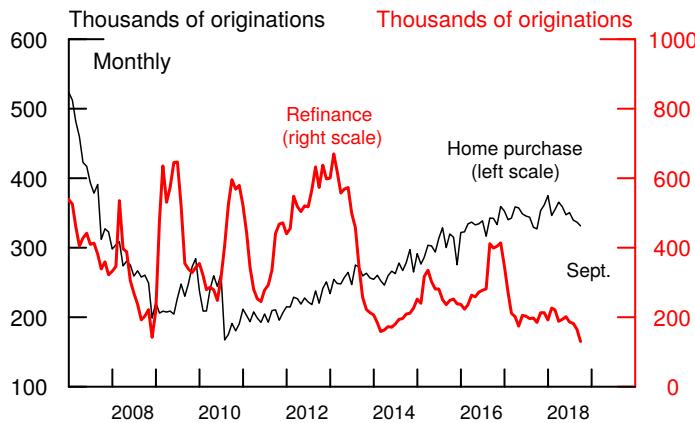
Source: Staff calculations, Federal Reserve Board, Form FR 2644, Weekly Report of Selected Assets and Liabilities of Domestically Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks.

Maximum Allowed Debt-Service-to-Income Ratio for Residential Mortgages

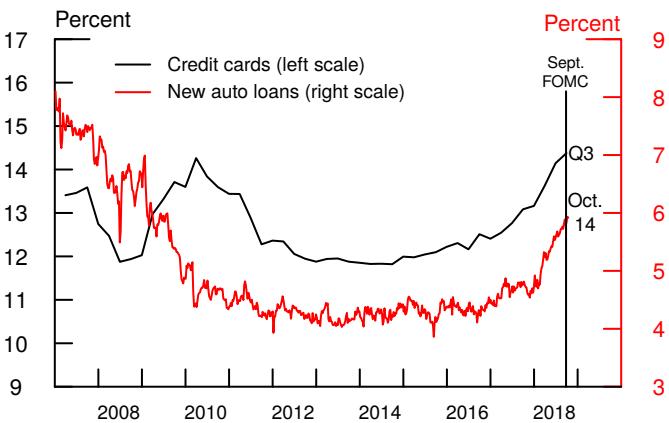
Note: DTI is debt service to income.
Source: For frontiers shown with circles, McDash and CoreLogic; for frontiers shown with solid lines, Optimal Blue.

Mortgage Rate and MBS Yield

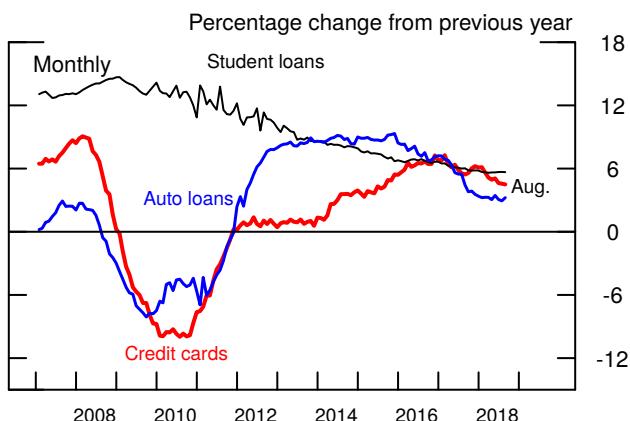
Note: The mortgage-backed securities (MBS) yield is the Fannie Mae 30-year current-coupon rate.
Source: For mortgage rate before 2010, Freddie Mac; after 2010, Loansifter; for MBS yield, Barclays.

Purchase and Refinance Activity

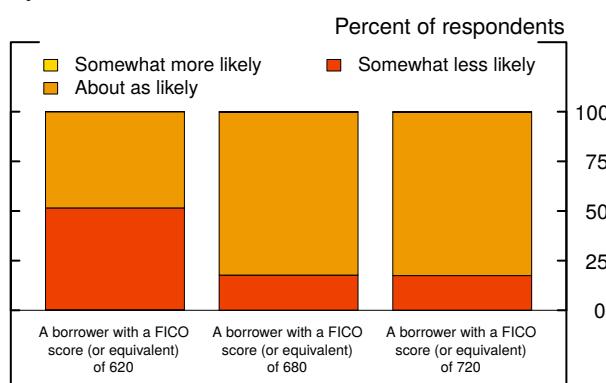
Note: The data are seasonally adjusted by Federal Reserve Board staff.
Source: For values before 2017, data reported under the Home Mortgage Disclosure Act of 1975; for values in and after 2017, staff estimates.

Consumer Interest Rates

Note: Credit card data reflect rates at commercial banks on all credit card plans; data are reported quarterly and not seasonally adjusted. Auto loans data are reported weekly and seasonally adjusted.
Source: For credit cards, Federal Reserve Board; for auto loans, J.D. Power.

Consumer Credit

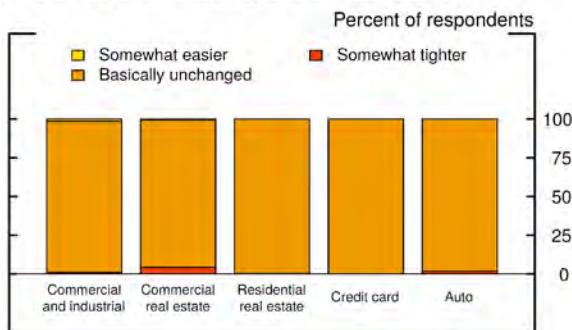
Source: Federal Reserve Board.

Likelihood of Approving Credit Card Applications, by FICO Score

Note: Compared with the beginning of the year. Individual bank responses have been weighted by the outstanding amount of the relevant loan category on the bank's balance sheet at the end of the previous quarter.

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

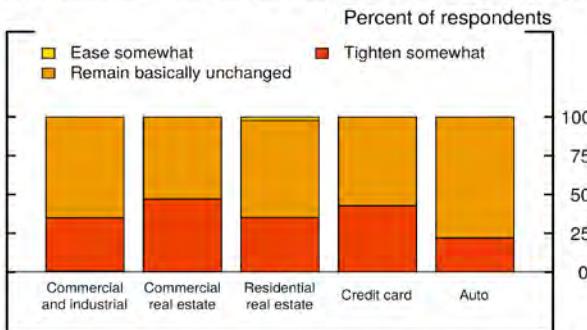
Figure 1. Changes in Credit Standards in Response to the Recent Flattening of the Yield Curve



Note: Chart shows reported changes in credit standards in response to the flattening of the yield curve since the beginning of the year. Individual bank responses have been weighted by the outstanding amount of the relevant loan category on the bank's balance sheet at the end of the previous quarter.

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

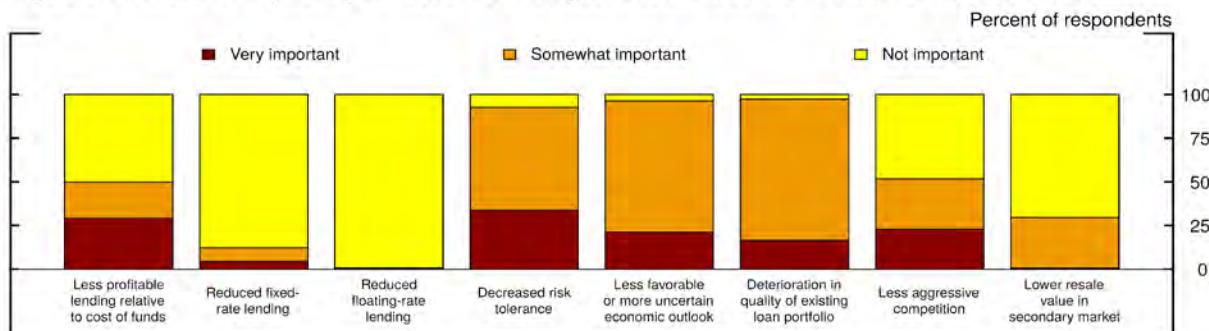
Figure 2. Changes in Credit Standards in Response to a Hypothetical, Moderate Inversion of the Yield Curve



Note: Chart shows reported changes in credit standards in response to a hypothetical, moderate inversion of the yield curve where the 3-month Treasury bill yield remains at its current level and the 10-year Treasury yield falls moderately below that level. Individual bank responses have been weighted by the outstanding amount of the relevant loan category on the bank's balance sheet at the end of the previous quarter.

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

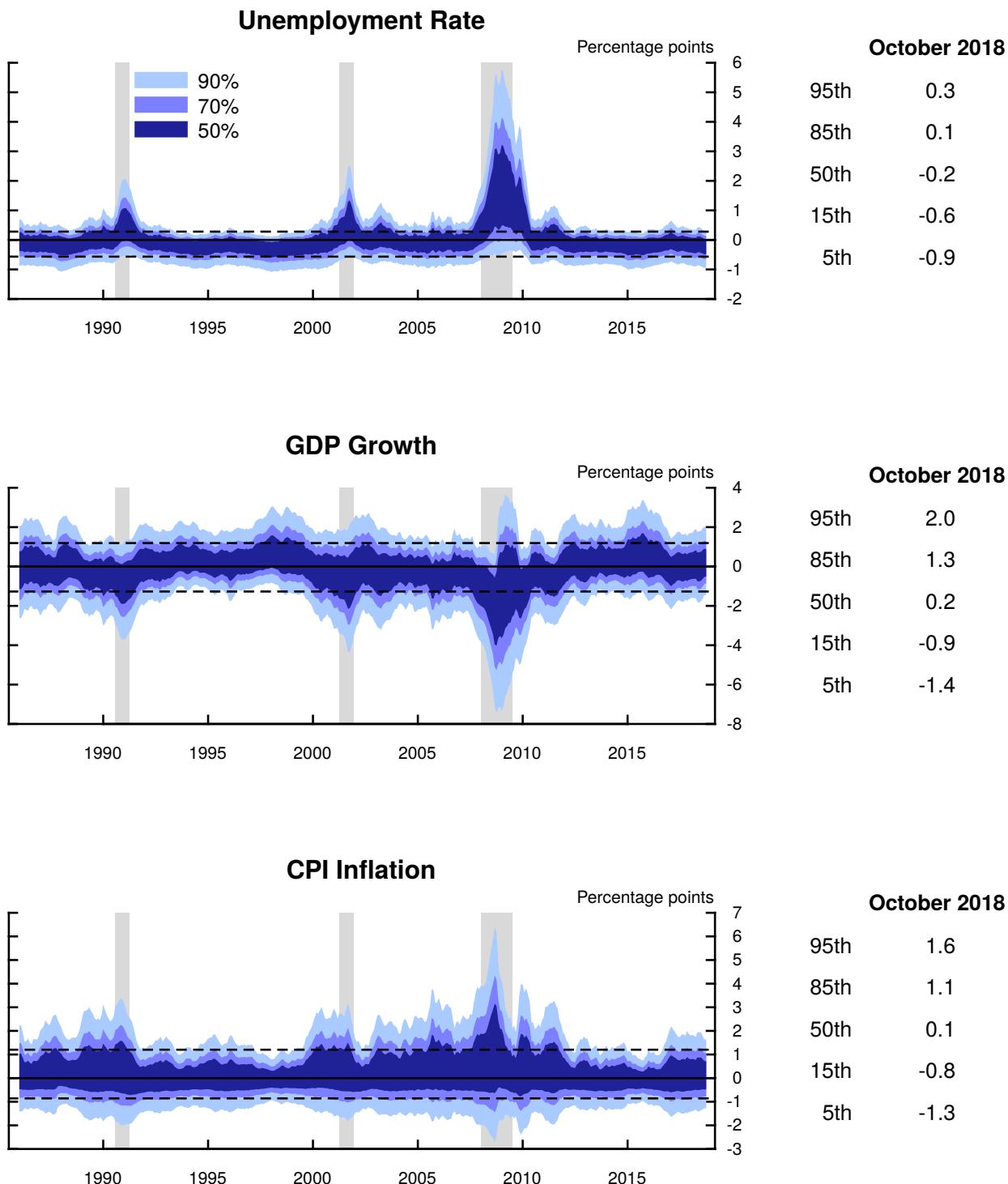
Figure 3. Reasons for Tightening in Response to a Hypothetical, Moderate Inversion of the Yield Curve



Note: Chart shows reasons that banks reported they would tighten credit standards in response to a hypothetical, moderate inversion of the yield curve where the 3-month Treasury bill yield remains at its current level and the 10-year Treasury yield falls moderately below that level. Individual bank responses have been weighted by the outstanding amount of the relevant loan category on the bank's balance sheet at the end of the previous quarter.

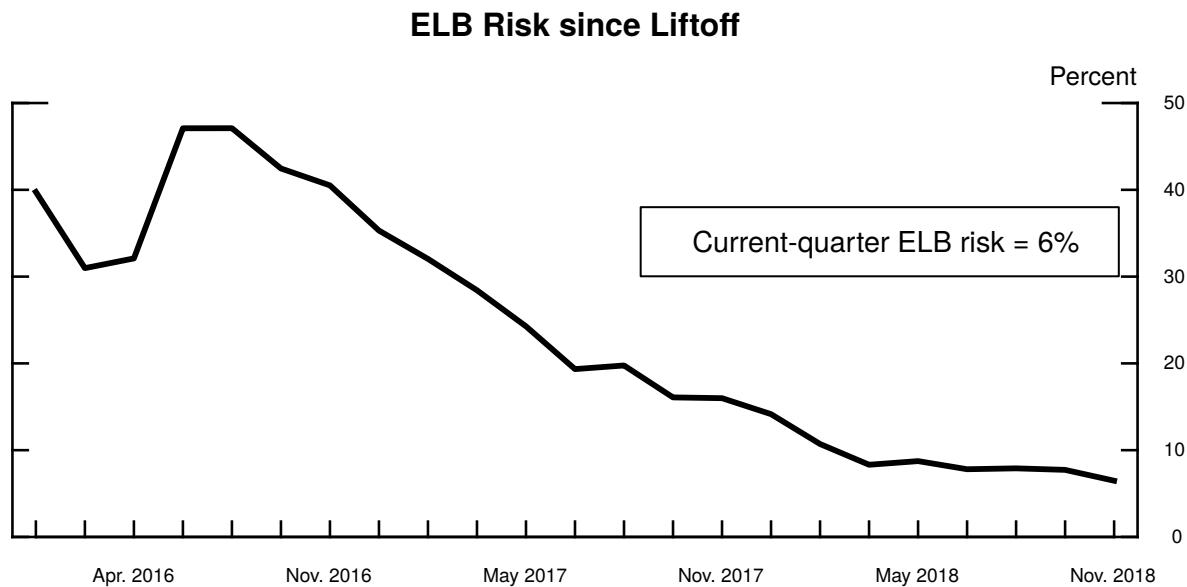
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Time-Varying Macroeconomic Risk

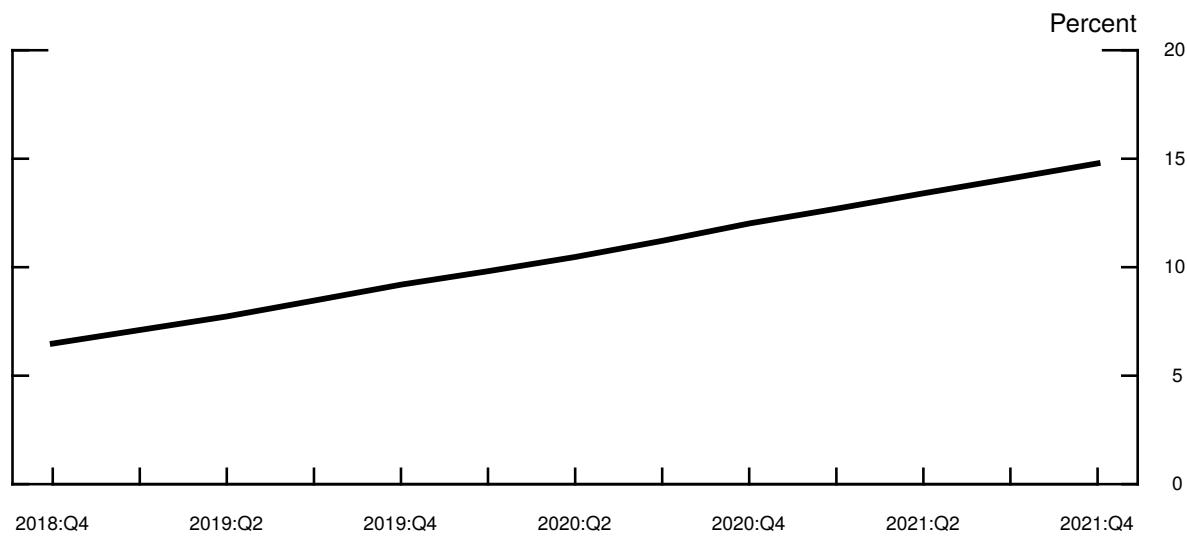


Note: The exhibit shows estimates of quantiles of the distribution of errors for four-quarter-ahead staff forecasts. The estimates are conditioned on indicators of real activity, inflation, financial market strain, and the volatility of high-frequency macroeconomic indicators. The tables show selected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

