

Prefatory Note

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

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

Class II FOMC – Restricted (FR)

Report to the FOMC on Economic Conditions and Monetary Policy



Book A

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

December 1, 2017

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

Comparing the Staff Projection with Other Forecasts

The staff's projection for real GDP growth is a little below the projections from both the Survey of Professional Forecasters (SPF) and the Blue Chip consensus in 2017 and similar to both of them in 2018. The staff's unemployment rate forecast is similar to the SPF and Blue Chip forecasts in 2017 and about ½ percentage point below them in 2018. The staff's projection for CPI inflation is above the Blue Chip and SPF forecasts in 2017 but in line with both in 2018. The staff's projections for overall PCE price inflation is a little higher than the SPF forecast in 2017 and similar in 2018, while the staff's projection for core PCE price inflation is similar to the SPF forecast in both years.

Comparison of Tealbook and Outside Forecasts

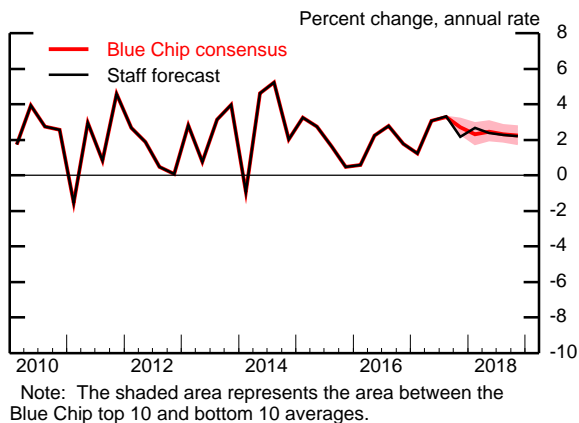
	2017	2018
GDP (Q4/Q4 percent change)		
December Tealbook	2.4	2.4
Blue Chip (11/10/17)	2.5	2.3
SPF median (11/13/17)	2.6	2.3
Unemployment rate (Q4 level)		
December Tealbook	4.1	3.6
Blue Chip (11/10/17)	4.2	4.0
SPF median (11/13/17)	4.2	4.0
CPI inflation (Q4/Q4 percent change)		
December Tealbook	2.1	2.0
Blue Chip (11/10/17)	1.8	2.1
SPF median (11/13/17)	1.8	2.1
PCE price inflation (Q4/Q4 percent change)		
December Tealbook	1.7	1.7
SPF median (11/13/17)	1.5	1.8
Core PCE price inflation (Q4/Q4 percent change)		
December Tealbook	1.5	1.8
SPF median (11/13/17)	1.4	1.8

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

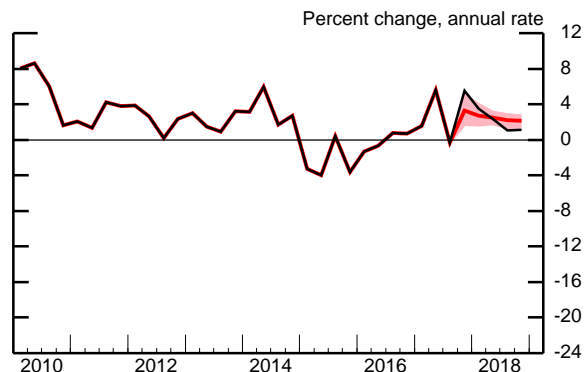
Source: Blue Chip Economic Indicators; Federal Reserve Bank of Philadelphia.

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

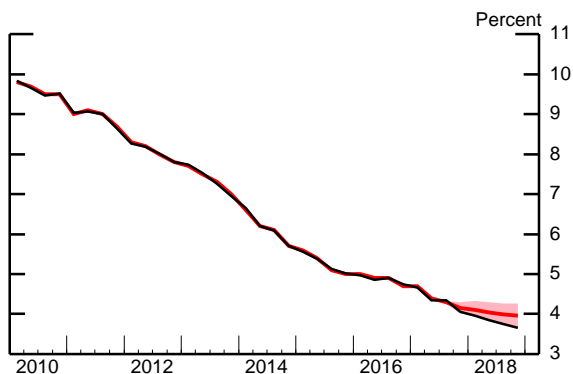
Real GDP



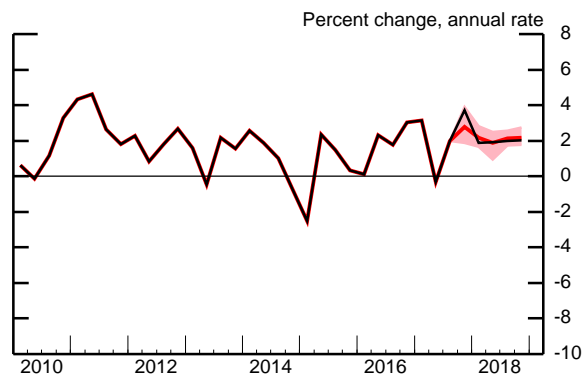
Industrial Production



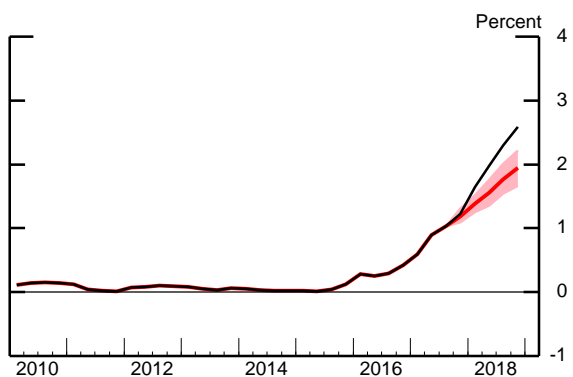
Unemployment Rate



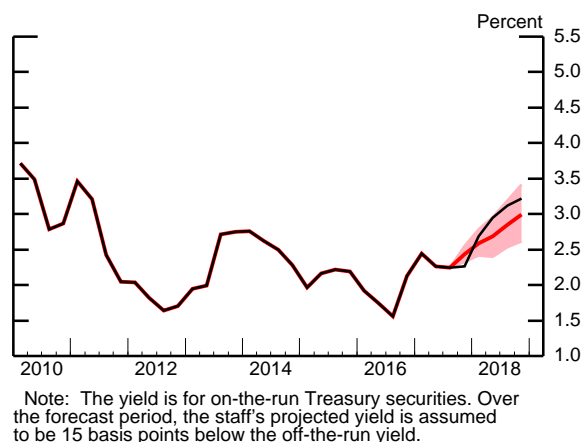
Consumer Price Index



Treasury Bill Rate



10-Year Treasury Yield



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

Revisions to the Staff Projection since the Previous SEP

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

GDP growth this year now looks to be a little weaker than it did in September. Nonetheless, we have upgraded our growth outlook slightly for next year and beyond, reflecting financial assumptions that are a little more supportive. The unemployment rate has again come in a bit lower than we had projected, and with a further reduction in our estimate of the natural rate of unemployment (to 4.7 percent), our projection for the unemployment rate over the medium term is revised down 0.2 percentage point relative to September. Thus, resource utilization, as measured by the unemployment gap or the output gap, is slightly tighter in this projection than in September.

Our projection for core PCE price inflation in 2017 is unrevised relative to the September Tealbook, while a rise in oil prices has pushed our projection for headline inflation higher in the near term. We continue to view this year's weak core inflation readings as being largely transitory, though we have reduced our core inflation projection for 2018 slightly since September. We continue to project that both total and core inflation will edge up further after next year and will reach 2 percent over the medium term.

With both resource utilization and inflation close to our September projections, the federal funds rate path from the intercept-adjusted inertial Taylor (1999) rule that we use in our baseline forecast is also close to that in the September Tealbook.

Staff Economic Projections Compared with the September Tealbook

Variable	2017		2017	2018	2019	2020	Longer run
	H1	H2					
Real GDP ¹	2.1	2.7	2.4	2.4	2.0	1.7	1.7
September Tealbook	2.3	3.0	2.6	2.3	1.9	1.6	1.7
Unemployment rate ²	4.4	4.1	4.1	3.6	3.5	3.5	4.7
September Tealbook	4.4	4.2	4.2	3.8	3.7	3.7	4.8
PCE inflation ¹	1.2	2.2	1.7	1.7	1.9	2.0	2.0
September Tealbook	1.2	1.9	1.5	1.9	2.0	2.0	2.0
Core PCE inflation ¹	1.4	1.6	1.5	1.8	2.0	2.0	n.a.
September Tealbook	1.4	1.6	1.5	1.9	2.0	2.0	n.a.
Federal funds rate ²	.95	1.25	1.25	2.50	3.46	4.00	2.50
September Tealbook	.95	1.42	1.42	2.62	3.47	3.93	2.50
Memo:							
Federal funds rate,							
end of period	1.13	1.26	1.26	2.52	3.47	4.01	2.50
September Tealbook	1.13	1.44	1.44	2.64	3.49	3.94	2.50
Output gap ^{2,3}	.8	1.3	1.3	2.1	2.3	2.1	n.a.
September Tealbook	.8	1.4	1.4	2.1	2.2	2.0	n.a.

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

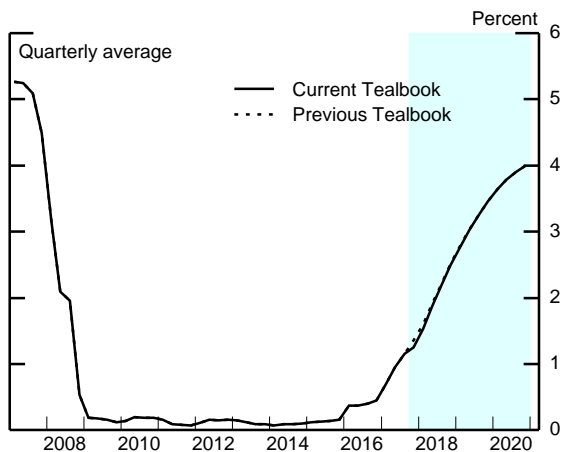
2. Percent, final quarter of period indicated.

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

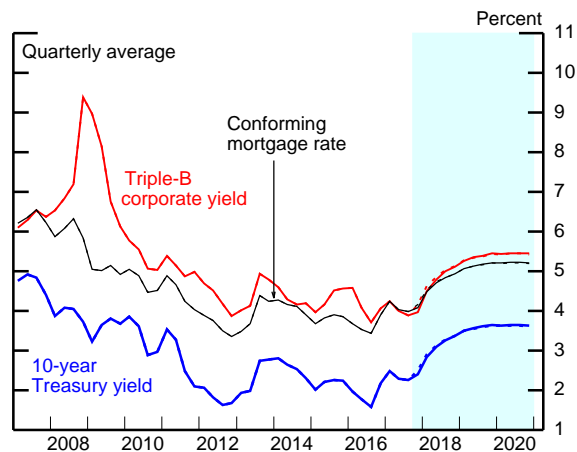
n.a. Not available.

Key Background Factors underlying the Baseline Staff Projection

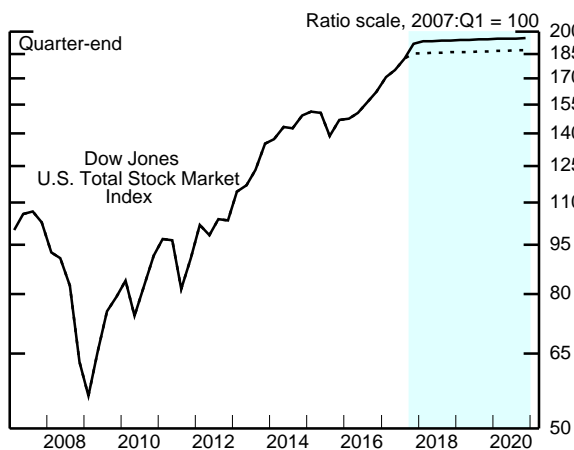
Federal Funds Rate



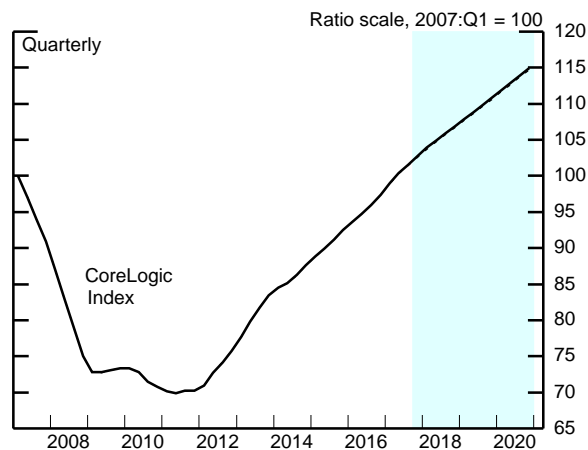
Long-Term Interest Rates



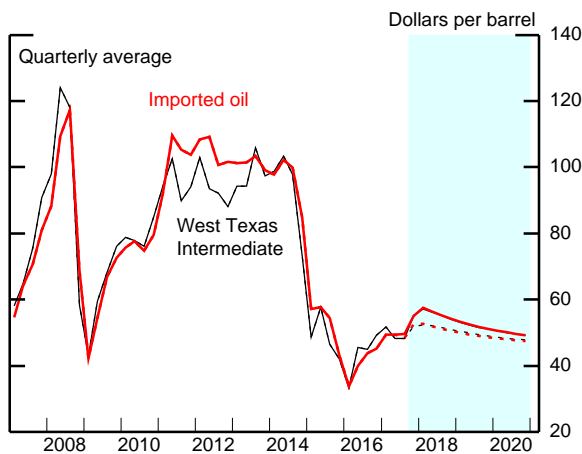
Equity Prices



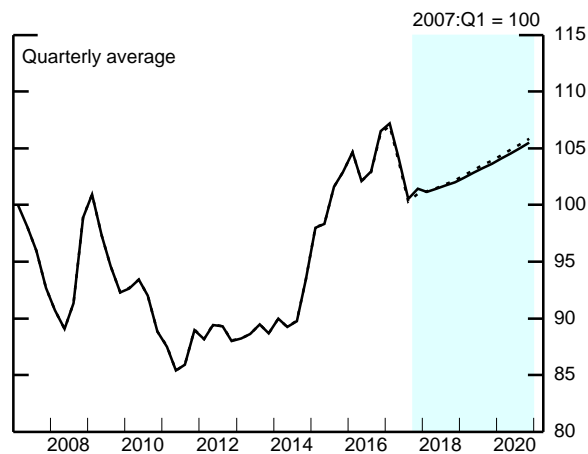
House Prices



Crude Oil Prices



Broad Real Dollar



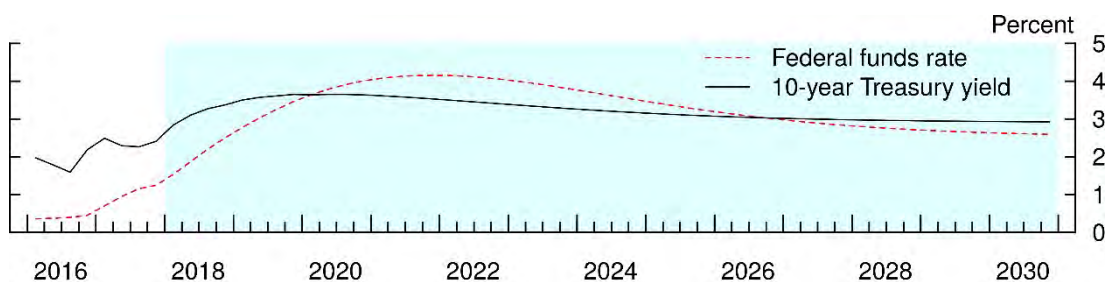
Why Is the Yield Curve Inverted in the Tealbook Projection?

In the baseline projection, the federal funds rate implied by the staff's assumed intercept-adjusted inertial Taylor (1999) rule rises above the 10-year Treasury yield starting in the second quarter of 2020, resulting in an inverted yield curve that lasts until late 2026, as illustrated in figure 1.

We construct the projected 10-year yield as the sum of an expectations-hypothesis component and a term-premium component. In our framework, two factors explain the projected inversion. First, the policy rule used in the staff projection implies that the federal funds rate begins to overshoot its estimated long-run value of 2.5 percent in early 2019, reaching 4¼ percent by the end of 2021 and then converging back very slowly.¹ During most of the period of this overshoot, the federal funds rate is high relative to its 10-year-forward moving average (the expectations-hypothesis component of the 10-year yield). Second, the 10-year term premium is currently quite low and is assumed to increase only gradually to a long-run value of about 40 basis points, which is still very low by historical standards. All else being equal, a regime with lower term premiums makes a yield curve inversion more likely, as the required overshoot in the federal funds rate is smaller in that case.²

Figure 2 shows the evolution of the term premium on 10-year Treasury securities estimated using the procedure developed by Kim and Wright (2005). The term premium appears to have trended materially lower over time, and there is evidence of structural breaks in its mean.³

Figure 1: Interest Rate Projections



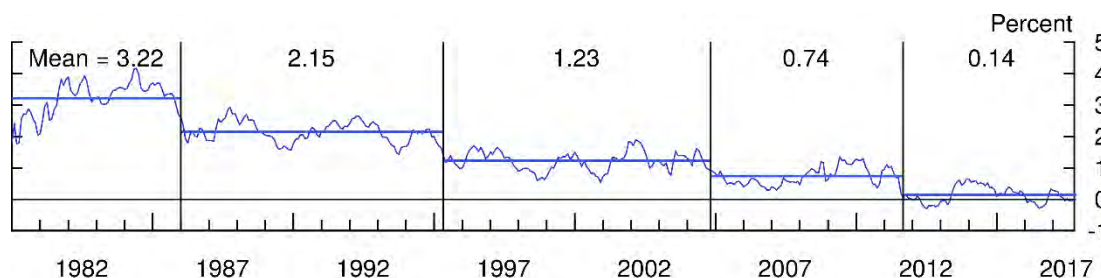
Source: Staff forecast.

¹ This overshoot, in turn, is mainly a consequence of an overshoot in the projected output gap. Inflation is projected to exceed its target, but only slightly.

² The box “The Flattening of the U.S. Yield Curve since December 2015” in the Financial Market Developments section explores the reasons for the recent decline in the slope of the yield curve, focusing on the spread between 2- and 10-year Treasury yields. The behavior of the slope of the yield curve in the projection is qualitatively similar at present using either the 2-year Treasury yield or the federal funds rate.

³ See Don H. Kim and Jonathan Wright (2005), “An Arbitrage-Free Three-Factor Term Structure Model and the Recent Behavior of Long-Term Yields and Distant-Horizon Forward Rates,” Finance and Economics Discussion Series 2005-33 (Washington: Board of Governors of the Federal Reserve System, August), www.federalreserve.gov/pubs/feds/2005/200533/200533pap.pdf. The estimated structural break dates in figure 2, indicated by vertical lines, are as follows: January 1986, April 1995, October 2004, and August 2011.

Figure 2: Kim-Wright 10-Year Term Premium (1980–2017)



Source: Staff estimates.

The current regime is estimated to have started in late 2011 and implies an average term premium of only 14 basis points. This term premium is significantly lower than it was between 1995 and 2011, for example, when it averaged about 1 percent. Mechanically, and keeping everything else constant, had we assumed the term premium would return to its 1995–2011 average by the end of the medium term, the projection would not imply an inverted yield curve.

Historically, an inverted yield curve has often signaled an oncoming recession. Indeed, a yield curve inversion has preceded each of the past seven recessions in the United States.⁴ However, in many of these instances, the inversion occurred as the FOMC increased the federal funds rate aggressively, with the goal of curbing significant inflation pressures even at the cost of a recession.⁵ In contrast, over the forecast period, inflation is never more than about 0.1 percentage point above target and the federal funds rate tightening implied by the assumed policy rule is correspondingly relatively mild.

In the baseline forecast, the inverted yield curve is indeed associated with a period of subpar growth as the policy rule coaxes the economy toward its longer-run equilibrium, but not with recession. To be sure, the risk of recession during this period is elevated because a smaller adverse shock would be sufficient to tip the economy from subpar growth into outright contraction. But the inverted yield curve that is forecast to prevail during this period should not be interpreted as an exogenous signal that a recession will mechanically follow.

⁴ There also have been inversions that were not followed by a recession.

⁵ These instances are broadly consistent with the “Romer and Romer dates” as identified in Christina D. Romer and David H. Romer (1989), “Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz,” in Olivier Jean Blanchard and Stanley Fischer, eds., *NBER Macroeconomics Annual*, vol. 4 (Cambridge, Mass.: MIT Press), pp. 121–84; and in Christina D. Romer and David H. Romer (1994), “Monetary Policy Matters,” *Journal of Monetary Economics*, vol. 34 (August), pp. 75–88.

Federal Reserve System Nowcasts of 2017:Q4 Real GDP Growth
(Percent change at annual rate from previous quarter)

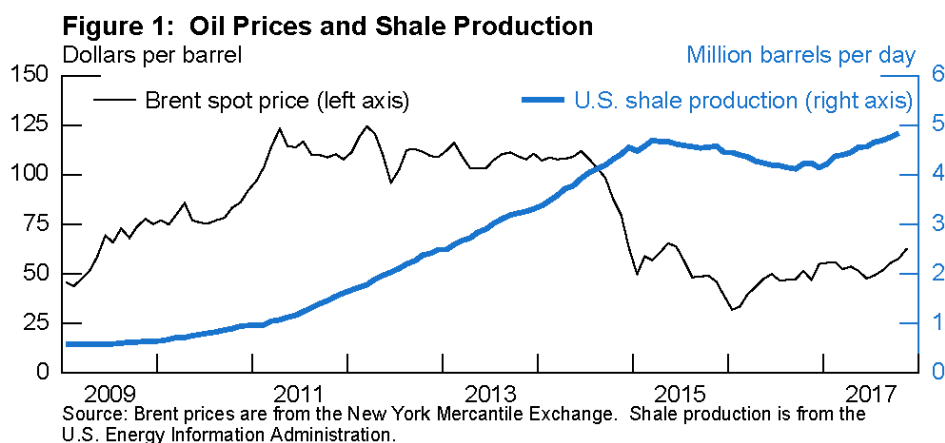
Federal Reserve entity	Type of model	Nowcast as of Nov. 29, 2017
Federal Reserve Bank		
Boston	<ul style="list-style-type: none"> Mixed-frequency BVAR 	3.5
New York	<ul style="list-style-type: none"> Factor-augmented autoregressive model combination Factor-augmented autoregressive model combination, financial factors only Dynamic factor model 	2.4 2.4 3.9
Cleveland	<ul style="list-style-type: none"> Bayesian regressions with stochastic volatility Tracking model 	3.4 2.0
Atlanta	<ul style="list-style-type: none"> Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow) 	3.0
Chicago	<ul style="list-style-type: none"> Dynamic factor models Bayesian VARs 	3.3 3.6
St. Louis	<ul style="list-style-type: none"> Dynamic factor models News index model Let-the-data-decide regressions 	3.5 3.3 2.8
Kansas City	<ul style="list-style-type: none"> Accounting-based tracking estimate 	2.5
Board of Governors	<ul style="list-style-type: none"> Board staff's forecast (judgmental tracking model) Monthly dynamic factor models (DFM-45) Mixed-frequency dynamic factor model (DFM-BM) 	2.4 3.8 4.5
Memo: Median of Federal Reserve System nowcasts		3.3

The Limited Effectiveness of Shale Oil in Moderating Oil Price Fluctuations

Recent political turmoil in the Middle East has again raised concerns about the stability of global oil supplies, pushing up the spot price of oil. In recent years, some commentators have suggested that U.S. shale oil production is flexible enough to moderate, or even neutralize, oil price shocks in the medium term.¹ Here we critically examine the hypothesis that shale oil has altered the perceived persistence of oil price changes.² We estimate that the co-movement of oil price futures with the spot price of oil has not declined following the rapid growth of shale production, suggesting that the potential buffering effect of shale production might be overstated, or, at least, that market participants have not yet fully internalized that effect into their expectations for prices.

The potential for shale oil production to moderate oil price shocks is based on two key differences between shale and conventional oil production. First, shale oil wells move more quickly from planning to production than conventional wells. Second, the output of a producing shale well naturally declines more quickly. As such, with a greater share of production coming from shale wells, U.S. production can respond more quickly to prices and possibly moderate the price effects of changes in oil market supply and demand.

As shown in figure 1, shale production has responded to shifts in oil prices, falling back when prices started declining in mid-2014 and then resuming growth relatively quickly after prices troughed in early 2016.³



¹ This hypothesis is discussed in Spencer Dale (2015), “The New Economics of Oil,” Oxford Institute for Energy Studies, October, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2015/10/The-New-Economics-of-Oil.pdf>.

² The role of the perceived persistence of oil price changes in determining macroeconomic outcomes is discussed in Sylvain Leduc, Kevin Moran, and Robert Vigfusson (2016), “Learning in the Oil Futures Markets: Evidence and Macroeconomic Implications,” International Finance Discussion Papers 1179 (Washington: Board of Governors of the Federal Reserve System, September), <http://dx.doi.org/10.17016/IFDP.2016.1179>.

³ As discussed in the June 2017 Tealbook box “Why Is U.S. Oil Output So Strong?,” although the U.S. oil industry did dramatically reduce the number of operating drilling rigs, strong productivity growth moderated the decline in shale output.

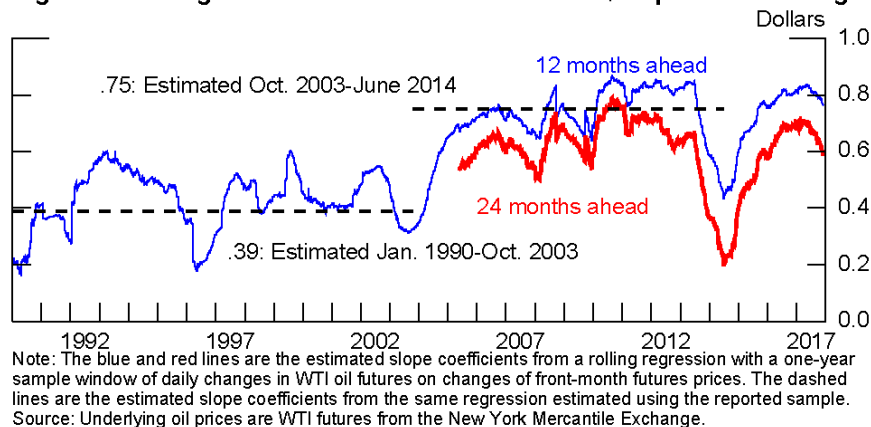
If market participants perceive that shale oil production largely moderates oil price spikes, then oil price changes should be less persistent and farther-dated futures prices should co-move less with spot prices. To test this claim, figure 2 reports time-varying estimates of how oil price futures co-move with spot prices.⁴ In the 2003–14 period, a \$1 change in the spot price was associated with 12-month-ahead futures increasing 75 cents. In mid-2014, the link between spot and futures temporarily weakened but quickly bounced back. The current co-movement is much higher than its average in the 1990s, when oil markets believed that OPEC would stabilize the long-term price of oil.

Why has increased shale oil production not made oil price futures less responsive to spot prices? One possibility is that shale production is indeed flexible enough to buffer price shocks in the medium run, but, after a 15-year period when oil prices went from \$20 to \$145 and then back to \$26 per barrel, market participants are reluctant to believe that longer-term oil prices have stabilized. Over time, market participants could internalize the increased flexibility of shale production, disconnecting futures prices from spot prices.

Another possibility is that market participants are accurately assessing the reality that aggregate shale production is less flexible than boosters would suggest. The flexibility of individual shale oil wells may not directly scale up to overall production because of industry-wide constraints on materials, labor, and transportation. For example, to increase production beyond existing pipeline capacity requires transporting oil by rail, putting an additional \$10 wedge per barrel between wellhead and delivery prices.

Whether shale oil will ultimately prove flexible enough to neutralize the effects of foreign supply disruptions is yet to be determined and could change over time as the industry evolves, constraints are relaxed, and new technologies are developed. But at present, even though the domestic shale oil industry would expand in response to a foreign supply outage, it appears that markets would expect that expansion to have only a modest effect on global oil prices.⁵

Figure 2: Change in Oil Futures Associated with \$1 Spot Price Change



⁴ Regressions are for daily dollar changes in West Texas intermediate oil prices using a one-year rolling window.

⁵ The alternative scenario “Higher Oil Prices and Faster AFE Tightening” in the Risks and Uncertainty section discusses macroeconomic effects of oil price changes.

Summary of the Near-Term Outlook

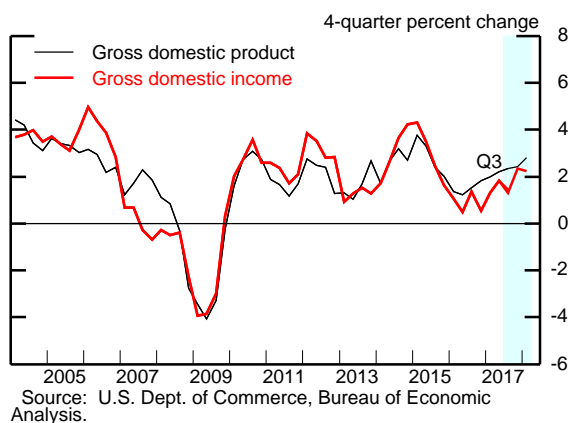
(Percent change at annual rate except as noted)

Measure	2017:Q3		2017:Q4		2018:Q1	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	2.9	3.3	3.2	2.2	2.5	2.7
Private domestic final purchases	2.4	2.4	3.3	2.9	2.9	2.8
Personal consumption expenditures	2.3	2.3	3.3	2.5	2.8	2.7
Residential investment	-6.2	-5.1	-6	3.2	1.6	1.0
Nonres. private fixed investment	5.6	5.1	5.0	5.2	3.8	4.0
Government purchases	-1.0	.4	.8	.7	.4	.3
<i>Contributions to change in real GDP</i>						
Inventory investment ¹	.4	.8	.1	-.5	.2	.4
Net exports ¹	.6	.4	.2	.0	-.2	-.2
Unemployment rate	4.3	4.3	4.2	4.1	4.1	4.0
PCE chain price index	1.5	1.5	2.0	2.8	1.6	1.7
Ex. food and energy	1.3	1.4	1.5	1.9	1.8	1.9

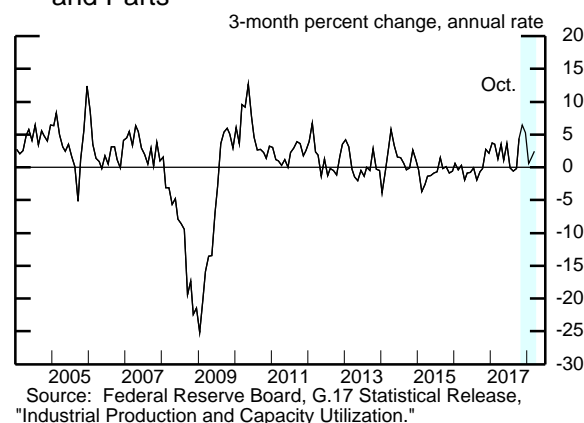
1. Percentage points.

Recent Nonfinancial Developments (1)

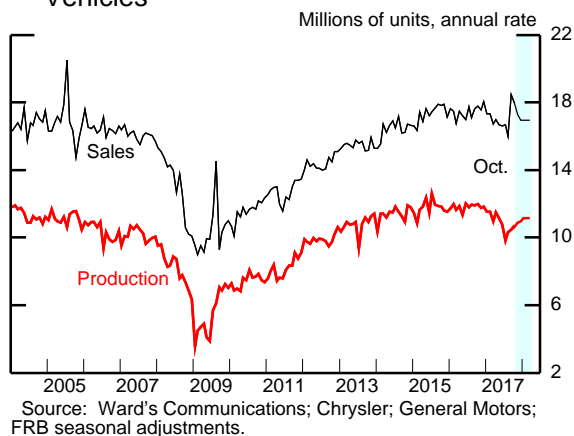
Real GDP and GDI



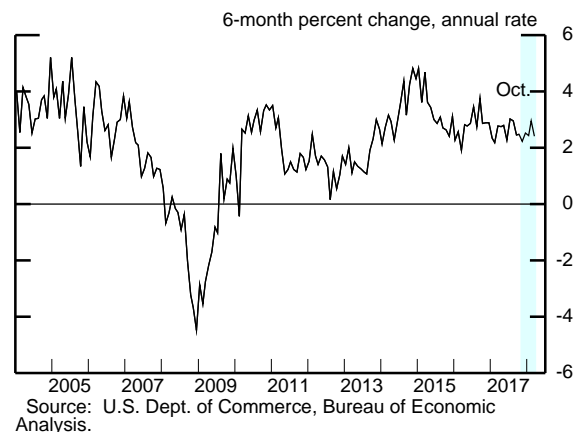
Manufacturing IP ex. Motor Vehicles and Parts



Sales and Production of Light Motor Vehicles

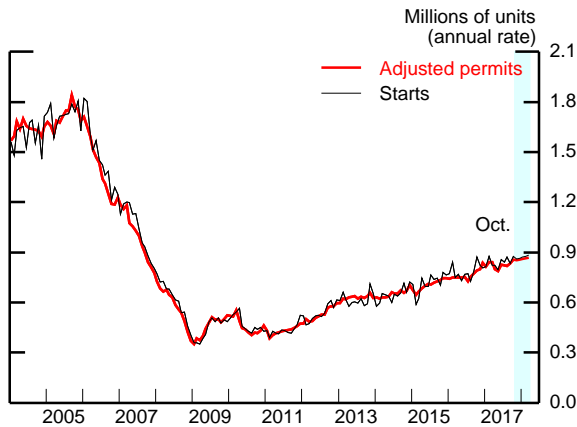


Real PCE Growth



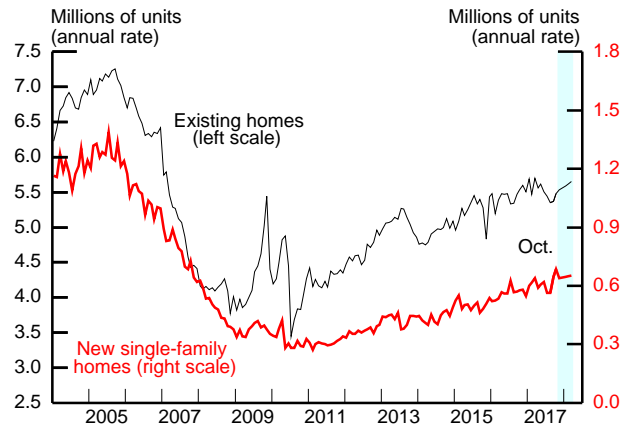
Recent Nonfinancial Developments (2)

Single-Family Housing Starts and Permits



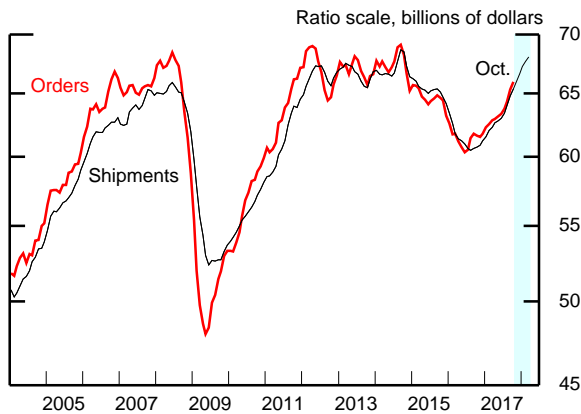
Note: Adjusted permits equal permit issuance plus starts outside of permit-issuing areas.
Source: U.S. Census Bureau.

Home Sales



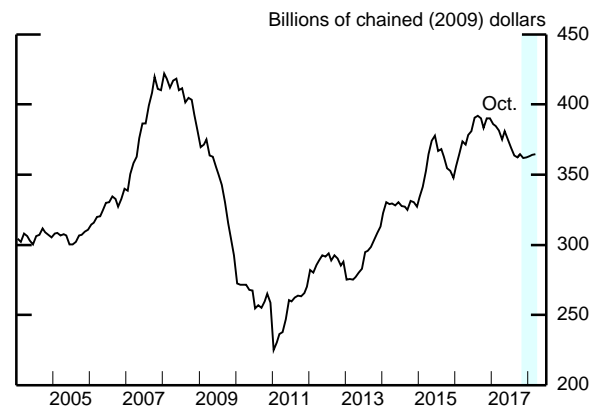
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

Nondefense Capital Goods ex. Aircraft



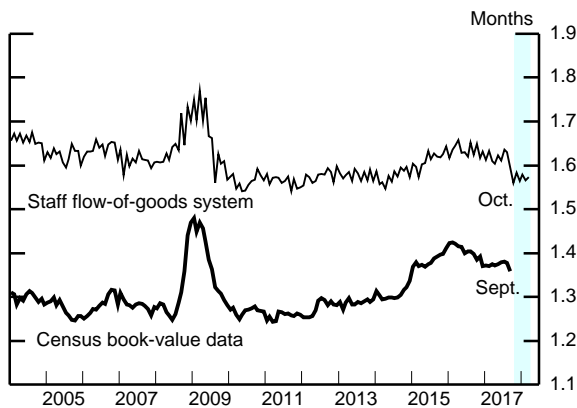
Note: Data are 3-month moving averages.
Source: U.S. Census Bureau.

Nonresidential Construction Put in Place



Note: Nominal CPIP deflated by BEA prices through 2017:Q2 and by the staff's estimated deflator thereafter.
Source: U.S. Census Bureau.

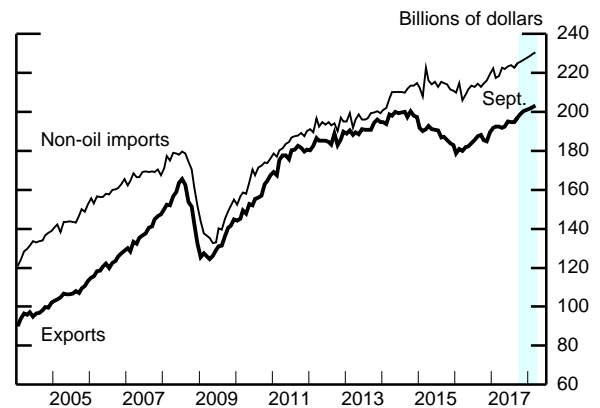
Inventory Ratios



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



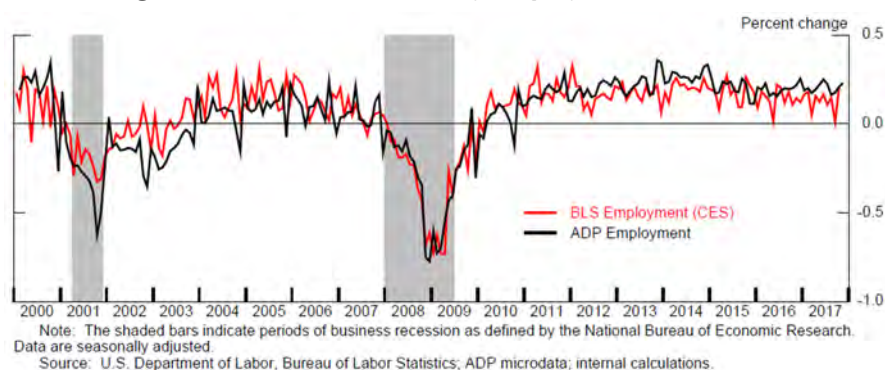
Note: Forecasts are linear interpolations of quarterly values.
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis; U.S. Census Bureau.

Measuring the Labor Market Using ADP Microdata

A key challenge for both policymakers and staff is to gauge the current state of the macroeconomy, including the labor market. The payroll employment series from the Bureau of Labor Statistics (BLS) Current Employment Statistics (CES) program is one of the most carefully constructed measures of labor market activity, but even this series is subject to sampling and nonsampling errors.¹ Indeed, the 90 percent confidence interval around the monthly change in private payroll employment is $\pm 111,000$ due to sampling error alone. Moreover, the variation of actual (preliminary-to-benchmark) revisions to this series since 2003, which reflects both some sampling and some nonsampling errors, is even larger than would be implied by the sampling-based confidence interval. New sources of labor market data offer an opportunity to complement official statistics and to produce more timely, accurate, and detailed analyses of labor market activity. In this regard, the Board's staff has been working with data from the payroll-processing company ADP that cover 20 percent of the private workforce and are available weekly in near real time.²

The BLS and ADP data are both based on large samples of firms that cover roughly equal fractions of private payroll employment. The BLS measure is based on a probability sample of establishments.³ In contrast, the ADP data set consists of the firms that hire ADP to manage their payrolls, which may introduce sample selection issues. These potential selection issues are reduced to some extent by the fact that we reweight the ADP data by establishment size and industry to match the characteristics of the universe of firms along these dimensions. Reassuringly, our ADP employment index (the black line shown in figure 1) has a similar mean and variance to, and is highly correlated with, the BLS series (the red line).

Figure 1: BLS and ADP Monthly Employment Growth



¹ Sampling error arises because the estimate of payroll employment is based on responses from a sample of employers, not a census. Nonsampling error arises because of issues such as respondent errors, errors in data processing, and bias due to nonresponse.

² One existing use of ADP data is ADP's monthly National Employment Report (NER). The NER forecasts BLS payroll employment changes using a combination of ADP-derived data and other publicly available data. By contrast, our primary goal in using the ADP microdata is to produce an estimate of employment changes independent from the BLS payroll series as well as other data sources.

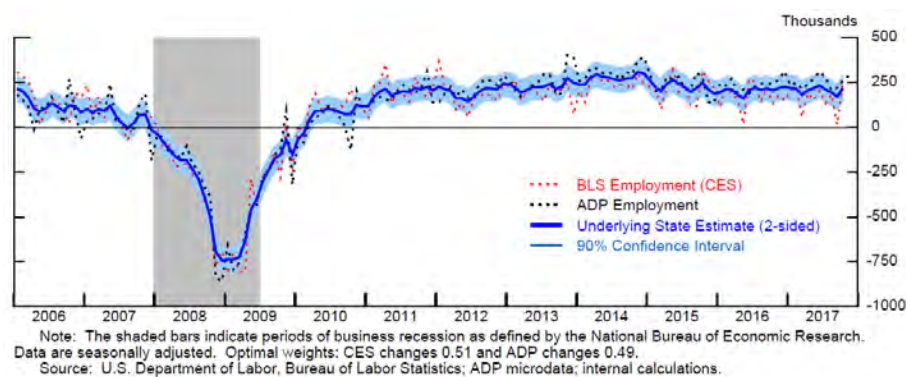
³ The BLS payroll series is benchmarked annually to administrative data, which increases the reliability of the historical series. However, the administrative data are available only with several months' delay.

The ADP data have several useful properties. First, the data cover each week of the month, so the ADP index captures employment developments for the month as a whole, whereas the BLS series covers only the pay period including the 12th of the month. Second, our ADP employment index helps predict BLS employment changes in real time, even after accounting for private forecaster expectations and other standard indicators. Third, the ADP index is useful for dealing with a particular anomaly of the BLS data: In recent years, the first BLS estimate of employment changes for August has tended to be too low and has subsequently been revised upward, while the ADP index does not have this bias. Finally, the ADP data can be updated every week and include full geographic detail. This timeliness and detail allow better analysis of transitory or localized events such as storms. The staff has already started to incorporate such insights in its assessment of the labor market, including when estimating the effects of the recent hurricanes.

A natural question is whether we can create a more precise estimate of employment growth by pooling the information in the BLS and ADP payroll employment data. In preliminary work, we combine the information in the two series using a statistical tool called the Kalman filter. The resultant measure of underlying employment growth is the blue line in figure 2, plotted along with the model-based confidence interval. A similar exercise that excludes ADP data and only uses BLS data yields a confidence interval that is about 20 percent wider. The Kalman filter places roughly equal weight on the BLS series and the ADP series, which is consistent with the fact that ADP and BLS cover roughly equal-sized samples from the establishment population.⁴

These results are encouraging in their own right. Moreover, they point to the possibility of even greater gains if information from other large payroll-processing companies could be incorporated into the estimates as well. Over the coming years, we are hopeful that ever-expanding technological possibilities combined with a rise in the availability of private data will continue to improve economic measurement.

Figure 2: Combining BLS and ADP Monthly Employment Changes with the Kalman Filter

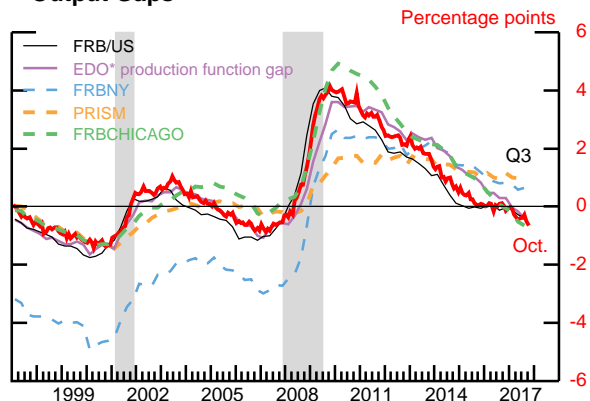


⁴ For comparison, the same exercise with the BLS payroll employment series and the employment series from the household survey (adjusted to match the scope of the payroll series) puts a weight of well over 90 percent on the payroll series.

Alternative Measures of Slack

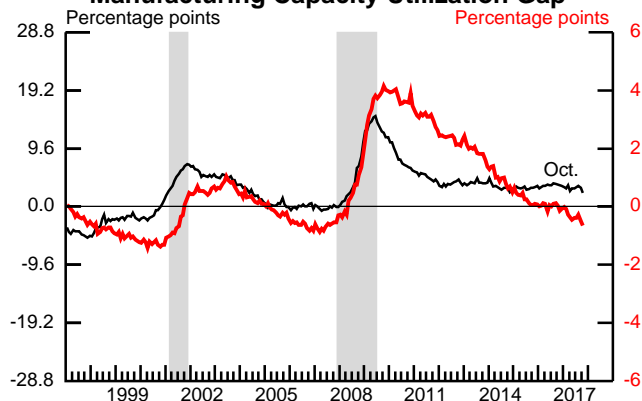
The red line in each panel is the staff's measure of the unemployment rate gap (right axis).

Output Gaps



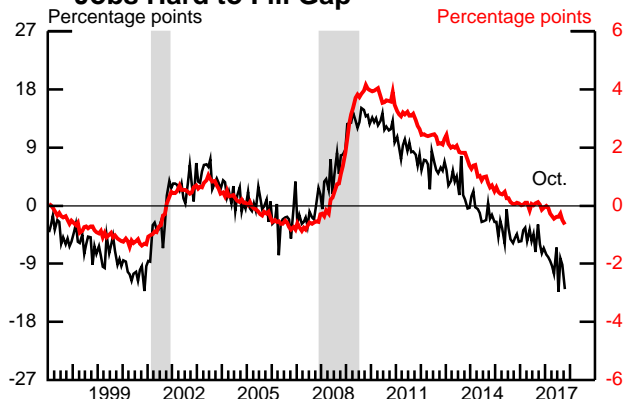
* EDO is Estimated, Dynamic, Optimization-based model.
Source: Federal Reserve Board; PRISM: Federal Reserve Board Bank of Chicago; Federal Reserve Board of Philadelphia, PRISM Model Documentation (June 2011); FRBNY: Federal Reserve Bank of New York Staff Report 618 (May 2013, revised April 2014).

Manufacturing Capacity Utilization Gap*



Source: Federal Reserve Board.

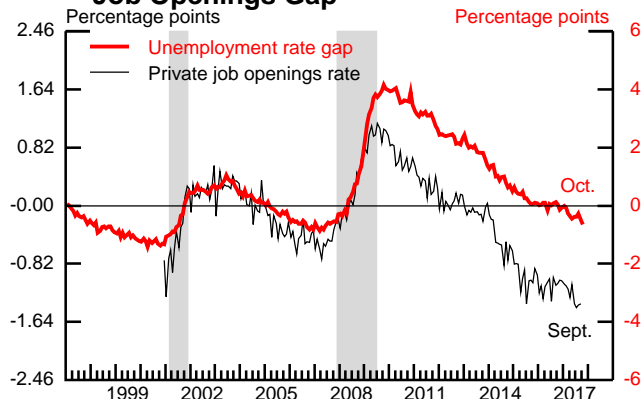
Jobs Hard to Fill Gap*



Note: Percent of small businesses surveyed with at least one "hard to fill" job opening. Seasonally adjusted by Federal Reserve Board Staff.

Source: National Federation of Independent Business, Small Business Economic Trends Survey.

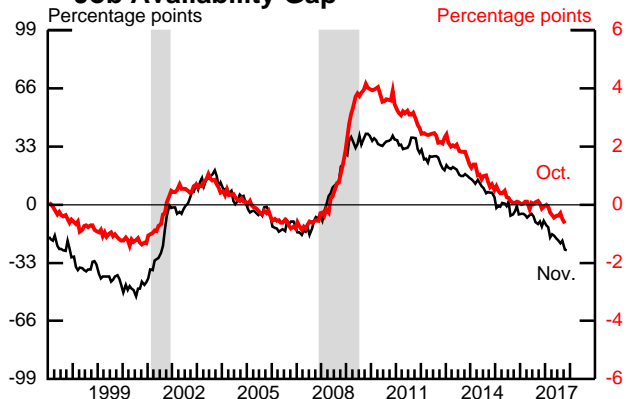
Job Openings Gap*



Note: Job openings rate is the number of job openings divided by employment plus job openings.

Source: Job Openings and Labor Turnover Survey; U.S. Department of Labor, Bureau of Labor Statistics, Current Employment Statistics; Conference Board, Help Wanted OnLine.

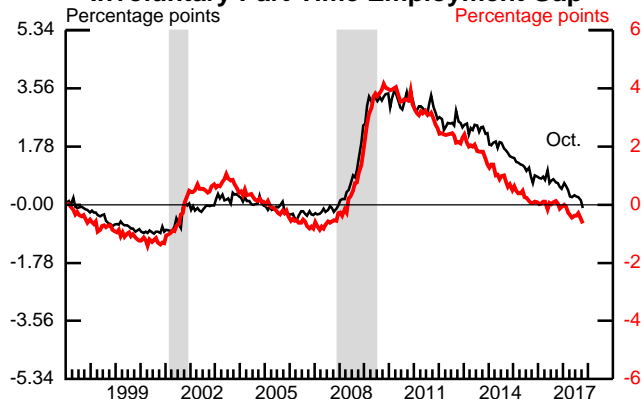
Job Availability Gap*



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

Source: Conference Board.

Involuntary Part-Time Employment Gap



Note: Percent of employment.

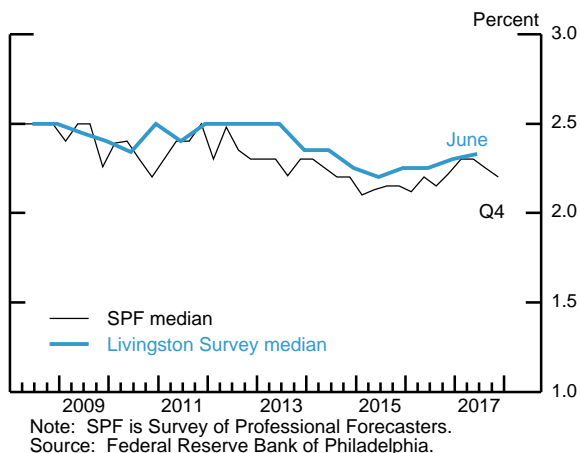
Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey.

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

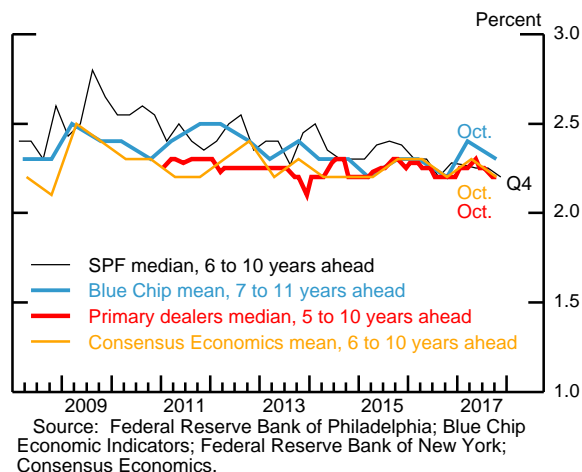
Note: The shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research. Output gaps are multiplied by negative 0.54 to facilitate comparison with the unemployment rate gap. Manufacturing capacity utilization gap is constructed by subtracting its average rate from 1972 to 2013. Other gaps were constructed by subtracting each series' average in 2004:Q4 and 2005:Q1.

Survey Measures of Longer-Term Inflation Expectations

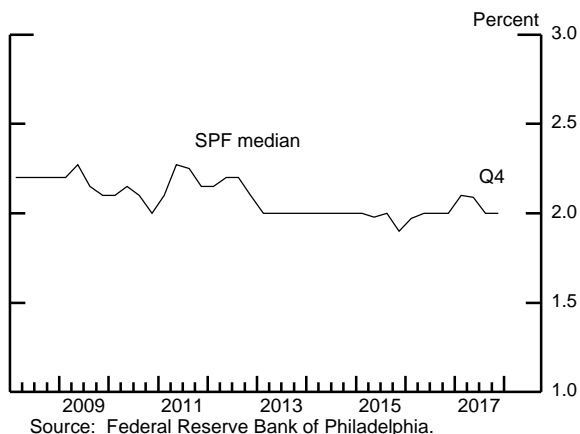
CPI Next 10 Years



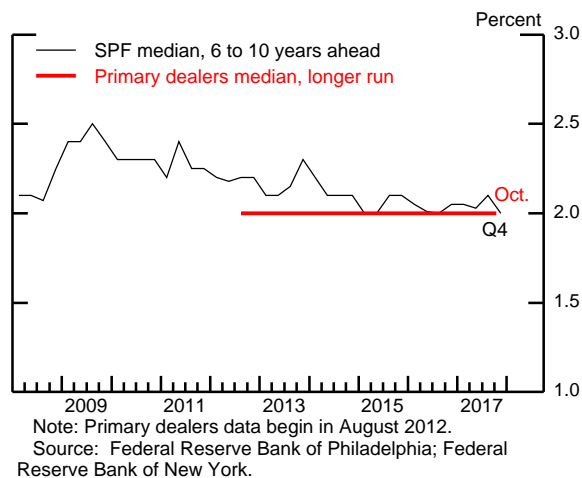
CPI Forward Expectations



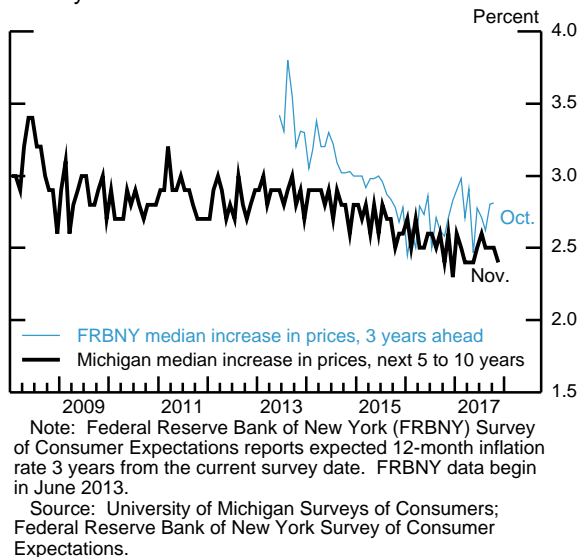
PCE Next 10 Years



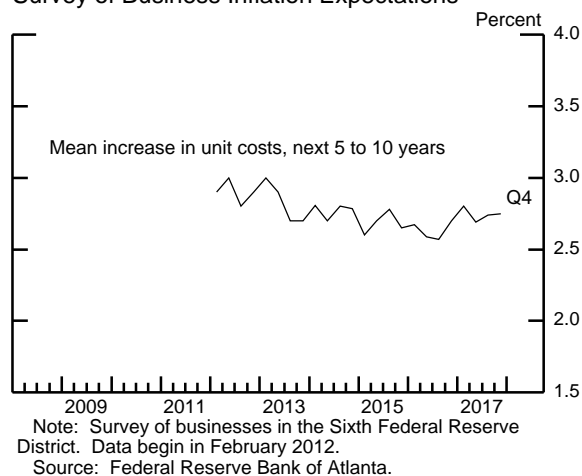
PCE Forward Expectations



Surveys of Consumers



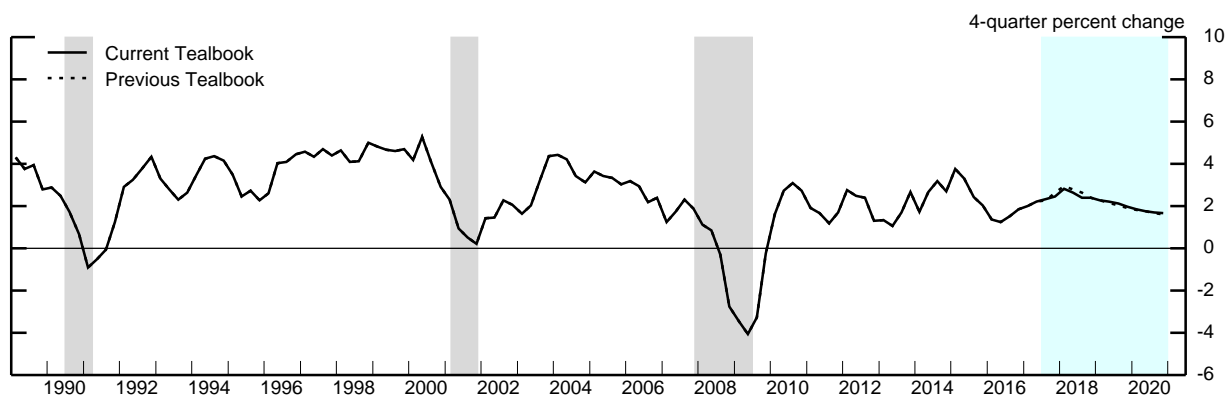
Survey of Business Inflation Expectations



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

Measure	2016	2017		2017	2018	2019	2020
		H1	H2				
Real GDP	1.8	2.1	2.7	2.4	2.4	2.0	1.7
Previous Tealbook	1.8	2.1	3.1	2.6	2.4	1.9	1.6
Final sales	1.9	2.8	2.6	2.7	2.5	1.9	1.7
Previous Tealbook	1.9	2.8	2.8	2.8	2.4	1.9	1.6
Personal consumption expenditures	2.8	2.6	2.4	2.5	2.6	2.3	2.1
Previous Tealbook	2.8	2.6	2.8	2.7	2.6	2.3	2.1
Residential investment	2.5	1.5	-1.0	.2	3.9	2.0	3.4
Previous Tealbook	2.5	1.5	-3.5	-1.0	3.9	2.3	2.7
Nonresidential structures	3.5	10.8	-6.0	2.1	2.5	.7	-.6
Previous Tealbook	3.5	10.8	-3.6	3.4	2.0	.1	-1.2
Equipment and intangibles	-.1	5.8	8.7	7.2	4.0	2.5	1.6
Previous Tealbook	-.1	5.8	8.1	7.0	3.4	1.9	1.2
Federal purchases	-.3	-.3	.6	.2	-.4	.6	.5
Previous Tealbook	-.3	-.3	.1	-.1	-.6	.7	.6
State and local purchases	.8	-.5	.5	.0	1.0	.8	.9
Previous Tealbook	.8	-.5	-.2	-.3	1.1	.9	.9
Exports	.6	5.4	3.4	4.4	4.5	4.2	3.1
Previous Tealbook	.6	5.4	3.4	4.4	4.8	4.0	2.9
Imports	2.7	2.9	1.2	2.0	3.7	4.1	3.8
Previous Tealbook	2.7	2.9	.2	1.5	4.1	4.1	3.7
Contributions to change in real GDP (percentage points)							
Inventory change	.0	-.7	.1	-.3	-.1	.0	.0
Previous Tealbook	.0	-.7	.3	-.2	.0	.0	.0
Net exports	-.3	.2	.2	.2	.0	-.1	-.2
Previous Tealbook	-.3	.2	.4	.3	.0	-.1	-.2

Real GDP

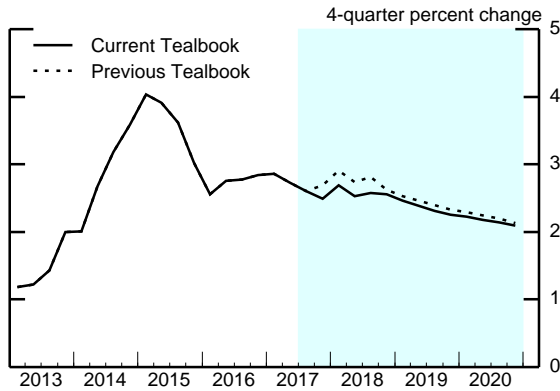


Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

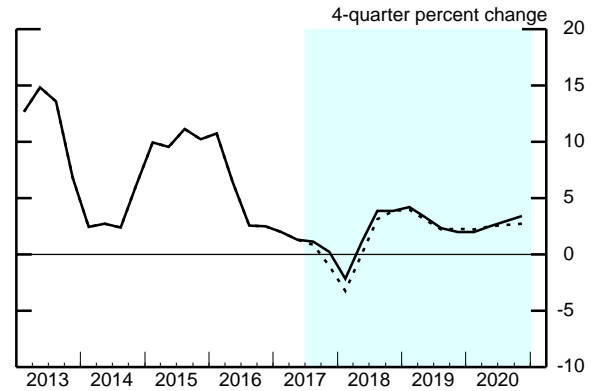
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Components of Final Demand

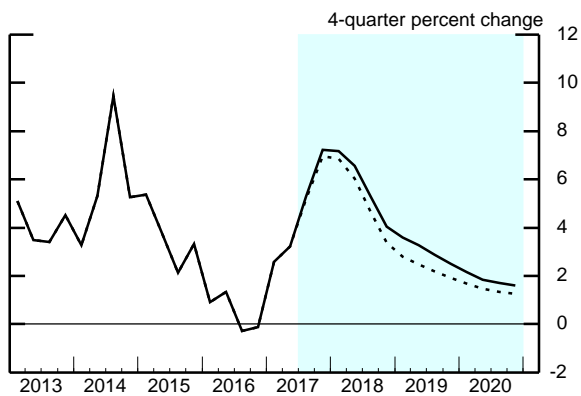
Personal Consumption Expenditures



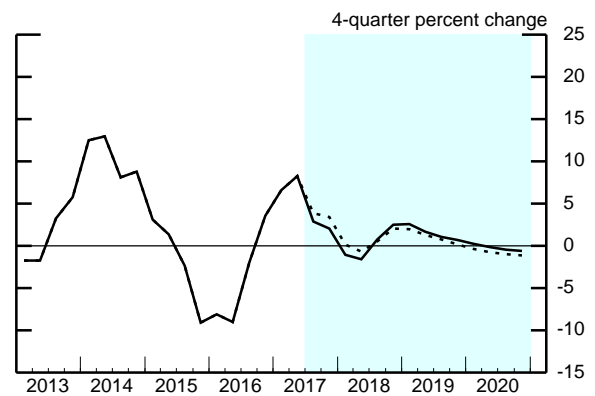
Residential Investment



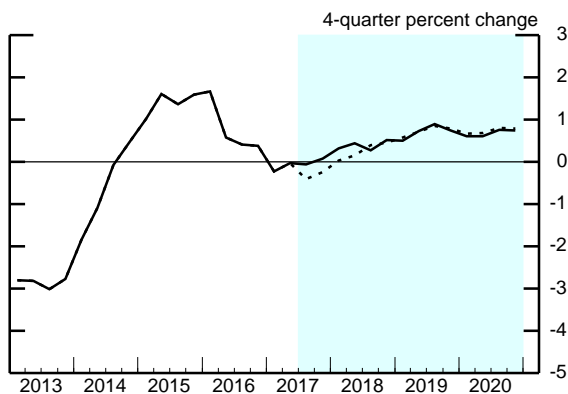
Equipment and Intangibles



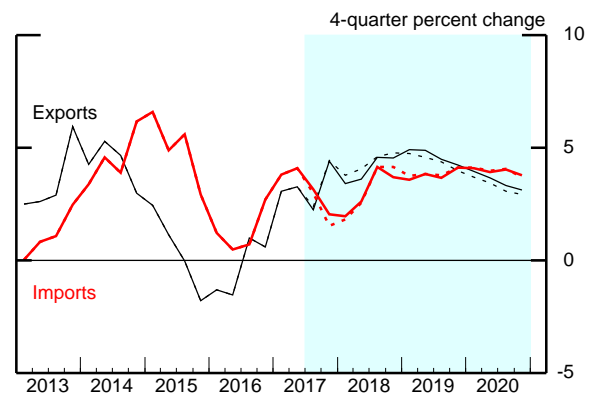
Nonresidential Structures



Government Consumption and Investment



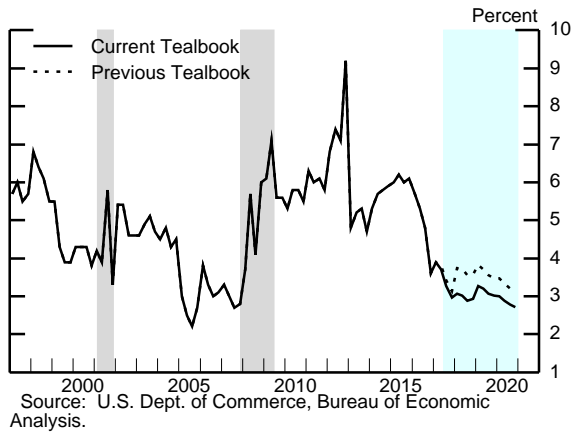
Exports and Imports



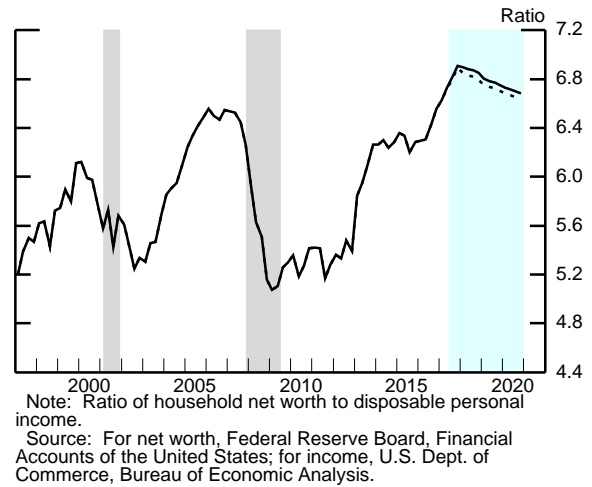
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Aspects of the Medium-Term Projection

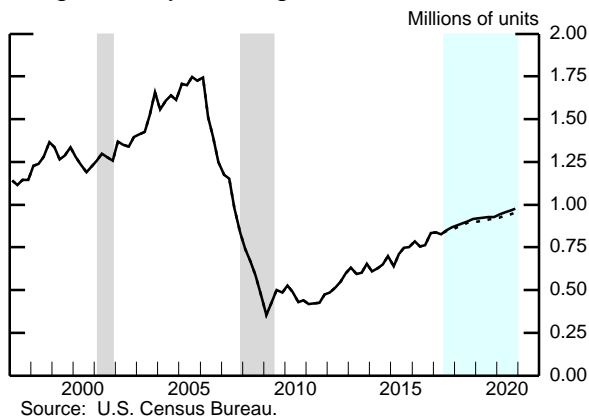
Personal Saving Rate



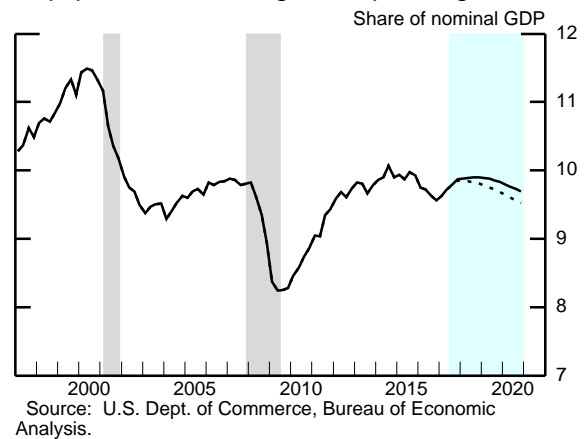
Wealth-to-Income Ratio



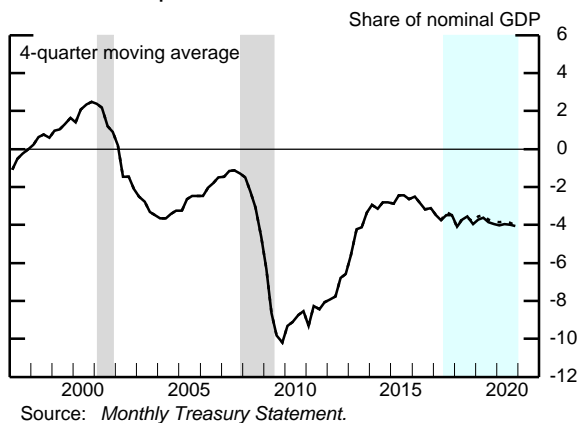
Single-Family Housing Starts



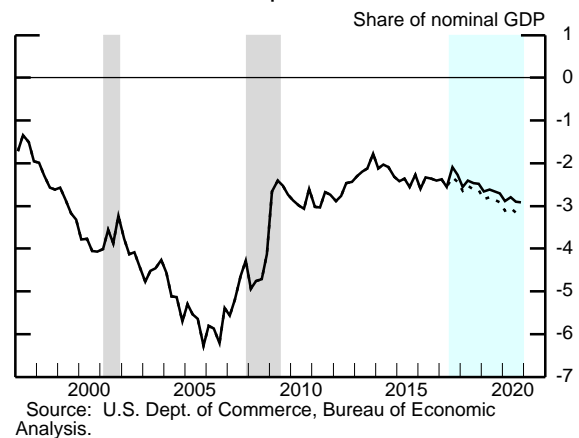
Equipment and Intangibles Spending



Federal Surplus/Deficit



Current Account Surplus/Deficit



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

Decomposition of Potential GDP

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

Measure	1974-95	1996-2000	2001-07	2008-10	2011-15	2016	2017	2018	2019	2020
Potential real GDP	3.1	3.4	2.6	1.6	1.2	1.4	1.4	1.6	1.8	1.8
Previous Tealbook	3.1	3.4	2.6	1.6	1.2	1.4	1.5	1.6	1.7	1.7
<i>Selected contributions¹</i>										
Structural labor productivity ²	1.6	2.9	2.8	1.4	.8	.8	1.0	1.1	1.3	1.3
Previous Tealbook	1.6	2.9	2.8	1.4	.8	.8	1.1	1.2	1.3	1.3
Capital deepening	.6	1.5	1.0	.3	.5	.5	.5	.5	.5	.4
Multifactor productivity	.7	1.0	1.5	.9	.1	.1	.3	.4	.6	.7
Structural hours	1.6	1.2	.8	.0	.6	.8	.2	.5	.5	.5
Previous Tealbook	1.6	1.2	.8	.0	.6	.8	.1	.5	.5	.5
Labor force participation	.4	-.1	-.2	-.5	-.6	-.3	-.3	-.3	-.3	-.3
Previous Tealbook	.4	-.1	-.2	-.5	-.6	-.3	-.3	-.4	-.4	-.4
Memo:										
Output gap ³	-1.9	2.4	.8	-4.2	-.1	.3	1.3	2.1	2.3	2.1
Previous Tealbook	-1.9	2.4	.8	-4.2	-.1	.3	1.4	2.1	2.3	2.1

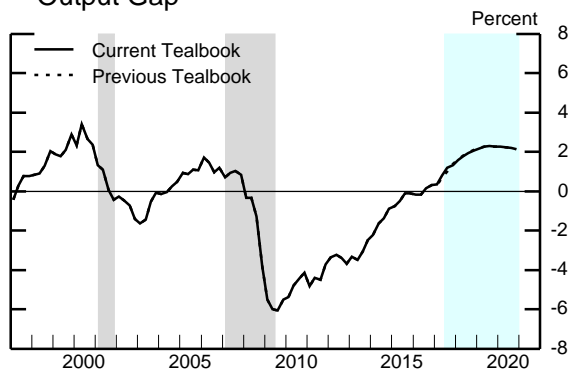
Note: For multiyear periods, the percent change is the annual average from Q4 of the year preceding the first year shown to Q4 of the last year shown.