Effective Lower Bound Risk Estimate



ELB Risk over the Projection Period



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

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

Measure and scenario	2018					
	H2	2019	2020	2021	2022	2023-24
<i>Real GDP</i>						
Tealbook baseline and extension	2.8	2.4	1.9	1.4	1.2	1.2
Greater interest rate sensitivity	2.3	1.5	.9	1.2	1.4	1.7
Inflation fears	2.8	1.3	1.3	1.1	1.0	1.2
Federal debt concerns	2.8	1.9	1.5	1.4	1.3	1.4
Stronger supply side	2.8	2.9	2.6	2.1	1.7	1.5
EME financial turbulence	2.8	1.9	1.4	1.4	1.4	1.4
Inflation-driven global tightening	2.7	1.5	.7	1.2	1.4	1.5
<i>Unemployment rate¹</i>						
Tealbook baseline and extension	3.6	3.3	3.3	3.4	3.7	4.2
Greater interest rate sensitivity	3.7	3.7	4.0	4.2	4.3	4.3
Inflation fears	3.6	3.7	4.0	4.2	4.5	5.1
Federal debt concerns	3.6	3.5	3.6	3.7	4.0	4.3
Stronger supply side	3.6	3.2	3.1	3.1	3.4	4.0
EME financial turbulence	3.6	3.5	3.7	3.9	4.1	4.5
Inflation-driven global tightening	3.6	3.6	4.1	4.4	4.6	4.7
<i>Total PCE prices</i>						
Tealbook baseline and extension	1.7	2.0	1.9	1.9	2.0	2.1
Greater interest rate sensitivity	1.7	2.0	1.9	1.9	1.9	2.0
Inflation fears	1.8	2.4	2.8	3.1	3.4	3.4
Federal debt concerns	1.7	2.0	1.9	1.9	1.9	2.0
Stronger supply side	1.7	1.9	1.9	1.8	1.9	2.0
EME financial turbulence	1.6	1.3	1.6	1.8	1.9	2.0
Inflation-driven global tightening	2.2	3.4	2.6	2.2	2.0	2.1
<i>Core PCE prices</i>						
Tealbook baseline and extension	1.7	2.0	2.0	2.0	2.1	2.1
Greater interest rate sensitivity	1.7	2.0	2.0	2.0	2.0	2.0
Inflation fears	1.8	2.5	2.9	3.2	3.5	3.5
Federal debt concerns	1.7	2.0	2.0	2.0	2.0	2.0
Stronger supply side	1.7	2.0	2.0	1.9	2.0	2.0
EME financial turbulence	1.6	1.6	1.7	1.9	2.0	2.0
Inflation-driven global tightening	1.8	3.1	2.8	2.3	2.1	2.1
<i>Federal funds rate¹</i>						
Tealbook baseline and extension	2.3	3.6	4.5	4.8	4.7	4.0
Greater interest rate sensitivity	2.3	3.3	3.7	3.6	3.3	3.2
Inflation fears	2.3	3.5	4.3	4.7	4.7	4.2
Federal debt concerns	2.3	3.5	4.1	4.2	4.0	3.5
Stronger supply side	2.2	3.2	4.0	4.4	4.4	3.8
EME financial turbulence	2.3	3.2	3.8	4.2	4.1	3.6
Inflation-driven global tightening	2.3	4.3	4.7	4.1	3.5	3.2

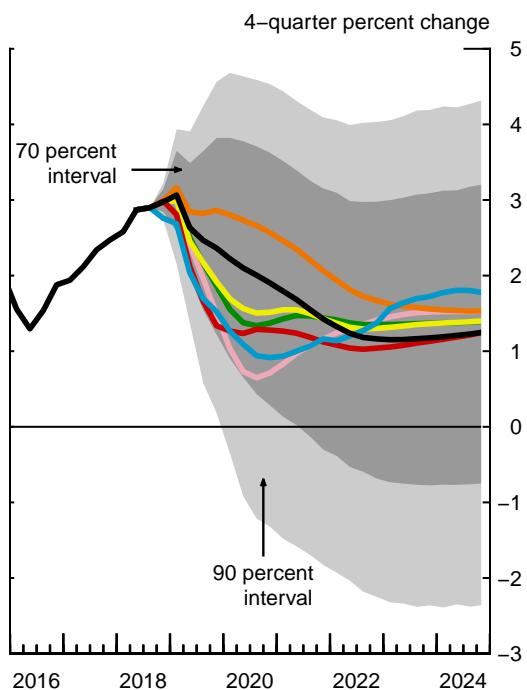
1. Percent, average for the final quarter of the period.

Forecast Confidence Intervals and Alternative Scenarios

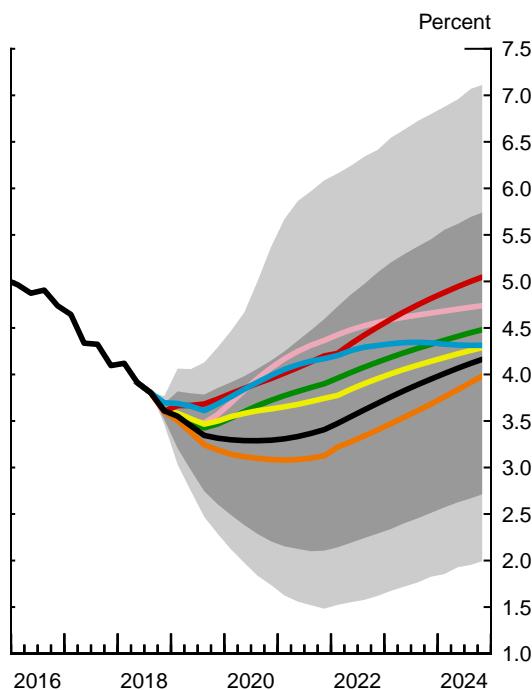
Confidence Intervals Based on FRB/US Stochastic Simulations

- Tealbook baseline and extension
- Federal debt concerns
- EME financial turbulence
- Greater interest rate sensitivity
- Stronger supply side
- Inflation fears
- Inflation–driven global tightening

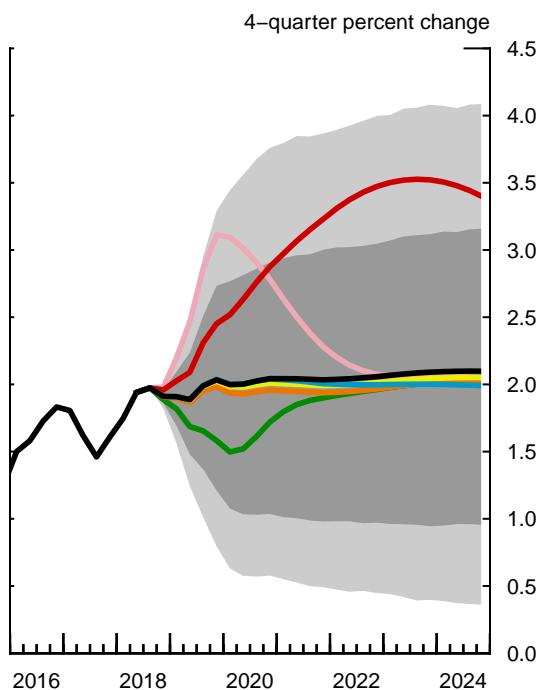
Real GDP



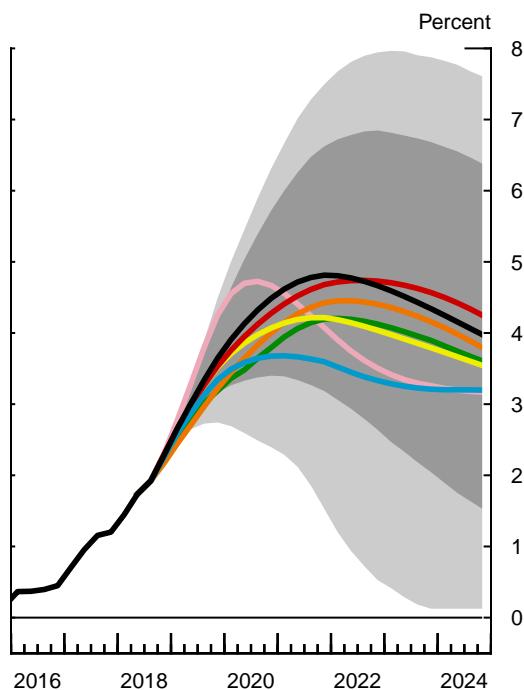
Unemployment Rate



PCE Prices excluding Food and Energy



Federal Funds Rate



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

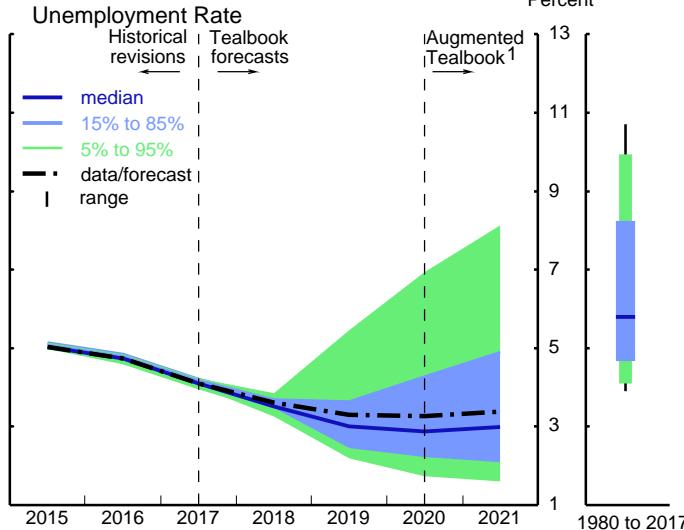
Measure	2018	2019	2020	2021	2022	2023	2024
<i>Real GDP</i> (percent change, Q4 to Q4)							
Projection	3.0	2.4	1.9	1.4	1.2	1.2	1.3
Confidence interval							
Tealbook forecast errors	2.4–4.2	1.2–4.0	-.2–3.7	-1.0–3.1
FRB/US stochastic simulations	2.8–3.1	1.2–3.8	.3–3.6	-.3–3.2	-.7–3.0	-.8–3.1	-.7–3.2
<i>Civilian unemployment rate</i> (percent, Q4)							
Projection	3.6	3.3	3.3	3.4	3.7	4.0	4.2
Confidence interval							
Tealbook forecast errors	3.4–3.7	2.4–3.7	2.2–4.3	2.1–4.9
FRB/US stochastic simulations	3.5–3.7	2.6–3.9	2.2–4.1	2.1–4.6	2.3–5.1	2.5–5.5	2.7–5.7
<i>PCE prices, total</i> (percent change, Q4 to Q4)							
Projection	2.0	2.0	1.9	1.9	2.0	2.1	2.1
Confidence interval							
Tealbook forecast errors	1.8–2.3	1.4–3.4	1.2–3.6	1.3–3.4
FRB/US stochastic simulations	1.9–2.0	1.0–2.8	.8–2.9	.8–3.0	.8–3.1	.8–3.2	.8–3.2
<i>PCE prices excluding</i> <i>food and energy</i> (percent change, Q4 to Q4)							
Projection	1.9	2.0	2.0	2.0	2.1	2.1	2.1
Confidence interval							
Tealbook forecast errors	1.7–2.2	1.6–2.6	1.5–2.9
FRB/US stochastic simulations	1.9–2.0	1.2–2.7	1.0–2.9	1.0–3.0	1.0–3.0	.9–3.1	1.0–3.2
<i>Federal funds rate</i> (percent, Q4)							
Projection	2.3	3.6	4.5	4.8	4.7	4.3	4.0
Confidence interval							
FRB/US stochastic simulations	2.3–2.3	3.2–4.2	3.4–5.7	3.2–6.6	2.6–6.8	2.0–6.7	1.5–6.4

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

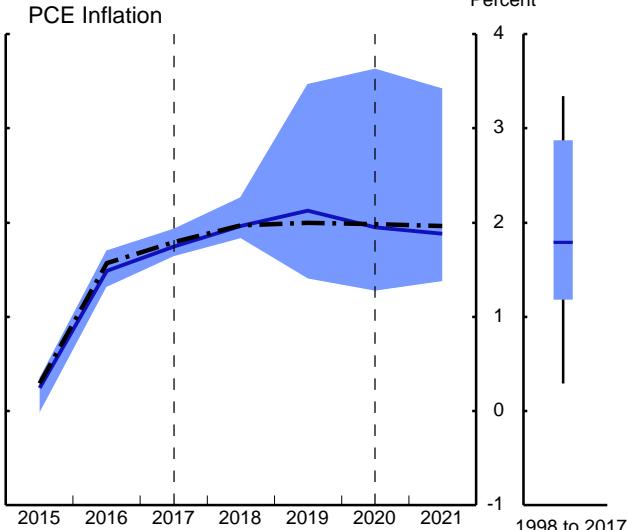
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Prediction Intervals Derived from Historical Tealbook Forecast Errors

Forecast Error Percentiles

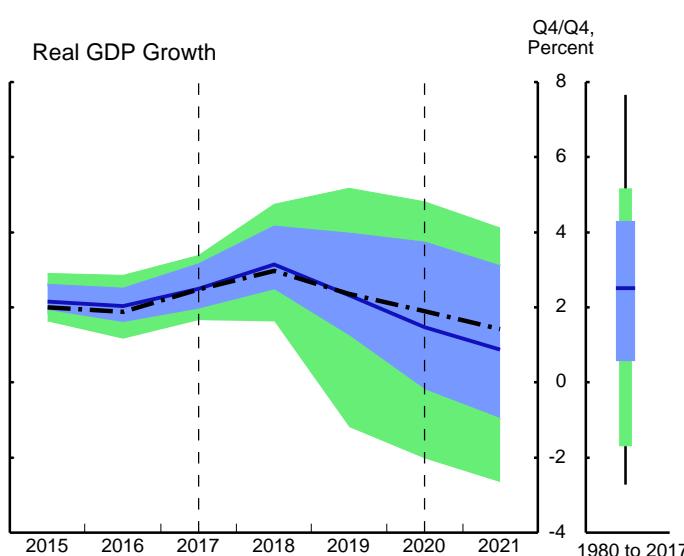


Historical Distributions

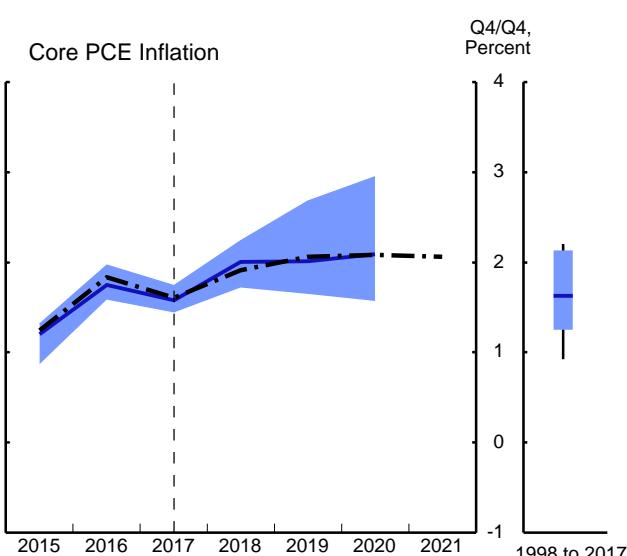


Risks & Uncertainty

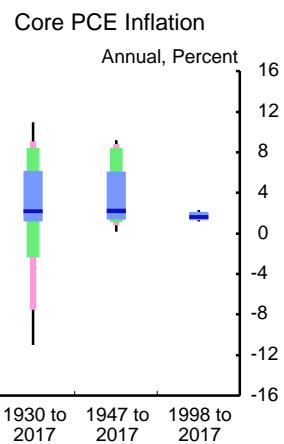
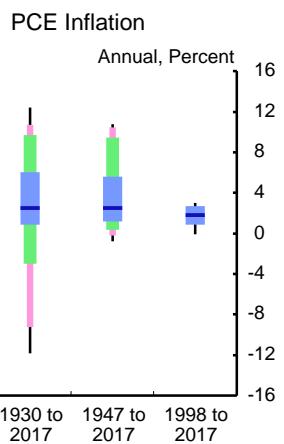
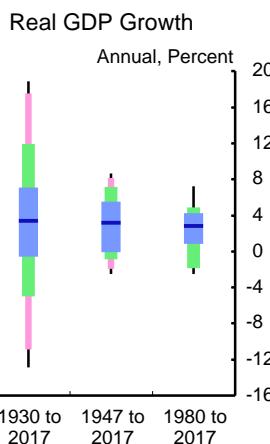
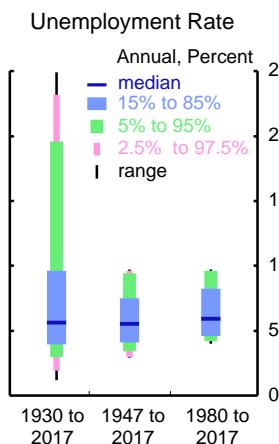
Real GDP Growth



Core PCE Inflation



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 2021.