1. Percentage points.

2. Total business sector.

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

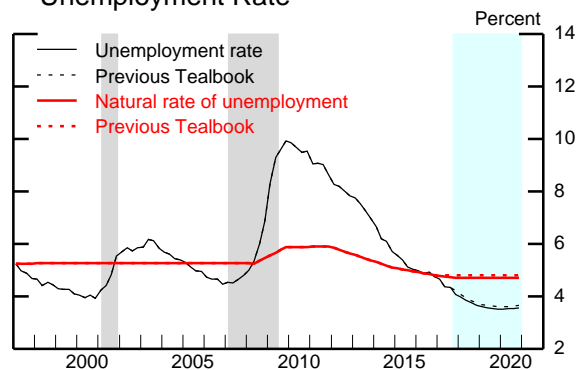
Output Gap



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

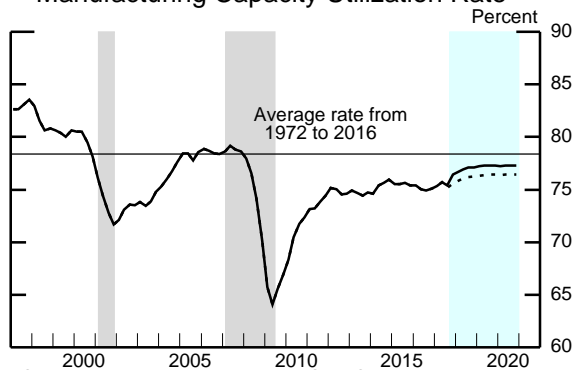
Source: U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.

Unemployment Rate



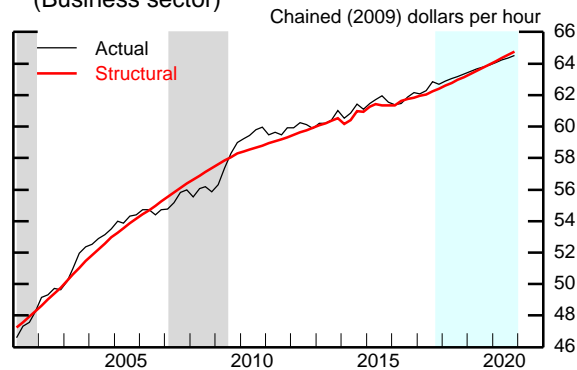
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Manufacturing Capacity Utilization Rate



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

Structural and Actual Labor Productivity (Business sector)



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

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

The Outlook for the Labor Market

Measure	2016	2017		2017	2018	2019	2020
		H1	H2				
Output per hour, business ¹	1.0	.3	1.3	.8	1.0	.9	.9
Previous Tealbook	1.0	.2	2.1	1.2	1.0	.8	.9
Nonfarm payroll employment ²	187	177	171	174	179	147	117
Previous Tealbook	187	177	167	172	179	138	109
Private employment ²	170	174	163	168	170	138	108
Previous Tealbook	170	173	161	167	170	129	100
Labor force participation rate ³	62.7	62.8	62.7	62.7	62.6	62.5	62.4
Previous Tealbook	62.7	62.8	62.8	62.8	62.6	62.5	62.4
Civilian unemployment rate ³	4.7	4.4	4.1	4.1	3.6	3.5	3.5
Previous Tealbook	4.7	4.4	4.2	4.2	3.7	3.6	3.6

1. Percent change from final quarter of preceding period at annual rate.

2. Thousands, average monthly changes.

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

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

Inflation Projections

Measure	2016	2017		2017	2018	2019	2020
		H1	H2				
<i>Percent change at annual rate from final quarter of preceding period</i>							
PCE chain-weighted price index	1.6	1.2	2.2	1.7	1.7	1.9	2.0
Previous Tealbook	1.6	1.2	1.7	1.5	1.7	2.0	2.0
Food and beverages	-1.7	1.2	.5	.9	2.1	2.3	2.2
Previous Tealbook	-1.7	1.2	.9	1.0	2.1	2.3	2.2
Energy	2.2	-1.5	19.2	8.3	-2.5	-.4	.3
Previous Tealbook	2.2	-1.5	11.2	4.6	-1.6	.2	.7
Excluding food and energy	1.9	1.4	1.6	1.5	1.8	2.0	2.0
Previous Tealbook	1.9	1.4	1.4	1.4	1.8	2.0	2.0
Prices of core goods imports ¹	-.2	1.2	1.9	1.6	.9	.7	.7
Previous Tealbook	-.2	1.2	2.4	1.8	.9	.7	.7
	Sept. 2017	Oct. 2017	Nov. 2017 ²	Dec. 2017 ²	Jan. 2018 ²	Feb. 2018 ²	Mar. 2018 ²
<i>12-month percent change</i>							
PCE chain-weighted price index	1.7	1.6	1.8	1.7	1.5	1.5	1.8
Previous Tealbook	1.6	1.5	1.5	1.4	1.2	1.2	1.6
Excluding food and energy	1.4	1.4	1.5	1.5	1.4	1.4	1.7
Previous Tealbook	1.3	1.3	1.4	1.4	1.3	1.3	1.6

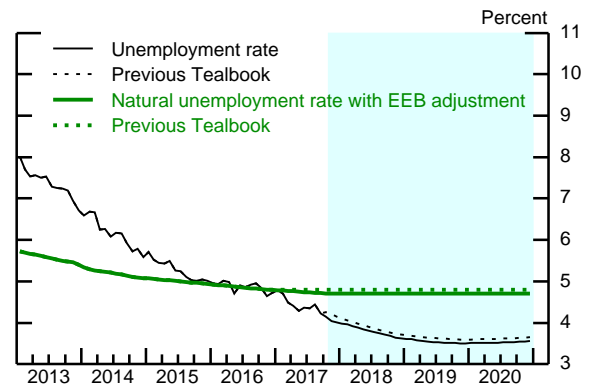
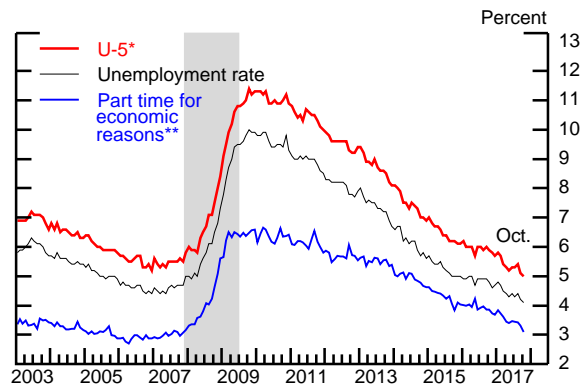
1. Core goods imports exclude computers, semiconductors, oil, and natural gas.

2. Staff forecast.

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

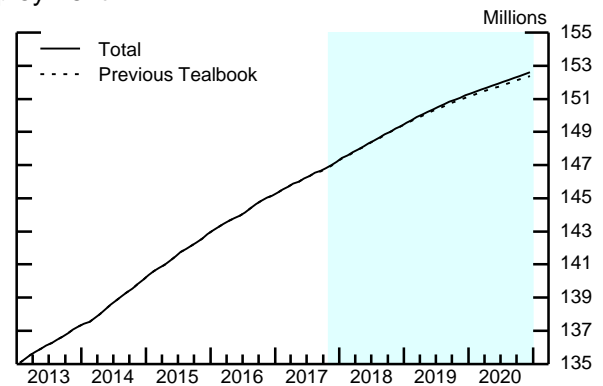
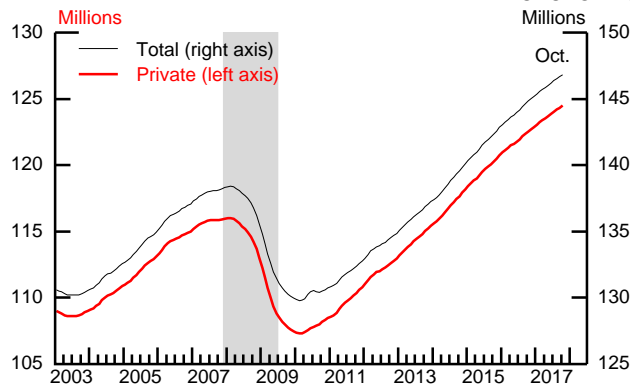
Labor Market Developments and Outlook (1)

Measures of Labor Underutilization



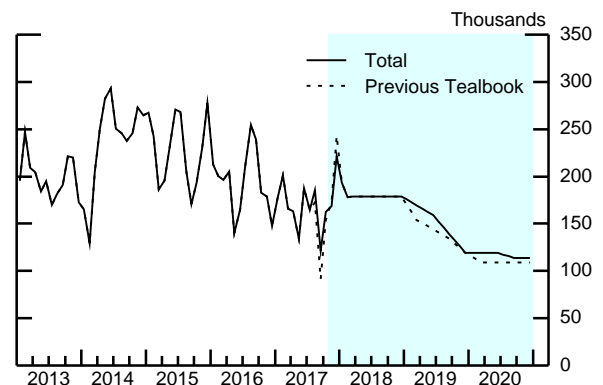
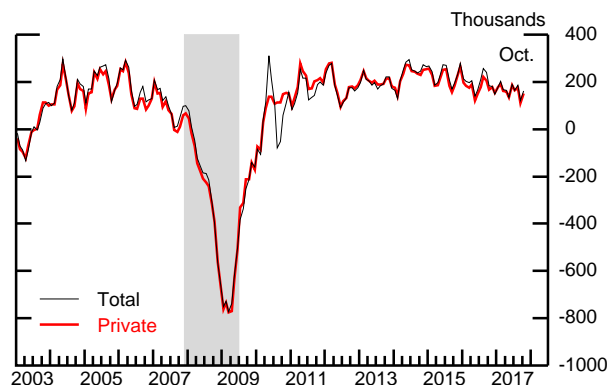
* U-5 measures total unemployed persons plus all marginally attached to the labor force, as a percent of the labor force plus persons marginally attached to the labor force.
 ** Percent of Current Population Survey employment.
 EEB Extended and emergency unemployment benefits.
 Source: U.S. Department of Labor, Bureau of Labor Statistics.

Level of Payroll Employment*



* 3-month moving averages.
 Source: U.S. Department of Labor, Bureau of Labor Statistics.

Change in Payroll Employment*

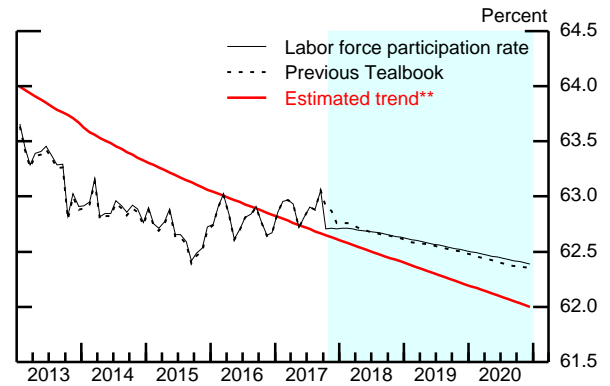
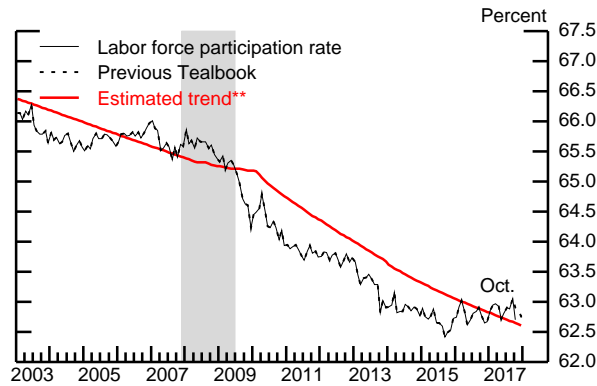


* 3-month moving averages.
 Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

Labor Market Developments and Outlook (2)

Labor Force Participation Rate*

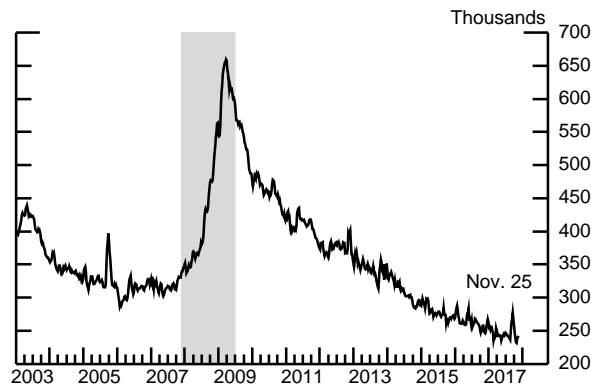


* Published data adjusted by staff to account for changes in population weights.

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

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

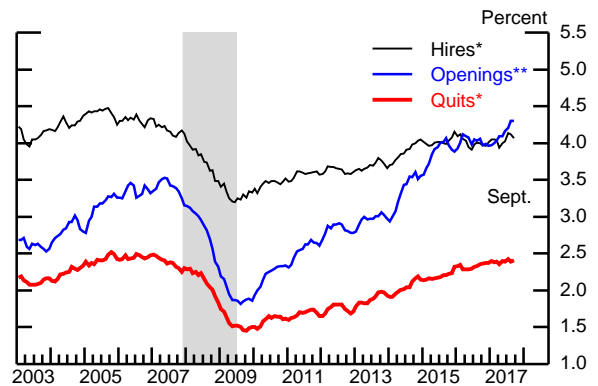
Initial Unemployment Insurance Claims*



* 4-week moving average.

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

Hires, Quits, and Job Openings

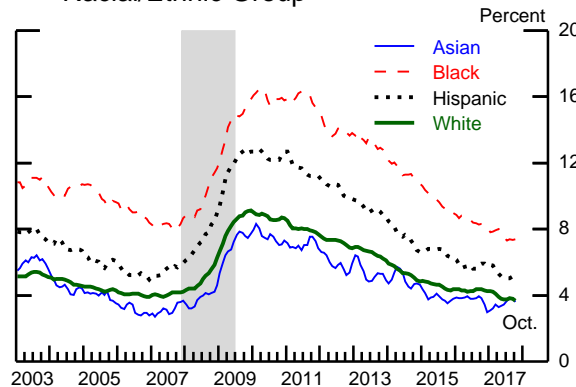


* Percent of private nonfarm payroll employment, 3-month moving average.

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

Source: Job Openings and Labor Turnover Survey.

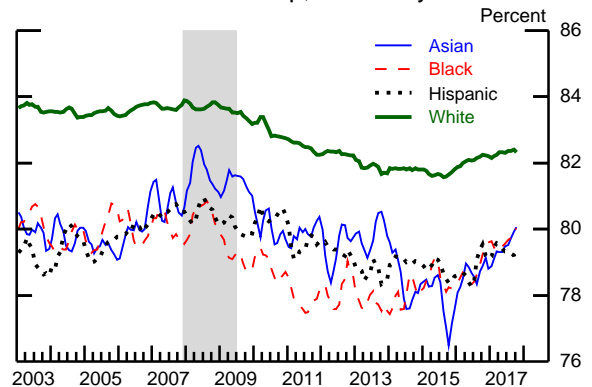
Unemployment Rate by Racial/Ethnic Group



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

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

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



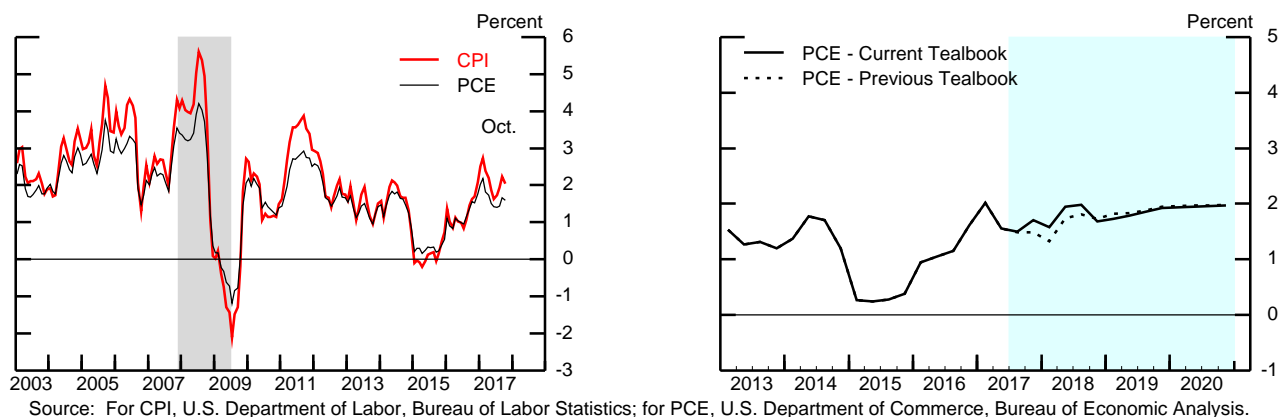
Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving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

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

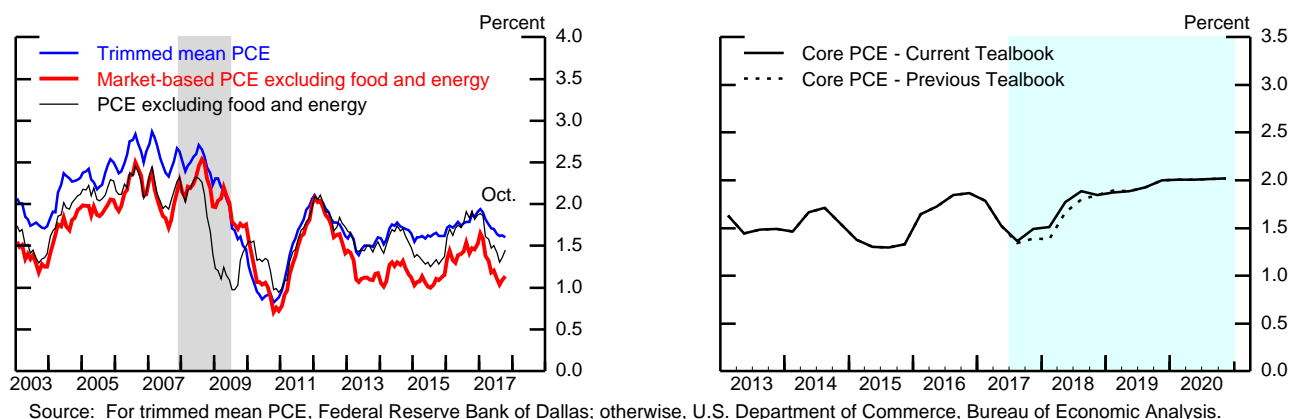
Inflation Developments and Outlook (1)

(Percent change from year-earlier period)

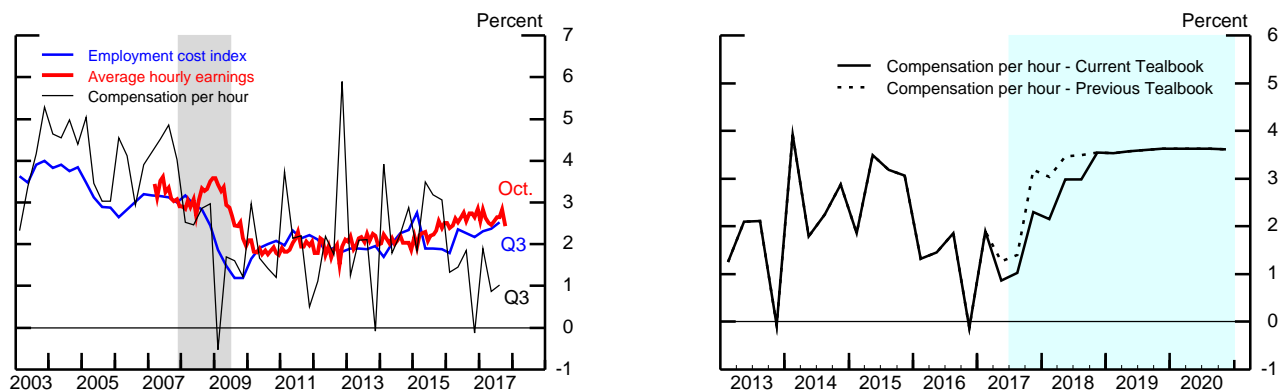
Headline Consumer Price Inflation



Measures of Underlying PCE Price Inflation



Labor Cost Growth



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

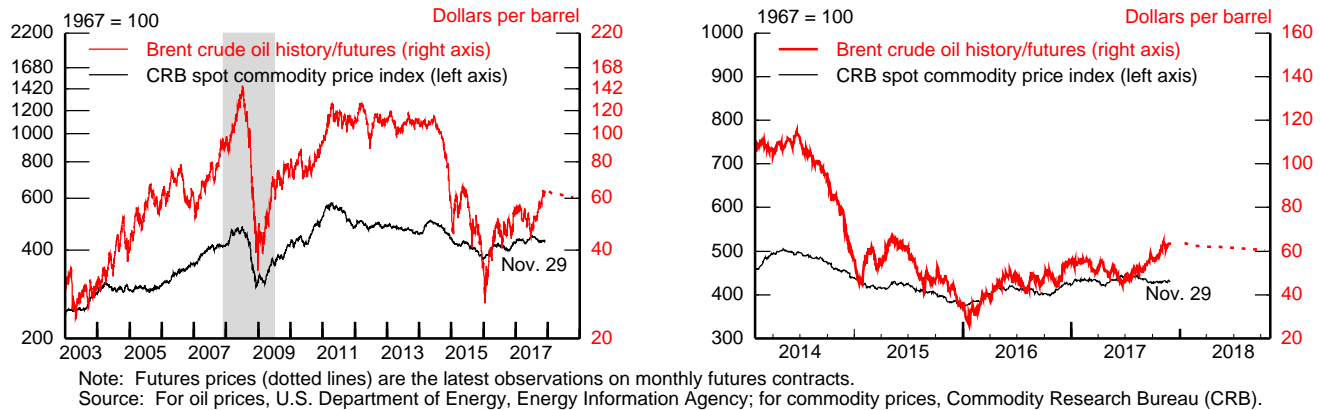
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

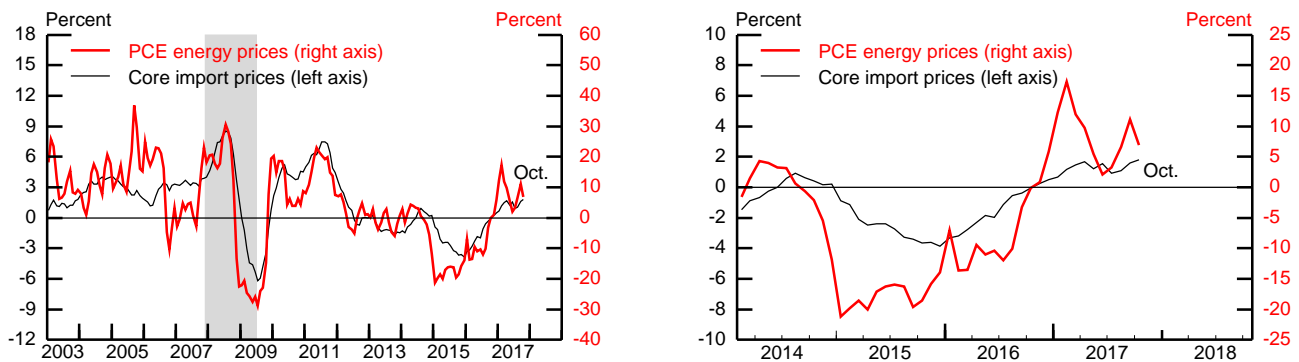
Inflation Developments and Outlook (2)

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

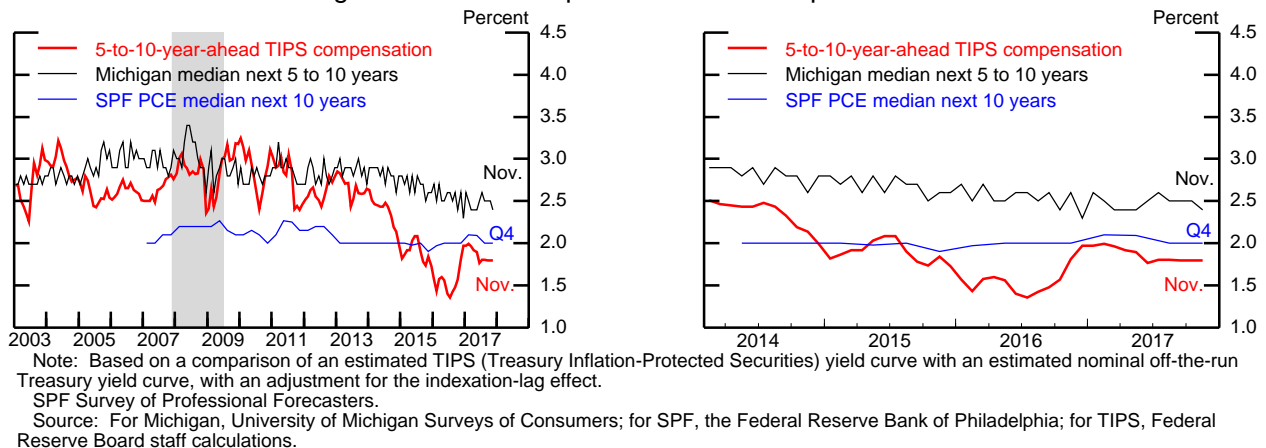
Commodity and Oil Price Levels



Energy and Import Price Inflation



Long-Term Inflation Expectations and Compensation



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

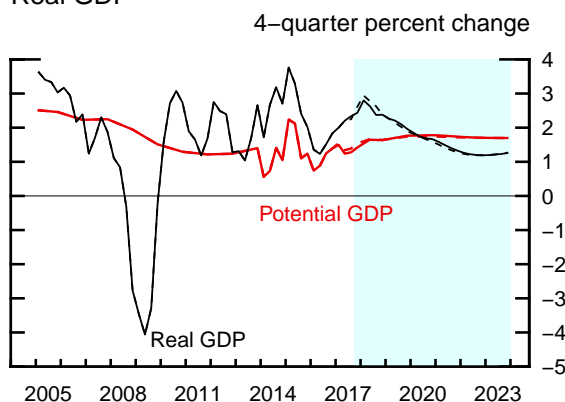
The Long–Term Outlook

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

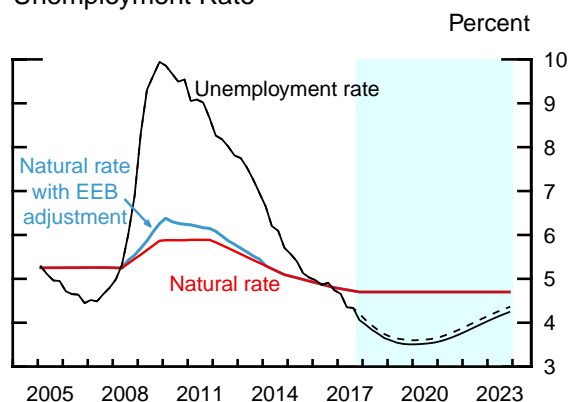
Measure	2017	2018	2019	2020	2021	2022	2023	Longer run
Real GDP	2.4	2.4	2.0	1.7	1.3	1.2	1.3	1.7
Previous Tealbook	2.6	2.4	1.9	1.6	1.3	1.2	1.3	1.7
Civilian unemployment rate ¹	4.1	3.6	3.5	3.5	3.7	4.0	4.2	4.7
Previous Tealbook	4.2	3.7	3.6	3.6	3.8	4.1	4.4	4.8
PCE prices, total	1.7	1.7	1.9	2.0	2.1	2.1	2.1	2.0
Previous Tealbook	1.5	1.7	2.0	2.0	2.1	2.1	2.1	2.0
Core PCE prices	1.5	1.8	2.0	2.0	2.1	2.1	2.1	2.0
Previous Tealbook	1.4	1.8	2.0	2.0	2.1	2.1	2.1	2.0
Federal funds rate ¹	1.25	2.50	3.46	4.00	4.16	4.05	3.80	2.50
Previous Tealbook	1.35	2.52	3.46	4.00	4.13	4.02	3.77	2.50
10-year Treasury yield ¹	2.4	3.4	3.7	3.6	3.5	3.4	3.3	2.9
Previous Tealbook	2.5	3.4	3.6	3.6	3.5	3.4	3.3	2.9

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

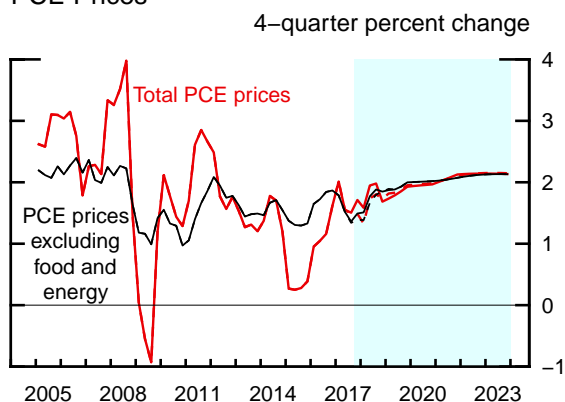
Real GDP



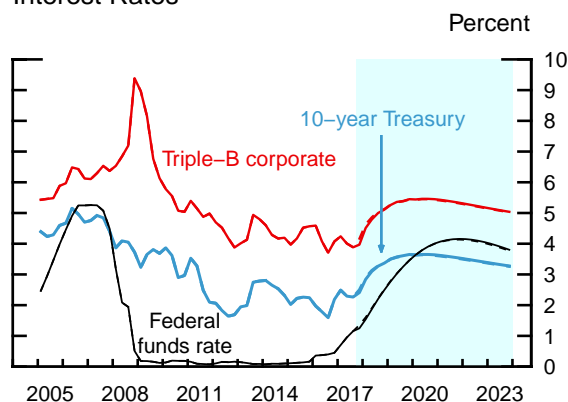
Unemployment Rate



PCE Prices



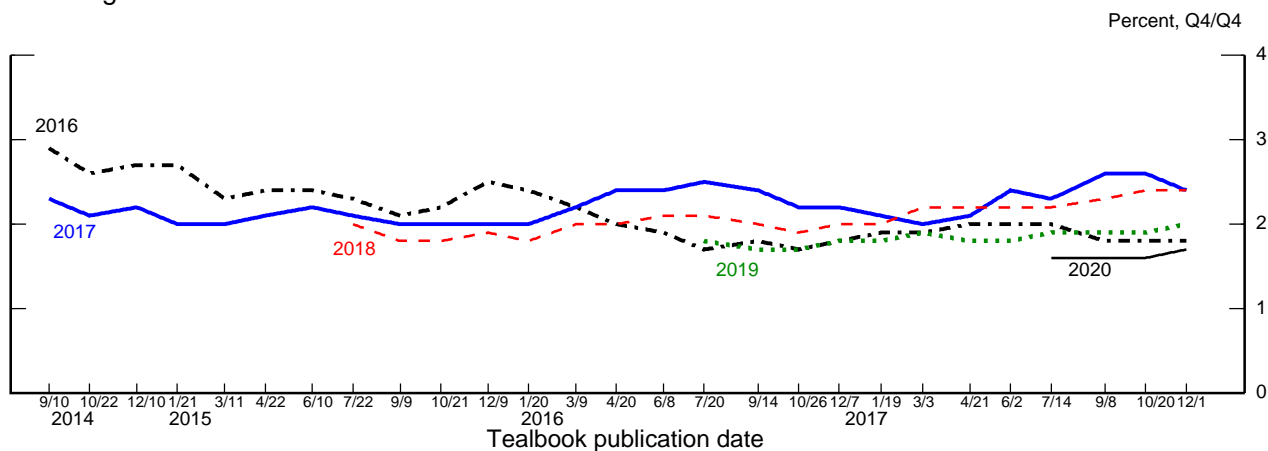
Interest Rates



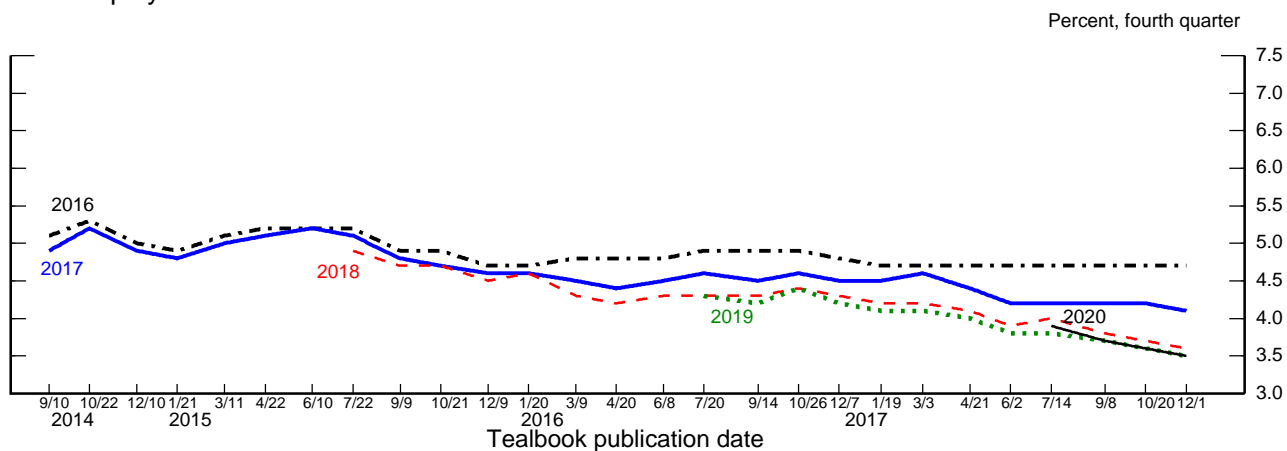
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

Evolution of the Staff Forecast

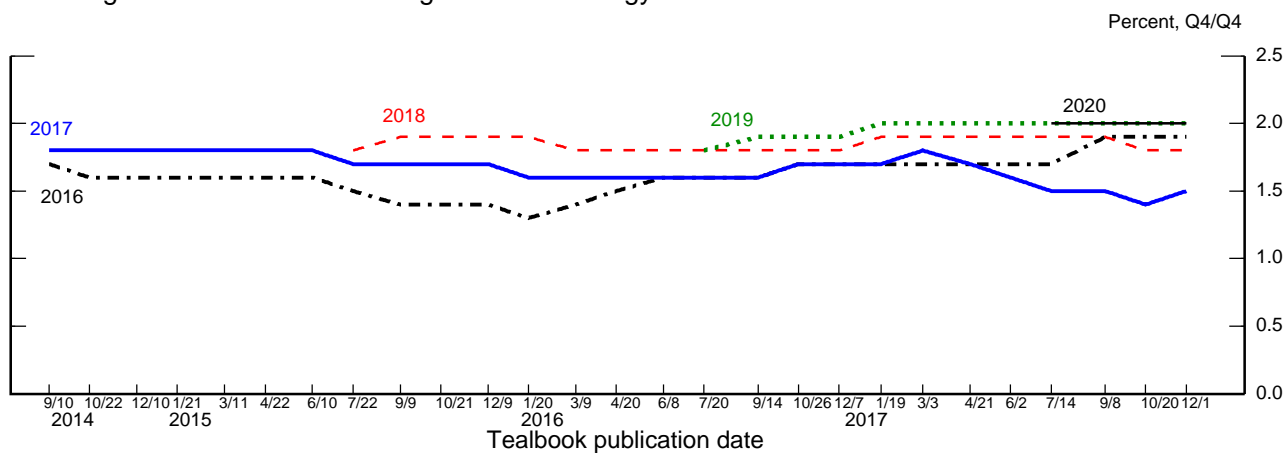
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



The Foreign GDP Outlook

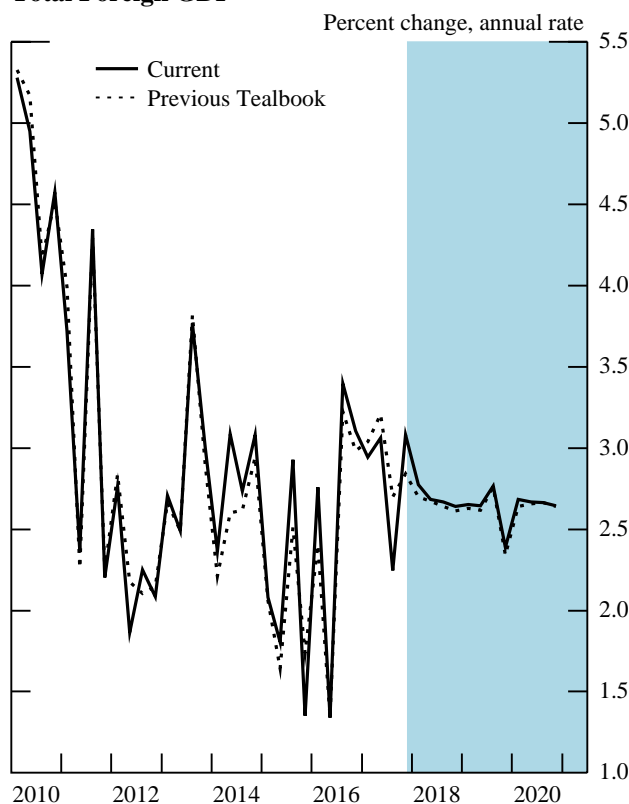
Real GDP*

Percent change, annual rate

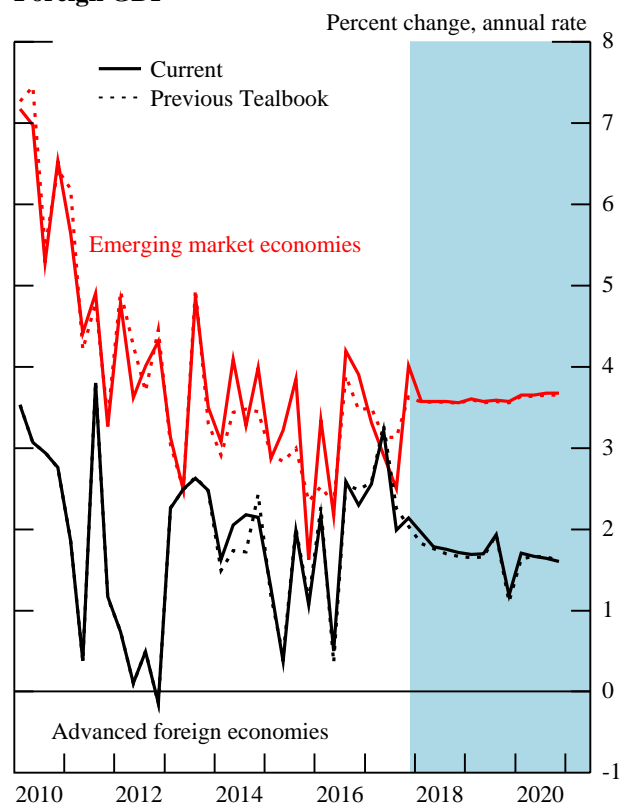
	2017			2018			2019	2020
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	3.0	2.2	3.1	2.8	2.7	2.7	2.6	2.7
Previous Tealbook	3.1	2.7	2.8	2.7	2.7	2.6	2.6	2.7
2. Advanced Foreign Economies	2.9	2.0	2.1	2.0	1.8	1.7	1.6	1.7
Previous Tealbook	2.9	2.3	2.0	1.8	1.8	1.7	1.6	1.6
3. Canada	4.0	1.7	2.2	2.1	2.0	1.9	1.8	1.7
4. Euro Area	2.4	2.5	2.4	2.0	1.6	1.7	1.7	1.7
5. Japan	1.8	1.4	1.4	1.2	1.1	.8	.2	.8
6. United Kingdom	1.1	1.6	1.7	1.5	1.5	1.5	1.5	1.7
7. Emerging Market Economies	3.1	2.5	4.0	3.6	3.6	3.6	3.6	3.7
Previous Tealbook	3.3	3.1	3.6	3.6	3.6	3.6	3.6	3.6
8. China	6.9	6.5	6.6	6.3	6.3	6.1	6.0	5.8
9. Emerging Asia ex. China	4.2	5.1	4.2	3.9	3.7	3.7	3.6	3.6
10. Mexico	1.7	-1.2	3.5	2.6	2.6	2.6	2.7	2.9
11. Brazil	4.0	.6	1.9	2.0	2.0	2.0	2.5	2.5

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

Total Foreign GDP



Foreign GDP



The Foreign Inflation Outlook

Consumer Prices*

Percent change, annual rate

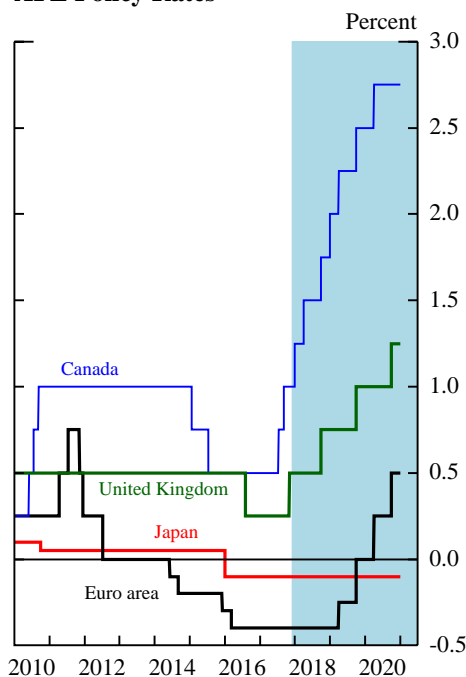
	2017			2018			2019	2020
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	2.4	2.2	2.6	2.5	2.5	2.5	2.5	2.4
Previous Tealbook	2.4	2.2	2.4	2.5	2.4	2.4	2.5	2.4
2. Advanced Foreign Economies	1.3	1.1	1.8	1.7	1.6	1.6	1.9	1.7
Previous Tealbook	1.3	1.1	1.6	1.6	1.5	1.6	1.9	1.7
3. Canada	1.3	1.2	2.1	2.4	2.4	2.3	2.1	2.0
4. Euro Area	1.5	1.0	1.6	1.5	1.3	1.4	1.6	1.7
5. Japan	-.2	.4	1.3	.9	.8	.8	2.3	1.0
6. United Kingdom	3.4	2.3	2.8	2.5	2.3	2.2	2.2	2.1
7. Emerging Market Economies	3.3	3.0	3.1	3.0	3.1	3.1	3.0	2.9
Previous Tealbook	3.3	2.9	3.0	3.1	3.0	3.0	3.0	2.9
8. China	.9	2.0	3.0	2.3	2.5	2.5	2.5	2.5
9. Emerging Asia ex. China	2.0	2.1	2.4	3.1	3.2	3.2	3.1	3.1
10. Mexico	8.4	5.1	3.5	3.2	3.2	3.2	3.2	3.2
11. Brazil	2.7	2.3	3.8	4.3	4.3	4.3	4.3	4.3

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

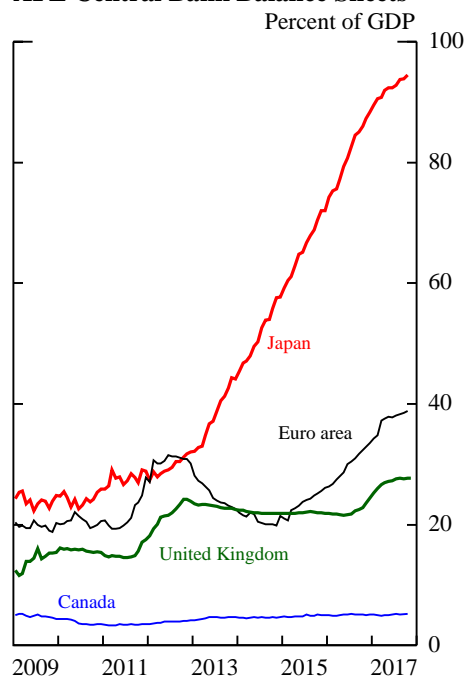
Int'l Econ Devel & Outlook

Foreign Monetary Policy

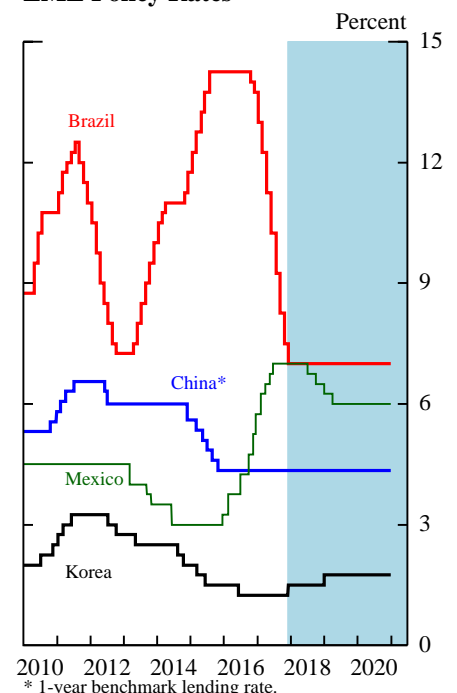
AFE Policy Rates



AFE Central Bank Balance Sheets

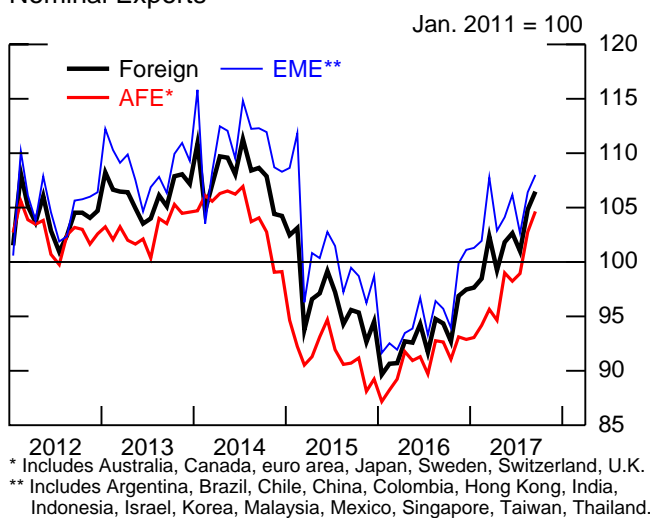


EME Policy Rates

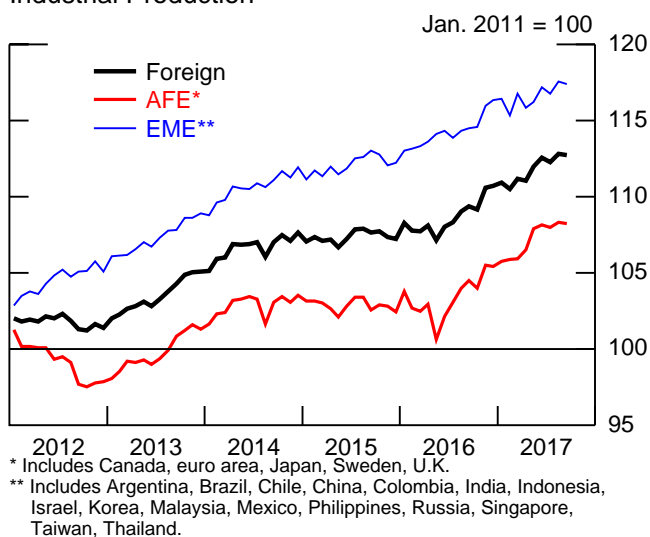


Recent Foreign Indicators

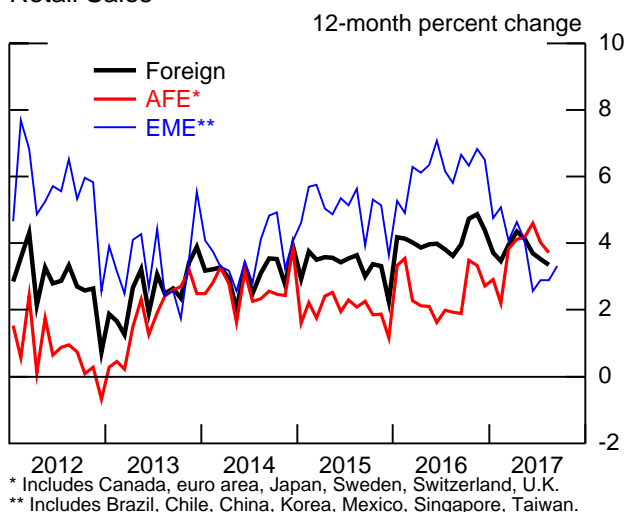
Nominal Exports



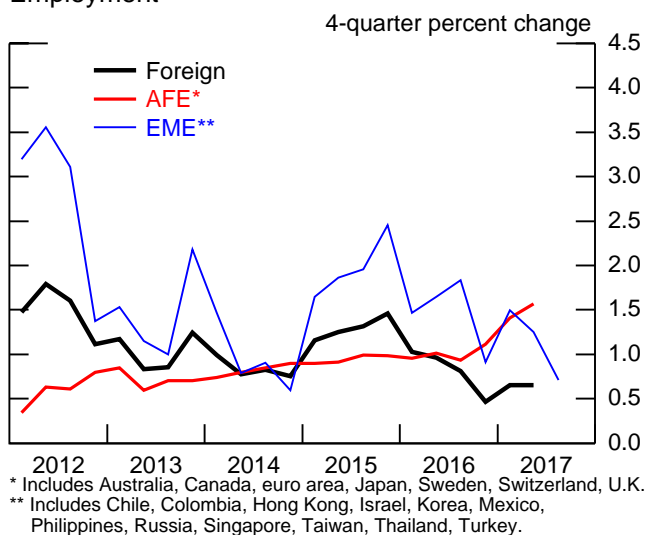
Industrial Production



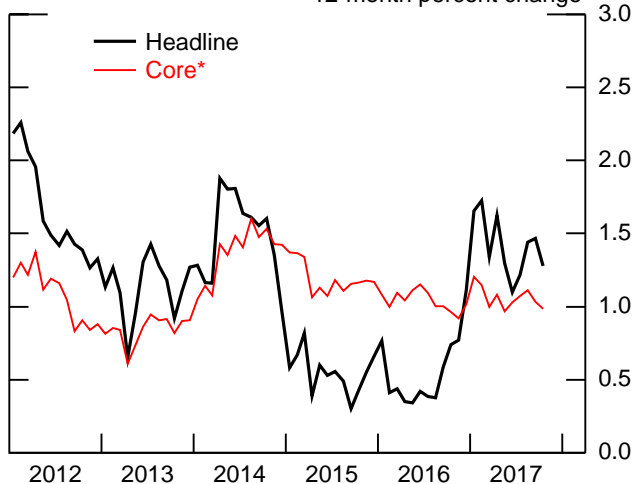
Retail Sales



Employment

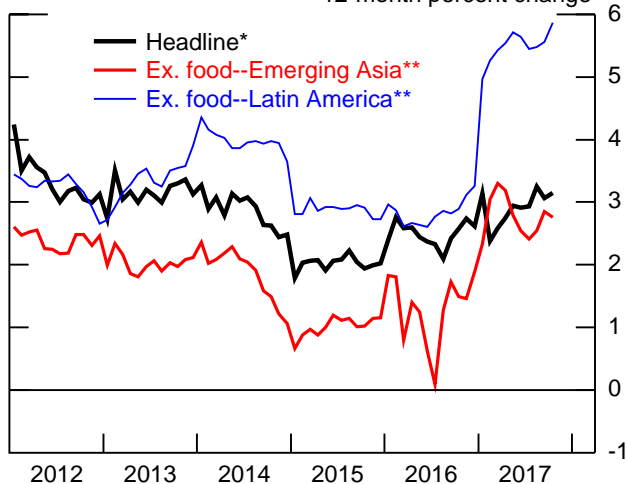


Consumer Prices: Advanced Foreign Economies



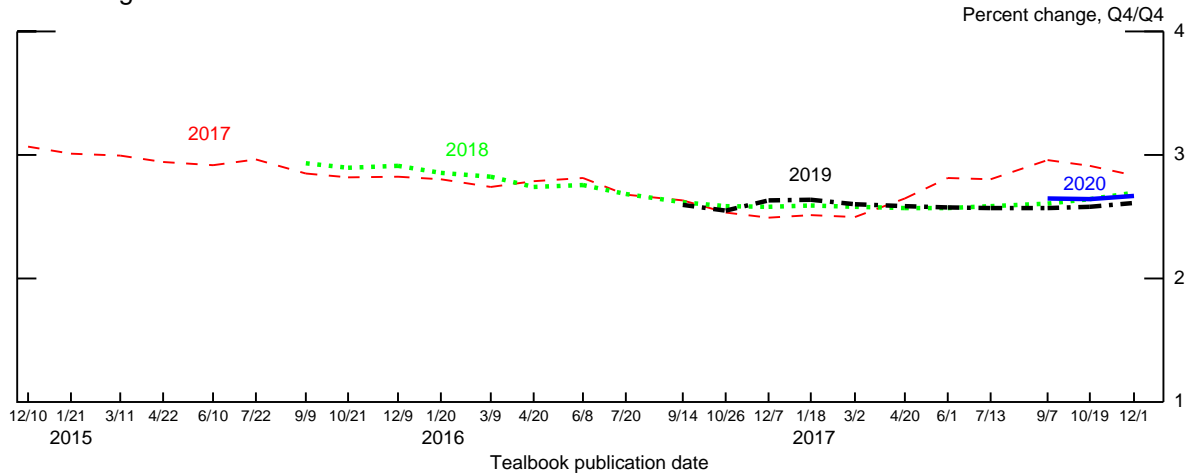
Source: Haver Analytics.

Consumer Prices: Emerging Market Economies

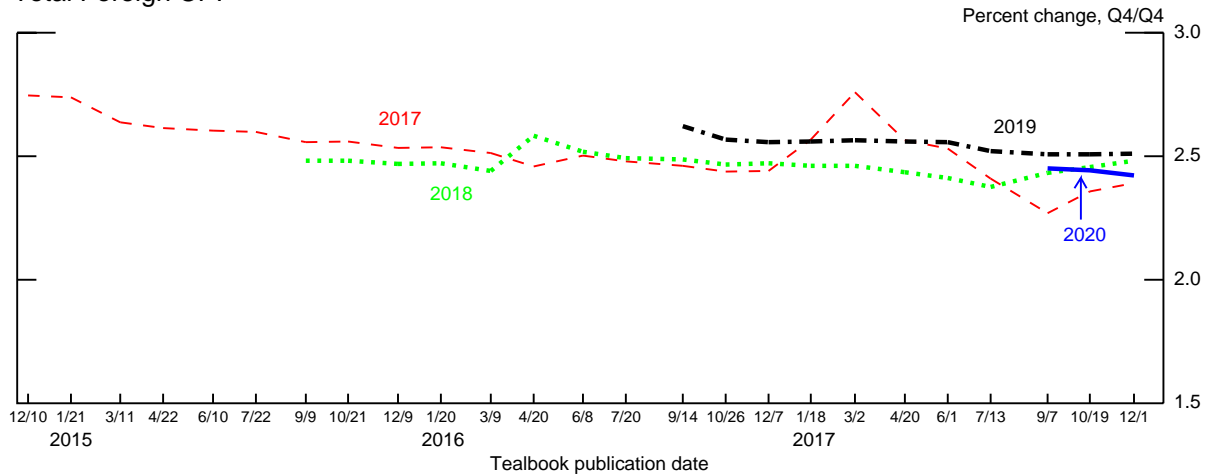


Evolution of Staff's International Forecast

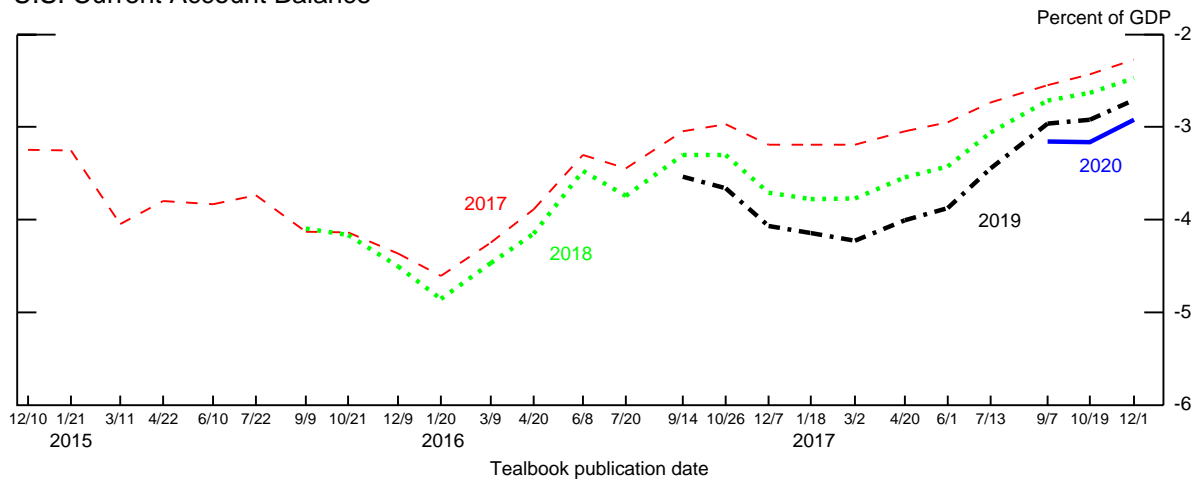
Total Foreign GDP



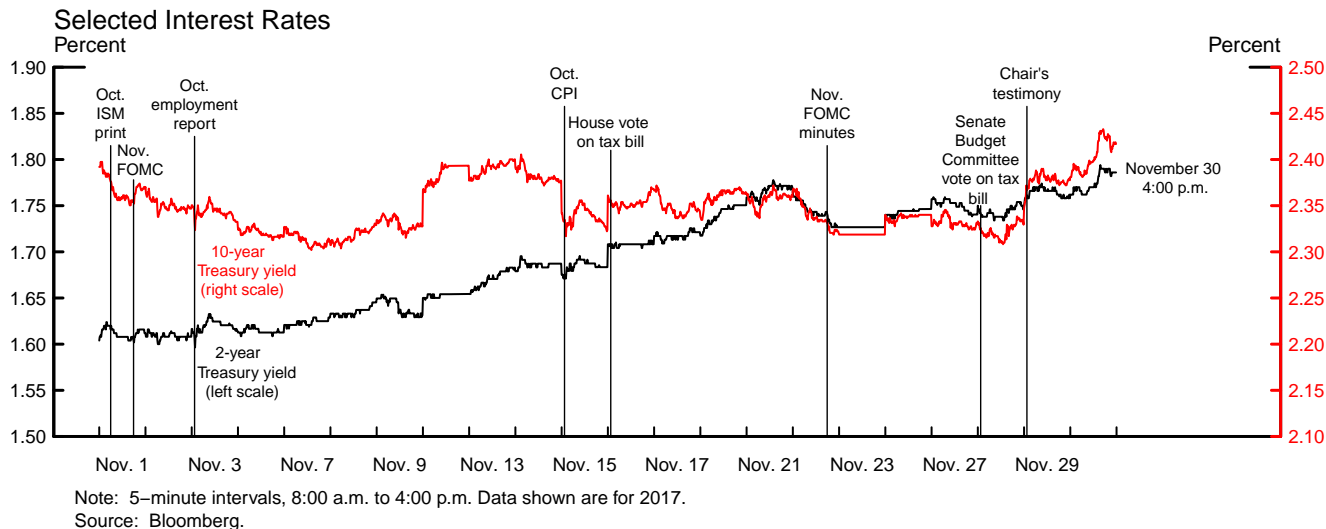
Total Foreign CPI



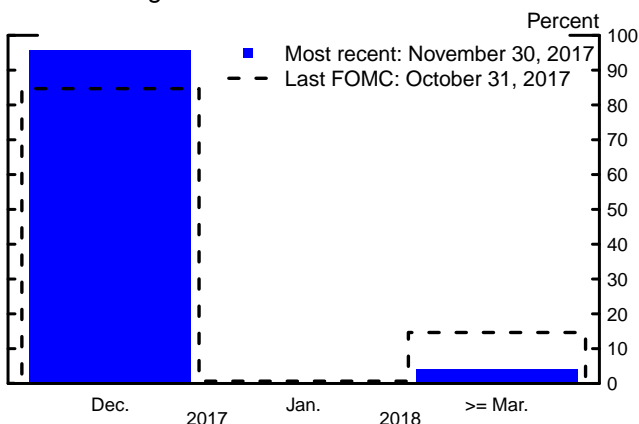
U.S. Current Account Balance



Policy Expectations and Treasury Yields



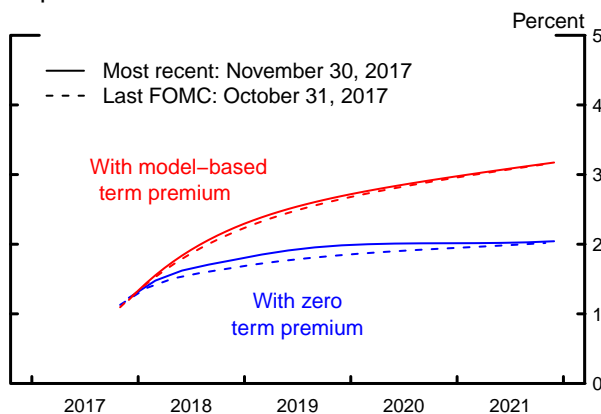
Market-Implied Probability Distribution of the Timing of Next Rate Increase



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

Source: CME Group; Federal Reserve Board staff estimates.

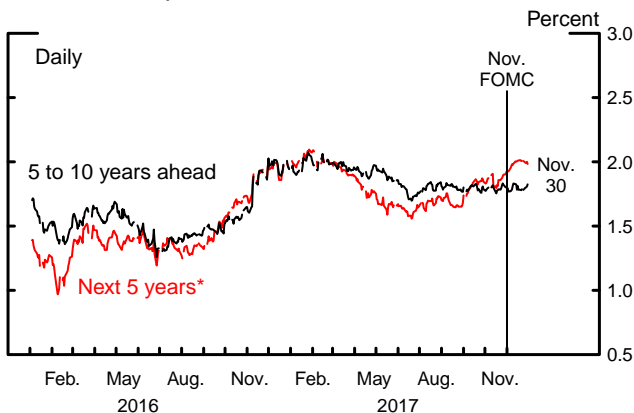
Implied Federal Funds Rate



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.

Inflation Compensation

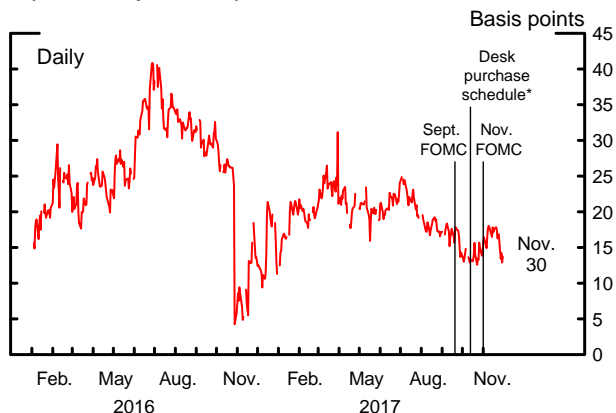


Note: Estimates based on smoothed nominal and inflation-indexed Treasury yield curves.

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

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

30-year Fannie Mae MBS Current-Coupon Option-Adjusted Spread



Note: In October 2016 Barclays made changes to the cohort mappings used to generate the series resulting in a roughly 20 basis point decline in the current coupon OAS.

* Release of the first schedule of mortgage-backed securities (MBS) operations based on reduced reinvestment purchases.

Source: Barclays.

The Flattening of the U.S. Yield Curve since December 2015

On balance since the FOMC began its current tightening cycle in December 2015, the 2-year nominal Treasury yield (the red line in figure 1) has risen about 70 basis points while the 10-year yield (the blue line) is little changed, leaving the spread between these yields (the green line) at its lowest level since 2007.¹ This analysis puts this flattening of the Treasury yield curve into historical perspective, discusses factors that appear to explain these movements in yields, and then describes the signal that may be taken for real economic activity in the near term.

Although the recent flattening of the yield curve has attracted significant attention by market participants, the current spread between 10- and 2-year yields, seen in figure 2, is not unusually low by historical standards—it stands at about the 40th percentile of its distribution since August 1971. In addition, the extent of the recent narrowing of the spread since December 2015 has been smaller than that observed at a comparable stage in three previous tightening cycles (figure 3).²

Separate factors appear to explain the recent movements at the short and long ends of the yield curve since liftoff. The increase in short-term yields has

Figure 1: 2- and 10-Year Treasury Yields and the Term Spread

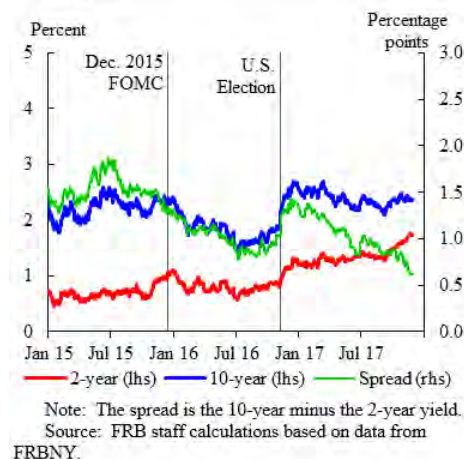
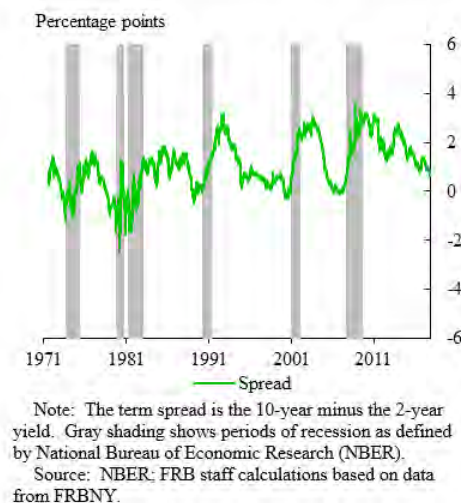


Figure 2: Term Spread and NBER Recessions



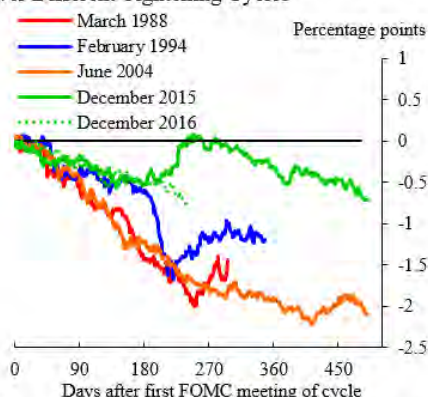
¹ The spread between the 10-year Treasury yield and the federal funds rate—an alternative measure of the slope of the yield curve that is used in the staff’s baseline economic projections—has similarly declined.

² The three previous tightening cycles began in 1988, 1994, and 2004. Of course, this sample is small and each cycle had different characteristics, which makes a direct comparison with the current cycle difficult. For example, the current cycle has been characterized by a relatively gradual pace of rate increases. How one dates the start of each cycle also matters for comparison purposes. For example, the dashed green line in figure 3 shows the cumulative change in the spread since December 2016, a period that more closely resembles previous cycles.

reflected the gradual removal of monetary policy accommodation over this period as well as expectations for continued removal over the near term. At the same time, other factors appear to have held down longer-term yields.³ There is some evidence that expectations of the longer-run equilibrium real interest rate, or r^* , may have fallen: A Blue Chip survey-based measure of 5-to-10-year-ahead real rate expectations has moved down by about 30 basis points since the end of 2015, many model-based estimates of r^* have remained persistently low relative to pre-crisis levels, and survey expectations of longer-run GDP growth have also declined.⁴ Furthermore, spillovers from unconventional monetary policies abroad, particularly in the euro area and Japan, also seem likely to have put some downward pressure on the term premium component of longer-term Treasury yields over this period. Indeed, since December 2015, staff estimates of the 10-year term premium have declined about 30 basis points.