Assessment of Key Macroeconomic Risks

Probability of Inflation Events

(4 quarters ahead)

Probability that the 4-quarter change in total PCE prices will be . . .	Staff	FRB/US	EDO	BVAR
<i>Greater than 3 percent</i>				
Current Tealbook	.10	.08	.03	.04
Previous Tealbook	.10	.07	.02	.03
<i>Less than 1 percent</i>				
Current Tealbook	.13	.17	.10	.23
Previous Tealbook	.12	.18	.12	.26

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	.00	.09	.19	.03
Previous Tealbook	.00	.11	.18	.03
<i>Decrease by 1 percentage point</i>				
Current Tealbook	.23	.01	.02	.09
Previous Tealbook	.26	.01	.03	.08

Probability of Near-Term Recession

Probability that real GDP declines in the next two quarters	Staff	FRB/US	EDO	BVAR	Factor Model
Current Tealbook	.01	.02	.05	.02	.03
Previous Tealbook	.01	.02	.04	.02	.00

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

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Simple Policy Rules¹

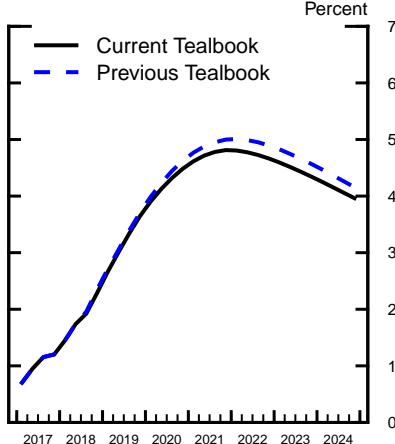
(Percent)

2018:Q4 2019:Q1

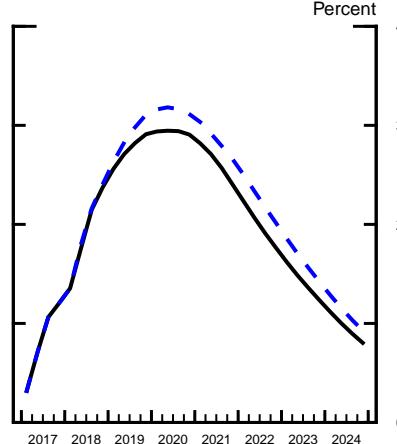
Taylor (1999) rule	4.71	4.90
<i>Previous Tealbook</i>	4.69	4.87
Taylor (1993) rule	3.53	3.62
<i>Previous Tealbook</i>	3.49	3.56
First-difference rule	2.25	2.52
<i>Previous Tealbook projection</i>	2.31	2.66
Flexible price-level targeting rule	1.77	1.66
<i>Previous Tealbook projection</i>	1.75	1.62
<i>Addendum:</i>		
Tealbook baseline	2.29	2.66

Key Elements of the Staff Projection

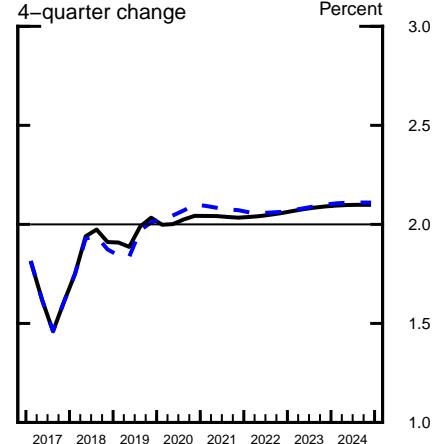
Federal Funds Rate



GDP Gap



PCE Prices ex. Food and Energy



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

(Percent)

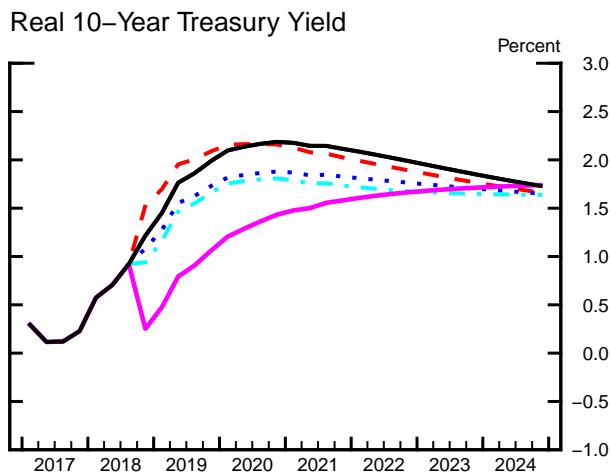
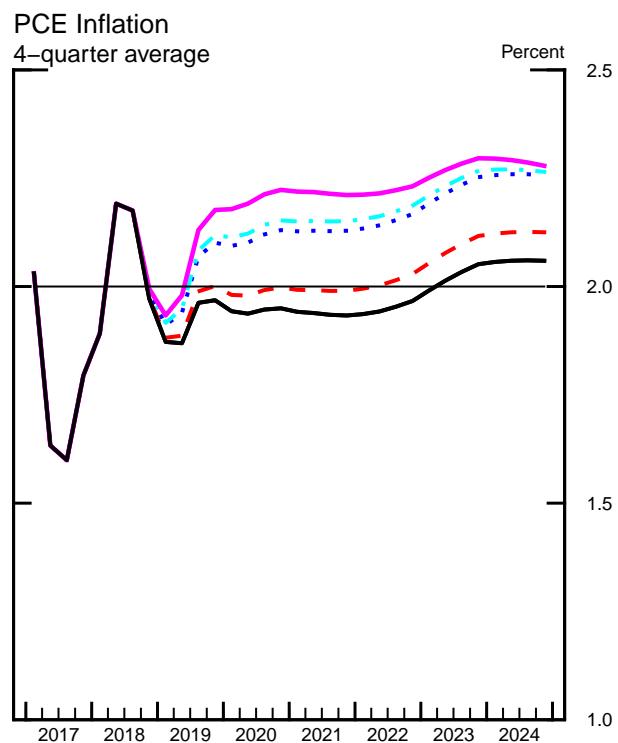
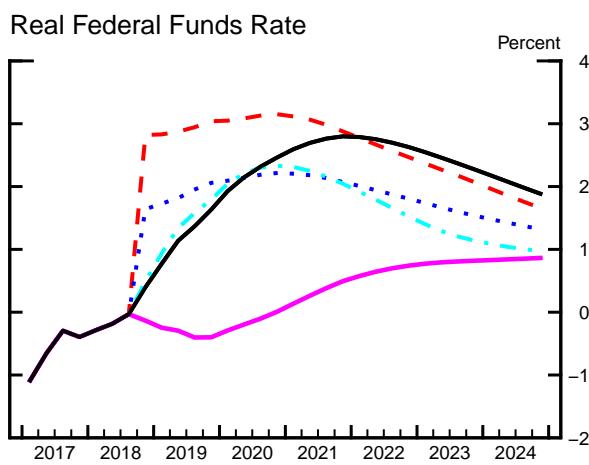
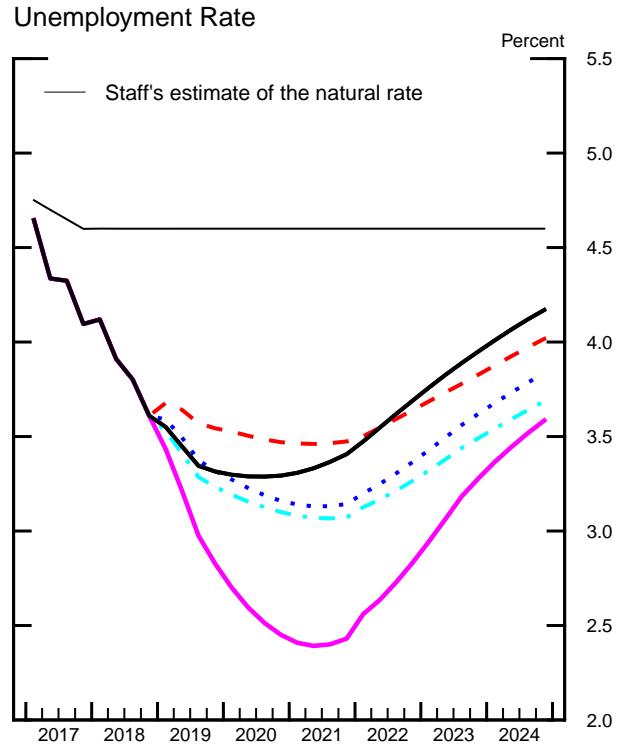
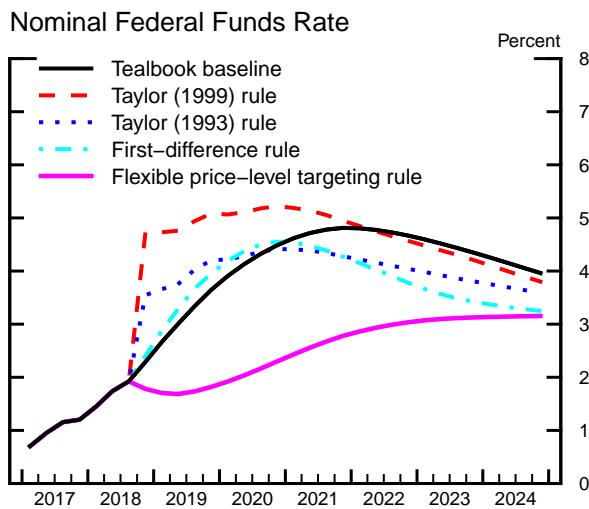
	Current Value	Current-Quarter Estimate Based on Previous Tealbook	Previous Tealbook
Tealbook baseline			
FRB/US r^*	3.29	3.47	3.29
Average projected real federal funds rate	1.85	1.94	1.70
SEP-consistent baseline			
FRB/US r^*	1.92		
Average projected real federal funds rate	1.00		

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

2. The "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 2018 median SEP responses. The "Average projected real federal funds rate" is calculated under the Tealbook and SEP-consistent baseline projections over the same 12-quarter period as FRB/US r^* .

Simple Policy Rule Simulations

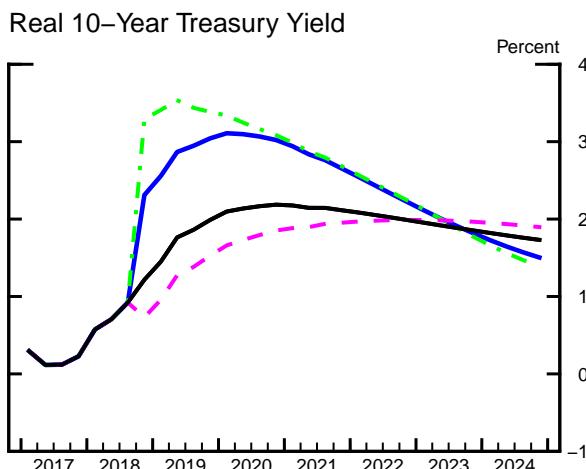
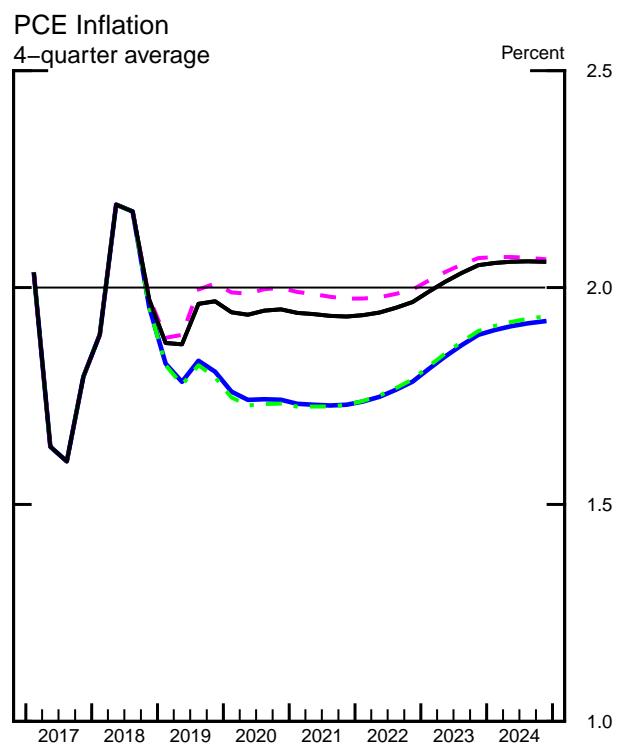
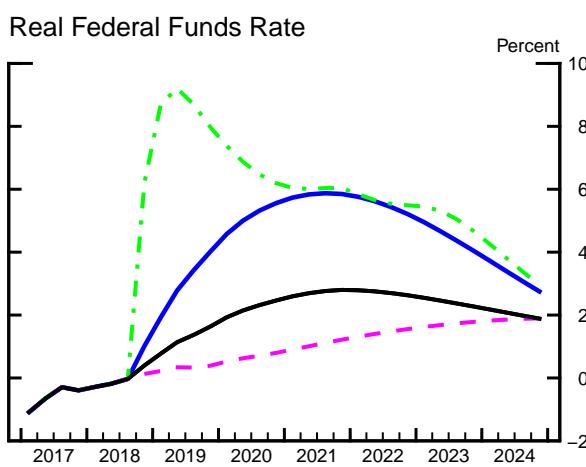
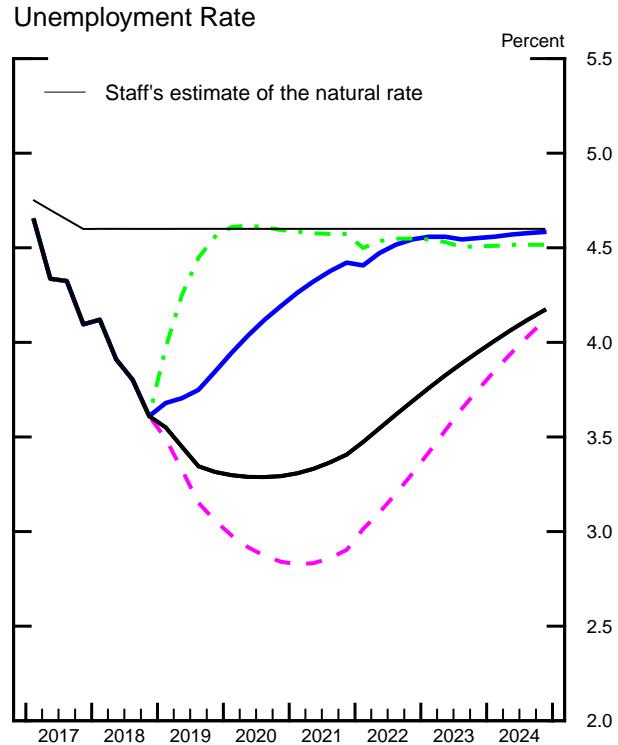
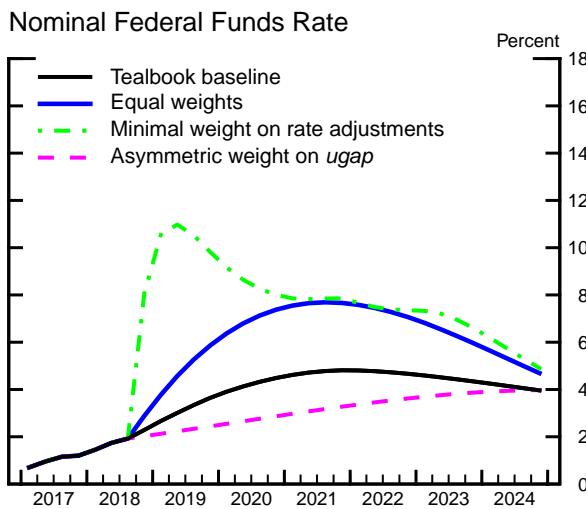
Monetary Policy Strategies



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

Optimal Control Simulations under Commitment

Monetary Policy Strategies

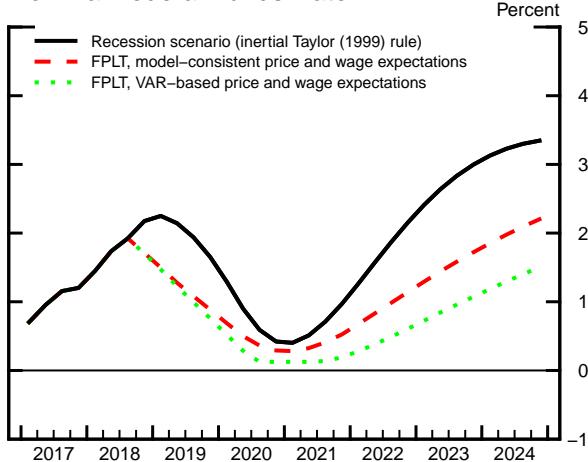


Note: Each set of lines corresponds to an optimal control policy under commitment in which policymakers minimize a discounted weighted sum of squared deviations of 4-quarter headline PCE inflation from the Committee's 2 percent objective, of squared deviations of the unemployment rate from the staff's estimate of the natural rate, and of squared changes in the federal funds rate. The weights vary across simulations. See the appendix for technical details and the box "Optimal Control and the Loss Function" in the June 2016 Tealbook B for a motivation.

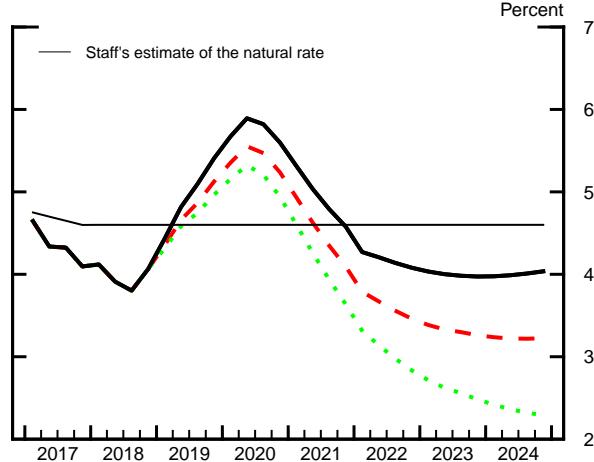
The Implications of Expectations for Flexible Price–Level Targeting

A Recession Scenario

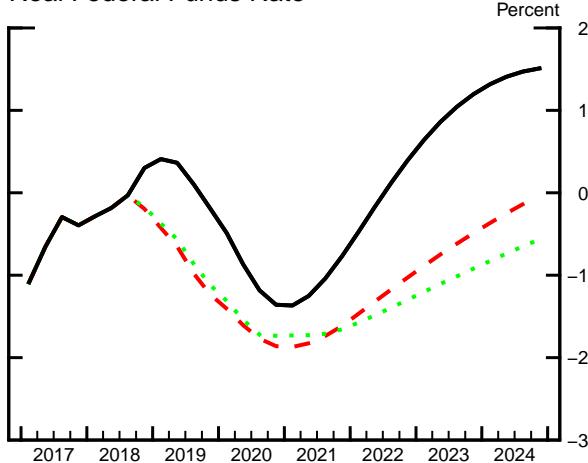
Nominal Federal Funds Rate



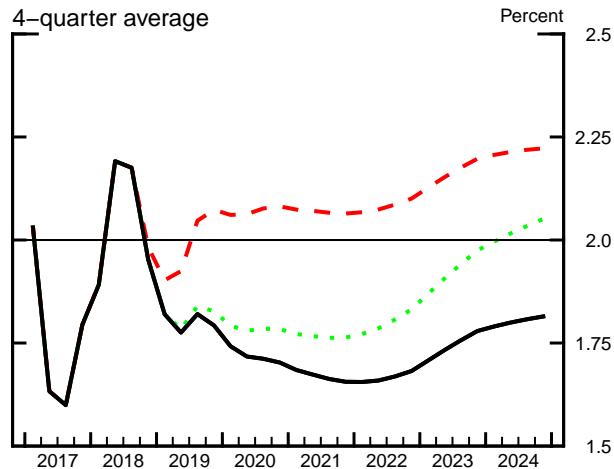
Unemployment Rate



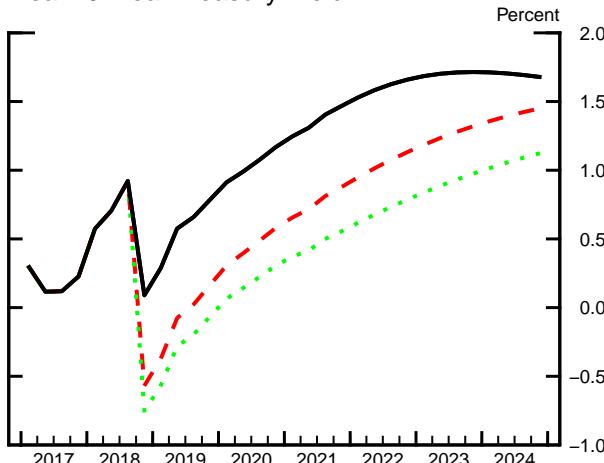
Real Federal Funds Rate



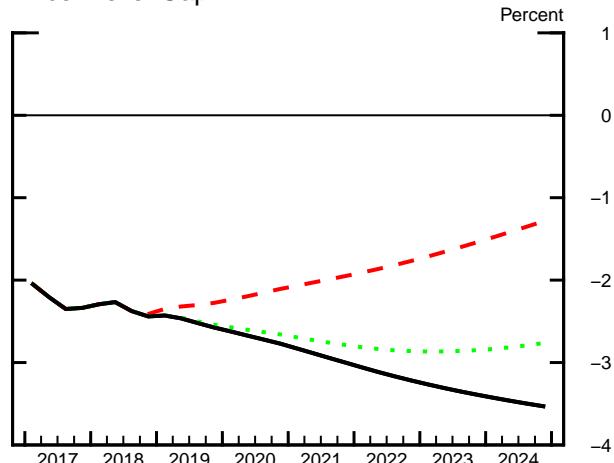
PCE Inflation



Real 10-Year Treasury Yield



Price–Level Gap



Note: The FPLT rule used herein responds to the unemployment gap with a coefficient of -1.85. We constructed the recession scenario in the FRB/US model by subjecting the Tealbook baseline to a sequence of negative spending shocks starting in the fourth quarter of 2018, the first quarter in the simulation.