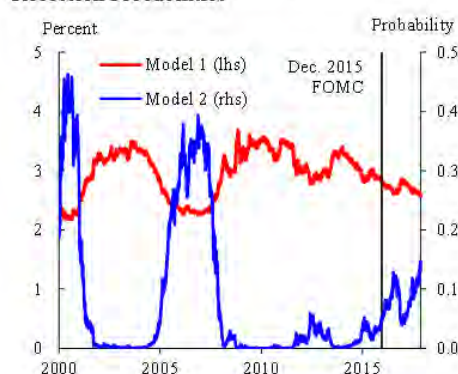
More recently this year, market commentaries have pointed to two additional factors that may have contributed to the flattening of the yield curve. First, investors appear to have revised down their expectations for expansionary U.S. fiscal policy amid slower-than-expected progress with the Administration's legislative agenda; this factor has reportedly led to some unwinding of the steepening of the yield curve seen immediately following the U.S. election late last year. Second, the generally weaker-than-expected incoming inflation data

Figure 3: Cumulative Changes in Term Spread Over Different Tightening Cycles



Note: Cumulative changes relative to the day before the FOMC meeting of the first rate rise in the cycle. We truncate the 1988 and 1994 lines the day before the start of rate cuts.
Source: FRB staff calculations based on data from FRBNY.

Figure 4: Expected Real GDP Growth and Recession Probabilities



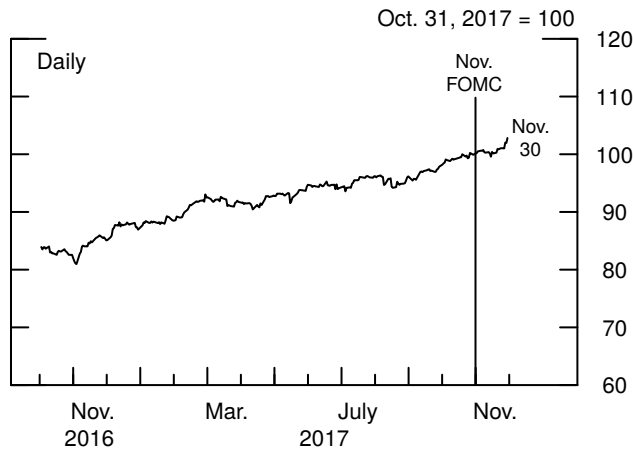
Note: 10- over 2-year yield spread used to predict GDP growth one year ahead (model 1) and NBER recession probability (model 2) in a year's time.
Source: FRB staff calculations based on data from FRBNY, BEA, and NBER.

³ For a more detailed discussion of factors holding down longer-dated yields, see the memo to the FOMC titled "Recent Movements in Longer-Term Treasury Yields: Causes and Potential Policy Implications," by the staff at the Board and the Federal Reserve Bank of New York, dated July 14, 2017.

⁴ The Monetary Policy Strategies section in the October 2017 Tealbook discussed a range of recent time-series estimates of r^* and showed that they are subject to sizable uncertainty. The median respondent to the November 2017 Survey of Primary Dealers expected "longer run" growth of 1.8 percent, down from 2.1 percent in the December 2015 survey.

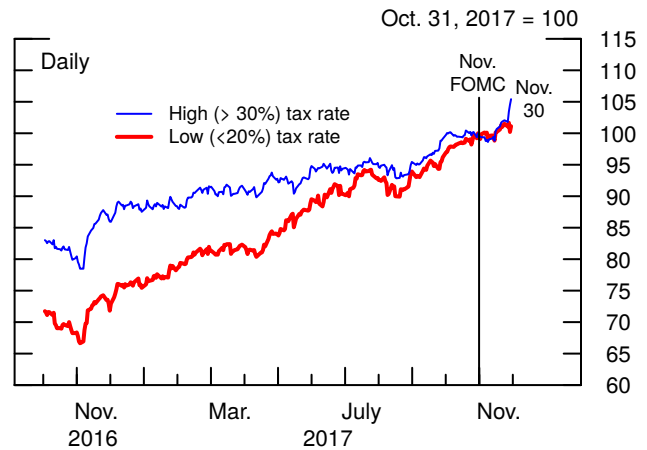
Corporate Asset Market Developments

S&P 500 Stock Price Index



Source: Bloomberg.

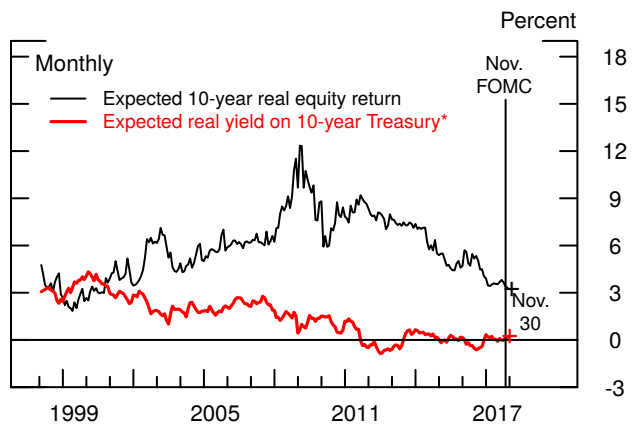
Value-Weighted Stock Returns, by Domestic Tax Rate



Note: The data include small firms excluding those in the financial and energy sectors. Tax rates are measured as U.S. taxes over pretax income.

Source: Bloomberg.

Equity Risk Premium



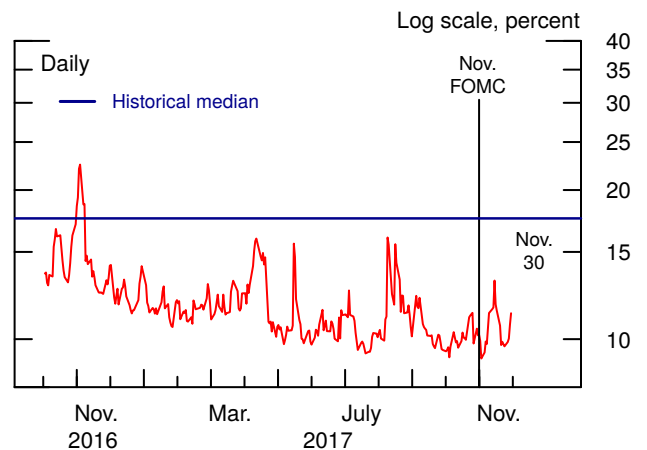
Note: The equity risk premium is the difference between the two data series.

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

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

Source: Staff projections.

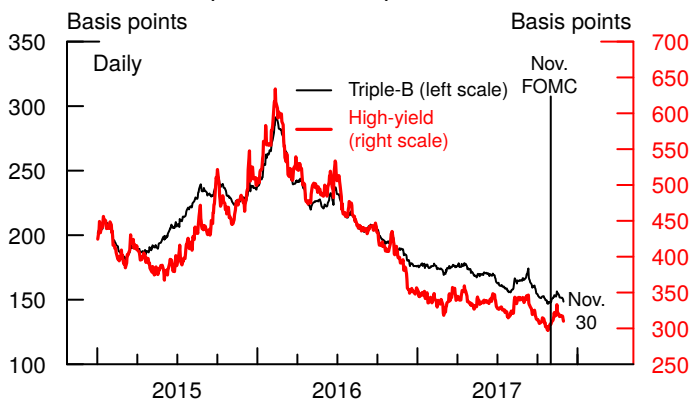
Implied Volatility on S&P 500 (VIX)



Note: Historical median is taken from 1990 onward.

Source: Chicago Board Options Exchange.

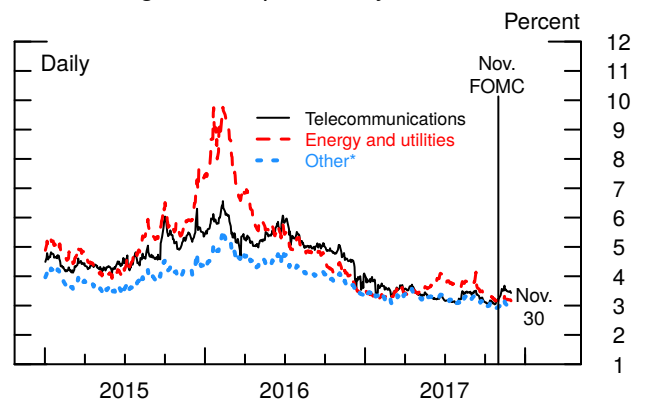
10-Year Corporate Bond Spreads



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.

10-Year High-Yield Spreads, by Sector



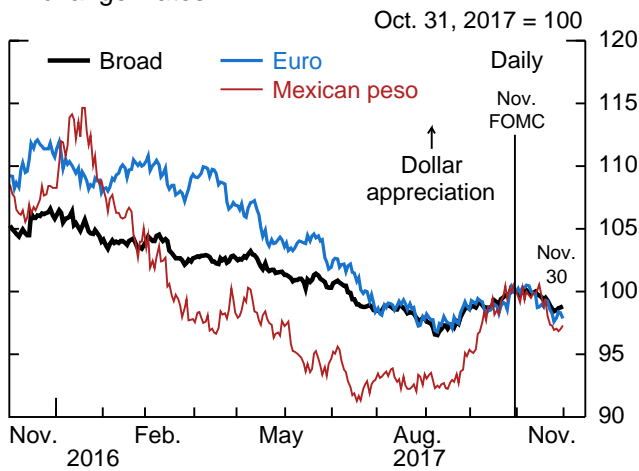
Note: Spreads over 10-year Treasury yield.

* Includes high-yield firms that are not in the telecommunications sector or energy and utilities sectors.

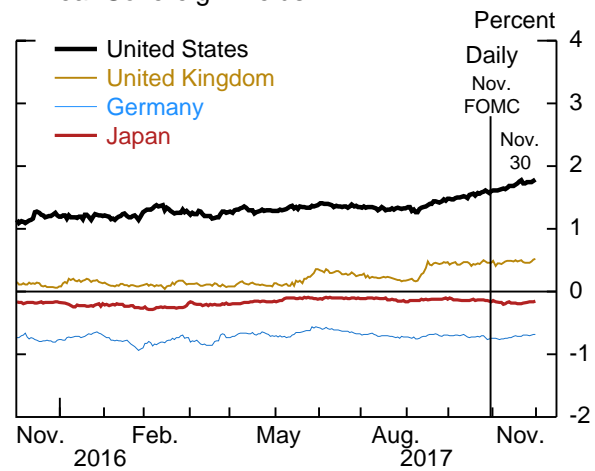
Source: Staff estimates of smoothed corporate yield curves based on Merrill Lynch data and smoothed Treasury yield curve.

Foreign Developments

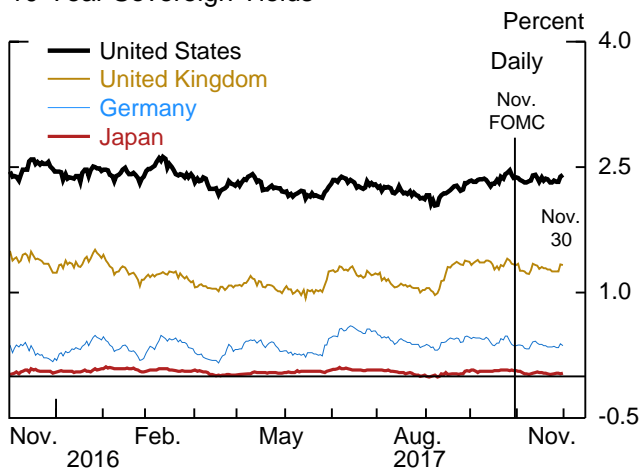
Exchange Rates



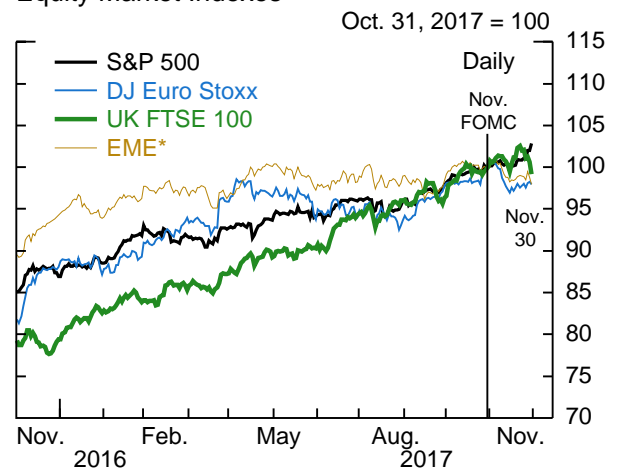
2-Year Sovereign Yields



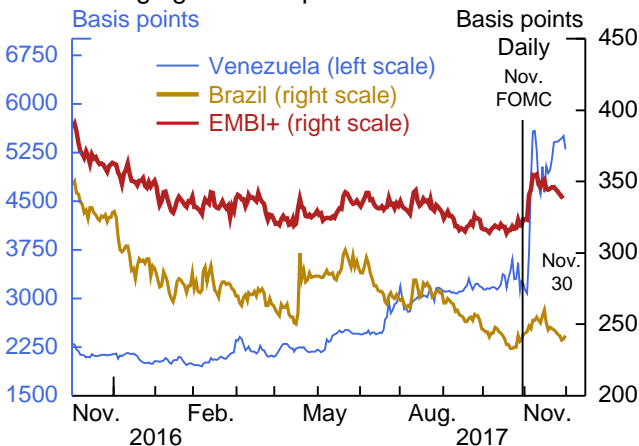
10-Year Sovereign Yields



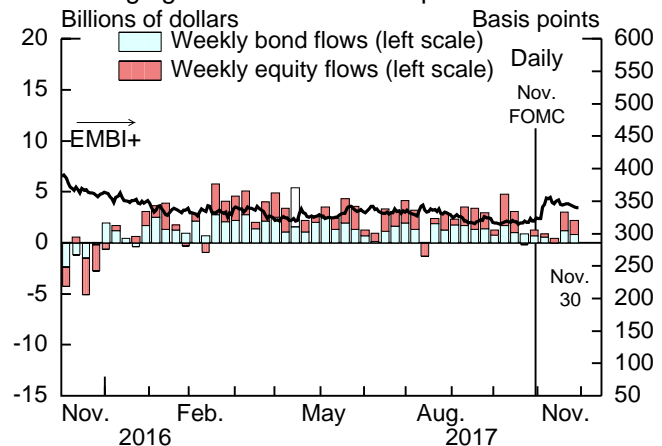
Equity Market Indexes



Emerging Market Spreads

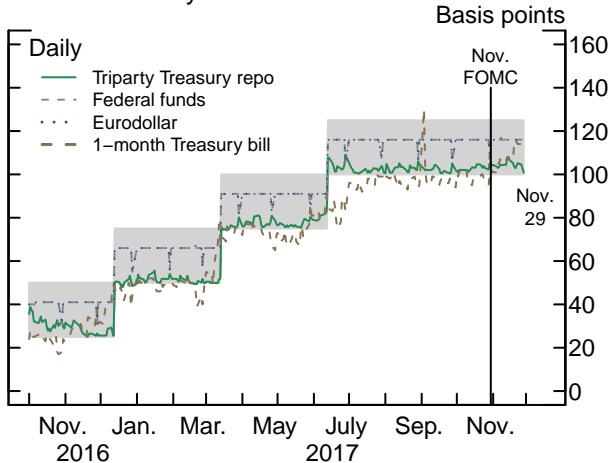


Emerging Market Flows and Spreads



Short-Term Funding Markets and Federal Reserve Operations

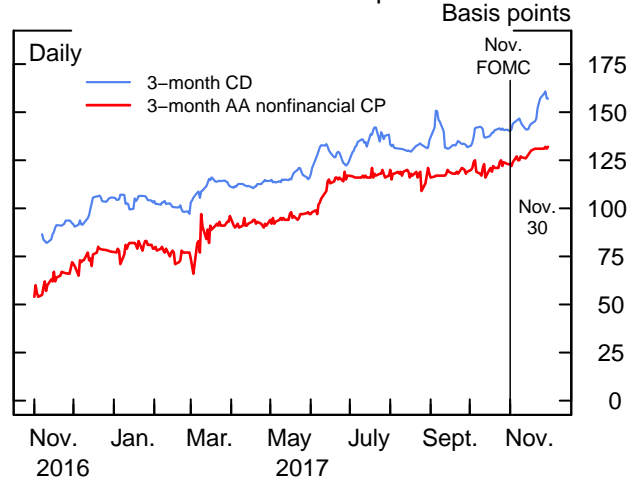
Selected Money Market Rates



Note: Federal funds rate is a weighted median. Shaded area is the target range for the federal funds rate. Repo is repurchase agreement.

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

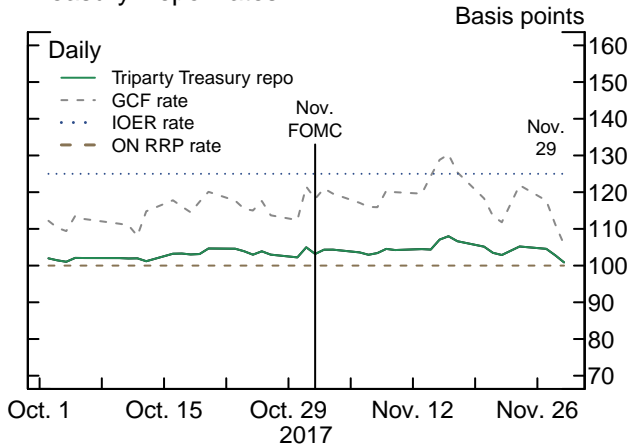
Term Rates on Commercial Paper and CDs



Note: Certificate of deposit (CD) yields are a 5-day moving average. CP is commercial paper.

Source: Depository Trust & Clearing Corporation.

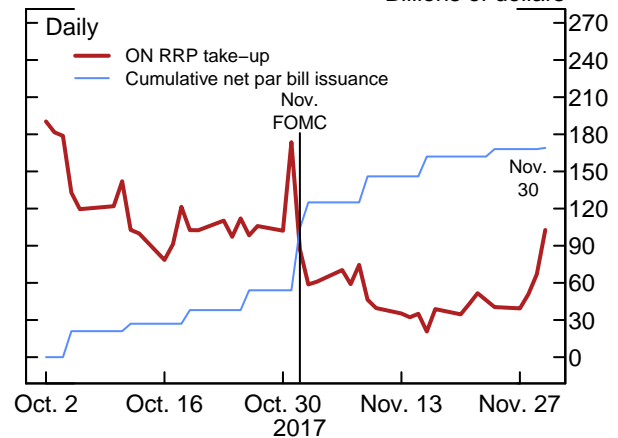
Treasury Repo Rates



Note: Repo is repurchase agreement; GCF is General Collateral Finance; IOER is interest on excess reserves; ON RRP is overnight reverse repurchase agreement.

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

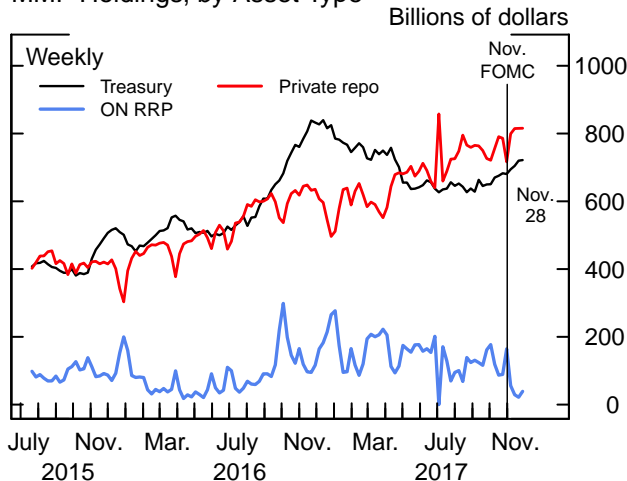
ON RRP Take-Up and Cumulative Bill Issuance



Note: ON RRP is overnight reverse repurchase agreement.

Source: Federal Reserve Bank of New York; Treasury auction announcements and results.

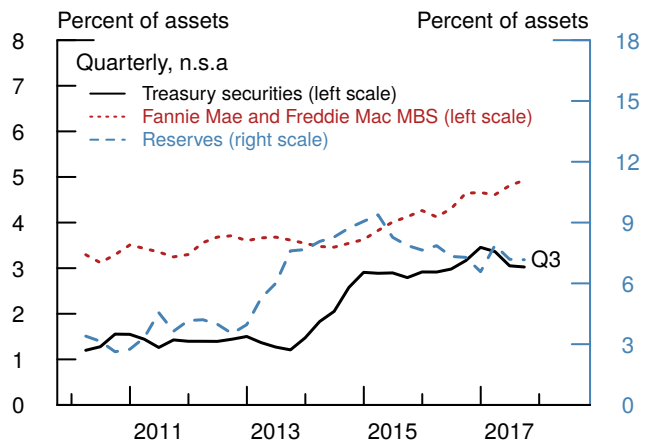
MMF Holdings, by Asset Type



Note: Repo is repurchase agreement.

Source: iMoneyNet.

Selected Liquid Assets at Standard LCR BHCs

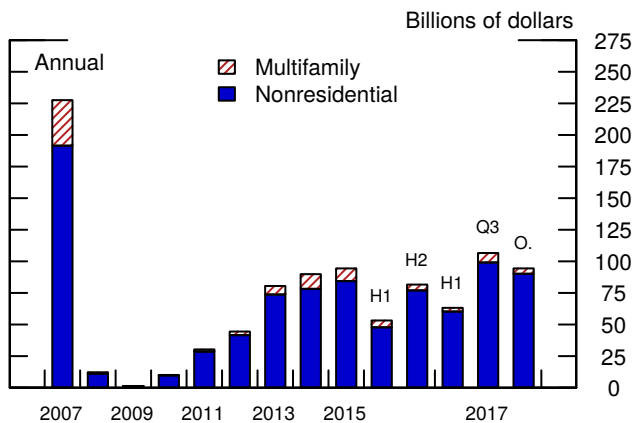


Note: Standard liquidity coverage ratio (LCR) bank holding companies (BHCs) are large (>\$250B) BHCs.

Source: Federal Reserve Board, Form FR Y-9C and Form FR 2900.

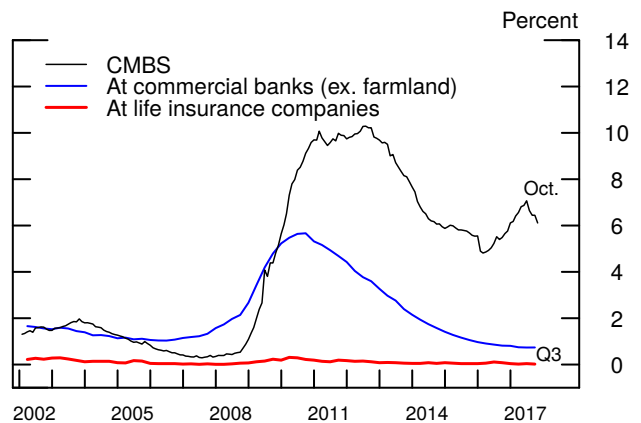
Commercial Real Estate and Bank Lending

Non-agency CMBS Issuance



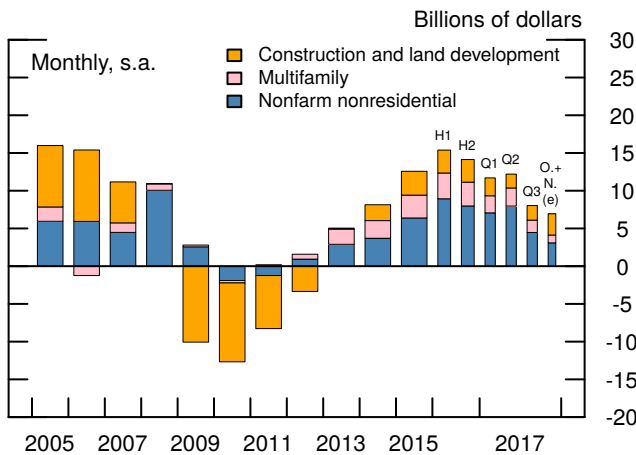
Note: CMBS is commercial mortgage-backed securities.
Source: Commercial Mortgage Alert.

Delinquency Rates on Commercial Mortgages on Existing Properties



Note: For life insurance companies and commercial banks, the data are quarterly; for commercial mortgage-backed securities (CMBS), the data are monthly.
Source: Citigroup; Call Report; American Council of Life Insurers.

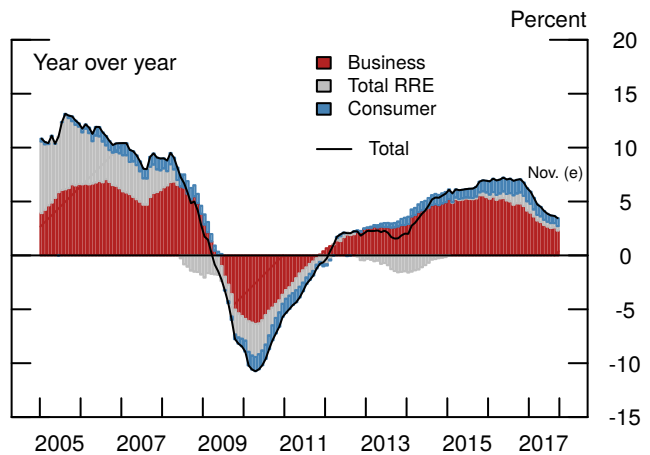
Commercial Real Estate Loans at Banks



(e) Estimate.

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

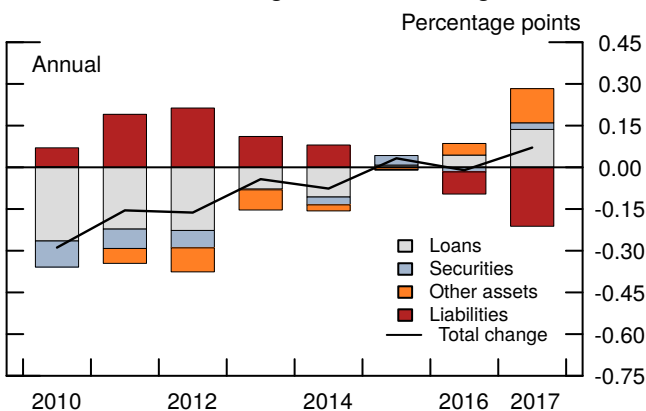
Core Loan Growth



Note: Business loans include commercial and industrial loans and commercial real estate loans. Consumer loans include credit card, auto, and other consumer loans. RRE is residential real estate.

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

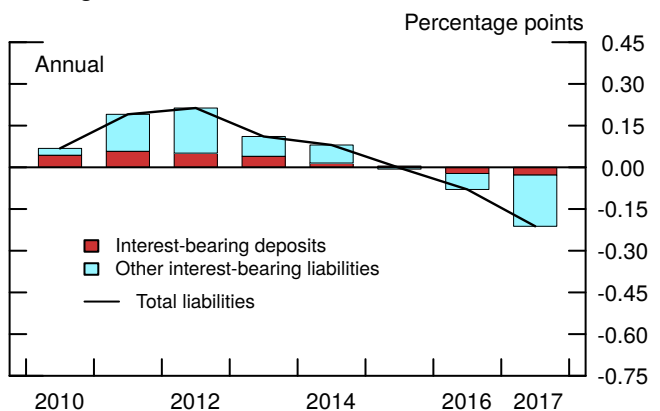
Contributions to Changes in NIM at Large BHCs



Note: NIM is net interest margin; BHC is bank holding company. The 2017 bar is based on data through the third quarter.

Source: Staff calculations, FR Y-9C, Consolidated Financial Statements for Holding Companies.

Liabilities' Contribution to Changes in NIM at Large BHCs

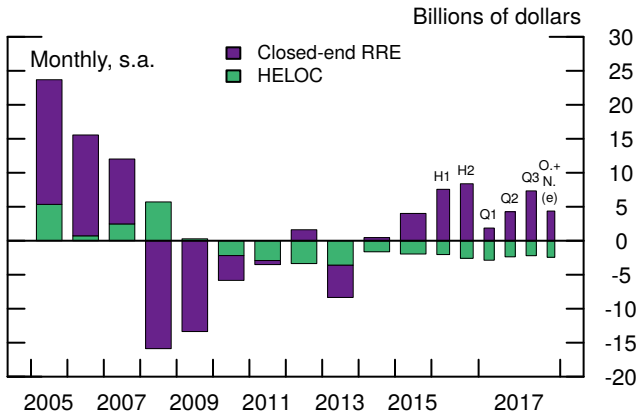


Note: NIM is net interest margin; BHC is bank holding company. The 2017 bar is based on data through the third quarter.

Source: Staff calculations, FR Y-9C, Consolidated Financial Statements for Holding Companies.

Household Finance

Residential Real Estate Loans at Banks

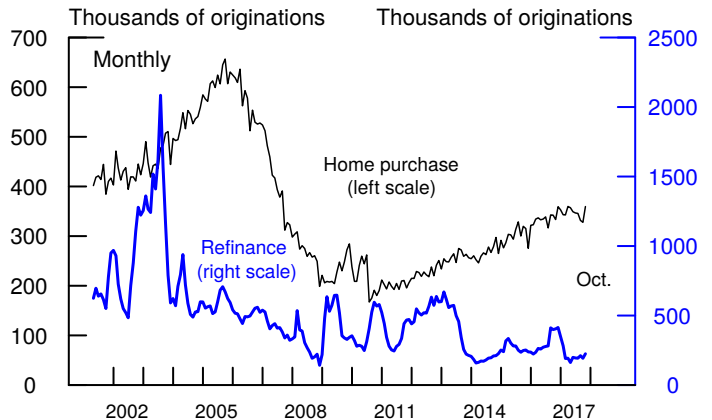


Note: RRE is residential real estate; HELOC is home equity line of credit.

(e) Estimate.

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

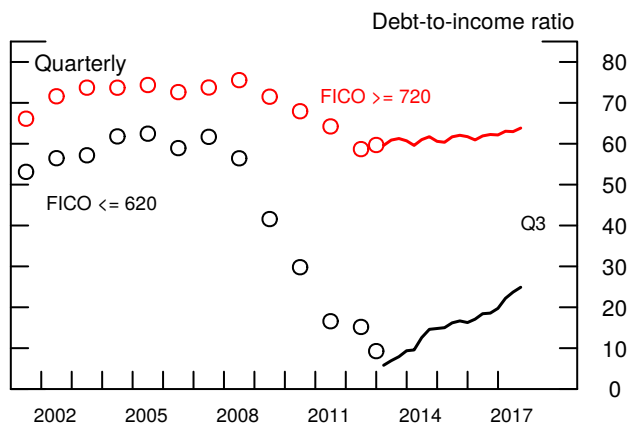
Purchase and Refinance Activity



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

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

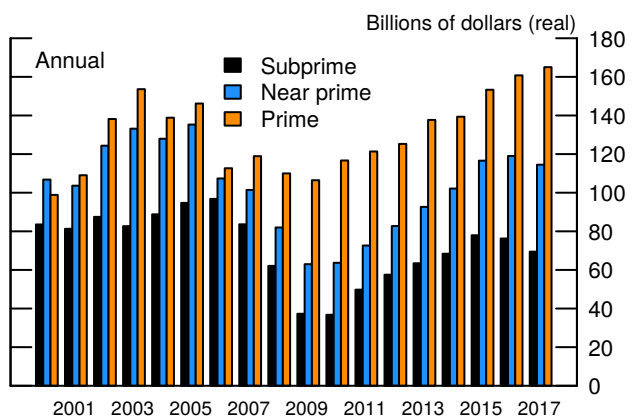
Mortgage Credit Summary Frontiers, by FICO Score



Note: Summary frontier is a weighted average of the individual frontiers associated with each loan-to-value ratio, property location, and FICO group.

Source: For frontiers shown with circles, McDash and CoreLogic; for frontiers shown with solid lines, Optimal Blue.

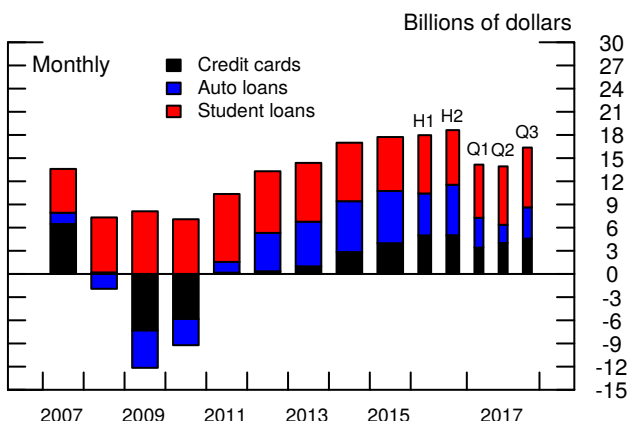
New Extensions: Auto



Note: New credit extensions in the past year; data for the 3rd quarter of each year. Near prime is between 620 and 719 and prime is greater than 719; scores were measured a year ago.

Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax.

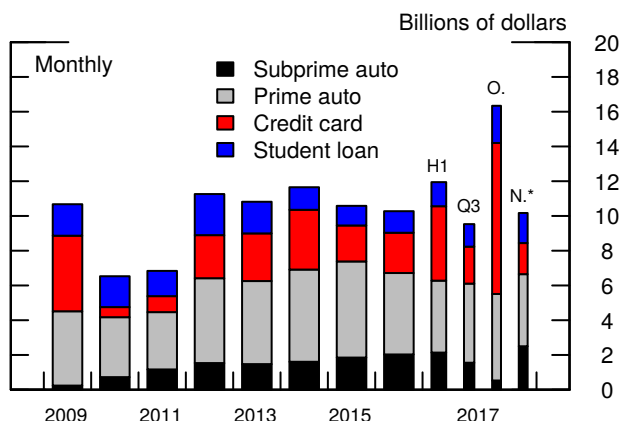
Consumer Credit Flows



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

Source: Federal Reserve Board.

Gross Consumer ABS Issuance



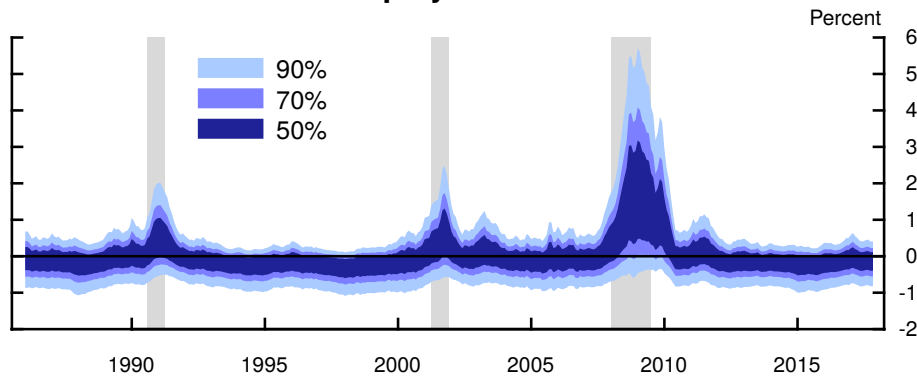
Note: ABS is asset-backed securities.