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

Outcome and strategy	2018	2019	2020	2021	2022	2023	2024
<i>Nominal federal funds rate¹</i>							
Taylor (1999)	4.7	5.1	5.2	4.9	4.6	4.2	3.8
Taylor (1993)	3.5	4.2	4.4	4.3	4.0	3.8	3.6
First-difference	2.4	4.0	4.6	4.3	3.8	3.4	3.2
Flexible price-level targeting	1.8	1.8	2.3	2.8	3.0	3.1	3.2
Extended Tealbook baseline	2.3	3.6	4.5	4.8	4.7	4.3	4.0
<i>Real GDP</i>							
Taylor (1999)	3.0	1.9	2.0	1.6	1.4	1.3	1.3
Taylor (1993)	3.0	2.4	2.2	1.7	1.3	1.2	1.3
First-difference	3.0	2.6	2.2	1.7	1.4	1.2	1.3
Flexible price-level targeting	3.0	3.5	2.7	1.7	1.0	.8	1.2
Extended Tealbook baseline	3.0	2.4	1.9	1.4	1.2	1.2	1.3
<i>Unemployment rate¹</i>							
Taylor (1999)	3.6	3.5	3.5	3.5	3.6	3.8	4.0
Taylor (1993)	3.6	3.3	3.2	3.1	3.4	3.6	3.8
First-difference	3.6	3.2	3.1	3.1	3.3	3.5	3.7
Flexible price-level targeting	3.6	2.8	2.5	2.4	2.8	3.3	3.6
Extended Tealbook baseline	3.6	3.3	3.3	3.4	3.7	4.0	4.2
<i>Total PCE prices</i>							
Taylor (1999)	2.0	2.0	2.0	2.0	2.0	2.1	2.1
Taylor (1993)	2.0	2.1	2.1	2.1	2.2	2.3	2.3
First-difference	2.0	2.1	2.2	2.2	2.2	2.3	2.3
Flexible price-level targeting	2.0	2.2	2.2	2.2	2.2	2.3	2.3
Extended Tealbook baseline	2.0	2.0	1.9	1.9	2.0	2.1	2.1
<i>Core PCE prices</i>							
Taylor (1999)	1.9	2.1	2.1	2.1	2.1	2.2	2.2
Taylor (1993)	1.9	2.2	2.2	2.2	2.3	2.3	2.3
First-difference	1.9	2.2	2.2	2.3	2.3	2.3	2.3
Flexible price-level targeting	1.9	2.2	2.3	2.3	2.3	2.3	2.3
Extended Tealbook baseline	1.9	2.0	2.0	2.0	2.1	2.1	2.1

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

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

Outcome and strategy	2018		2019				2020	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
<i>Nominal federal funds rate¹</i>								
Taylor (1999)	1.9	4.7	4.7	4.8	4.9	5.1	5.1	5.1
Taylor (1993)	1.9	3.5	3.7	3.8	4.0	4.2	4.2	4.3
First-difference	1.9	2.4	2.9	3.3	3.7	4.0	4.2	4.4
Flexible price-level targeting	1.9	1.8	1.7	1.7	1.7	1.8	1.9	2.0
Extended Tealbook baseline	1.9	2.3	2.7	3.0	3.3	3.6	3.9	4.1
<i>Real GDP</i>								
Taylor (1999)	2.9	3.0	2.9	2.3	2.1	1.9	2.0	2.0
Taylor (1993)	2.9	3.0	3.0	2.6	2.5	2.4	2.4	2.3
First-difference	2.9	3.0	3.1	2.7	2.6	2.6	2.5	2.4
Flexible price-level targeting	2.9	3.0	3.3	3.2	3.3	3.5	3.3	3.1
Extended Tealbook baseline	2.9	3.0	3.1	2.6	2.5	2.4	2.2	2.1
<i>Unemployment rate¹</i>								
Taylor (1999)	3.8	3.6	3.7	3.6	3.6	3.5	3.5	3.5
Taylor (1993)	3.8	3.6	3.6	3.5	3.4	3.3	3.3	3.2
First-difference	3.8	3.6	3.5	3.4	3.3	3.2	3.2	3.2
Flexible price-level targeting	3.8	3.6	3.4	3.2	3.0	2.8	2.7	2.6
Extended Tealbook baseline	3.8	3.6	3.6	3.4	3.3	3.3	3.3	3.3
<i>Total PCE prices</i>								
Taylor (1999)	2.2	2.0	1.9	1.9	2.0	2.0	2.0	2.0
Taylor (1993)	2.2	2.0	1.9	1.9	2.1	2.1	2.1	2.1
First-difference	2.2	2.0	1.9	1.9	2.1	2.1	2.1	2.1
Flexible price-level targeting	2.2	2.0	1.9	2.0	2.1	2.2	2.2	2.2
Extended Tealbook baseline	2.2	2.0	1.9	1.9	2.0	2.0	1.9	1.9
<i>Core PCE prices</i>								
Taylor (1999)	2.0	1.9	1.9	1.9	2.0	2.1	2.0	2.0
Taylor (1993)	2.0	1.9	1.9	2.0	2.1	2.2	2.1	2.2
First-difference	2.0	1.9	2.0	2.0	2.1	2.2	2.2	2.2
Flexible price-level targeting	2.0	1.9	2.0	2.0	2.2	2.2	2.2	2.3
Extended Tealbook baseline	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0

1. Percent, average for the quarter.

Outcomes of Optimal Control Simulations under Commitment

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

Outcome and strategy	2018	2019	2020	2021	2022	2023	2024
<i>Nominal federal funds rate¹</i>							
Equal weights	2.9	5.9	7.4	7.7	7.1	6.0	4.7
Minimal weight on rate adjustments	8.1	9.8	8.0	7.9	7.4	6.6	4.9
Asymmetric weight on ugap	2.0	2.4	2.9	3.3	3.6	3.9	4.0
Extended Tealbook baseline	2.3	3.6	4.5	4.8	4.7	4.3	4.0
<i>Real GDP</i>							
Equal weights	3.0	1.2	1.1	1.2	1.4	1.7	1.5
Minimal weight on rate adjustments	3.0	-.1	1.4	1.7	1.7	1.8	1.5
Asymmetric weight on ugap	3.0	2.9	2.3	1.5	.9	.8	1.0
Extended Tealbook baseline	3.0	2.4	1.9	1.4	1.2	1.2	1.3
<i>Unemployment rate¹</i>							
Equal weights	3.6	3.8	4.2	4.4	4.5	4.6	4.6
Minimal weight on rate adjustments	3.6	4.6	4.6	4.6	4.5	4.5	4.5
Asymmetric weight on ugap	3.6	3.1	2.8	2.9	3.3	3.8	4.1
Extended Tealbook baseline	3.6	3.3	3.3	3.4	3.7	4.0	4.2
<i>Total PCE prices</i>							
Equal weights	2.0	1.8	1.7	1.7	1.8	1.9	1.9
Minimal weight on rate adjustments	2.0	1.8	1.7	1.7	1.8	1.9	1.9
Asymmetric weight on ugap	2.0	2.0	2.0	2.0	2.0	2.1	2.1
Extended Tealbook baseline	2.0	2.0	1.9	1.9	2.0	2.1	2.1
<i>Core PCE prices</i>							
Equal weights	1.9	1.9	1.8	1.8	1.9	1.9	2.0
Minimal weight on rate adjustments	1.9	1.9	1.8	1.8	1.9	1.9	2.0
Asymmetric weight on ugap	1.9	2.1	2.1	2.1	2.1	2.1	2.1
Extended Tealbook baseline	1.9	2.0	2.0	2.0	2.1	2.1	2.1

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

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

Outcome and strategy	2018		2019				2020	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
<i>Nominal federal funds rate¹</i>								
Equal weights	1.9	2.9	3.8	4.6	5.3	5.9	6.4	6.8
Minimal weight on rate adjustments	1.9	8.1	10.5	11.0	10.5	9.8	9.2	8.6
Asymmetric weight on <i>ugap</i>	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.7
Extended Tealbook baseline	1.9	2.3	2.7	3.0	3.3	3.6	3.9	4.1
<i>Real GDP</i>								
Equal weights	2.9	3.0	2.8	2.1	1.6	1.2	1.1	1.0
Minimal weight on rate adjustments	2.9	3.0	2.3	1.2	.4	-.1	.2	.6
Asymmetric weight on <i>ugap</i>	2.9	3.0	3.2	2.9	2.9	2.9	2.8	2.6
Extended Tealbook baseline	2.9	3.0	3.1	2.6	2.5	2.4	2.2	2.1
<i>Unemployment rate¹</i>								
Equal weights	3.8	3.6	3.7	3.7	3.7	3.8	3.9	4.0
Minimal weight on rate adjustments	3.8	3.6	4.0	4.3	4.4	4.6	4.6	4.6
Asymmetric weight on <i>ugap</i>	3.8	3.6	3.5	3.3	3.2	3.1	3.0	2.9
Extended Tealbook baseline	3.8	3.6	3.6	3.4	3.3	3.3	3.3	3.3
<i>Total PCE prices</i>								
Equal weights	2.2	2.0	1.8	1.8	1.8	1.8	1.8	1.7
Minimal weight on rate adjustments	2.2	2.0	1.8	1.8	1.8	1.8	1.7	1.7
Asymmetric weight on <i>ugap</i>	2.2	2.0	1.9	1.9	2.0	2.0	2.0	2.0
Extended Tealbook baseline	2.2	2.0	1.9	1.9	2.0	2.0	1.9	1.9
<i>Core PCE prices</i>								
Equal weights	2.0	1.9	1.9	1.8	1.9	1.9	1.8	1.8
Minimal weight on rate adjustments	2.0	1.9	1.9	1.8	1.8	1.9	1.8	1.8
Asymmetric weight on <i>ugap</i>	2.0	1.9	1.9	1.9	2.0	2.1	2.0	2.1
Extended Tealbook baseline	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0

1. Percent, average for the quarter.

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

	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate ¹	
Interval	09/14/18	10/25/18	09/14/18	10/25/18	09/14/18	10/25/18	09/14/18	10/25/18	09/14/18	10/25/18
<i>Quarterly</i>										
2018:Q1	4.3	4.3	2.2	2.2	2.5	2.5	2.2	2.2	4.1	4.1
Q2	8.1	7.6	4.7	4.2	1.9	2.0	2.1	2.1	3.9	3.9
Q3	4.7	4.3	3.0	2.9	1.5	1.5	1.5	1.5	3.8	3.8
Q4	4.4	4.6	2.5	2.6	2.1	1.9	1.8	1.8	3.7	3.6
2019:Q1	4.8	4.7	2.7	2.6	2.0	2.1	2.1	2.2	3.6	3.6
Q2	5.1	4.9	2.6	2.4	1.9	2.0	2.0	2.0	3.4	3.4
Q3	4.6	4.4	2.4	2.3	1.9	1.9	2.0	2.0	3.3	3.3
Q4	4.3	4.2	2.3	2.2	1.9	1.9	2.0	2.0	3.3	3.3
2020:Q1	4.2	4.1	2.1	2.0	2.0	2.0	2.1	2.0	3.3	3.3
Q2	4.4	4.3	2.0	1.9	2.0	1.9	2.1	2.0	3.2	3.3
Q3	4.0	4.1	1.8	1.9	2.0	1.9	2.1	2.1	3.2	3.3
Q4	3.8	3.8	1.7	1.8	2.0	1.9	2.1	2.1	3.2	3.3
<i>Two-quarter²</i>										
2018:Q2	6.2	5.9	3.4	3.2	2.2	2.2	2.1	2.1	-2	-2
Q4	4.5	4.5	2.8	2.8	1.8	1.7	1.6	1.7	-2	-3
2019:Q2	5.0	4.8	2.7	2.5	2.0	2.0	2.1	2.1	-3	-2
Q4	4.5	4.3	2.4	2.2	1.9	1.9	2.0	2.0	-1	-1
2020:Q2	4.3	4.2	2.1	2.0	2.0	1.9	2.1	2.0	-1	0
Q4	3.9	4.0	1.8	2.0	1.9	1.9	2.1	2.1	0	0
<i>Four-quarter³</i>										
2017:Q4	4.5	4.5	2.5	2.5	1.8	1.8	1.6	1.6	-6	-6
2018:Q4	5.3	5.2	3.1	3.0	2.0	1.9	1.9	1.9	-4	-5
2019:Q4	4.7	4.6	2.5	2.4	1.9	2.0	2.0	2.0	-4	-3
2020:Q4	4.1	4.1	1.9	1.9	2.0	1.9	2.1	2.0	-1	0
2021:Q4	3.6	3.5	1.5	1.4	2.0	1.9	2.1	2.0	.2	.1
<i>Annual</i>										
2017	4.2	4.2	2.2	2.2	1.8	1.8	1.6	1.6	4.4	4.4
2018	5.3	5.1	2.9	2.8	2.1	1.9	1.9	1.9	3.9	3.9
2019	4.9	4.8	2.8	2.6	1.9	1.9	2.0	2.0	3.4	3.4
2020	4.3	4.2	2.1	2.1	2.0	1.9	2.1	2.0	3.2	3.3
2021	3.7	3.7	1.6	1.6	2.0	1.9	2.1	2.0	3.3	3.4

- 1. Level, except for two-quarter and four-quarter intervals.
- 2. Percent change from two quarters earlier; for unemployment rate, change is in percentage points.
- 3. Percent change from four quarters earlier; for unemployment rate, change is in percentage points.

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

Item	2018			2019			2020			2018 ¹			2019 ¹			2020 ¹		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2018 ¹	2019 ¹	2020 ¹	2021 ¹			
Real GDP <i>Previous Tealbook</i>	4.2 4.7	2.9 3.0	2.6 2.5	2.6 2.7	2.4 2.6	2.3 2.5	2.2 2.1	2.0 2.1	1.9 2.0	1.9 1.8	1.8 1.7	3.0 3.1	2.4 2.5	1.9 1.9	1.4 1.5			
Final sales <i>Previous Tealbook</i>	5.4 5.6	1.1 1.8	3.0 2.8	2.8 2.9	2.5 2.6	2.1 2.3	2.1 2.3	2.0 2.1	1.9 2.0	1.7 1.9	1.9 1.9	2.9 3.0	2.4 2.5	1.9 1.9	1.6 1.6			
Priv. dom. final purch. <i>Previous Tealbook</i>	4.3 4.6	3.0 2.8	3.3 3.4	2.9 3.3	2.6 3.2	2.3 2.9	2.2 2.6	2.1 2.4	1.9 2.3	1.9 2.2	1.9 2.1	3.1 3.2	2.5 3.0	2.0 2.3	2.0 2.3	1.7 1.9		
Personal cons. expend. <i>Previous Tealbook</i>	3.8 4.2	3.2 2.9	2.7 2.7	2.7 2.8	2.4 2.8	2.3 2.8	2.2 2.7	2.2 2.5	2.2 2.4	2.1 2.3	2.1 2.4	2.5 2.6	2.4 2.6	2.2 2.5	2.2 2.5	2.2 2.5	1.9 2.1	
Durables	8.6	4.5	6.1	3.2	1.9	1.8	1.7	1.7	1.6	1.6	1.5	4.2	2.1	1.6	1.3			
Nondurables	4.0	4.8	3.7	3.3	2.5	2.4	2.3	2.3	2.3	2.2	2.2	3.1	2.6	2.3	2.3	2.0		
Services	3.0	2.6	1.8	2.5	2.5	2.3	2.3	2.2	2.3	2.2	2.2	2.1	2.4	2.2	2.2	2.2	1.9	
Residential investment <i>Previous Tealbook</i>	-1.3 -1.8	-5.2 -2.1	-1.3 -.2	-3 5.1	.7 5.8	.5 2.2	1.0 .4	.6 .7	.2 .4	.3 .2	.5 .3	-2.8 -1.9	.5 .4	.4 .4	.4 .4	1.6 1.3		
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	8.7 8.9	4.0 3.7	7.6 7.9	4.8 5.2	4.0 4.4	3.0 3.4	2.4 2.3	1.7 1.9	1.5 1.7	1.4 1.7	1.3 1.6	7.9 8.0	3.6 3.8	1.5 1.7	.8 .9			
Equipment & intangibles <i>Previous Tealbook</i>	7.1 7.3	7.4 4.1	8.3 8.8	5.3 5.7	4.3 4.9	3.2 3.7	2.6 2.6	2.1 2.2	2.0 2.1	1.9 2.3	1.9 2.3	8.4 7.7	3.9 7.7	2.0 4.2	1.7 2.2	1.7 2.2		
Nonres. structures <i>Previous Tealbook</i>	14.5 14.4	-6.5 2.5	5.4 5.2	3.1 3.5	3.1 2.8	2.4 2.2	1.9 1.4	.3 .8	.2 .2	.5 .4	.8 .7	6.5 8.9	2.6 2.5	-.3 .5	-2.1 .0	-1.8		
Net exports ² <i>Previous Tealbook²</i>	-841 -844	-939 -887	-945 -907	-944 -920	-952 -952	-967 -984	-973 -1001	-979 -1019	-990 -1042	-1007 -1075	-1004 -1083	-907 -885	-959 -964	-995 -1055	-1018 -1121			
Exports	9.3	-2.6	3.4	2.7	2.4	2.6	2.1	2.6	2.9	3.0	3.2	3.3	2.5	2.9	3.2			
Imports	-.6	9.9	3.1	1.9	2.7	3.6	2.2	2.5	3.3	4.1	1.9	3.8	2.6	3.0	2.8			
Gov't. cons. & invest. <i>Previous Tealbook</i>	2.5 2.4	2.1 1.1	1.8 1.6	1.8 1.5	1.6 1.5	2.0 1.8	2.0 2.0	1.7 1.6	2.0 2.3	1.9 1.8	1.1 1.1	2.0 1.7	1.9 1.8	1.7 1.7	1.1 1.1			
Federal	3.7	2.3	2.6	2.7	2.8	3.3	3.5	3.0	3.8	3.4	1.2	2.8	3.1	2.9	1.2			
Defense	6.0	3.0	3.4	3.0	3.0	3.9	4.1	3.3	4.4	3.3	1.0	3.8	3.5	3.0	1.0			
Nonddefense	.5	1.3	1.5	2.3	2.6	2.5	2.6	2.6	3.0	3.6	1.6	1.4	2.5	2.7	1.6			
State & local	1.8	1.9	1.3	1.2	1.3	1.1	1.1	1.0	1.0	1.0	1.0	1.5	1.2	1.0	1.0	1.0		
Change in priv. inventories ² <i>Previous Tealbook²</i>	-37 -23	56 37	33 21	20 14	19 19	27 29	29 31	30 31	32 31	41 39	33 29	21 16	24 23	34 32	15 16			

1. Change from fourth quarter of previous year to fourth quarter of year indicated.
2. Billions of chained (2012) dollars; annual values show annual averages.

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

Item	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Real GDP <i>Previous Tealbook</i>	1.5	2.6	2.7	2.0	1.9	2.5	3.0	2.4	1.9	1.4
Final sales <i>Previous Tealbook</i>	1.9	2.0	3.0	1.9	2.1	2.6	2.9	2.4	1.9	1.6
Priv. dom. final purch. <i>Previous Tealbook</i>	2.6	2.6	4.3	2.7	2.7	3.3	3.1	2.5	2.0	1.6
Personal cons. expend. <i>Previous Tealbook</i>	1.6	1.9	3.8	3.0	2.8	2.7	2.5	2.4	2.2	1.9
Durables	1.6	1.9	3.8	3.0	2.8	2.7	2.6	2.8	2.5	2.1
Nondurables	6.3	5.0	9.2	6.0	6.8	7.7	4.2	2.1	1.6	1.3
Services	.7	2.8	3.0	3.0	2.0	3.0	3.1	2.6	2.3	2.0
Residential investment <i>Previous Tealbook</i>	15.4	7.1	7.8	8.9	4.5	3.8	-2.8	.5	.4	1.6
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	5.6	5.4	6.4	-.7	1.8	6.3	7.9	3.6	1.5	.8
Equipment & intangibles <i>Previous Tealbook</i>	5.6	5.4	6.4	-.7	1.8	6.3	8.0	3.8	1.7	.9
Nonres. structures <i>Previous Tealbook</i>	6.1	5.1	5.6	2.6	1.6	7.3	8.4	3.9	2.0	1.7
Net exports ¹ <i>Previous Tealbook</i>	-569	-533	-578	-725	-786	-859	-907	-959	-995	-1018
Exports	2.1	6.0	3.0	-1.6	.8	4.7	3.3	2.5	2.9	3.2
Imports	.6	3.0	6.7	3.4	3.1	5.4	3.8	2.6	3.0	2.8
Gov't. cons. & invest. <i>Previous Tealbook</i>	-2.1	-2.4	.2	2.2	.9	.1	2.0	1.9	1.7	1.1
Federal	-2.1	-2.4	.2	2.2	.9	.1	1.7	1.8	1.7	1.1
Defense	-2.6	-6.1	-1.2	1.2	.2	1.3	2.8	3.1	2.9	1.2
Nondefense	-4.7	-6.5	-3.6	-.2	-.7	1.3	3.8	3.5	3.0	1.0
State & local	1.2	-5.5	2.7	3.4	1.5	1.3	1.4	2.5	2.7	1.6
Change in priv. inventories ¹ <i>Previous Tealbook</i>	71	109	87	129	23	23	21	24	34	15
	71	109	87	129	23	16	23	32	32	16

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

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

Item	2018			2019			2020			2018 ¹			2019 ¹			2020 ¹			2021 ¹		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2018 ¹	2019 ¹	2020 ¹	2021 ¹	2018 ¹	2019 ¹	2020 ¹	2021 ¹		
Real GDP <i>Previous Tealbook</i>	4.2 4.7	2.9 3.0	2.6 2.5	2.6 2.7	2.4 2.6	2.3 2.4	2.2 2.3	2.0 2.1	1.9 2.0	1.9 1.8	1.8 1.7	3.0 3.1	2.4 2.5	1.9 1.9	1.4 1.5						
Final sales <i>Previous Tealbook</i>	5.3 5.6	1.1 1.9	3.0 2.8	2.8 2.9	2.5 2.5	2.1 2.3	2.1 2.3	2.0 2.1	1.9 2.0	1.7 1.7	1.9 1.9	2.9 3.0	2.4 2.5	1.9 1.9	1.6 1.6						
Priv. dom. final purch. <i>Previous Tealbook</i>	3.7 4.0	2.5 2.4	2.8 2.9	2.5 2.8	2.2 2.7	2.0 2.5	1.9 2.2	1.8 2.1	1.7 2.0	1.7 1.9	1.6 1.8	2.7 2.7	2.2 2.6	1.7 1.9	1.4 1.6						
Personal cons. expend. <i>Previous Tealbook</i>	2.6 2.9	2.2 2.0	1.8 1.9	1.8 1.9	1.7 1.9	1.6 1.9	1.5 1.8	1.5 1.7	1.5 1.6	1.5 1.6	1.4 1.6	1.7 1.8	1.6 1.8	1.6 1.9	1.5 1.7						
Durables Nondurables Services	.6 .6 1.4	.3 .7 1.2	.4 .5 .9	.2 .5 1.2	.1 .4 1.1	.1 .3 1.1	.1 .3 1.1	.1 .3 1.1	.1 .3 1.1	.1 .3 1.0	.1 .3 1.0	.3 .3 1.0	.3 .4 1.0	.2 .4 1.1	.1 .3 1.0	.1 .3 1.0	.1 .3 1.0	.1 .3 1.0			
Residential investment <i>Previous Tealbook</i>	-1 -1	-2 0	0 .2	0 .2	0 .1	0 .1	0 .0	0 .0													
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	1.2 1.2	.5 .5	1.0 1.1	.7 .7	.6 .6	.4 .5	.3 .3	.2 .2	.1 .1	.5 .5	.2 .2	.1 .1	.1 .1								
Equipment & intangibles <i>Previous Tealbook</i>	.7 .8	.9 .4	.6 .9	.6 .6	.5 .5	.3 .4	.3 .3	.2 .2	.4 .4	.2 .2	.2 .2	.2 .2	.2 .2								
Nonres. structures <i>Previous Tealbook</i>	.4 .4	-.2 .1	.2 .2	.1 .1	.1 .1	.1 .1	.1 .0	.0 .0	.2 .1	.0 .1	.0 .1	.0 .0	.0 .0								
Net exports <i>Previous Tealbook</i>	1.2 1.2	-1.8 -.8	-.1 -.3	0 -.2	-.1 -.5	-.2 -.3	-.1 -.3	-.1 -.4	-.2 -.5	-.1 -.3	-.3 -.4	-.1 -.5	-.1 -.6	-.1 -.6	-.2 -.6	-.1 -.4	-.1 -.4	-.1 -.4	0 -.4		
Gov't. cons. & invest. <i>Previous Tealbook</i>	.4 .4	.4 .2	.3 .2	.3 .2																	
Federal Defense Nondefense State & local	.2 .2 .0 .2	.2 .1 .0 .1	.2 .1 .1 .1																		
Change in priv. inventories <i>Previous Tealbook</i>	-1.2 -.9	1.8 1.2	-.4 -.3	-.3 -.1	0 .1	.2 .2	0 .0	0 -.1													

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

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

Class II FOMC – Restricted (FR)

Authorized for Public Release

October 26, 2018

Item	2018			2019				2020				2019 ¹				2020 ¹		2021 ¹	
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2018 ¹	2019 ¹	2020 ¹	2021 ¹				
GDP chain-wt. price index	3.0	1.9	2.0	2.1	2.4	2.1	2.0	2.1	2.3	2.1	2.0	2.2	2.1	2.1	2.1	2.2	2.1	2.1	
<i>Previous Tealbook</i>	3.0	1.6	1.8	2.0	2.4	2.1	2.0	2.1	2.4	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	
PCE chain-wt. price index	2.0	1.5	1.9	2.1	2.0	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0	1.9	2.0	1.9	1.9	2.0	
<i>Previous Tealbook</i>	1.9	1.5	2.1	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	
Energy	.7	3.5	-4	.4	-.2	-.8	-.2	-1.0	-1.1	-1.2	-1.1	5.4	-2	-1.1	-1.0	-1.2	-1.2	-1.0	
<i>Previous Tealbook</i>	.6	5.0	7.9	1.0	-.8	-.9	-1.2	-1.2	-1.2	-1.3	-1.2	6.5	-.5	-1.2	-1.2	-1.2	-1.2	-1.0	
Food	.4	1.3	2.1	2.2	2.6	3.0	2.8	2.6	2.5	2.4	2.4	.8	2.5	2.6	2.6	2.6	2.6	2.3	
<i>Previous Tealbook</i>	1.2	.6	1.9	2.0	2.2	2.6	3.0	2.8	2.6	2.5	2.4	1.0	2.4	2.6	2.6	2.6	2.6	2.3	
Ex. food & energy	2.1	1.5	1.8	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.1	1.9	2.0	2.0	2.0	2.0	2.0	2.0	
<i>Previous Tealbook</i>	2.1	1.5	1.8	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	1.9	2.0	2.1	2.1	2.1	2.1	2.1	
Ex. food & energy, market based	2.2	1.2	1.6	2.1	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.7	1.9	1.9	1.9	1.9	1.9	1.9	
<i>Previous Tealbook</i>	2.2	1.2	1.7	1.9	1.8	1.8	1.8	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	
CPI	1.7	2.0	2.2	2.4	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	
<i>Previous Tealbook</i>	1.7	2.2	2.6	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.5	2.2	2.2	2.3	2.3	2.3	
Ex. food & energy	1.8	2.0	2.6	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.2	2.2	2.5	2.5	2.5	
<i>Previous Tealbook</i>	1.8	2.1	2.1	2.2	2.4	2.4	2.4	2.6	2.6	2.6	2.5	2.5	2.5	2.2	2.2	2.3	2.3	2.6	
ECI, hourly compensation ²	2.4	2.3	2.3	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.8	2.9	2.9	2.9	
<i>Previous Tealbook</i>	2.4	2.3	2.3	2.8	2.8	2.8	2.9	3.0	3.0	3.0	3.0	3.0	3.0	2.8	2.8	2.8	2.8	3.0	
Business sector																			
Output per hour																			
<i>Previous Tealbook</i>	3.4	1.4	1.1	.7	1.2	1.0	1.1	1.1	1.2	1.3	1.2	1.6	1.0	1.2	1.2	1.2	1.2	1.1	
Compensation per hour																			
<i>Previous Tealbook</i>	4.2	1.5	.8	1.3	1.2	1.1	1.0	1.1	1.2	1.2	1.2	1.8	1.1	1.1	1.2	1.2	1.2	1.1	
Unit labor costs																			
<i>Previous Tealbook</i>	2.3	3.4	3.2	3.9	3.9	4.0	4.1	4.1	4.0	4.0	4.0	3.3	4.0	4.0	4.0	4.0	4.0	3.9	
Core goods imports chain-wt. price index ³	.6	-2.2	-1.1	.1	.6	1.0	.9	.9	.8	.8	.7	.7	.0	.6	.6	.8	.8	.7	
<i>Previous Tealbook</i>	.5	-2.2	-.9	.2	.6	.6	.8	.8	.7	.7	.7	.0	.6	.6	.6	.8	.8	.7	

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

2. Private-industry workers.

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

Greensheets

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

Item	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
GDP chain-wt. price index <i>Previous Tealbook</i>	2.1	1.8	1.6	.9	1.5	2.0	2.2	2.1	2.1	2.1
PCE chain-wt. price index <i>Previous Tealbook</i>	1.8	1.2	1.2	.3	1.6	1.8	2.0	1.9	1.9	2.0
Energy <i>Previous Tealbook</i>	2.1	-2.9	-6.9	-16.4	2.1	8.1	5.4	-.2	-1.1	-1.0
Food <i>Previous Tealbook</i>	2.1	-2.9	-6.9	-16.4	2.1	8.1	6.5	-.5	-1.2	-.8
Ex. food & energy <i>Previous Tealbook</i>	1.3	.7	2.8	.3	-1.8	.7	.8	2.5	2.6	2.3
Ex. food & energy; market based <i>Previous Tealbook</i>	1.3	.7	2.8	.3	-1.8	.7	1.0	2.4	2.6	2.3
CPI <i>Previous Tealbook</i>	1.9	1.2	1.2	.4	1.8	2.1	2.3	2.3	2.3	2.3
Ex. food & energy <i>Previous Tealbook</i>	1.9	1.2	1.2	.4	1.8	2.1	2.5	2.2	2.3	2.3
ECI, hourly compensation ¹ <i>Previous Tealbook</i>	1.8	2.0	2.3	1.9	2.2	2.6	2.8	2.8	2.5	2.5
Business sector										
Output per hour <i>Previous Tealbook</i>	.2	1.8	.1	.7	1.1	.8	1.6	1.0	1.2	1.1
Compensation per hour <i>Previous Tealbook</i>	5.9	-.3	2.8	2.5	2.1	3.0	3.3	4.0	4.0	3.9
Unit labor costs <i>Previous Tealbook</i>	5.7	-2.0	2.7	1.8	1.0	2.3	1.7	2.9	2.7	2.7
Core goods imports chain-wt. price index ² <i>Previous Tealbook</i>	-4	-2.2	-4	-4.4	-7	1.1	.0	.6	.8	.7

1. Private-industry workers.

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

Other Macroeconomic Indicators

Item	2018			2019			2020			2018 ^l	2019 ^l	2020 ^l	2021 ^l
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3			
<i>Employment and production</i>													
Nonfarm payroll employment ²	217	190	201	187	171	163	149	136	123	114	110	206	167
Unemployment rate ³	3.9	3.8	3.6	3.6	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.6	3.3
<i>Previous Tealbook³</i>	3.9	3.8	3.7	3.6	3.4	3.3	3.3	3.2	3.2	3.2	3.3	3.3	3.4
Natural rate of unemployment ³	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
<i>Previous Tealbook³</i>	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Employment-to-Population Ratio ³	60.4	60.4	60.5	60.6	60.7	60.7	60.7	60.7	60.7	60.7	60.5	60.7	60.4
Employment-to-Population Trend ³	59.8	59.7	59.7	59.6	59.6	59.6	59.5	59.5	59.4	59.4	59.7	59.5	59.2
Output gap ⁴	1.8	2.2	2.4	2.6	2.7	2.9	3.0	3.0	3.0	2.9	2.4	3.0	2.9
<i>Previous Tealbook⁴</i>	1.8	2.2	2.4	2.7	2.9	3.0	3.2	3.2	3.2	3.2	3.2	3.2	2.7
Industrial production ⁵	5.3	3.3	2.0	1.5	2.2	2.0	1.8	1.7	1.1	1.1	.9	3.3	1.2
<i>Previous Tealbook⁵</i>	5.1	3.0	1.9	2.4	2.7	2.5	2.3	2.0	1.4	1.3	1.0	3.1	2.5
Manufacturing industr. prod. ⁵	2.3	2.8	1.9	.8	1.8	1.9	1.3	1.1	1.1	1.2	.8	2.2	1.5
<i>Previous Tealbook⁵</i>	2.3	2.8	2.5	2.0	2.7	3.0	2.4	1.7	1.5	1.4	1.0	2.4	2.5
Capacity utilization rate - mfg. ³	75.5	75.8	75.9	75.8	76.0	76.1	76.2	76.3	76.4	76.5	76.5	76.2	76.5
<i>Previous Tealbook³</i>	75.5	75.8	76.0	76.1	76.4	76.8	77.0	77.2	77.3	77.4	77.5	76.0	77.5
Housing starts ⁶	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.3
Light motor vehicle sales ⁶	17.2	16.9	17.1	17.0	17.0	17.0	17.0	16.9	16.8	16.8	16.7	17.1	16.8
<i>Income and saving</i>													
Nominal GDP ⁵	7.6	4.3	4.6	4.7	4.9	4.4	4.2	4.1	4.3	4.1	3.8	5.2	4.6
Real disposable pers. income ⁵	2.5	2.3	2.3	2.7	2.4	2.3	2.4	3.7	2.3	2.3	1.6	2.1	2.4
<i>Previous Tealbook⁵</i>	2.4	2.3	2.6	3.4	2.5	2.3	2.4	3.7	2.3	2.3	1.6	2.2	2.4
Personal saving rate ³	6.8	6.6	6.5	6.5	6.5	6.5	6.5	6.9	6.9	6.7	6.8	6.5	6.7
<i>Previous Tealbook³</i>	6.7	6.6	6.5	6.7	6.6	6.5	6.4	6.6	6.6	6.4	6.4	6.4	6.1
Corporate profits ⁷	12.5	8.9	3.8	1.3	2.4	-.6	-1.9	-1.6	1.7	1.1	-.1	7.5	.3
Profit share of GNP ³	10.8	11.0	11.0	10.9	10.9	10.7	10.6	10.4	10.4	10.3	10.2	11.0	10.6
Gross national saving rate ³	18.7	19.0	19.0	18.7	18.7	18.7	18.7	18.5	18.6	18.5	18.5	19.0	18.7
Net national saving rate ³	3.5	4.1	4.0	3.5	3.5	3.4	3.3	3.1	3.0	2.9	2.8	4.0	3.3

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Class II FOMC – Restricted (FR)

October 26, 2018

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

2.