* Month to date.

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

Time-Varying Macroeconomic Risk

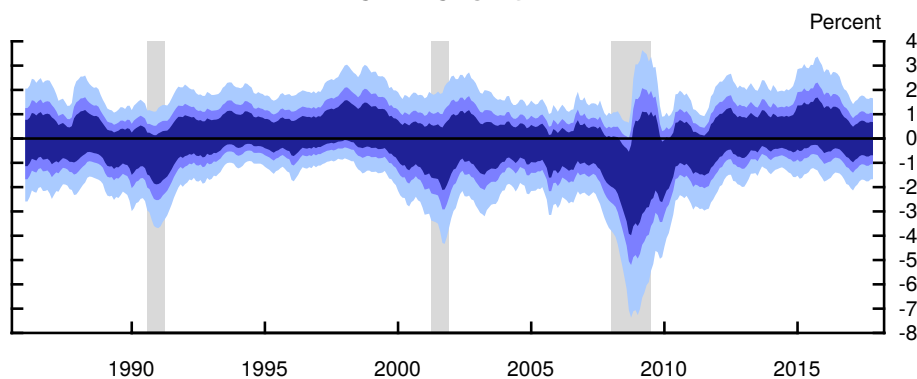
Unemployment Rate



November 2017

95th	0.4
85th	0.2
50th	-0.1
15th	-0.6
5th	-0.8

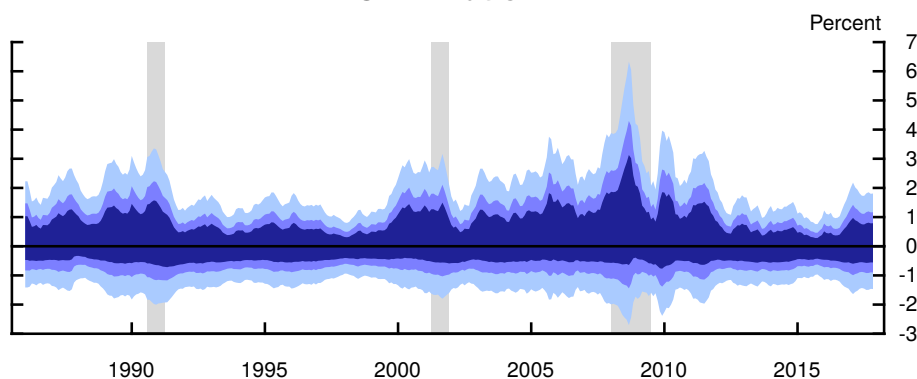
GDP Growth



November 2017

95th	1.7
85th	1.0
50th	0.0
15th	-1.1
5th	-1.7

CPI Inflation

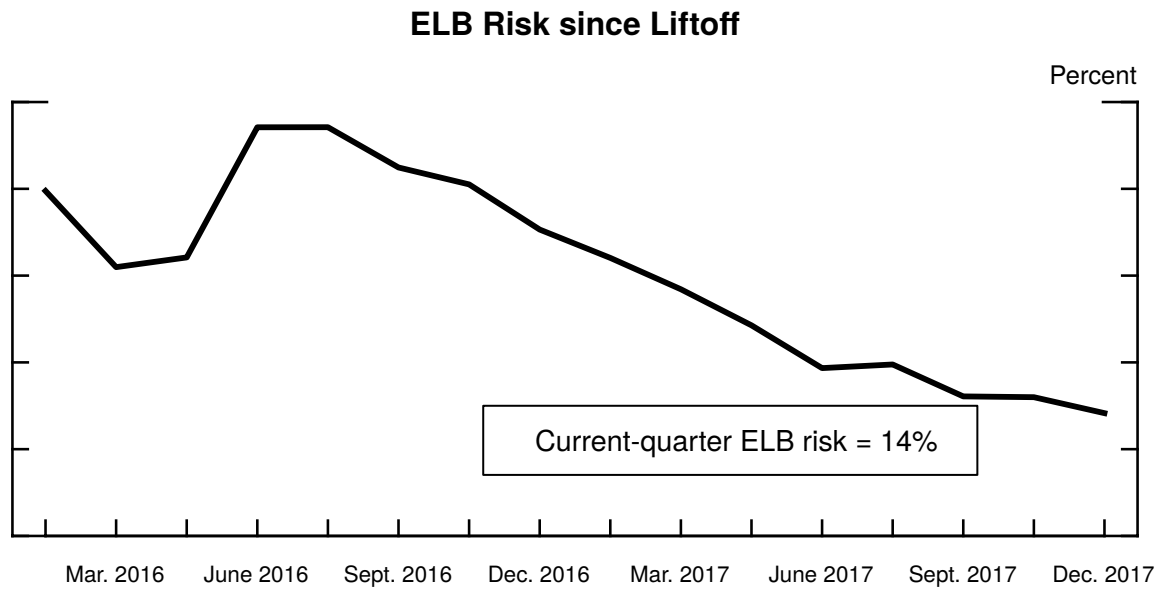


November 2017

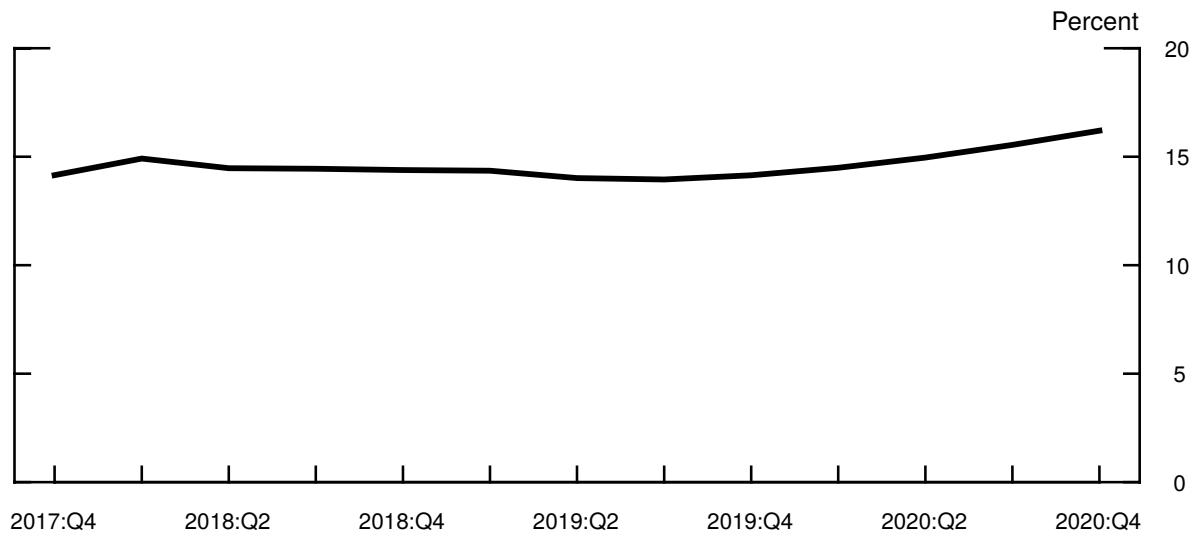
95th	1.8
85th	1.2
50th	0.1
15th	-0.9
5th	-1.5

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.

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	2017	2018	2019	2020	2021-22
	H2				
<i>Real GDP</i>					
Extended Tealbook baseline	2.7	2.4	2.0	1.7	1.3
Lower inflation expectations	2.7	2.0	2.1	1.7	1.3
Steeper Phillips curve	2.7	2.4	1.9	1.5	1.1
Market correction	2.7	1.7	1.7	1.8	1.5
Misperceived lower natural rate	2.7	2.4	2.1	1.8	1.3
Higher oil prices and faster AFE tightening	2.7	2.0	1.8	1.6	1.3
China-driven EME turbulence	2.7	1.4	1.4	1.8	1.5
<i>Unemployment rate¹</i>					
Extended Tealbook baseline	4.1	3.6	3.5	3.5	4.0
Lower inflation expectations	4.1	3.8	3.6	3.6	4.0
Steeper Phillips curve	4.1	3.7	3.6	3.7	4.3
Market correction	4.1	3.9	3.9	3.9	4.1
Misperceived lower natural rate	4.1	3.6	3.3	3.2	3.6
Higher oil prices and faster AFE tightening	4.1	3.8	3.7	3.7	4.1
China-driven EME turbulence	4.1	4.0	4.2	4.2	4.5
<i>Total PCE prices</i>					
Extended Tealbook baseline	2.2	1.7	1.9	2.0	2.1
Lower inflation expectations	2.2	1.3	1.6	1.6	1.8
Steeper Phillips curve	2.2	2.0	2.5	2.8	3.2
Market correction	2.2	1.7	1.9	1.9	2.1
Misperceived lower natural rate	2.2	1.6	1.7	1.7	2.0
Higher oil prices and faster AFE tightening	2.4	2.2	2.0	2.0	2.1
China-driven EME turbulence	2.0	.9	1.6	1.9	2.1
<i>Core PCE prices</i>					
Extended Tealbook baseline	1.6	1.8	2.0	2.0	2.1
Lower inflation expectations	1.6	1.5	1.6	1.6	1.7
Steeper Phillips curve	1.6	2.1	2.6	2.9	3.2
Market correction	1.6	1.8	2.0	2.0	2.1
Misperceived lower natural rate	1.6	1.8	1.8	1.8	1.9
Higher oil prices and faster AFE tightening	1.6	2.0	2.1	2.1	2.1
China-driven EME turbulence	1.5	1.2	1.7	1.9	2.0
<i>Federal funds rate¹</i>					
Extended Tealbook baseline	1.2	2.5	3.5	4.0	4.1
Lower inflation expectations	1.2	2.2	2.9	3.4	3.5
Steeper Phillips curve	1.2	2.6	3.8	4.7	5.0
Market correction	1.2	2.3	3.0	3.5	3.7
Misperceived lower natural rate	1.2	2.5	3.4	3.9	3.9
Higher oil prices and faster AFE tightening	1.2	2.6	3.4	3.9	3.9
China-driven EME turbulence	1.2	2.1	2.7	3.2	3.5

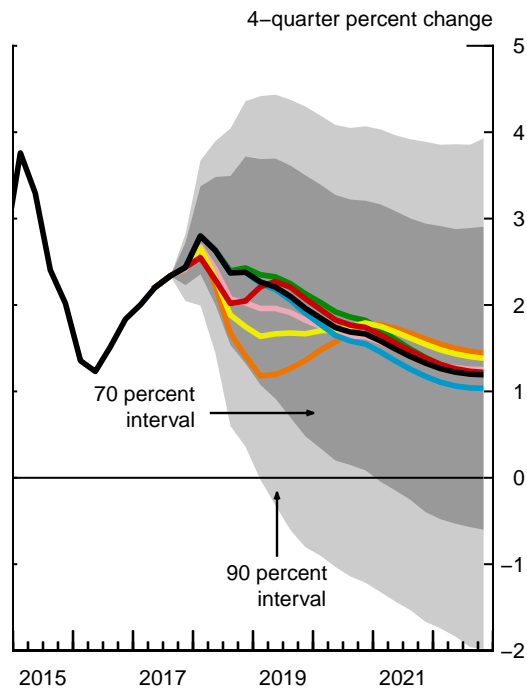
1. Percent, average for the final quarter of the period.

Forecast Confidence Intervals and Alternative Scenarios

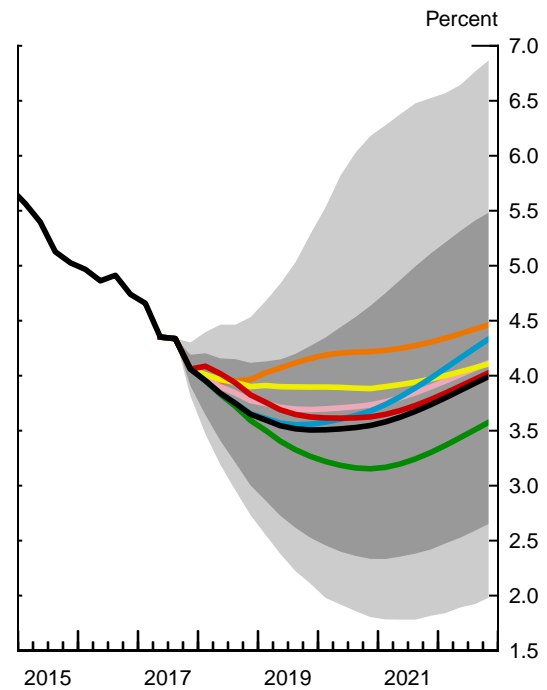
Confidence Intervals Based on FRB/US Stochastic Simulations

- Extended Tealbook baseline
- Market correction
- Higher oil prices and faster AFE tightening
- Lower inflation expectations
- Misperceived lower natural rate
- China-driven EME turbulence
- Steeper Phillips curve

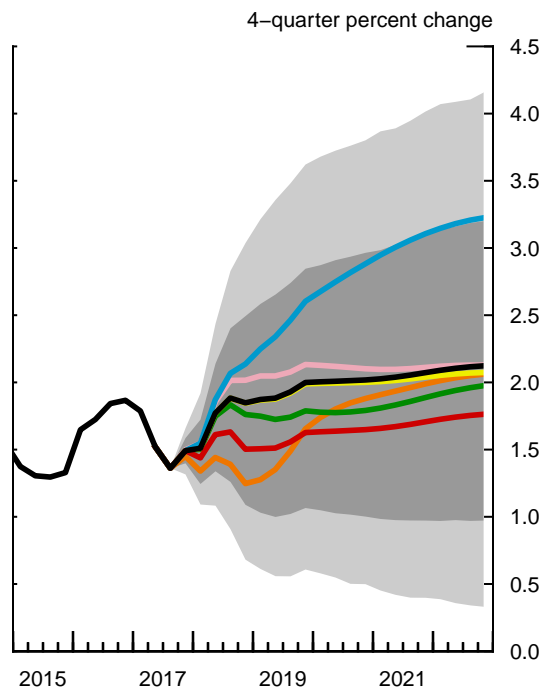
Real GDP



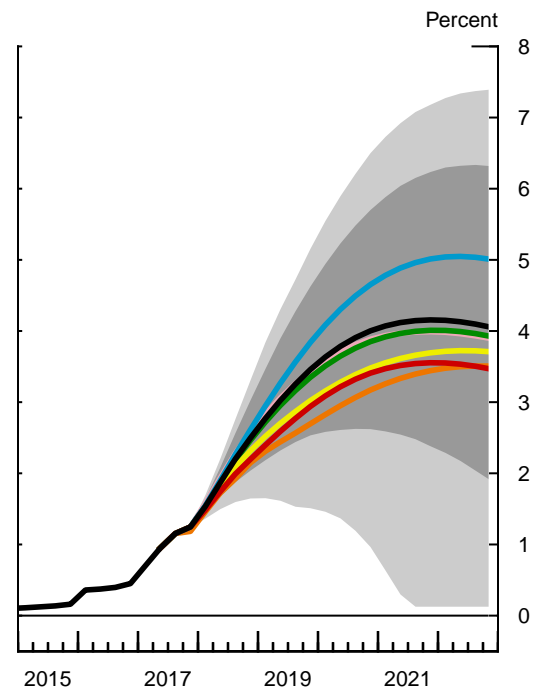
Unemployment Rate



PCE Prices excluding Food and Energy



Federal Funds Rate



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

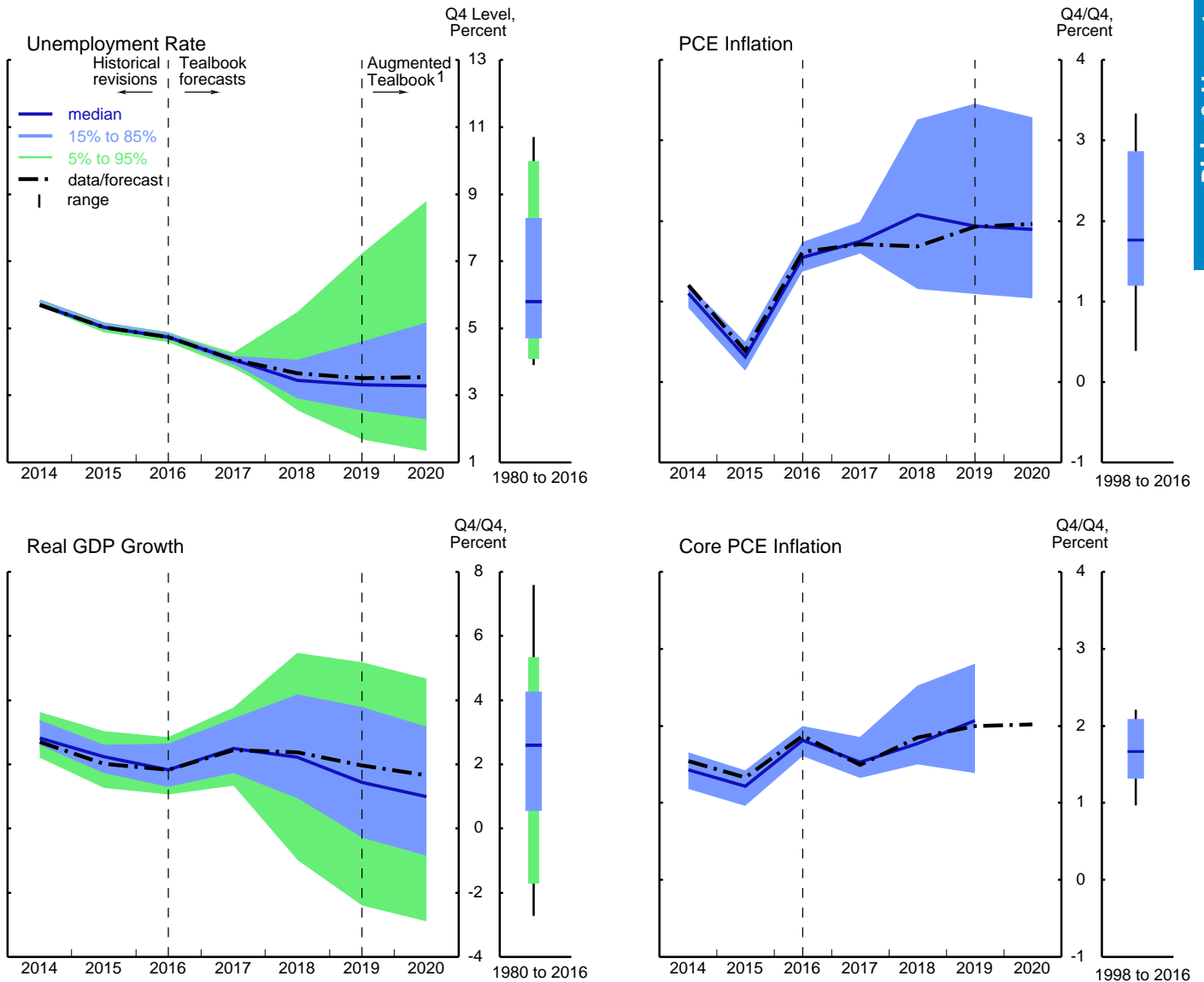
Measure	2017	2018	2019	2020	2021	2022
<i>Real GDP</i> (percent change, Q4 to Q4)						
Projection	2.4	2.4	2.0	1.7	1.3	1.2
Confidence interval						
Tealbook forecast errors	1.7–3.4	.9–4.2	-.3–3.8	-.9–3.2
FRB/US stochastic simulations	2.2–2.7	1.3–3.7	.5–3.5	.1–3.2	-.4–2.9	-.6–2.9
<i>Civilian unemployment rate</i> (percent, Q4)						
Projection	4.1	3.6	3.5	3.5	3.7	4.0
Confidence interval						
Tealbook forecast errors	3.9–4.2	2.8–4.0	2.5–4.6	2.2–5.2
FRB/US stochastic simulations	3.9–4.2	3.0–4.1	2.5–4.3	2.3–4.6	2.4–5.1	2.7–5.5
<i>PCE prices, total</i> (percent change, Q4 to Q4)						
Projection	1.7	1.7	1.9	2.0	2.1	2.1
Confidence interval						
Tealbook forecast errors	1.6–2.0	1.1–3.3	1.1–3.5	1.0–3.3
FRB/US stochastic simulations	1.6–1.8	.8–2.4	.9–2.9	.9–3.0	1.0–3.2	.9–3.3
<i>PCE prices excluding food and energy</i> (percent change, Q4 to Q4)						
Projection	1.5	1.8	2.0	2.0	2.1	2.1
Confidence interval						
Tealbook forecast errors	1.3–1.8	1.5–2.5	1.4–2.8
FRB/US stochastic simulations	1.4–1.6	1.1–2.5	1.1–2.8	1.0–3.0	1.0–3.1	1.0–3.2
<i>Federal funds rate</i> (percent, Q4)						
Projection	1.2	2.5	3.5	4.0	4.2	4.1
Confidence interval						
FRB/US stochastic simulations	1.2–1.3	2.0–3.0	2.5–4.6	2.6–5.7	2.4–6.2	1.9–6.3

Note: Shocks underlying FRB/US stochastic simulations are randomly drawn from the 1969–2016 set of model equation residuals. Intervals derived from Tealbook forecast errors are based on projections made from 1980 to 2016 for real GDP and unemployment and from 1998 to 2016 for PCE prices. The intervals for real GDP, unemployment, and total PCE prices are extended into 2020 using information from the Blue Chip survey and forecasts from the CBO and CEA.

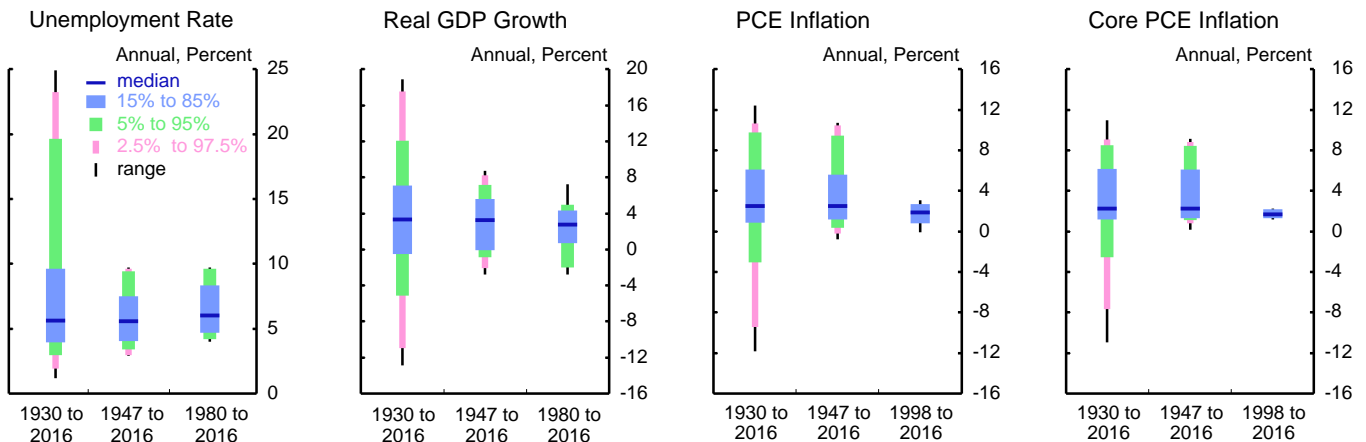
... Not applicable.

Prediction Intervals Derived from Historical Tealbook Forecast Errors

Forecast Error Percentiles



Historical Distributions



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

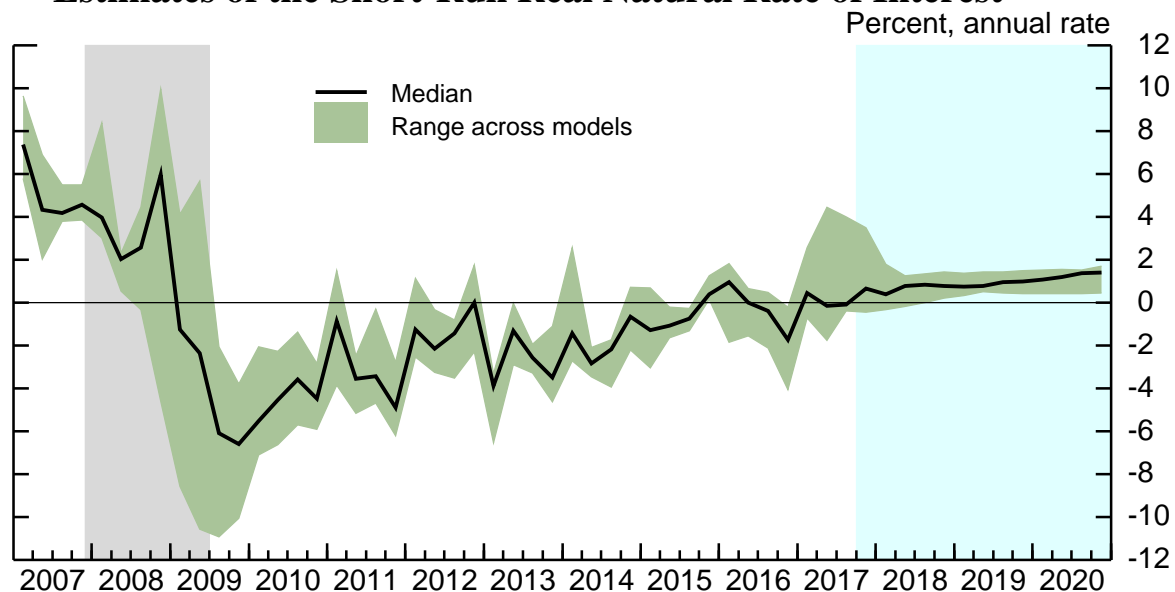
1. Augmented Tealbook prediction intervals use 2- and 3-year-ahead forecast errors from Blue Chip, CBO, and CEA to extend the Tealbook prediction intervals through 2020.

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

Measure and projection	2017		2018		2019	
	September Tealbook	Current Tealbook	September Tealbook	Current Tealbook	September Tealbook	Current Tealbook
<i>Real GDP</i>						
Staff	2.6	2.4	2.3	2.4	1.9	2.0
FRB/US	2.6	2.4	2.7	2.2	2.0	1.5
EDO	2.7	2.4	2.6	2.4	2.4	2.3
<i>Unemployment rate¹</i>						
Staff	4.2	4.1	3.8	3.6	3.7	3.5
FRB/US	4.2	4.1	3.9	3.9	3.9	4.0
EDO	4.3	4.2	4.4	4.3	4.6	4.5
<i>Total PCE prices</i>						
Staff	1.5	1.7	1.9	1.7	2.0	1.9
FRB/US	1.4	1.7	1.6	1.7	1.8	1.8
EDO	1.3	1.7	1.8	1.7	2.1	1.9
<i>Core PCE prices</i>						
Staff	1.5	1.5	1.9	1.8	2.0	2.0
FRB/US	1.4	1.5	1.7	1.8	1.9	1.8
EDO	1.3	1.5	1.8	1.7	2.1	1.9
<i>Federal funds rate¹</i>						
Staff	1.4	1.2	2.6	2.5	3.5	3.5
FRB/US	1.4	1.2	2.4	2.3	3.2	2.9
EDO	1.6	1.2	2.7	2.3	3.4	3.0

1. Percent, average for Q4.

Estimates of the Short-Run Real Natural Rate of Interest



Note: Estimates are based on the four models from the System DSGE project; for more information, see the box "Estimates of the Short-Run Real Natural Rate of Interest" in the March 2016 Tealbook. The gray shaded bar indicates a period of recession as defined by the National Bureau of Economic Research.

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	.05	.04	.02	.10
Previous Tealbook	.06	.04	.01	.02
<i>Less than 1 percent</i>				
Current Tealbook	.19	.19	.13	.12
Previous Tealbook	.15	.21	.17	.27

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	.01	.01	.18	.02
Previous Tealbook	.01	.01	.13	.01
<i>Decrease by 1 percentage point</i>				
Current Tealbook	.15	.06	.05	.16
Previous Tealbook	.21	.04	.09	.22

Probability of Near-Term Recession

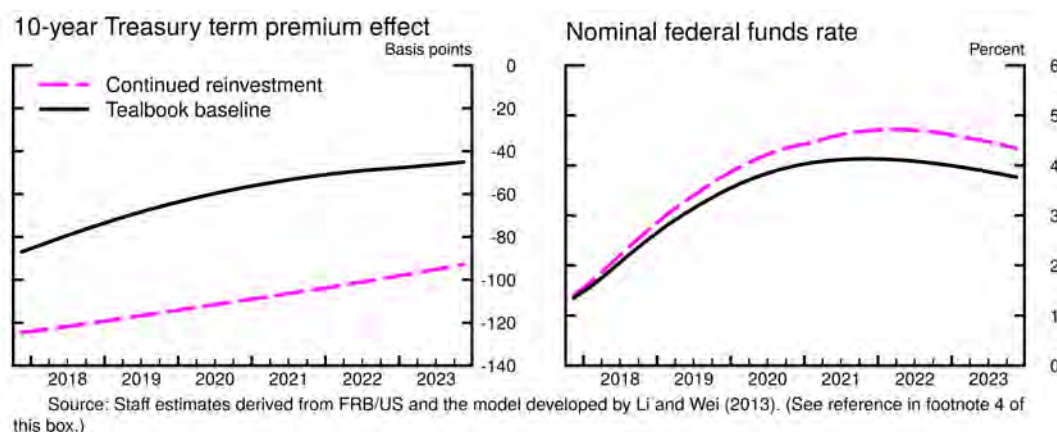
Probability that real GDP declines in the next two quarters	Staff	FRB/US	EDO	BVAR	Factor Model
Current Tealbook	.01	.01	.05	.03	.00
Previous Tealbook	.01	.01	.03	.02	.02

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.

premium paths widens to about 55 basis points as the alternative SOMA portfolio maintains its current size for a number of years and includes a larger amount of longer-term Treasury securities and agency mortgage-backed securities than in the baseline. Both TPE paths narrow over time because of the aging of the SOMA portfolio and as balance sheets move closer to their normalized sizes in proportion to nominal GDP.⁵

The right panel of the figure shows the baseline federal funds rate path and the alternative path that, by construction, generates nearly identical macroeconomic outcomes. Because the normalization in the size of the balance sheet under the Tealbook baseline gradually tightens financial conditions, the alternative path of the policy rate rises steadily above the baseline policy path so as to generate an equivalent gradual tightening in financial conditions. The offsetting federal funds rate path is, on average, about 40 basis points above the baseline over the horizon shown, compared with an average difference of 50 basis points for the 10-year TPEs.

Our results depend on several assumptions, three of which are particularly noteworthy. First, the staff's models postulate that balance sheet policies operate through term premium effects, estimates of which are subject to considerable uncertainty, and that those effects are transmitted to the real economy entirely via aggregate demand channels.⁶ Second, the effects of both balance sheet policy and federal funds rate policy—and therefore our policy-equivalence estimates—crucially depend on the modeling of the public's expectations. Third, the monetary accommodation associated with a particular reinvestment strategy could differ under a different composition of the SOMA portfolio or a different economic projection.⁷



⁵ Beyond the projection period, the TPEs converge to zero as the balance sheet ultimately expands in line with growth in Federal Reserve notes and Federal Reserve Bank capital.

⁶ If balance sheet policy also had implications for the economy's aggregate supply—for instance via unmodeled effects on financial market fluctuations—then policymakers might face a tradeoff between stabilizing prices and reaching full employment. Such considerations would, in turn, imply a different degree of substitutability between balance sheet policy and policy for the federal funds rate.

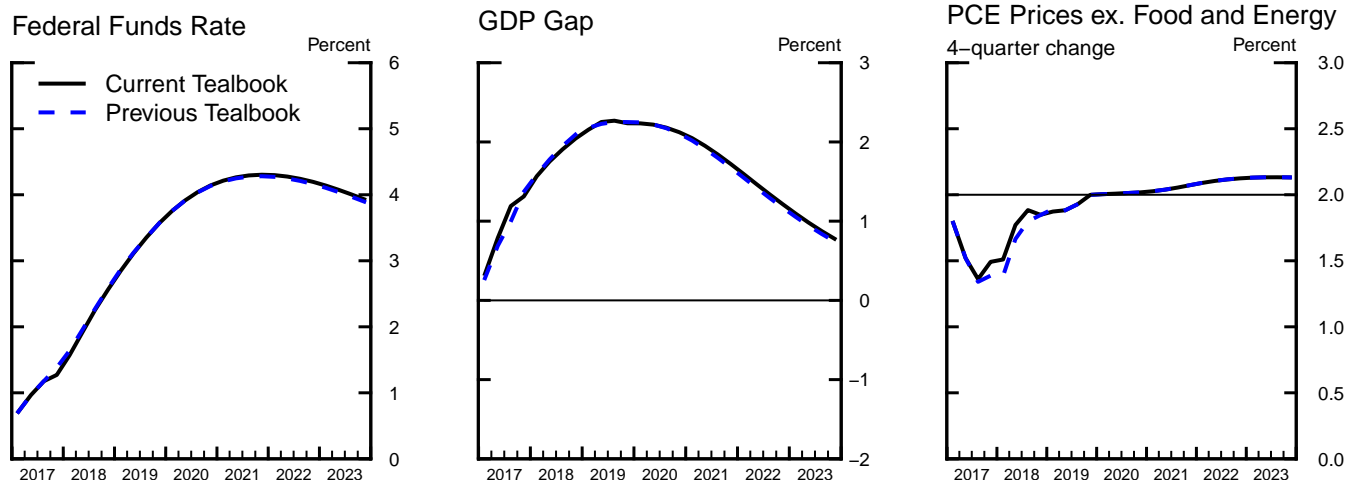
⁷ These results are valid in the neighborhood of the Tealbook baseline, in which the federal funds rate is projected to remain well away from the effective lower bound and mortgage rates are not projected to fall precipitously. The difference between the two reinvestment strategies would become more pronounced during an economic contraction because the rapid decline in the federal funds rate associated with such a scenario would induce prepayments of mortgages. As a result, the difference between the required federal funds rate paths across the alternative policies would increase.