Average monthly change, thousands.

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

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

Annual values are for the fourth quarter of the year indicated.

5. Percent change, annual rate.

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

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

Greensheets

Other Macroeconomic Indicators

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

Item	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<i>Employment and production</i>										
Nonfarm payroll employment ¹	179	192	250	226	195	182	206	167	121	82
Unemployment rate ²	7.8	7.0	5.7	5.0	4.7	4.1	3.6	3.3	3.3	3.4
<i>Previous Tealbook</i> ²	7.8	7.0	5.7	5.0	4.7	4.1	3.7	3.3	3.2	3.4
Natural rate of unemployment ²	5.6	5.4	5.1	4.9	4.8	4.6	4.6	4.6	4.6	4.6
<i>Previous Tealbook</i> ²	5.6	5.4	5.1	4.9	4.8	4.6	4.6	4.6	4.6	4.6
Employment-to-Population Ratio ²	58.7	58.5	59.3	59.4	59.8	60.1	60.5	60.7	60.4	60.4
Employment-to-Population Trend ²	60.3	60.2	60.1	60.0	59.9	59.8	59.7	59.5	59.4	59.2
Output gap ³	-3.7	-2.8	-8	-2	-4	1.2	2.4	3.0	2.9	2.4
<i>Previous Tealbook</i> ³	-3.7	-2.8	-8	-2	-4	1.2	2.4	3.2	3.2	2.7
Industrial production	2.2	2.3	3.4	-3.3	-5	3.0	3.3	1.9	1.2	5
<i>Previous Tealbook</i>	2.2	2.3	3.4	-3.3	-5	3.0	3.1	2.5	1.4	7
Manufacturing industr. prod.	1.4	1.1	1.4	-1.6	-1	1.9	2.2	1.5	1.1	4
<i>Previous Tealbook</i>	1.4	1.1	1.4	-1.6	-1	1.9	2.4	2.5	1.4	7
Capacity utilization rate - mfg. ²	74.7	75.1	76.3	75.4	74.4	75.2	75.9	76.2	76.5	76.5
<i>Previous Tealbook</i> ²	74.7	75.1	76.3	75.4	74.4	75.2	76.0	77.0	77.5	77.5
Housing starts ⁴	.8	.9	1.0	1.1	1.2	1.2	1.3	1.2	1.2	1.3
Light motor vehicle sales ⁴	14.4	15.5	16.5	17.4	17.5	17.1	17.1	17.0	16.8	16.6
<i>Income and saving</i>										
Nominal GDP	3.6	4.4	4.4	2.9	3.4	4.5	5.2	4.6	4.1	3.5
Real disposable pers. income	4.9	-2.5	5.2	3.1	1.6	2.8	2.9	2.4	2.4	1.9
<i>Previous Tealbook</i>	4.9	-2.5	5.2	3.1	1.6	2.8	2.9	2.7	2.4	1.8
Personal saving rate ²	10.2	6.3	7.4	7.4	6.4	6.3	6.5	6.5	6.8	6.7
<i>Previous Tealbook</i> ²	10.2	6.3	7.4	7.4	6.4	6.3	6.5	6.4	6.4	6.1
Corporate profits ⁵	7	3.9	5.9	-10.7	7.6	3.3	7.5	3	3	1
Profit share of GNP ²	11.9	11.8	12.0	10.4	10.8	10.7	11.0	10.6	10.2	9.9
Gross national saving rate ²	18.8	19.2	20.2	19.4	18.3	18.3	19.0	18.7	18.5	18.3
Net national saving rate ²	3.7	4.0	5.1	4.3	3.0	3.1	4.0	3.3	2.8	2.5

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	2016	2017	2018	2019	2020	2021	2018		2019	
							Q2	Q3	Q4	Q1
Unified federal budget¹										
Receipts	3,268	3,316	3,329	3,443	3,586	3,716	1,044	788	782	715
Outlays	3,853	3,982	4,108	4,407	4,752	5,037	1,051	960	1,117	1,119
Surplus/deficit	-585	-665	-779	-964	-1,66	-1,320	-7	-172	-335	-404
Surplus/deficit	-3.2	-3.5	-3.9	-4.5	-5.3	-5.7	-.1	-3.4	-6.5	-7.8
<i>Previous Tealbook</i>	-3.2	-3.5	-3.8	-4.4	-5.0	-5.5	-.1	-3.3	-6.5	-7.6
Primary surplus/deficit	-1.9	-2.1	-2.2	-2.7	-3.0	-3.3	.8	-2.2	-4.4	-5.9
Net interest	1.3	1.4	1.6	1.8	2.3	2.4	2.0	1.2	2.1	1.9
Cyclically adjusted surplus/deficit	-3.1	-3.7	-4.5	-5.7	-6.6	-7.1	-.9	-4.3	-7.5	-8.9
Federal debt held by public	76.4	76.1	77.9	78.0	80.3	83.3	77.4	77.9	78.6	78.5
Government in the NIPA²										
Purchases	.9	.1	2.0	1.9	1.7	1.1	2.5	2.1	1.8	1.8
Consumption	.9	-.1	1.5	1.3	1.2	.8	1.9	1.3	1.1	1.1
Investment	.7	1.4	4.1	4.3	3.4	2.1	5.3	5.3	4.5	4.3
State and local construction	1.8	-2.9	4.3	2.5	1.0	1.0	6.3	5.0	3.0	3.0
Real disposable personal income	1.6	2.8	2.9	2.4	2.4	1.9	2.4	2.3	2.3	2.7
Contribution from transfers ³	.3	.2	.5	.8	.6	.6	.4	.3	.4	1.7
Contribution from taxes ³	-.1	-.6	-.2	-.7	-.6	-.7	-.2	-.8	-.7	-.3
Government employment	3	-1	0	2	1	1	1	1	-0	2
Federal	14	3	8	9	9	9	7	7	19	7
State and local										9
Fiscal indicators²										
Fiscal effect (FE) ⁴	.4	.1	.5	.7	.6	.4	.6	.6	.6	.8
Discretionary policy actions (FI)	.3	.2	.7	.6	.5	.2	.8	.7	.7	.7
<i>Previous Tealbook</i>	.3	.2	.6	.6	.5	.2	.8	.5	.6	.6
Federal purchases	.0	.1	.2	.2	.2	.1	.2	.1	.2	.2
State and local purchases	.1	-.1	.2	.1	.1	.1	.2	.2	.1	.1
Taxes and transfers	.1	.1	.4	.3	.2	.0	.4	.4	.4	.4
Cyclical	-.1	-.1	-.2	-.2	-.1	.0	-.2	-.2	-.2	-.2
Other	.2	.1	.0	.3	.2	.2	.0	.1	.1	.3

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 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).

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

Measure and country	2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP¹												
Total foreign	3.0	2.0	2.5	2.6	2.6	2.7	2.9	2.5	2.7	2.7	2.7	2.7
<i>Previous Tealbook</i>	3.1	2.0	2.5	2.6	2.7	2.7	2.9	2.5	2.7	2.7	2.7	2.7
Advanced foreign economies	1.3	2.5	1.9	1.9	1.7	1.7	2.0	1.3	1.7	1.7	1.7	1.7
Canada	1.4	2.9	2.2	2.5	2.2	2.1	2.1	2.1	2.0	1.8	1.8	1.8
Japan	-9	3.0	.7	.5	.5	.7	3.1	-3.8	.9	.8	.8	.8
United Kingdom	.4	1.6	2.5	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7
Euro area	1.6	1.8	1.6	1.5	1.3	1.4	1.3	1.6	1.6	1.6	1.6	1.6
Germany	1.5	1.8	1.8	1.7	1.5	1.5	1.5	1.6	1.5	1.4	1.4	1.4
Emerging market economies	4.7	1.5	3.1	3.4	3.6	3.6	3.7	3.7	3.7	3.7	3.7	3.7
Asia	6.2	4.1	4.4	4.8	4.7	4.6	4.7	4.6	4.6	4.6	4.5	4.5
Korea	4.1	2.4	2.3	3.3	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0
China	7.2	6.5	5.9	6.3	6.2	6.1	6.1	6.0	6.0	5.9	5.9	5.9
Latin America	3.3	-1.0	1.8	2.1	2.6	2.8	2.9	2.9	2.9	2.9	2.9	2.9
Mexico	4.0	-.6	2.1	2.6	2.7	2.7	2.9	2.9	2.9	2.9	2.9	2.9
Brazil	.6	.7	4.0	2.3	2.5	2.5	2.8	2.8	2.8	2.8	2.8	2.8
<i>Consumer prices²</i>												
Total foreign	2.6	1.7	3.7	2.9	2.6	2.6	2.5	2.5	2.9	2.4	2.4	2.4
<i>Previous Tealbook</i>	2.7	1.7	3.5	2.7	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.4
Advanced foreign economies	2.6	1.0	2.5	2.1	1.8	1.6	1.7	2.6	1.6	1.7	1.7	1.7
Canada	3.6	1.1	2.6	2.4	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.0
Japan	2.5	-2.3	2.7	1.2	1.2	.9	1.0	6.3	1.0	1.0	1.0	1.0
United Kingdom	2.4	2.0	2.9	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.1
Euro area	2.0	2.2	2.5	2.3	1.6	1.4	1.4	1.5	1.5	1.5	1.5	1.6
Germany	1.2	2.5	2.5	2.8	2.5	2.1	2.2	2.3	2.3	2.3	2.2	2.2
Emerging market economies	2.7	2.2	4.6	3.5	3.2	3.2	3.1	3.1	3.0	2.9	2.9	2.9
Asia	1.8	1.0	3.1	2.7	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Korea	1.6	1.8	2.4	2.6	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1
China	1.5	.7	4.1	2.9	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Latin America	4.8	4.9	8.0	5.4	4.8	4.4	4.2	4.1	3.7	3.6	3.5	3.5
Mexico	4.1	3.8	6.8	3.9	3.7	3.5	3.3	3.3	3.2	3.2	3.2	3.2
Brazil	3.1	4.3	6.6	4.0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3

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

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

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

Class II FOMC – Restricted (FR)

Authorized for Public Release

October 26, 2018

Measure and country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Projected
Real GDP¹											
Total foreign	2.2	3.0	2.8	2.1	2.7	2.9	2.5	2.7	2.7	2.6	2.6
<i>Previous Tealbook</i>	2.2	3.0	2.8	2.1	2.7	2.9	2.5	2.7	2.7	2.6	2.6
Advanced foreign economies	3.3	2.5	2.0	1.2	1.9	2.6	1.9	1.7	1.7	1.7	1.7
Canada	.7	3.6	2.5	.3	2.0	3.0	2.3	2.1	1.8	1.8	1.8
Japan	.3	2.8	-.3	1.2	1.5	2.0	.8	.1	.8	.8	.8
United Kingdom	1.6	2.6	3.1	2.2	1.7	1.4	1.5	1.6	1.7	1.6	1.6
Euro area	-1.1	.7	1.6	2.0	2.1	2.7	1.6	1.4	1.6	1.6	1.6
Germany	.2	1.6	2.3	1.3	1.9	2.8	1.7	1.5	1.4	1.4	1.4
Emerging market economies	4.1	3.5	3.6	2.9	3.4	3.2	3.2	3.7	3.7	3.6	3.6
Asia	5.8	5.4	5.0	4.5	4.9	5.2	4.9	4.6	4.6	4.4	4.4
Korea	2.1	3.5	2.8	3.2	2.6	2.8	3.0	3.1	3.0	2.8	2.8
China	8.0	7.6	7.1	6.8	6.8	6.8	6.5	6.1	5.9	5.7	5.7
Latin America	2.9	1.7	2.5	1.6	2.1	1.5	1.5	2.8	2.9	2.9	2.9
Mexico	3.0	1.2	3.4	2.8	3.3	1.6	2.0	2.8	2.9	2.9	2.9
Brazil	2.2	2.6	-.1	-5.5	-2.1	2.1	1.9	2.6	2.8	2.8	2.8
<i>Consumer prices²</i>											
Total foreign	2.3	2.4	2.0	1.4	1.9	2.6	2.7	2.6	2.6	2.4	2.4
<i>Previous Tealbook</i>	2.3	2.4	2.0	1.4	1.9	2.6	2.6	2.7	2.7	2.4	2.4
Advanced foreign economies	1.3	1.0	1.2	.4	.9	1.5	2.1	1.9	1.7	1.7	1.7
Canada	1.0	1.0	2.0	1.3	1.4	1.8	2.4	2.3	2.1	2.0	2.0
Japan	-.2	1.4	2.6	.1	.3	.6	1.0	2.3	1.0	1.1	1.1
United Kingdom	2.6	2.1	.9	.1	1.2	3.0	2.4	2.3	2.2	2.1	2.1
Euro area	2.3	.8	.1	.2	.7	1.4	2.3	1.5	1.5	1.7	1.7
Germany	1.9	1.4	.4	.2	1.0	1.6	2.2	2.3	2.2	2.0	2.0
Emerging market economies	3.1	3.4	2.7	2.1	2.7	3.4	3.2	3.1	2.9	2.9	2.9
Asia	2.6	3.1	1.8	1.5	2.0	2.0	2.1	2.6	2.6	2.6	2.6
Korea	1.7	1.1	1.0	.9	1.5	1.5	2.1	2.1	2.1	2.1	2.1
China	2.1	2.9	1.5	2.1	1.8	2.3	2.5	2.5	2.5	2.5	2.5
Latin America	4.4	4.2	4.9	3.4	4.3	6.7	5.8	4.4	3.6	3.6	3.5
Mexico	4.1	3.6	4.2	2.3	3.3	6.6	4.6	3.4	3.2	3.2	3.2
Brazil	5.6	5.8	6.5	10.4	7.1	2.8	4.5	4.3	4.3	4.3	4.3

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

U.S. Current Account									
Quarterly Data									
	2018			2019			2020		
	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3
U.S. current account balance	-486.8	-405.8	-519.8	-564.7	-608.6	-638.3	-658.3	-691.5	-689.9
<i>Previous Tealbook</i>	-489.9	-409.4	-494.6	-551.8	-610.1	-638.2	-685.8	-720.9	-769.9
Current account as percent of GDP	-2.4	-2.0	-2.5	-2.7	-2.9	-2.9	-3.0	-3.0	-3.1
<i>Previous Tealbook</i>	-2.4	-2.0	-2.4	-2.6	-2.9	-3.0	-3.2	-3.3	-3.5
Net goods & services	-616.0	-535.2	-627.7	-633.6	-635.1	-620.6	-626.0	-630.2	-639.0
Investment income, net	258.2	256.9	224.9	181.8	148.4	122.6	104.7	85.0	69.4
Direct, net	310.4	309.9	309.4	295.7	284.4	281.0	287.0	291.2	298.2
Portfolio, net	-52.2	-53.0	-84.5	-113.9	-135.9	-158.4	-182.3	-206.2	-228.8
Other income and transfers, net	-129.1	-127.5	-117.0	-113.0	-121.9	-110.9	-117.0	-113.0	-117.0
Billions of dollars, s.a.a.r.									
Projected									
	2018	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
	2018	2019	2019	2020	2018	2019	2020	2020	2021
U.S. current account balance	-426.2	-349.5	-365.1	-409.7	-434.3	-449.1	-494.3	-628.5	-702.9
<i>Previous Tealbook</i>	-426.2	-349.5	-365.1	-409.7	-434.3	-449.1	-486.4	-663.8	-801.8
Current account as percent of GDP	-2.6	-2.1	-2.1	-2.2	-2.2	-2.3	-2.3	-2.4	-2.9
<i>Previous Tealbook</i>	-2.6	-2.1	-2.1	-2.2	-2.2	-2.3	-2.3	-2.4	-3.1
Net goods & services	-536.8	-461.9	-489.5	-500.4	-503.5	-552.3	-603.1	-628.0	-636.0
Investment income, net	216.1	215.4	229.0	214.7	205.7	235.1	230.5	115.2	48.8
Direct, net	285.5	283.3	284.2	284.6	272.6	298.4	306.4	285.9	312.1
Portfolio, net	-69.4	-67.9	-55.3	-70.0	-66.9	-63.3	-75.9	-170.7	-263.2
Other income and transfers, net	-105.5	-103.1	-104.6	-123.9	-136.6	-132.0	-121.7	-115.7	-115.7
Billions of dollars									
Projected									
	2012	2013	2014	2015	2016	2017	2018	2019	2020
	2012	2013	2014	2015	2016	2017	2018	2019	2021
U.S. current account balance	-426.2	-349.5	-365.1	-409.7	-434.3	-449.1	-494.3	-628.5	-702.9
<i>Previous Tealbook</i>	-426.2	-349.5	-365.1	-409.7	-434.3	-449.1	-486.4	-663.8	-801.8
Current account as percent of GDP	-2.6	-2.1	-2.1	-2.2	-2.2	-2.3	-2.3	-2.4	-2.9
<i>Previous Tealbook</i>	-2.6	-2.1	-2.1	-2.2	-2.2	-2.3	-2.3	-2.4	-3.1
Net goods & services	-536.8	-461.9	-489.5	-500.4	-503.5	-552.3	-603.1	-628.0	-636.0
Investment income, net	216.1	215.4	229.0	214.7	205.7	235.1	230.5	115.2	48.8
Direct, net	285.5	283.3	284.2	284.6	272.6	298.4	306.4	285.9	312.1
Portfolio, net	-69.4	-67.9	-55.3	-70.0	-66.9	-63.3	-75.9	-170.7	-263.2
Other income and transfers, net	-105.5	-103.1	-104.6	-123.9	-136.6	-132.0	-121.7	-115.7	-115.7
Billions of dollars									
Projected									
	2012	2013	2014	2015	2016	2017	2018	2019	2021
	2012	2013	2014	2015	2016	2017	2018	2019	2021

Abbreviations

ABS	asset-backed securities
AFE	advanced foreign economy
BBA	Bipartisan Budget Act of 2018
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BOC	Bank of Canada
BOE	Bank of England
BOJ	Bank of Japan
BOM	Bank of Mexico
CAP	cyclically adjusted primary
CD	certificate of deposit
C&I	commercial and industrial
CMBS	commercial mortgage-backed securities
CP	commercial paper
CPH	compensation per hour
CPI	consumer price index
CRE	commercial real estate
DSGE	dynamic stochastic general equilibrium
ECI	employment cost index
EFFR	effective federal funds rate
EME	emerging market economy
FI	fiscal impetus
FOMC	Federal Open Market Committee; also, the Committee
FPLT	flexible price-level targeting
FRB/US	A large-scale macroeconometric model of the U.S. economy

FX	foreign exchange
FY	fiscal year
GDP	gross domestic product
GFC	Global Financial Crisis
G-SIB	globally systemically important bank
IMF	International Monetary Fund
IOER	interest on excess reserves
IP	industrial production
IRA	individual retirement account
ISM	Institute for Supply Management
LFPR	labor force participation rate
LIBOR	London interbank offered rate
MBS	mortgage-backed securities
Michigan survey	University of Michigan Surveys of Consumers
MMF	money market fund
NAFTA	North American Free Trade Agreement
NBER	National Bureau of Economic Research
NIPA	national income and product accounts
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
PCE	personal consumption expenditures
PDFP	private domestic final purchases
PMI	purchasing managers index
PPI	producer price index
QS	quantitative surveillance
SCF	Survey of Consumer Finances
SCOOS	Senior Credit Officer Opinion Survey on Dealer Financing Terms

SEC	Securities and Exchange Commission
SEP	Summary of Economic Projections
SIGMA	A calibrated multicountry DSGE model
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SOMA	System Open Market Account
S&P	Standard & Poor's
SPF	Survey of Professional Forecasters
TCJA	Tax Cuts and Jobs Act
TIPS	Treasury Inflation-Protected Securities
USMCA	U.S.-Mexico-Canada Agreement
VAR	vector autoregression
VIX	one-month-ahead option-implied volatility on the S&P 500 index

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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 I FOMC – Restricted Controlled (FR)

Report to the FOMC on Economic Conditions and Monetary Policy

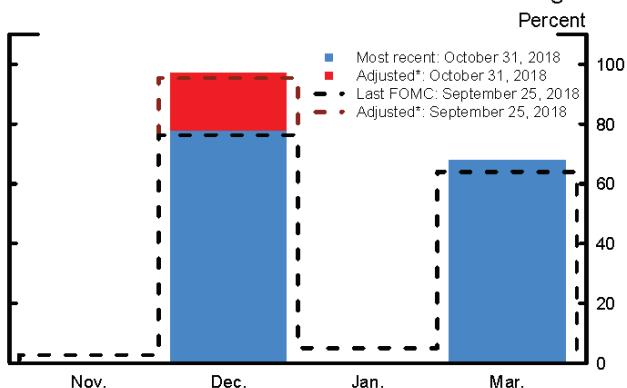


Book B Monetary Policy Alternatives

November 1, 2018

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 of a Rate Increase at Each of the Next Four FOMC Meetings

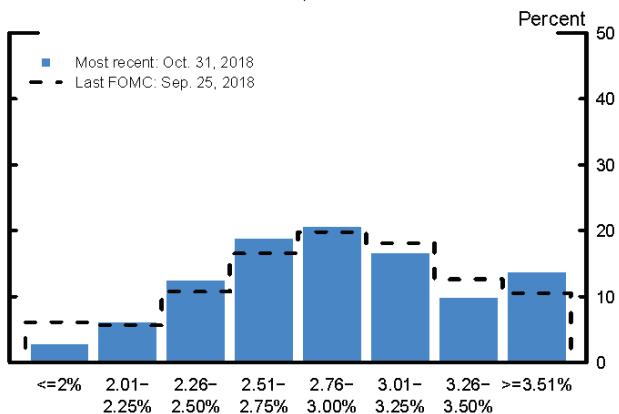


Note: Probabilities implied by a binomial tree fitted to settlement prices on federal funds futures contracts, assuming the policy action at each meeting is either no change or a 25-basis point increase in rates and no intermeeting moves.

*Adjusted under the assumption that the policy action for the December 2018 meeting is either no change or a 20-basis point increase in rates.

Source: CME Group; Federal Reserve Board staff estimates.

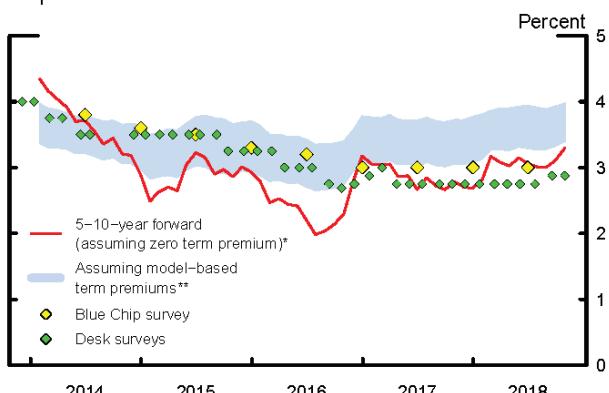
Figure 3: Market-Implied Probability Distribution of the Federal Funds Rate, Year-End 2019



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

Source: CME Group; Federal Reserve Board staff estimates.

Figure 5: Measures of Longer-Run Federal Funds Rate Expectations

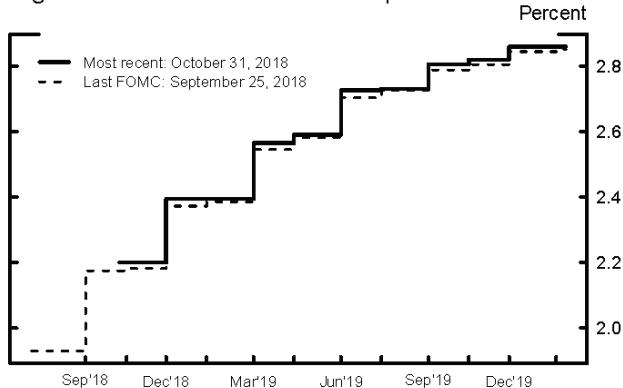


* Monthly average 5–10-year forward rate derived from prices of Treasury securities.

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

Source: Blue Chip, FRBNY; Board staff estimates.

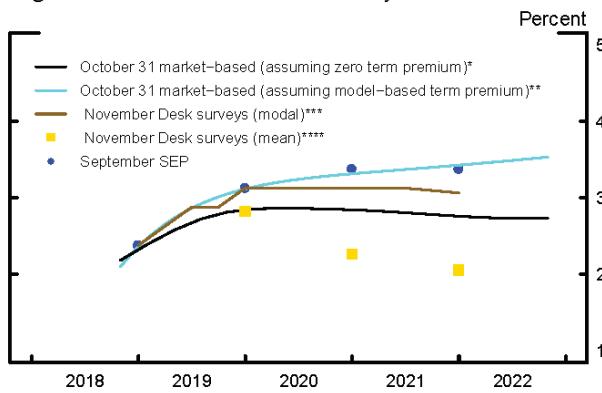
Figure 2: Federal Funds Rate Step Path



Note: Estimated from settlement prices on federal funds futures contracts, without adjusting for risk premiums, and assuming no intermeeting moves.

Source: CME Group; Federal Reserve Board staff estimates.

Figure 4: Federal Funds Rate Projections



* Estimated using overnight index swap quotes with a spline approach and without adjusting for term premiums.

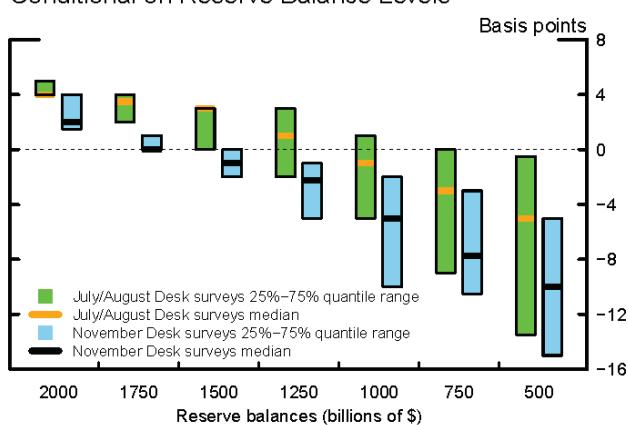
** Adjusting for premiums using a term structure model maintained by Board staff.

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

**** Calculated from averaging over individual respondents' year-end probability distributions.

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

Figure 6: Estimate of the IOER-EFFR Spread Conditional on Reserve Balance Levels



Source: FRBNY.

Redemptions and Reinvestments of SOMA Principal Payments

Projections for Treasury Securities
(Billions of dollars)

	Redemptions		Reinvestments	
	Period	Since Oct. 2017	Period	Since Oct. 2017
2018: Q4	72.1	247.1	29.3	224.3
2018	229.1	247.1	197.2	224.3
2019	270.8	517.9	114.2	338.5
2020	210.5	728.3	82.1	420.6
2021*	106.4	834.7	56.3	476.9

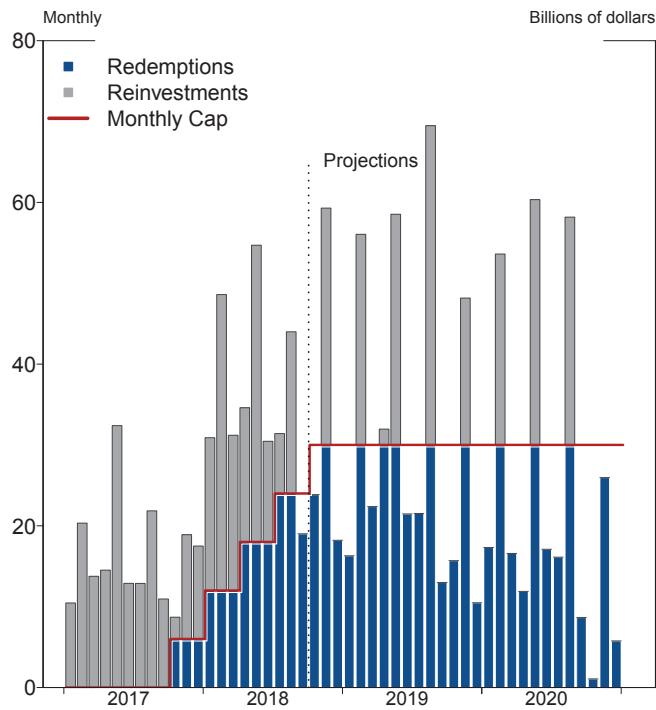
*Until projected normalization in August 2021.

Projections for Agency Securities
(Billions of dollars)

	Redemptions		Reinvestments	
	Period	Since Oct. 2017	Period	Since Oct. 2017
2018: Q4	43.6	163.6	0.0	152.0
2018	151.6	163.6	87.6	152.0
2019	153.4	317.0	0.0	152.0
2020	132.7	449.7	0.0	152.0
2021*	73.5	523.3	0.0	152.0

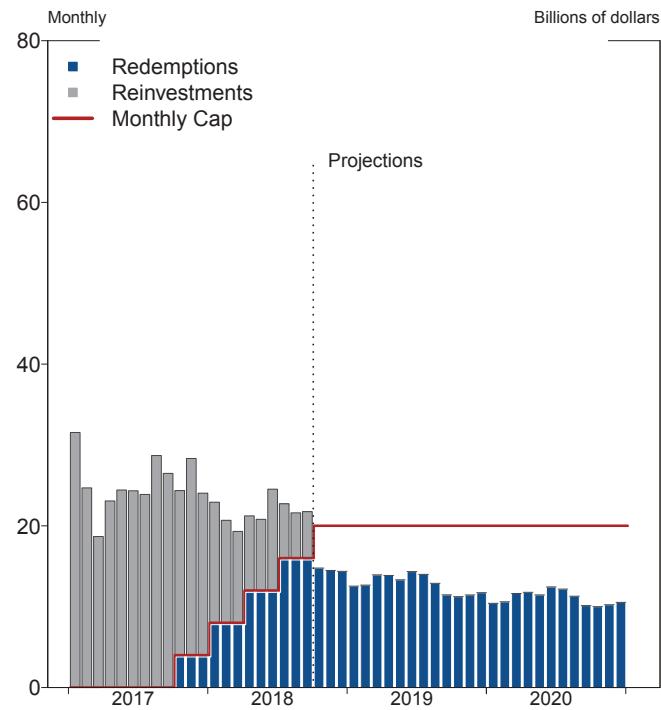
*Until projected normalization in August 2021.

SOMA Treasury Securities Principal Payments



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

SOMA Agency Debt and MBS Principal Payments

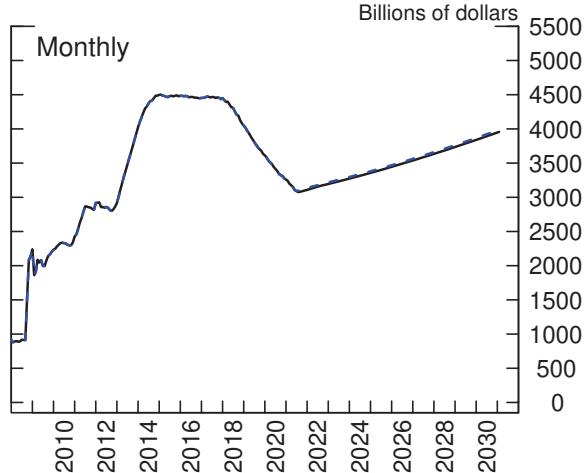


Note: Projection dependent on future interest rates and housing market developments.