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Simple Policy Rules¹

	(Percent)	
	2018:Q1	2018:Q2
Taylor (1993) rule	2.53	2.99
<i>Previous Tealbook</i>	2.36	2.85
Taylor (1999) rule	3.28	3.82
<i>Previous Tealbook</i>	3.12	3.70
First-difference rule	1.52	1.73
<i>Previous Tealbook projection</i>	1.52	1.74
Nominal income targeting rule	1.24	1.30
<i>Previous Tealbook projection</i>	1.20	1.23
<i>Addendum:</i>		
Tealbook baseline	1.54	1.87

Key Elements of the Staff Projection



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

	(Percent)	
	Current Tealbook	Previous Tealbook
Tealbook baseline		
FRB/US r^*	2.21	2.31
Average projected real federal funds rate	.93	.99
SEP-consistent baseline		
FRB/US r^*	.83	
Average projected real federal funds rate	.34	

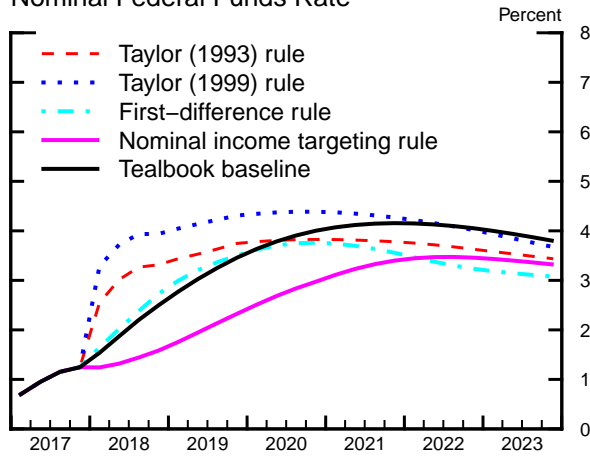
1. For rules that have a lagged policy rate as a right-hand-side variable, the lines denoted "Previous Tealbook projection" report prescriptions based on the previous Tealbook's staff outlook for inflation and the output gap, but conditional on the current-Tealbook value of the lagged policy rate.

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 2017 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^* . The previous-Tealbook r^* is adjusted to be consistent with a revision in the model's fiscal rules.

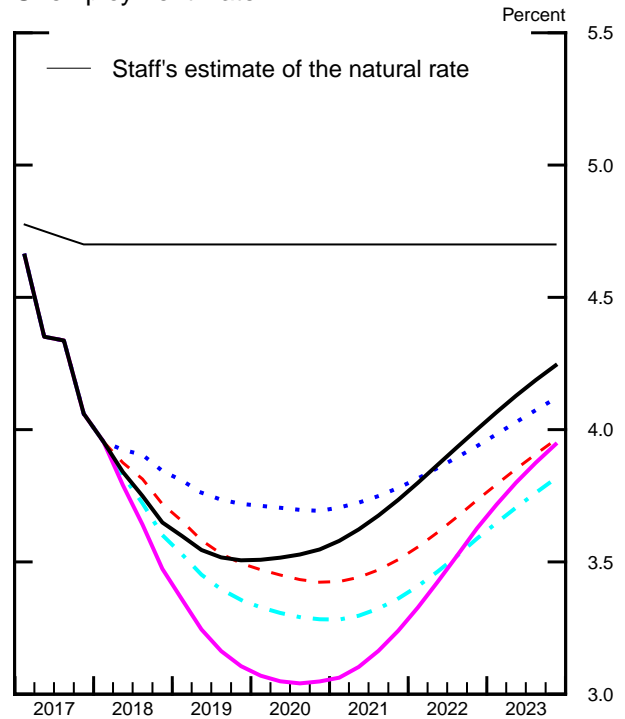
Simple Policy Rule Simulations

Monetary Policy Strategies

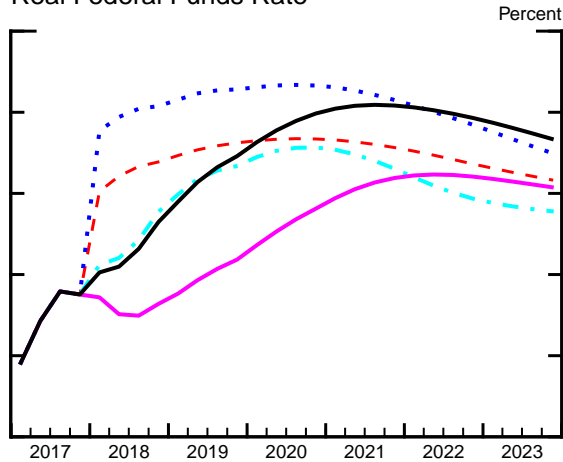
Nominal Federal Funds Rate



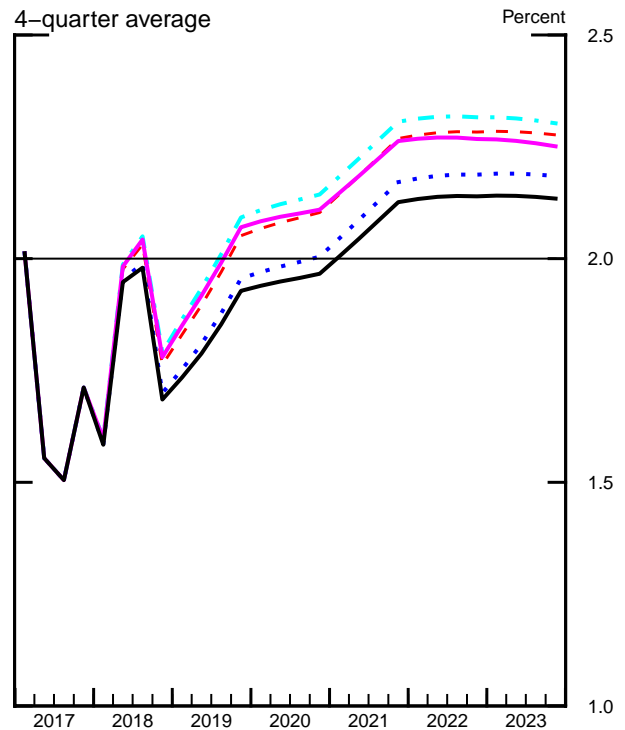
Unemployment Rate



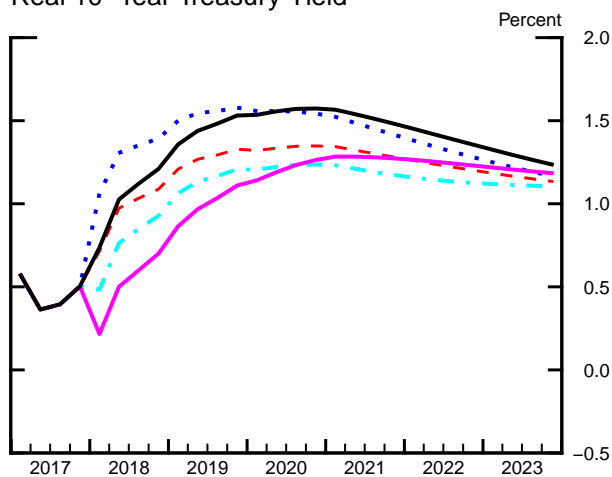
Real Federal Funds Rate



PCE Inflation
4-quarter average



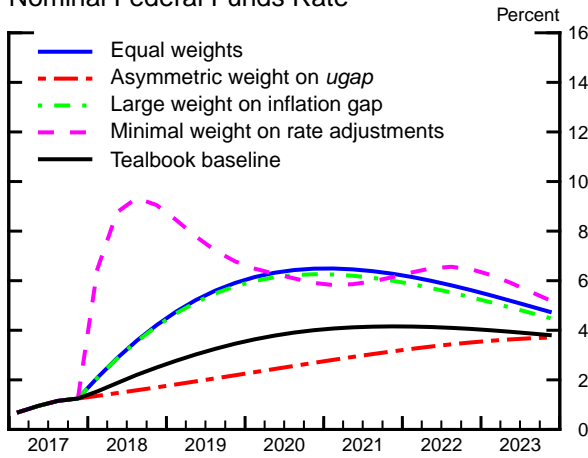
Real 10-Year Treasury Yield



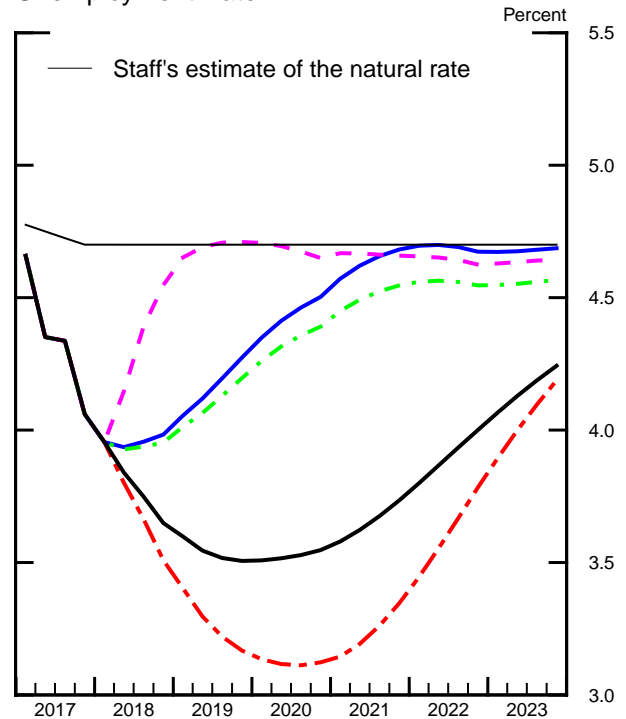
Note: The policy rule simulations in this exhibit are based on rules that respond to core inflation rather than to headline inflation. This choice of rule specification was made in light of a tendency for current and near-term core inflation rates to outperform headline inflation rates as predictors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

Optimal Control Simulations under Commitment

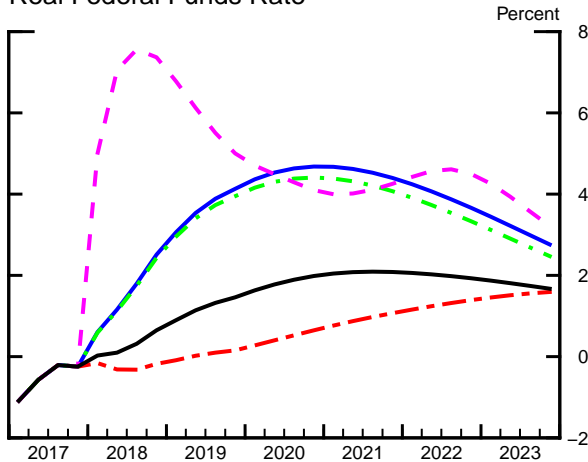
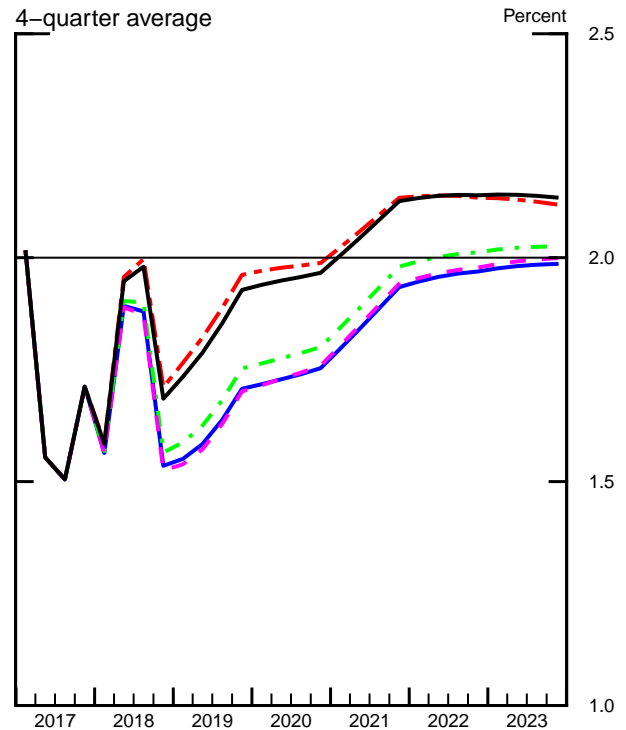
Nominal Federal Funds Rate



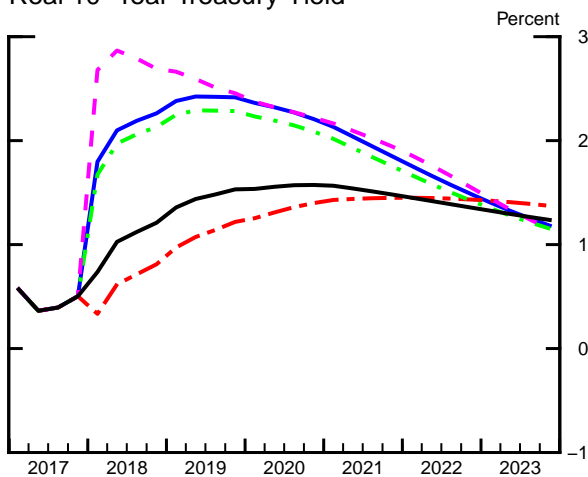
Unemployment Rate



Real Federal Funds Rate

PCE Inflation
4-quarter average

Real 10-Year Treasury Yield



Note: Each set of lines corresponds to an optimal control policy under commitment in which policymakers minimize a discounted weighted sum of squared deviations of 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.

Outcomes of Simple Policy Rule Simulations

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

Outcome and strategy	2017	2018	2019	2020	2021	2022	2023
<i>Nominal federal funds rate¹</i>							
Taylor (1993)	1.2	3.3	3.7	3.8	3.8	3.6	3.4
Taylor (1999)	1.2	3.9	4.3	4.4	4.3	4.0	3.7
First-difference	1.2	2.7	3.5	3.8	3.6	3.2	3.1
Nominal income targeting	1.2	1.6	2.3	3.0	3.4	3.5	3.3
Extended Tealbook baseline	1.2	2.5	3.5	4.0	4.2	4.1	3.8
<i>Real GDP</i>							
Taylor (1993)	2.4	2.3	2.1	1.9	1.5	1.3	1.3
Taylor (1999)	2.4	2.1	1.9	1.8	1.5	1.4	1.3
First-difference	2.4	2.5	2.2	1.9	1.5	1.3	1.4
Nominal income targeting	2.4	2.8	2.4	1.9	1.3	1.0	1.2
Extended Tealbook baseline	2.4	2.4	2.0	1.7	1.3	1.2	1.3
<i>Unemployment rate¹</i>							
Taylor (1993)	4.1	3.7	3.5	3.4	3.5	3.7	4.0
Taylor (1999)	4.1	3.8	3.7	3.7	3.8	3.9	4.1
First-difference	4.1	3.6	3.4	3.3	3.4	3.6	3.8
Nominal income targeting	4.1	3.5	3.1	3.0	3.2	3.6	3.9
Extended Tealbook baseline	4.1	3.6	3.5	3.5	3.7	4.0	4.2
<i>Total PCE prices</i>							
Taylor (1993)	1.7	1.8	2.1	2.1	2.3	2.3	2.3
Taylor (1999)	1.7	1.7	2.0	2.0	2.2	2.2	2.2
First-difference	1.7	1.8	2.1	2.1	2.3	2.3	2.3
Nominal income targeting	1.7	1.8	2.1	2.1	2.3	2.3	2.3
Extended Tealbook baseline	1.7	1.7	1.9	2.0	2.1	2.1	2.1
<i>Core PCE prices</i>							
Taylor (1993)	1.5	1.9	2.1	2.2	2.2	2.3	2.3
Taylor (1999)	1.5	1.9	2.0	2.1	2.1	2.2	2.2
First-difference	1.5	2.0	2.2	2.2	2.3	2.3	2.3
Nominal income targeting	1.5	1.9	2.1	2.2	2.2	2.3	2.2
Extended Tealbook baseline	1.5	1.8	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	2017		2018				2019	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
<i>Nominal federal funds rate¹</i>								
Taylor (1993)	1.2	1.2	2.5	3.0	3.3	3.3	3.4	3.5
Taylor (1999)	1.2	1.2	3.3	3.7	3.9	3.9	4.0	4.1
First-difference	1.2	1.2	1.6	2.0	2.4	2.7	3.0	3.2
Nominal income targeting	1.2	1.2	1.2	1.3	1.4	1.6	1.8	1.9
Extended Tealbook baseline	1.2	1.2	1.5	1.9	2.2	2.5	2.8	3.0
<i>Real GDP</i>								
Taylor (1993)	2.3	2.4	2.8	2.6	2.3	2.3	2.2	2.2
Taylor (1999)	2.3	2.4	2.8	2.5	2.1	2.1	1.9	1.9
First-difference	2.3	2.4	2.8	2.7	2.5	2.5	2.5	2.4
Nominal income targeting	2.3	2.4	2.8	2.7	2.6	2.8	2.8	2.7
Extended Tealbook baseline	2.3	2.4	2.8	2.6	2.4	2.4	2.3	2.2
<i>Unemployment rate¹</i>								
Taylor (1993)	4.3	4.1	4.0	3.9	3.8	3.7	3.7	3.6
Taylor (1999)	4.3	4.1	4.0	3.9	3.9	3.8	3.8	3.8
First-difference	4.3	4.1	4.0	3.8	3.7	3.6	3.5	3.5
Nominal income targeting	4.3	4.1	4.0	3.8	3.6	3.5	3.4	3.2
Extended Tealbook baseline	4.3	4.1	4.0	3.8	3.7	3.6	3.6	3.5
<i>Total PCE prices</i>								
Taylor (1993)	1.5	1.7	1.6	2.0	2.0	1.8	1.8	1.9
Taylor (1999)	1.5	1.7	1.6	2.0	2.0	1.7	1.8	1.8
First-difference	1.5	1.7	1.6	2.0	2.0	1.8	1.9	1.9
Nominal income targeting	1.5	1.7	1.6	2.0	2.0	1.8	1.9	1.9
Extended Tealbook baseline	1.5	1.7	1.6	1.9	2.0	1.7	1.7	1.8
<i>Core PCE prices</i>								
Taylor (1993)	1.4	1.5	1.5	1.8	1.9	1.9	2.0	2.0
Taylor (1999)	1.4	1.5	1.5	1.8	1.9	1.9	1.9	1.9
First-difference	1.4	1.5	1.5	1.8	2.0	2.0	2.0	2.0
Nominal income targeting	1.4	1.5	1.5	1.8	1.9	1.9	2.0	2.0
Extended Tealbook baseline	1.4	1.5	1.5	1.8	1.9	1.8	1.9	1.9

1. Percent, average for the quarter.

Outcomes of Optimal Control Simulations under Commitment

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

Outcome and strategy	2017	2018	2019	2020	2021	2022	2023
<i>Nominal federal funds rate¹</i>							
Equal weights	1.2	4.2	5.9	6.5	6.3	5.6	4.7
Asymmetric weight on <i>ugap</i>	1.2	1.7	2.2	2.7	3.1	3.5	3.7
Large weight on inflation gap	1.2	4.2	5.8	6.3	6.0	5.3	4.5
Minimal weight on rate adjustments	1.2	9.1	6.8	5.9	6.1	6.5	5.2
Extended Tealbook baseline	1.2	2.5	3.5	4.0	4.2	4.1	3.8
<i>Real GDP</i>							
Equal weights	2.4	1.6	1.1	1.3	1.4	1.6	1.5
Asymmetric weight on <i>ugap</i>	2.4	2.7	2.3	1.8	1.2	0.9	1.0
Large weight on inflation gap	2.4	1.7	1.2	1.4	1.4	1.6	1.5
Minimal weight on rate adjustments	2.4	0.8	1.1	1.8	1.7	1.6	1.4
Extended Tealbook baseline	2.4	2.4	2.0	1.7	1.3	1.2	1.3
<i>Unemployment rate¹</i>							
Equal weights	4.1	4.0	4.3	4.5	4.7	4.7	4.7
Asymmetric weight on <i>ugap</i>	4.1	3.5	3.2	3.1	3.3	3.8	4.2
Large weight on inflation gap	4.1	4.0	4.2	4.4	4.5	4.5	4.6
Minimal weight on rate adjustments	4.1	4.5	4.7	4.6	4.7	4.6	4.6
Extended Tealbook baseline	4.1	3.6	3.5	3.5	3.7	4.0	4.2
<i>Total PCE prices</i>							
Equal weights	1.7	1.5	1.7	1.8	1.9	2.0	2.0
Asymmetric weight on <i>ugap</i>	1.7	1.7	2.0	2.0	2.1	2.1	2.1
Large weight on inflation gap	1.7	1.6	1.8	1.8	2.0	2.0	2.0
Minimal weight on rate adjustments	1.7	1.5	1.7	1.8	1.9	2.0	2.0
Extended Tealbook baseline	1.7	1.7	1.9	2.0	2.1	2.1	2.1
<i>Core PCE prices</i>							
Equal weights	1.5	1.7	1.8	1.8	1.9	2.0	2.0
Asymmetric weight on <i>ugap</i>	1.5	1.9	2.0	2.0	2.1	2.1	2.1
Large weight on inflation gap	1.5	1.7	1.8	1.9	1.9	2.0	2.0
Minimal weight on rate adjustments	1.5	1.7	1.8	1.8	1.9	2.0	2.0
Extended Tealbook baseline	1.5	1.8	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	2017		2018				2019	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
<i>Nominal federal funds rate¹</i>								
Equal weights	1.2	1.2	2.1	2.9	3.6	4.2	4.8	5.2
Asymmetric weight on <i>ugap</i>	1.2	1.2	1.4	1.5	1.6	1.7	1.8	1.9
Large weight on inflation gap	1.2	1.2	2.1	2.9	3.5	4.2	4.7	5.1
Minimal weight on rate adjustments	1.2	1.2	6.5	8.8	9.3	9.1	8.5	7.8
Extended Tealbook baseline	1.2	1.2	1.5	1.9	2.2	2.5	2.8	3.0
<i>Real GDP</i>								
Equal weights	2.3	2.4	2.8	2.4	1.9	1.6	1.3	1.2
Asymmetric weight on <i>ugap</i>	2.3	2.4	2.8	2.7	2.6	2.7	2.7	2.6
Large weight on inflation gap	2.3	2.4	2.8	2.4	2.0	1.7	1.4	1.3
Minimal weight on rate adjustments	2.3	2.4	2.8	2.1	1.3	0.8	0.3	0.5
Extended Tealbook baseline	2.3	2.4	2.8	2.6	2.4	2.4	2.3	2.2
<i>Unemployment rate¹</i>								
Equal weights	4.3	4.1	4.0	3.9	4.0	4.0	4.1	4.1
Asymmetric weight on <i>ugap</i>	4.3	4.1	4.0	3.8	3.7	3.5	3.4	3.3
Large weight on inflation gap	4.3	4.1	4.0	3.9	3.9	4.0	4.0	4.1
Minimal weight on rate adjustments	4.3	4.1	4.0	4.1	4.4	4.5	4.7	4.7
Extended Tealbook baseline	4.3	4.1	4.0	3.8	3.7	3.6	3.6	3.5
<i>Total PCE prices</i>								
Equal weights	1.5	1.7	1.6	1.9	1.9	1.5	1.6	1.6
Asymmetric weight on <i>ugap</i>	1.5	1.7	1.6	2.0	2.0	1.7	1.8	1.8
Large weight on inflation gap	1.5	1.7	1.6	1.9	1.9	1.6	1.6	1.6
Minimal weight on rate adjustments	1.5	1.7	1.6	1.9	1.9	1.5	1.5	1.6
Extended Tealbook baseline	1.5	1.7	1.6	1.9	2.0	1.7	1.7	1.8
<i>Core PCE prices</i>								
Equal weights	1.4	1.5	1.5	1.7	1.8	1.7	1.7	1.7
Asymmetric weight on <i>ugap</i>	1.4	1.5	1.5	1.8	1.9	1.9	1.9	1.9
Large weight on inflation gap	1.4	1.5	1.5	1.7	1.8	1.7	1.7	1.7
Minimal weight on rate adjustments	1.4	1.5	1.5	1.7	1.8	1.7	1.7	1.7
Extended Tealbook baseline	1.4	1.5	1.5	1.8	1.9	1.8	1.9	1.9

1. Percent, average for the quarter.

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

Interval	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate ¹	
	10/20/17	12/01/17	10/20/17	12/01/17	10/20/17	12/01/17	10/20/17	12/01/17	10/20/17	12/01/17
<i>Quarterly</i>										
2017:Q1	3.3	3.3	1.2	1.2	2.2	2.2	1.8	1.8	4.7	4.7
Q2	4.1	4.1	3.1	3.1	.3	.3	.9	.9	4.4	4.4
Q3	4.8	5.5	2.9	3.3	1.5	1.5	1.3	1.4	4.3	4.3
Q4	5.2	4.8	3.2	2.2	2.0	2.8	1.5	1.9	4.2	4.1
2018:Q1	4.4	4.5	2.5	2.7	1.6	1.7	1.8	1.9	4.1	4.0
Q2	4.5	4.3	2.4	2.4	1.9	1.7	2.0	2.0	3.9	3.8
Q3	4.3	4.2	2.3	2.3	1.7	1.7	1.8	1.8	3.8	3.7
Q4	4.1	4.0	2.2	2.2	1.7	1.6	1.7	1.7	3.7	3.6
2019:Q1	4.3	4.4	2.1	2.2	1.9	1.9	2.0	2.0	3.7	3.6
Q2	4.0	4.2	1.9	2.2	1.9	1.9	2.0	2.0	3.6	3.5
Q3	3.9	3.9	1.8	1.8	2.0	1.9	2.0	2.0	3.6	3.5
Q4	3.8	3.7	1.7	1.6	2.0	1.9	2.0	2.0	3.6	3.5
<i>Two-quarter²</i>										
2017:Q2	3.7	3.7	2.1	2.1	1.2	1.2	1.4	1.4	-3	-3
Q4	5.0	5.1	3.1	2.7	1.7	2.2	1.4	1.6	-2	-3
2018:Q2	4.5	4.4	2.5	2.5	1.7	1.7	1.9	1.9	-3	-3
Q4	4.2	4.1	2.3	2.2	1.7	1.7	1.8	1.8	-2	-2
2019:Q2	4.2	4.3	2.0	2.2	1.9	1.9	2.0	2.0	-1	-1
Q4	3.9	3.8	1.8	1.7	2.0	1.9	2.0	2.0	.0	.0
<i>Four-quarter³</i>										
2016:Q4	3.4	3.4	1.8	1.8	1.6	1.6	1.9	1.9	-3	-3
2017:Q4	4.3	4.4	2.6	2.4	1.5	1.7	1.4	1.5	-5	-6
2018:Q4	4.3	4.2	2.4	2.4	1.7	1.7	1.8	1.8	-5	-5
2019:Q4	4.0	4.1	1.9	2.0	2.0	1.9	2.0	2.0	-1	-1
2020:Q4	3.7	3.8	1.6	1.7	2.0	2.0	2.0	2.0	.0	.0
<i>Annual</i>										
2016	2.8	2.8	1.5	1.5	1.2	1.2	1.8	1.8	4.9	4.9
2017	4.0	4.1	2.3	2.2	1.6	1.7	1.5	1.5	4.4	4.4
2018	4.6	4.5	2.7	2.5	1.6	1.8	1.7	1.8	3.9	3.8
2019	4.2	4.2	2.1	2.1	1.9	1.8	1.9	1.9	3.6	3.5
2020	3.8	3.9	1.7	1.7	2.0	2.0	2.0	2.0	3.6	3.5

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

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

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

Changes in Real Gross Domestic Product and Related Items

(Percent, annual rate except as noted)

Item	2017			2018				2019				2017 ¹	2018 ¹	2019 ¹	2020 ¹
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Real GDP <i>Previous Tealbook</i>	3.1 3.1	3.3 2.9	2.2 3.2	2.7 2.5	2.4 2.4	2.3 2.3	2.2 2.2	2.2 2.1	2.2 1.9	1.8 1.8	1.6 1.7	2.4 2.6	2.4 2.4	2.0 1.9	1.7 1.6
Final sales <i>Previous Tealbook</i>	3.0	2.5	2.6	2.3	2.5	2.4	2.7	2.1	1.9	1.8	1.9	2.7	2.5	1.9	1.7
Priv. dom. final purch. <i>Previous Tealbook</i>	3.3 3.3	2.4 2.4	2.9 3.3	2.8 2.9	3.0 2.8	2.8 2.8	2.5 2.5	2.4 2.3	1.8 2.2	1.8 2.2	1.8 2.1	2.8 3.0	2.4 2.7	1.9 2.2	1.6 1.9
Personal cons. expend. <i>Previous Tealbook</i>	3.3 3.3	2.3 2.3	2.5 3.3	2.7 2.8	2.6 2.6	2.5 2.6	2.4 2.5	2.3 2.4	2.3 2.4	2.2 2.3	2.2 2.3	2.5 2.7	2.6 2.6	2.3 2.3	2.1 2.1
Durables	7.6	8.1	4.6	2.2	4.7	4.2	3.7	1.8	1.8	1.7	1.7	5.0	3.7	1.8	1.5
Nondurables	4.2	2.0	3.9	2.8	2.8	2.7	2.6	2.4	2.4	2.3	2.3	2.8	2.7	2.3	2.2
Services	2.3	1.5	1.7	2.7	2.2	2.2	2.1	2.4	2.3	2.3	2.3	2.0	2.3	2.3	2.1
Residential investment <i>Previous Tealbook</i>	-7.3 -7.3	-5.1 -6.2	3.2 -6	1.0 1.6	5.3 5.5	6.1 6.2	3.2 2.4	2.4 2.0	1.7 1.8	2.1 2.7	1.8 2.6	.2 -1.0	3.9 3.9	2.0 2.3	3.4 2.7
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	6.7 6.7	5.1 5.6	5.2 5.0	4.0 3.8	4.3 3.4	3.5 2.6	2.9 2.4	2.7 2.0	2.5 1.7	1.8 1.3	1.4 1.0	6.0 6.1	3.7 3.1	2.1 1.5	1.1 .7
Equipment & intangibles <i>Previous Tealbook</i>	6.6 6.6	8.9 8.4	8.4 7.8	4.8 4.6	4.1 3.4	3.8 2.9	3.4 2.6	3.1 2.3	2.9 2.1	2.2 1.8	1.8 1.5	7.2 7.0	4.0 3.4	2.5 1.9	1.6 1.2
Nonres. structures <i>Previous Tealbook</i>	7.0 7.0	-6.8 -3.1	-5.2 -4.0	1.3 1.1	4.7 3.4	2.6 1.7	1.4 1.8	1.4 1.0	1.0 .4	.4 -3	.0 -7	2.1 3.4	2.5 2.0	.7 .1	-6 -1.2
Net exports ² <i>Previous Tealbook</i> ²	-614 -614	-594 -586	-594 -579	-604 -591	-608 -596	-610 -601	-597 -589	-595 -591	-607 -602	-614 -610	-619 -616	-606 -600	-605 -594	-609 -605	-643 -645
Exports	3.5	2.2	4.6	3.3	4.4	6.0	4.5	4.7	4.3	4.3	3.5	4.4	4.5	4.2	3.1
Imports	1.5	-1.1	3.6	4.0	4.1	5.0	1.7	3.6	5.1	4.3	3.5	2.0	3.7	4.1	3.8
Gov't. cons. & invest. <i>Previous Tealbook</i>	-2 -2	.4 -1.0	.7 .8	.3 .4	.3 .3	-.3 .0	1.7 1.1	.3 1.0	1.2 .9	.4 .5	1.0 .8	.1 -2	.5 .4	.7 .8	.7 .8
Federal	1.9	1.3	.0	-1.4	-1.1	-1.9	3.0	-7	1.6	.0	1.3	.2	-.4	.6	.5
Defense	4.7	2.4	1.1	-1.7	-1	-1.4	5.2	-4	2.6	1.5	2.4	1.2	.5	1.5	.9
Nondefense	-1.9	-.3	-1.6	-1.1	-2.6	-2.6	-.1	-1.2	.1	-2.1	-.3	-1.3	-1.6	-.9	.1
State & local	-1.5	-.1	1.2	1.4	1.1	.7	.9	.9	1.0	.6	.9	.0	1.0	.8	.9
Change in priv. inventories ² <i>Previous Tealbook</i> ²	5 5	37 24	17 26	34 36	29 37	25 40	2 25	5 23	14 27	16 29	6 25	15 14	22 35	10 26	12 29

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

2. Billions of chained (2009) dollars.

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

Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Real GDP <i>Previous Tealbook</i>	1.7 1.7	1.3 1.3	2.7 2.7	2.7 2.7	2.0 2.0	1.8 1.8	2.4 2.6	2.4 2.4	2.0 1.9	1.7 1.6
Final sales <i>Previous Tealbook</i>	1.5 1.5	1.7 1.7	2.0 2.0	2.9 2.9	2.0 2.0	1.9 1.9	2.7 2.8	2.5 2.4	1.9 1.9	1.7 1.6
Priv. dom. final purch. <i>Previous Tealbook</i>	2.6 2.6	2.3 2.3	2.6 2.6	4.1 4.1	2.9 2.9	2.5 2.5	2.9 3.0	2.8 2.7	2.2 2.2	2.0 1.9
Personal cons. expend. <i>Previous Tealbook</i>	1.5 1.5	1.3 1.3	2.0 2.0	3.6 3.6	3.0 3.0	2.8 2.8	2.5 2.7	2.6 2.6	2.3 2.3	2.1 2.1
Durables	4.8	7.2	5.2	8.7	6.4	7.0	5.0	3.7	1.8	1.5
Nondurables	.4	.8	2.6	2.8	2.8	2.5	2.8	2.7	2.3	2.2
Services	1.4	.6	1.3	3.0	2.6	2.3	2.0	2.3	2.3	2.1
Residential investment <i>Previous Tealbook</i>	6.0 6.0	15.7 15.7	6.8 6.8	6.3 6.3	10.3 10.3	2.5 2.5	.2 -1.0	3.9 3.9	2.0 2.3	3.4 2.7
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	9.0 9.0	5.2 5.2	4.8 4.8	6.1 6.1	.3 .3	.7 .7	6.0 6.1	3.7 3.1	2.1 1.5	1.1 .7
Equipment & intangibles <i>Previous Tealbook</i>	9.2 9.2	5.5 5.5	4.5 4.5	5.3 5.3	3.3 3.3	-1 -1	7.2 7.0	4.0 3.4	2.5 1.9	1.6 1.2
Nonres. structures <i>Previous Tealbook</i>	8.0 8.0	4.1 4.1	5.8 5.8	8.8 8.8	-9.1 -9.1	3.5 3.5	2.1 3.4	2.5 2.0	.7 .1	-6 -1.2
Net exports ¹ <i>Previous Tealbook</i> ¹	-459 -459	-447 -447	-405 -405	-428 -428	-545 -545	-586 -586	-606 -600	-605 -594	-609 -605	-643 -645
Exports	4.2	2.2	5.9	3.0	-1.8	.6	4.4	4.5	4.2	3.1
Imports	3.5	.3	2.5	6.2	2.9	2.7	2.0	3.7	4.1	3.8
Gov't. cons. & invest. <i>Previous Tealbook</i>	-3.0 -3.0	-2.2 -2.2	-2.8 -2.8	.5 .5	1.6 1.6	.4 .4	.1 -2	.5 .4	.7 .8	.7 .8
Federal	-4.0	-2.1	-6.7	-1.2	1.2	-3	.2	-4	.6	.5
Defense	-4.1	-3.9	-7.1	-4.0	.0	-1.4	1.2	.5	1.5	.9
Nondefense	-3.9	1.0	-6.0	3.5	2.9	1.2	-1.3	-1.6	-9	.1
State & local	-2.3	-2.3	-1	1.5	1.9	.8	.0	1.0	.8	.9
Change in priv. inventories ¹ <i>Previous Tealbook</i> ¹	38 38	55 55	79 79	68 68	101 101	33 33	15 14	22 35	10 26	12 29