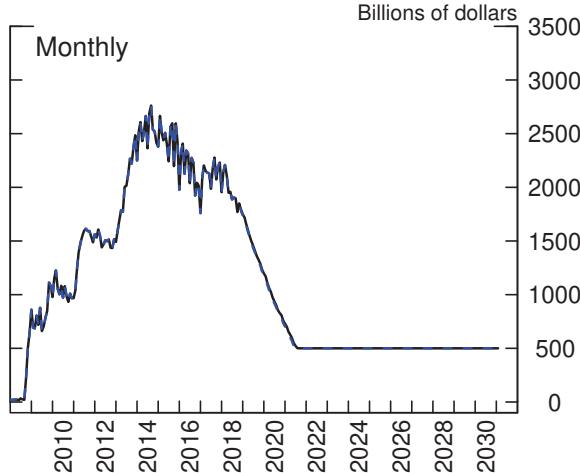
Total Assets and Selected Balance Sheet Items

— November Tealbook baseline - - September Tealbook baseline

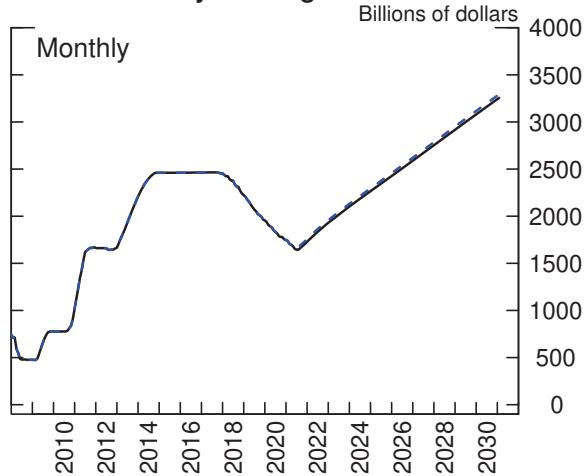
Total Assets



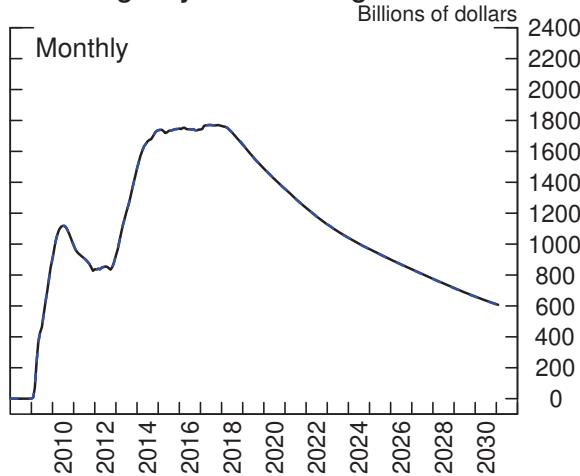
Reserve Balances



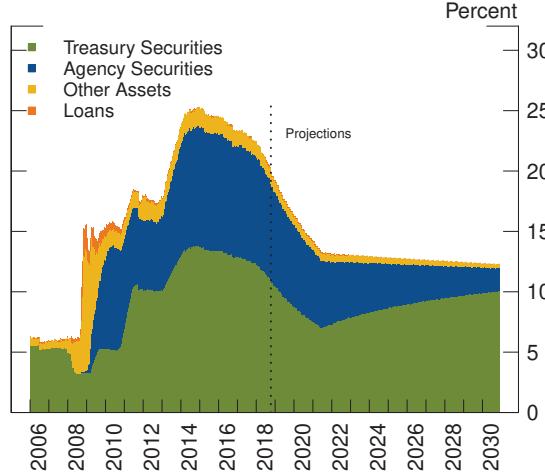
SOMA Treasury Holdings



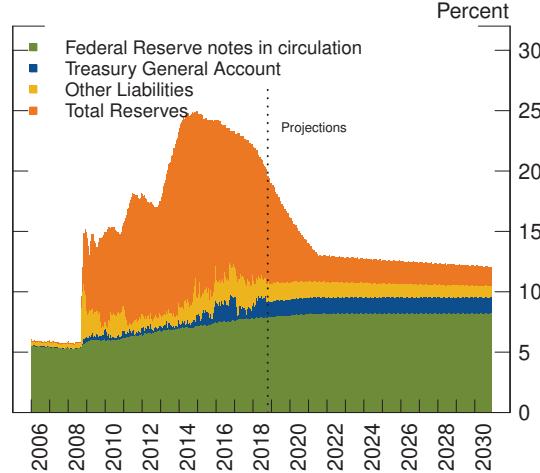
SOMA Agency MBS Holdings



Assets as a Share of GDP



Liabilities as a Share of GDP



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

	Historical*			Projections				
	Aug 2014	Sep 2017	Sep 2018	Dec 2018	Dec 2020	Dec 2022	Dec 2025	Dec 2030
Total assets	4,416	4,460	4,194	4,048	3,260	3,194	3,445	3,947
Selected assets								
Loans and other credit extensions**	2	6	0	0	0	0	0	0
Securities held outright	4,157	4,240	3,997	3,868	3,107	3,059	3,330	3,856
U.S. Treasury securities	2,437	2,465	2,313	2,223	1,748	1,929	2,427	3,242
Agency debt securities	42	7	2	2	2	2	2	2
Agency mortgage-backed securities	1,678	1,768	1,682	1,642	1,356	1,127	900	611
Unamortized premiums	209	162	145	140	111	90	69	43
Unamortized discounts	-19	-14	-14	-13	-10	-8	-7	-5
Total other assets	66	66	65	53	53	53	53	53
Total liabilities	4,360	4,419	4,155	4,009	3,221	3,151	3,395	3,884
Selected liabilities								
Federal Reserve notes in circulation	1,249	1,532	1,638	1,667	1,878	2,019	2,230	2,651
Reverse repurchase agreements	277	557	279	240	234	230	230	230
Deposits with Federal Reserve Banks	2,825	2,323	2,232	2,098	1,103	897	931	999
Reserve balances held by depository institutions	2,762	2,073	1,769	1,749	729	500	500	500
U.S. Treasury, General Account	49	159	385	279	304	327	361	429
Other deposits	15	91	78	70	70	70	70	70
Earnings remittances due to the U.S. Treasury	3	2	1	0	0	0	0	0
Total Federal Reserve Bank capital***	56	41	39	39	39	43	49	62

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

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

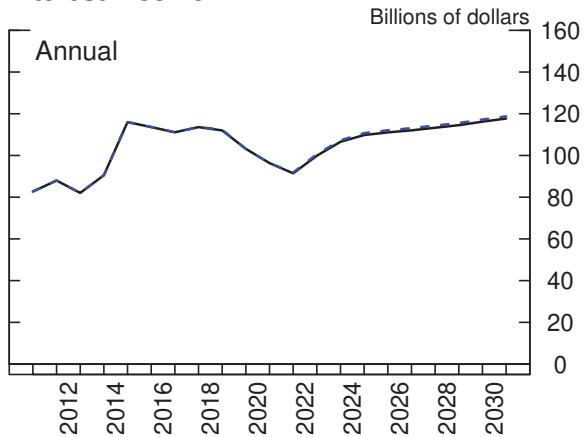
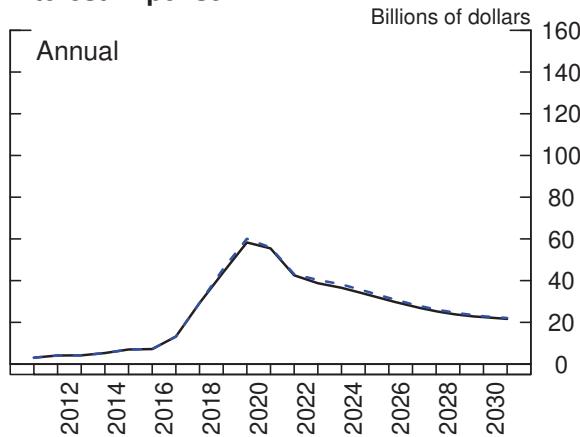
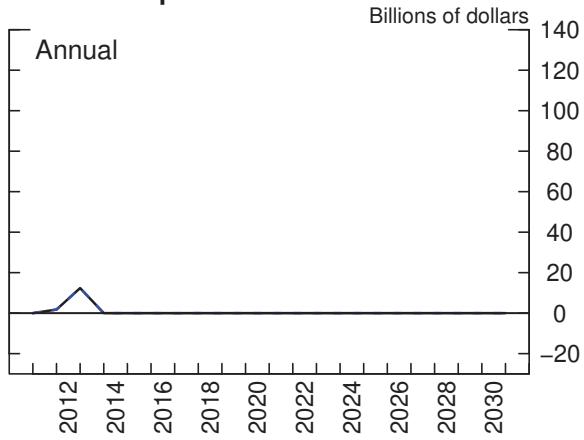
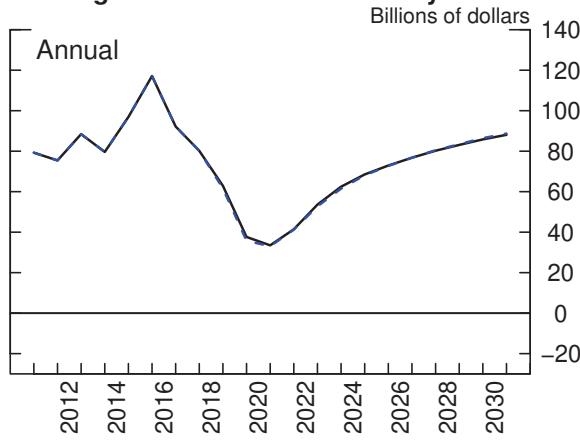
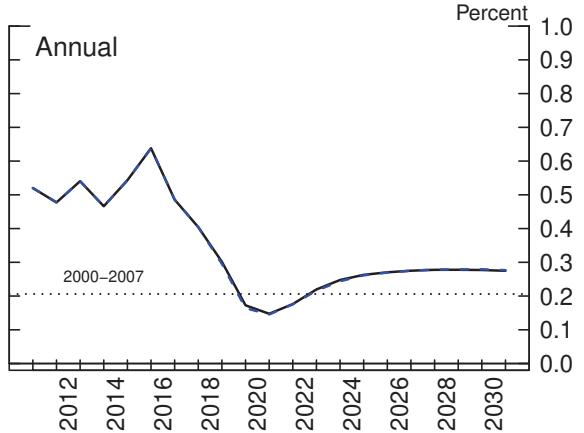
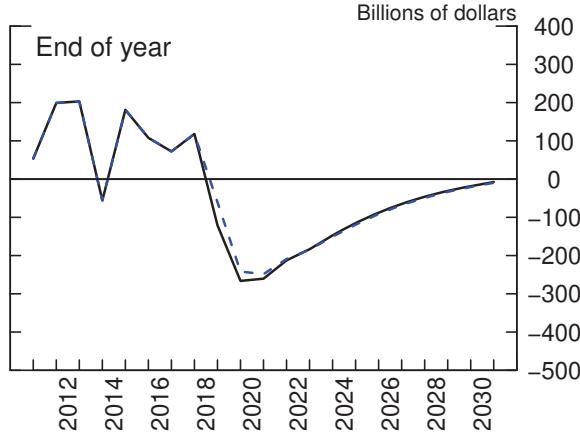
*August 2014 corresponds to the peak month-end value of reserve balances; September 2017 corresponds to the last month-end before the initiation of the normalization program; September 2018 is the most recent historical value.

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

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

Income Projections

— November Tealbook baseline - - September Tealbook baseline

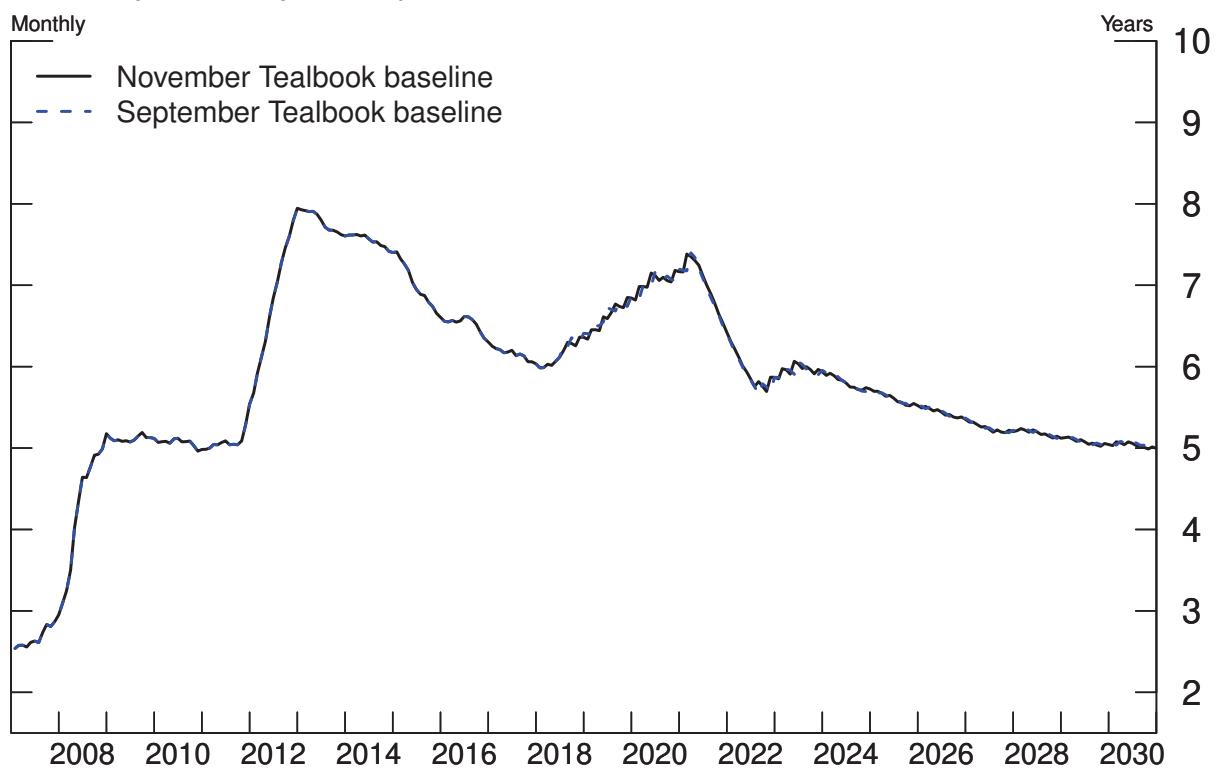
Interest Income**Interest Expense****Realized Capital Gains****Earnings Remittances to Treasury****Remittances as a Percent of GDP****Memo: Unrealized Gains/Losses**

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

Date	November Tealbook	September Tealbook
Quarterly Averages		
2018:Q4	-75	-75
2019:Q4	-65	-65
2020:Q4	-57	-58
2021:Q4	-52	-52
2022:Q4	-48	-49
2023:Q4	-45	-46
2024:Q4	-42	-43
2025:Q4	-39	-40
2026:Q4	-37	-38
2027:Q4	-35	-35
2028:Q4	-33	-34
2029:Q4	-31	-32
2030:Q4	-30	-30

* The figures show the estimated effects on the 10-year Treasury term premium resulting from the Federal Reserve's large-scale asset purchases.

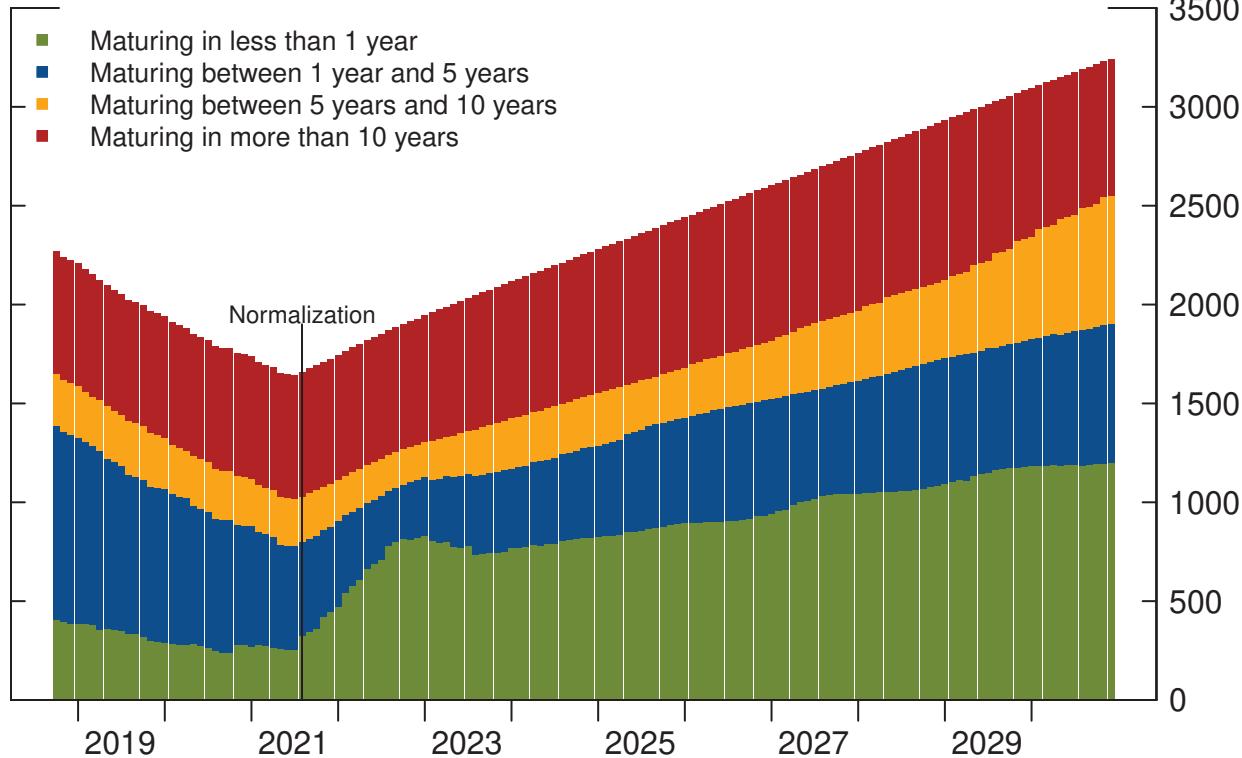
Projections for the Characteristics of SOMA Treasury Securities Holdings

SOMA Weighted-Average Treasury Duration

Balance Sheet & Income

Maturity Composition of SOMA Treasury Portfolio

November Tealbook baseline



Abbreviations

ABS	asset-backed securities
AFE	advanced foreign economy
BEA	Bureau of Economic Analysis, Department of Commerce
BHC	bank holding company
CDS	credit default swaps
CFTC	Commodity Futures Trading Commission
C&I	commercial and industrial
CLO	collateralized loan obligation
CMBS	commercial mortgage-backed securities
CPI	consumer price index
CRE	commercial real estate
DEDO	section in Tealbook A: “Domestic Economic Developments and Outlook”
Desk	Open Market Desk
DFMU	Designated Financial Market Utilities
ECB	European Central Bank
EFFR	effective federal funds rate
ELB	effective lower bound
EME	emerging market economy
EU	European Union
FAST Act	Fixing America’s Surface Transportation Act
FDIC	Federal Deposit Insurance Corporation
FOMC	Federal Open Market Committee; also, the Committee
GCF	general collateral finance
GDI	gross domestic income
GDP	gross domestic product
GSIBs	globally systemically important banking organizations
HQLA	high-quality liquid assets
IOER	interest on excess reserves

ISM	Institute for Supply Management
LIBOR	London interbank offered rate
LSAPs	large-scale asset purchases
MBS	mortgage-backed securities
MMFs	money market funds
NBER	National Bureau of Economic Research
NI	nominal income
NIPA	national income and product accounts
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
PCE	personal consumption expenditures
QS	Quantitative Surveillance
repo	repurchase agreement
RMBS	residential mortgage-backed securities
RRP	reverse repurchase agreement
SCOOS	Senior Credit Officer Opinion Survey on Dealer Financing Terms
SEP	Summary of Economic Projections
SFA	Supplemental Financing Account
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SOMA	System Open Market Account
TBA	to be announced (for example, TBA market)
TCJA	Tax Cuts and Jobs Act of 2017
TGA	U.S. Treasury's General Account
TIPS	Treasury inflation-protected securities
TPE	Term premium effects
ZLB	zero lower bound