1. Billions of chained (2009) dollars.

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

Item	2017				2018				2019				2017 ¹	2018 ¹	2019 ¹	2020 ¹
	Q2	Q3	Q4		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Real GDP <i>Previous Tealbook</i>	3.1 3.1	3.3 2.9	2.2 3.2		2.7 2.5	2.4 2.4	2.3 2.3	2.2 2.2	2.2 2.1	2.2 1.9	1.8 1.8	1.6 1.7	2.4 2.6	2.4 2.4	2.0 1.9	1.7 1.6
Final sales <i>Previous Tealbook</i>	2.9	2.5	2.6		2.3	2.5	2.4	2.7	2.1	1.9	1.8	1.9	2.7	2.5	1.9	1.7
Priv. dom. final purch. <i>Previous Tealbook</i>	2.9	2.5	3.2		2.3	2.4	2.3	2.6	2.1	1.8	1.8	1.8	2.8	2.4	1.9	1.6
	2.8	2.1	2.5		2.4	2.5	2.4	2.2	2.0	2.0	1.8	1.8	2.5	2.4	1.9	1.7
	2.8	2.1	2.9		2.4	2.4	2.3	2.1	2.0	1.9	1.9	1.8	2.6	2.3	1.9	1.7
Personal cons. expend. <i>Previous Tealbook</i>	2.2	1.6	1.7		1.9	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.7	1.8	1.6	1.4
Durables	2.2	1.6	2.3		1.9	1.8	1.8	1.7	1.6	1.6	1.6	1.6	1.9	1.8	1.6	1.5
Nondurables	.6	.6	.3		.2	.3	.3	.3	.1	.1	.1	.1	.4	.3	.1	.1
Services	.6	.3	.6		.4	.4	.4	.4	.3	.3	.3	.3	.4	.4	.3	.3
	1.1	.7	.8		1.3	1.1	1.0	1.0	1.1	1.1	1.1	1.1	.9	1.1	1.1	1.0
Residential investment <i>Previous Tealbook</i>	-.3	-.2	.1		.0	.2	.2	.1	.1	.1	.1	.1	.0	.1	.1	.1
	-.3	-.2	.0		.1	.2	.2	.1	.1	.1	.1	.1	.0	.1	.1	.1
Nonres. priv. fixed invest. <i>Previous Tealbook</i>	.8	.6	.6		.5	.5	.4	.4	.3	.3	.2	.2	.7	.5	.3	.1
Equipment & intangibles <i>Previous Tealbook</i>	.8	.7	.6		.5	.4	.3	.3	.3	.2	.2	.1	.8	.4	.2	.1
	.6	.8	.8		.5	.4	.4	.3	.3	.3	.2	.2	.7	.4	.2	.2
	.6	.8	.8		.4	.3	.3	.3	.2	.2	.2	.1	.7	.3	.2	.1
Nonres. structures <i>Previous Tealbook</i>	.2	-.2	-.2		.0	.1	.1	.0	.0	.0	.0	.0	.1	.1	.0	.0
	.2	-.1	-.1		.0	.1	.0	.1	.0	.0	.0	.0	.1	.1	.0	.0
Net exports <i>Previous Tealbook</i>	.2	.4	.0		-.2	-.1	.0	.3	.1	-.2	-.1	-.1	.2	.0	-.1	-.2
Exports	.2	.6	.2		-.2	-.1	-.1	.3	.0	-.2	-.1	-.1	.3	.0	-.1	-.2
Imports	.4	.3	.5		.4	.5	.7	.5	.6	.5	.5	.4	.5	.5	.5	.4
	-.2	.2	-.5		-.6	-.6	-.7	-.3	-.5	-.7	-.6	-.5	-.3	-.5	-.6	-.6
Gov't. cons. & invest. <i>Previous Tealbook</i>	.0	.1	.1		.1	.1	.0	.3	.1	.2	.1	.2	.0	.1	.1	.1
Federal	.0	-.2	.1		.1	.1	.0	.2	.2	.1	.1	.1	.0	.1	.1	.1
Defense	.1	.1	.0		-.1	-.1	-.1	.2	.0	.1	.0	.1	.0	.0	.0	.0
Nondefense	.2	.1	.0		-.1	.0	-.1	.2	.0	.1	.1	.1	.0	.0	.1	.0
State & local	-.1	.0	.0		.0	-.1	-.1	.0	.0	.0	-.1	.0	.0	.0	.0	.0
	-.2	.0	.1		.2	.1	.1	.1	.1	.1	.1	.1	.0	.1	.1	.1
Change in priv. inventories <i>Previous Tealbook</i>	.1	.8	-.5		.4	-.1	-.1	-.5	.1	.2	.0	-.2	-.3	-.1	.0	.0
	.1	.4	.1		.2	.0	.1	-.3	-.1	.1	.0	-.1	-.2	.0	.0	.0

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

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

Item	2017			2018				2019				2017 ¹	2018 ¹	2019 ¹	2020 ¹
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
GDP chain-wt. price index <i>Previous Tealbook</i>	1.0 1.0	2.1 1.8	2.6 1.9	1.7 1.9	1.9 2.0	1.9 1.9	1.8 1.8	2.2 2.2	2.0 2.1	2.0 2.1	2.0 2.0	1.9 1.7	1.8 1.9	2.1 2.1	2.1 2.1
PCE chain-wt. price index <i>Previous Tealbook</i>	.3 .3	1.5 1.5	2.8 2.0	1.7 1.6	1.7 1.9	1.7 1.7	1.6 1.7	1.9 1.9	1.9 2.0	1.9 2.0	1.9 2.0	1.7 1.5	1.7 1.7	1.9 2.0	2.0 2.0
Energy <i>Previous Tealbook</i>	-16.0 -16.0	8.3 8.5	31.2 14.0	-2.6 -4.0	-4.2 -1.7	-2.1 -5	-1.2 -1	-7 .1	-5 .0	-2 .2	-2 .3	8.3 4.6	-2.5 -1.6	-4 .2	.3 .7
Food <i>Previous Tealbook</i>	2.0 2.0	.2 .2	.9 1.5	2.0 2.0	2.1 2.1	2.1 2.1	2.3 2.3	2.3 2.3	2.3 2.3	2.3 2.3	2.3 2.3	.9 1.0	2.1 2.1	2.3 2.3	2.2 2.2
Ex. food & energy <i>Previous Tealbook</i>	.9 .9	1.4 1.3	1.9 1.5	1.9 1.8	2.0 2.0	1.8 1.8	1.7 1.7	2.0 2.0	2.0 2.0	2.0 2.0	2.0 2.0	1.5 1.4	1.8 1.8	2.0 2.0	2.0 2.0
Ex. food & energy, market based <i>Previous Tealbook</i>	.3 .3	1.0 1.0	1.5 1.5	1.6 1.6	1.7 1.8	1.6 1.6	1.5 1.5	1.8 1.8	1.8 1.8	1.8 1.8	1.8 1.8	1.2 1.2	1.6 1.6	1.8 1.8	1.9 1.9
CPI <i>Previous Tealbook</i>	-3 -3	2.0 2.0	3.7 2.8	1.9 1.8	1.9 2.1	2.0 2.1	2.0 2.1	2.2 2.3	2.3 2.3	2.3 2.3	2.3 2.3	2.1 1.9	2.0 2.1	2.3 2.3	2.4 2.4
Ex. food & energy <i>Previous Tealbook</i>	.6 .6	1.7 1.7	2.2 2.0	2.2 2.2	2.3 2.4	2.3 2.3	2.2 2.2	2.4 2.4	2.4 2.4	2.4 2.4	2.5 2.5	1.7 1.7	2.2 2.3	2.4 2.4	2.5 2.5
ECL, hourly compensation ² <i>Previous Tealbook</i> ²	2.2 2.2	3.1 2.3	2.5 2.4	2.6 2.6	2.4 2.4	2.4 2.5	2.4 2.5	2.5 2.6	2.5 2.6	2.6 2.6	2.6 2.6	2.8 2.5	2.5 2.5	2.5 2.6	2.6 2.6
Business sector															
Output per hour <i>Previous Tealbook</i>	1.4 1.3	3.8 4.3	-1.1 .1	1.3 1.1	1.1 1.0	.9 1.0	.9 .9	1.1 1.1	1.0 .9	.8 .7	.8 .7	.8 1.2	1.0 1.0	.9 .8	.9 .9
Compensation per hour <i>Previous Tealbook</i>	.2 1.8	3.5 3.4	1.3 3.3	3.6 3.6	3.5 3.5	3.5 3.5	3.5 3.5	3.6 3.6	3.6 3.6	3.6 3.6	3.6 3.6	2.3 3.2	3.5 3.5	3.6 3.6	3.6 3.6
Unit labor costs <i>Previous Tealbook</i>	-1.2 .5	-2 -8	2.4 3.2	2.3 2.5	2.4 2.4	2.6 2.4	2.6 2.6	2.5 2.6	2.6 2.7	2.8 2.9	2.9 2.9	1.5 2.0	2.5 2.5	2.7 2.8	2.7 2.7
Core goods imports chain-wt. price index ³ <i>Previous Tealbook</i> ³	2.5 2.5	1.2 1.5	2.6 3.2	.8 .8	1.2 1.0	.8 .8	.8 .8	.8 .8	.7 .7	.7 .7	.7 .7	1.6 1.8	.9 .9	.7 .7	.7 .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	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
GDP chain-wt. price index <i>Previous Tealbook</i>	1.9	1.9	1.6	1.6	1.0	1.5	1.9	1.8	2.1	2.1
PCE chain-wt. price index <i>Previous Tealbook</i>	2.7	1.8	1.2	1.2	.4	1.6	1.7	1.7	1.9	2.0
Energy <i>Previous Tealbook</i>	2.7	1.8	1.2	1.2	.4	1.6	1.5	1.7	2.0	2.0
Food <i>Previous Tealbook</i>	12.0	2.3	-2.5	-6.5	-16.2	2.2	8.3	-2.5	-4	.3
Ex. food & energy <i>Previous Tealbook</i>	12.0	2.3	-2.5	-6.5	-16.2	2.2	4.6	-1.6	.2	.7
Ex. food & energy, market based <i>Previous Tealbook</i>	5.1	1.2	.7	2.6	.3	-1.7	.9	2.1	2.3	2.2
CPI <i>Previous Tealbook</i>	5.1	1.2	.7	2.6	.3	-1.7	1.0	2.1	2.3	2.2
Ex. food & energy <i>Previous Tealbook</i>	1.9	1.8	1.5	1.5	1.3	1.9	1.5	1.8	2.0	2.0
Ex. food & energy, market based <i>Previous Tealbook</i>	1.9	1.8	1.5	1.5	1.3	1.9	1.4	1.8	2.0	2.0
CPI <i>Previous Tealbook</i>	1.9	1.5	1.1	1.2	1.1	1.5	1.2	1.6	1.8	1.9
Ex. food & energy <i>Previous Tealbook</i>	1.9	1.5	1.1	1.2	1.1	1.5	1.2	1.6	1.8	1.9
CPI <i>Previous Tealbook</i>	3.3	1.9	1.2	1.2	.4	1.8	2.1	2.0	2.3	2.4
Ex. food & energy <i>Previous Tealbook</i>	3.3	1.9	1.2	1.2	.4	1.8	1.9	2.1	2.3	2.4
ECL, hourly compensation ¹ <i>Previous Tealbook</i> ¹	2.2	1.9	1.7	1.7	2.0	2.2	1.7	2.2	2.4	2.5
ECL, hourly compensation ¹ <i>Previous Tealbook</i> ¹	2.2	1.9	1.7	1.7	2.0	2.2	1.7	2.3	2.4	2.5
ECL, hourly compensation ¹ <i>Previous Tealbook</i> ¹	2.2	1.8	2.0	2.3	1.9	2.2	2.8	2.5	2.5	2.6
ECL, hourly compensation ¹ <i>Previous Tealbook</i> ¹	2.2	1.8	2.0	2.3	1.9	2.2	2.5	2.5	2.6	2.6
Business sector Output per hour <i>Previous Tealbook</i>	-1	-1	1.9	.1	.7	1.0	.8	1.0	.9	.9
Compensation per hour <i>Previous Tealbook</i>	-1	-1	1.9	.1	.7	1.0	1.2	1.0	.8	.9
Unit labor costs <i>Previous Tealbook</i>	.5	5.9	-1	2.9	3.1	-1	2.3	3.5	3.6	3.6
Unit labor costs <i>Previous Tealbook</i>	.5	5.9	-1	2.9	3.1	-1	3.2	3.5	3.6	3.6
Core goods imports chain-wt. price index ² <i>Previous Tealbook</i> ²	.6	6.0	-2.0	2.8	2.4	-1.2	1.5	2.5	2.7	2.7
Core goods imports chain-wt. price index ² <i>Previous Tealbook</i> ²	.6	6.0	-2.0	2.8	2.4	-1.2	2.0	2.5	2.8	2.7
Core goods imports chain-wt. price index ² <i>Previous Tealbook</i> ²	4.3	.1	-1.5	.3	-3.7	-2	1.6	.9	.7	.7
Core goods imports chain-wt. price index ² <i>Previous Tealbook</i> ²	4.3	.1	-1.5	.3	-3.7	-2	1.8	.9	.7	.7

1. Private-industry workers.

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

Other Macroeconomic Indicators

Item	2017				2018				2019				2017 ¹	2018 ¹	2019 ¹	2020 ¹
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
<i>Employment and production</i>																
Nonfarm payroll employment ²	187	121	221	179	179	179	179	169	159	139	119	169	159	139	119	174
Unemployment rate ³	4.4	4.3	4.1	4.0	3.8	3.7	3.6	3.6	3.5	3.5	3.5	3.6	3.5	3.5	3.5	4.1
<i>Previous Tealbook³</i>	4.4	4.3	4.2	4.1	3.9	3.8	3.7	3.7	3.6	3.6	3.6	3.7	3.6	3.6	3.6	4.2
Natural rate of unemployment ³	4.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
<i>Previous Tealbook³</i>	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Employment-to-Population Ratio ³	60.1	60.2	60.2	60.2	60.3	60.3	60.4	60.4	60.4	60.4	60.3	60.4	60.4	60.4	60.3	60.2
Employment-to-Population Trend ³	59.8	59.7	59.7	59.6	59.6	59.5	59.5	59.4	59.4	59.3	59.3	59.4	59.4	59.5	59.3	59.1
Output gap ⁴	.8	1.2	1.3	1.6	1.8	1.9	2.1	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.3	1.3
<i>Previous Tealbook⁴</i>	.7	1.0	1.4	1.6	1.8	2.0	2.1	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.3	1.4
Industrial production ⁵	5.6	-3	5.5	3.5	2.4	1.1	1.1	1.2	9	.6	.4	1.2	9	.6	.4	3.1
<i>Previous Tealbook⁵</i>	5.6	-1.5	4.3	3.1	2.4	1.0	1.1	1.1	9	.7	.6	1.1	9	.7	.6	2.4
Manufacturing industr. prod. ⁵	2.6	-1.2	6.3	2.1	2.0	1.3	.9	.9	.8	.6	.2	.9	.8	.6	.2	2.5
<i>Previous Tealbook⁵</i>	2.5	-2.2	2.7	2.1	2.0	1.3	.9	.7	.9	.7	.3	.7	.9	.7	.3	1.3
Capacity utilization rate - mfg. ³	75.7	75.4	76.4	76.7	76.9	77.1	77.1	77.2	77.3	77.3	77.3	77.2	77.3	77.3	77.3	76.4
<i>Previous Tealbook³</i>	75.7	75.2	75.6	75.8	76.1	76.2	76.2	76.3	76.4	76.4	76.4	76.3	76.4	76.4	76.4	75.6
Housing starts ⁶	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2
Light motor vehicle sales ⁶	16.8	17.1	17.4	16.9	16.9	16.8	16.8	16.8	16.7	16.7	16.7	16.8	16.7	16.7	16.7	17.1
<i>Income and saving</i>																
Nominal GDP ⁵	4.1	5.5	4.8	4.5	4.3	4.2	4.0	4.4	4.2	3.9	3.7	4.4	4.2	3.9	3.7	4.4
Real disposable pers. income ⁵	2.7	.4	1.1	3.1	2.3	1.9	2.6	3.7	1.9	1.7	1.9	3.7	1.9	1.7	1.9	1.8
<i>Previous Tealbook⁵</i>	3.3	.7	2.0	5.3	2.5	1.8	2.6	3.4	1.8	1.6	1.9	3.4	1.8	1.6	1.9	2.2
Personal saving rate ³	3.7	3.3	3.0	3.1	3.0	2.9	2.9	3.3	3.2	3.1	3.0	3.3	3.2	3.1	3.0	3.0
<i>Previous Tealbook³</i>	3.8	3.4	3.1	3.7	3.7	3.6	3.6	3.8	3.7	3.6	3.5	3.8	3.7	3.6	3.5	3.1
Corporate profits ⁷	2.8	18.4	14.5	.1	6.1	3.1	1.4	2.5	4.2	3.7	2.3	2.5	4.2	3.7	2.3	6.3
Profit share of GNP ³	10.9	11.2	11.5	11.4	11.4	11.4	11.4	11.3	11.3	11.3	11.3	11.3	11.3	11.4	11.3	11.5
Gross national saving rate ³	17.2	17.4	17.3	17.1	17.2	17.2	17.2	17.2	17.2	17.1	17.1	17.2	17.2	17.1	17.1	17.3
Net national saving rate ³	2.0	2.4	2.3	2.2	2.3	2.3	2.2	2.1	2.1	2.0	1.9	2.1	2.1	2.2	1.9	2.3

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

2. Average monthly change, thousands.

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

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

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

5. Percent change, annual rate.

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

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

Greensheets

Other Macroeconomic Indicators

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

Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<i>Employment and production</i>										
Nonfarm payroll employment ¹	174	179	192	250	226	187	174	179	147	117
Unemployment rate ²	8.7	7.8	7.0	5.7	5.0	4.7	4.1	3.6	3.5	3.5
<i>Previous Tealbook²</i>	8.7	7.8	7.0	5.7	5.0	4.7	4.2	3.7	3.6	3.6
Natural rate of unemployment ²	5.9	5.6	5.4	5.1	4.9	4.8	4.7	4.7	4.7	4.7
<i>Previous Tealbook²</i>	5.9	5.6	5.4	5.1	4.9	4.8	4.8	4.8	4.8	4.8
Employment-to-Population Ratio ²	58.5	58.7	58.5	59.2	59.4	59.7	60.2	60.4	60.3	60.2
Employment-to-Population Trend ²	60.7	60.3	60.2	60.1	59.9	59.8	59.7	59.5	59.3	59.1
Output gap ³	-3.7	-3.7	-2.5	-9	-1	.3	1.3	2.1	2.3	2.1
<i>Previous Tealbook³</i>	-3.7	-3.7	-2.5	-9	-1	.3	1.4	2.1	2.3	2.1
Industrial production ⁴	2.8	2.3	2.2	3.4	-2.7	-1	3.1	2.0	.8	.5
<i>Previous Tealbook⁴</i>	2.8	2.3	2.2	3.4	-2.7	-1	2.4	1.9	.8	.5
Manufacturing industr. prod. ⁴	2.5	1.7	.9	1.5	-6	.3	2.5	1.6	.6	.2
<i>Previous Tealbook⁴</i>	2.5	1.7	.9	1.5	-6	.3	1.3	1.6	.6	.2
Capacity utilization rate - mfg. ²	74.4	74.6	74.7	75.9	75.4	75.1	76.4	77.1	77.3	77.3
<i>Previous Tealbook²</i>	74.4	74.6	74.7	75.9	75.4	75.1	75.6	76.2	76.4	76.4
Housing starts ⁵	.6	.8	.9	1.0	1.1	1.2	1.2	1.3	1.3	1.4
Light motor vehicle sales ⁵	12.7	14.4	15.5	16.5	17.4	17.5	17.1	16.9	16.7	16.6
<i>Income and saving</i>										
Nominal GDP ⁴	3.6	3.2	4.3	4.3	3.1	3.4	4.4	4.2	4.1	3.8
Real disposable pers. income ⁴	1.7	5.1	-2.8	4.9	3.2	.2	1.8	2.5	2.3	1.8
<i>Previous Tealbook⁴</i>	1.7	5.1	-2.8	4.9	3.2	.2	2.2	3.0	2.2	1.8
Personal saving rate ²	5.8	9.2	4.7	5.9	6.1	3.6	3.0	2.9	3.0	2.7
<i>Previous Tealbook²</i>	5.8	9.2	4.7	5.9	6.1	3.6	3.1	3.6	3.5	3.1
Corporate profits ⁶	6.8	.6	4.7	7.4	-11.1	8.7	6.3	2.7	3.2	4.2
Profit share of GNP ²	12.3	12.0	12.0	12.4	10.7	11.3	11.5	11.4	11.3	11.4
Gross national saving rate ²	16.1	18.0	18.2	19.5	19.0	17.2	17.3	17.2	17.1	16.9
Net national saving rate ²	.8	2.9	3.1	4.7	4.1	2.1	2.3	2.2	1.9	1.6

1. Average monthly change, thousands.

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

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

Values are for the fourth quarter of the year indicated.

4. Percent change.

5. Level, millions; values are annual averages.

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

Staff Projections of Government-Sector Accounts and Related Items

Item	2015	2016	2017	2018	2019	2020	2017			2018
							Q2	Q3	Q4	
Unified federal budget¹										
Receipts	3,250	3,268	3,315	3,413	3,595	3,795	1,035	807	793	682
Outlays	3,688	3,853	3,981	4,128	4,404	4,664	1,031	950	1,011	1,124
Surplus/deficit	-438	-585	-666	-715	-809	-869	4	-143	-218	-442
<i>Percent of GDP</i>										
Surplus/deficit	-2.4	-3.2	-3.5	-3.6	-3.9	-4.0	.1	-2.9	-4.4	-8.9
<i>Previous Tealbook</i>	-2.4	-3.2	-3.3	-3.6	-3.7	-3.9	.1	-2.9	-4.4	-8.9
Primary surplus/deficit	-1.2	-1.9	-2.0	-1.9	-2.0	-1.8	1.8	-2.0	-2.5	-7.2
Net interest	1.2	1.3	1.4	1.6	1.9	2.2	1.7	.9	1.9	1.7
Cyclically adjusted surplus/deficit	-1.9	-2.8	-3.3	-3.9	-4.6	-4.8	.2	-3.0	-4.6	-9.1
Federal debt held by public	72.9	76.7	76.5	77.4	78.9	80.5	74.6	75.2	74.8	76.6
Government in the NIPA²										
Purchases	1.6	.4	.1	.5	.7	.7	-.2	.4	.7	.3
Consumption	1.9	.6	.1	.1	.4	.4	.4	1.7	.2	-.2
Investment	.4	-.5	.2	2.4	2.2	1.9	-3.2	-3.0	3.1	2.6
State and local construction	.0	-2.3	-6.4	2.1	1.0	1.0	-17.8	-8.2	4.3	4.3
Real disposable personal income	3.2	.2	1.8	2.5	2.3	1.8	2.7	.4	1.1	3.1
Contribution from transfers ³	.7	.3	.3	.8	.8	.7	.1	.2	.5	1.4
Contribution from taxes ³	-1.4	.2	-.8	-.8	-.7	-.7	.1	-1.1	-.4	-.6
Government employment										
Federal	3	4	-0	0	0	0	-1	-0	2	0
State and local	10	13	7	9	9	9	4	11	5	9
Fiscal indicators²										
Fiscal effect (FE) ⁴	.3	.3	.0	.3	.5	.3	.1	-.1	.0	.4
Discretionary policy actions (FI)	.4	.2	.1	.3	.3	.2	.0	.1	.2	.4
<i>Previous Tealbook</i>	.4	.2	.0	.3	.3	.2	.0	-.2	.2	.5
Federal purchases	.1	.0	.0	.0	.0	.0	.1	.1	.0	-.1
State and local purchases	.2	.1	.0	.1	.1	.1	-.2	.0	.1	.2
Taxes and transfers	.1	.1	.0	.2	.2	.1	.1	.1	.1	.3
Cyclical	-.2	.0	-.2	-.2	-.1	.0	-.2	-.3	-.2	-.2
Other	.1	.2	.1	.2	.3	.1	.3	.1	.0	.2

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

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

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

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

Foreign Real GDP and Consumer Prices: Selected Countries

(Quarterly percent changes at an annual rate)

Measure and country	2017				2018				2019			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP¹												
Total foreign	2.9	3.1	2.2	3.1	2.8	2.7	2.7	2.6	2.7	2.6	2.8	2.4
<i>Previous Tealbook</i>	3.0	3.2	2.7	2.8	2.7	2.7	2.6	2.6	2.6	2.6	2.8	2.3
Advanced foreign economies	2.6	3.2	2.0	2.1	2.0	1.8	1.8	1.7	1.7	1.7	1.9	1.2
Canada	3.7	4.3	1.7	2.2	2.1	2.0	2.0	1.9	1.8	1.8	1.8	1.7
Japan	1.0	2.6	1.4	1.4	1.2	1.1	.8	.8	.8	.8	3.2	-3.8
United Kingdom	1.0	1.2	1.6	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Euro area	2.2	2.6	2.5	2.4	2.0	1.6	1.7	1.7	1.7	1.7	1.7	1.7
Germany	3.6	2.6	3.3	2.3	1.8	1.4	1.4	1.3	1.4	1.4	1.4	1.4
Emerging market economies	3.3	2.9	2.5	4.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Asia	5.4	5.1	5.6	5.1	4.8	4.7	4.7	4.7	4.6	4.6	4.6	4.5
Korea	4.3	2.4	6.3	3.6	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0
China	7.1	6.8	6.5	6.6	6.3	6.3	6.2	6.1	6.1	6.0	6.0	5.9
Latin America	2.1	1.3	-5	3.1	2.5	2.5	2.6	2.6	2.7	2.7	2.7	2.7
Mexico	2.2	1.1	-1.2	3.5	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.7
Brazil	5.3	2.7	.6	1.9	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5
Consumer prices²												
Total foreign	2.9	2.0	2.2	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.8
<i>Previous Tealbook</i>	2.8	2.0	2.2	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.8
Advanced foreign economies	2.3	.3	1.1	1.8	1.7	1.6	1.6	1.6	1.6	1.7	1.7	2.6
Canada	2.6	.1	1.2	2.1	2.4	2.4	2.4	2.2	2.1	2.1	2.1	2.0
Japan	-1	-3	.4	1.3	.9	.8	.8	.9	.9	1.0	1.0	6.3
United Kingdom	3.8	3.0	2.3	2.8	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2
Euro area	2.8	.2	1.0	1.6	1.5	1.3	1.4	1.5	1.5	1.5	1.6	1.7
Germany	2.0	.2	1.7	1.9	1.9	1.8	1.8	1.9	2.0	2.0	2.1	2.2
Emerging market economies	3.3	3.3	3.0	3.1	3.0	3.1	3.1	3.1	3.0	3.0	3.0	3.0
Asia	.8	1.7	2.1	2.8	2.6	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Korea	2.6	.7	2.2	.3	2.4	3.4	3.4	3.3	3.2	3.1	3.1	3.1
China	-6	2.3	2.0	3.0	2.3	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Latin America	9.1	7.0	5.2	4.0	3.9	3.8	3.8	3.8	3.6	3.5	3.4	3.4
Mexico	9.9	6.9	5.1	3.5	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Brazil	3.2	2.3	2.3	3.8	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)

Measure and country	-----Projected-----									
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Real GDP¹										
Total foreign	3.2	2.2	3.0	2.8	2.0	2.6	2.8	2.7	2.6	2.7
<i>Previous Tealbook</i>	3.2	2.3	3.0	2.6	2.0	2.5	2.9	2.7	2.6	2.7
Advanced foreign economies	1.8	.3	2.5	2.0	1.2	1.9	2.5	1.8	1.6	1.7
Canada	3.1	.7	3.6	2.5	.3	2.0	3.0	2.0	1.8	1.7
Japan	.2	.3	2.8	-.2	1.0	1.7	1.6	1.0	.2	.8
United Kingdom	1.3	1.5	2.6	3.3	2.1	1.6	1.4	1.5	1.5	1.7
Euro area	.5	-1.1	.8	1.5	2.0	1.9	2.4	1.7	1.7	1.7
Germany	2.4	.2	1.6	1.9	1.3	1.9	2.9	1.5	1.4	1.4
Emerging market economies	4.6	4.2	3.5	3.6	2.9	3.4	3.2	3.6	3.6	3.7
Asia	5.1	5.7	5.4	5.0	4.4	4.8	5.3	4.7	4.6	4.5
Korea	2.9	2.1	3.5	2.8	3.3	2.4	4.1	3.1	3.0	2.9
China	8.7	8.0	7.6	7.1	6.8	6.8	6.7	6.2	6.0	5.8
Latin America	4.0	3.1	1.7	2.5	1.6	2.1	1.5	2.5	2.7	2.9
Mexico	3.9	3.0	1.2	3.5	2.7	3.3	1.4	2.6	2.7	2.9
Brazil	2.6	2.6	2.6	-.1	-5.5	-2.4	2.6	2.0	2.5	2.5
Consumer prices²										
Total foreign	3.4	2.3	2.4	2.0	1.4	1.9	2.4	2.5	2.5	2.4
<i>Previous Tealbook</i>	3.4	2.3	2.4	2.0	1.4	1.9	2.3	2.4	2.5	2.4
Advanced foreign economies	2.2	1.3	1.0	1.2	.5	.9	1.3	1.7	1.9	1.7
Canada	2.7	1.0	1.0	2.0	1.3	1.4	1.5	2.3	2.1	2.0
Japan	-.3	-.2	1.4	2.6	.2	.3	.3	.9	2.3	1.0
United Kingdom	4.6	2.6	2.1	.9	.1	1.2	3.0	2.3	2.2	2.1
Euro area	2.9	2.3	.8	.2	.2	.7	1.4	1.4	1.6	1.7
Germany	2.6	1.9	1.4	.4	.2	1.0	1.5	1.8	2.1	2.2
Emerging market economies	4.3	3.1	3.4	2.7	2.1	2.7	3.2	3.1	3.0	2.9
Asia	4.4	2.6	3.1	1.8	1.5	2.0	1.8	2.8	2.8	2.7
Korea	3.9	1.7	1.1	1.0	.9	1.5	1.4	3.1	3.2	3.0
China	4.6	2.1	2.9	1.5	1.5	2.2	1.7	2.5	2.5	2.5
Latin America	4.1	4.4	4.1	4.8	3.4	4.2	6.3	3.8	3.5	3.4
Mexico	3.5	4.1	3.6	4.2	2.3	3.2	6.3	3.2	3.2	3.2
Brazil	6.7	5.6	5.8	6.5	10.4	7.1	2.9	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.

Greensheets

U.S. Current Account

Quarterly Data

	2017				2018				Projected			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<i>Billions of dollars, s.a.a.r.</i>												
U.S. current account balance	-454.1	-492.5	-408.8	-448.0	-508.8	-484.7	-501.8	-509.5	-554.6	-550.3	-564.8	-580.4
<i>Previous Tealbook</i>	<i>-454.1</i>	<i>-492.5</i>	<i>-455.6</i>	<i>-482.1</i>	<i>-530.5</i>	<i>-513.6</i>	<i>-536.0</i>	<i>-545.9</i>	<i>-595.0</i>	<i>-594.3</i>	<i>-613.8</i>	<i>-632.5</i>
Current account as percent of GDP	-2.4	-2.6	-2.1	-2.3	-2.5	-2.4	-2.5	-2.5	-2.7	-2.6	-2.7	-2.7
<i>Previous Tealbook</i>	<i>-2.4</i>	<i>-2.6</i>	<i>-2.3</i>	<i>-2.4</i>	<i>-2.7</i>	<i>-2.5</i>	<i>-2.6</i>	<i>-2.7</i>	<i>-2.9</i>	<i>-2.8</i>	<i>-2.9</i>	<i>-3.0</i>
Net goods & services	-552.4	-549.2	-519.3	-530.9	-567.2	-543.8	-534.8	-523.0	-537.5	-524.3	-522.5	-532.3
Investment income, net	213.7	202.8	240.8	213.3	197.7	187.5	167.5	144.0	122.3	102.3	92.1	82.4
Direct, net	295.7	278.6	314.2	292.4	296.7	304.8	305.3	302.1	300.0	299.1	307.9	316.1
Portfolio, net	-82.1	-75.8	-73.4	-79.0	-99.1	-117.3	-137.9	-158.1	-177.8	-196.8	-215.8	-233.8
Other income and transfers, net	-115.4	-146.1	-130.3	-130.4	-139.3	-128.3	-134.4	-130.4	-139.3	-128.3	-134.4	-130.4

Annual Data

	Projected									
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<i>Billions of dollars</i>										
U.S. current account balance	-444.6	-426.2	-349.5	-373.0	-434.6	-451.7	-450.9	-501.2	-562.5	-630.7
<i>Previous Tealbook</i>	<i>-444.6</i>	<i>-426.2</i>	<i>-349.5</i>	<i>-373.0</i>	<i>-434.6</i>	<i>-451.7</i>	<i>-471.1</i>	<i>-531.5</i>	<i>-608.9</i>	<i>-690.6</i>
Current account as percent of GDP	-2.9	-2.6	-2.1	-2.1	-2.4	-2.4	-2.3	-2.5	-2.7	-2.9
<i>Previous Tealbook</i>	<i>-2.9</i>	<i>-2.6</i>	<i>-2.1</i>	<i>-2.1</i>	<i>-2.4</i>	<i>-2.4</i>	<i>-2.4</i>	<i>-2.6</i>	<i>-2.9</i>	<i>-3.2</i>
Net goods & services	-548.6	-536.8	-461.9	-489.5	-500.4	-504.8	-537.9	-542.2	-529.2	-557.5
Investment income, net	219.2	216.1	215.4	221.3	192.7	186.8	217.7	174.2	99.8	59.9
Direct, net	288.7	285.5	283.3	276.7	266.5	258.8	295.2	302.2	305.8	333.7
Portfolio, net	-69.5	-69.4	-67.9	-55.4	-73.8	-72.0	-77.6	-128.1	-206.0	-273.7
Other income and transfers, net	-115.1	-105.5	-103.1	-104.8	-126.9	-133.7	-130.6	-133.1	-133.1	-133.1

Abbreviations

ABS	asset-backed securities
AFE	advanced foreign economy
BOC	Bank of Canada
BOE	Bank of England
C&I	commercial and industrial
CMBS	commercial mortgage-backed securities
CP	commercial paper
CPI	consumer price index
CRE	commercial real estate
ECB	European Central Bank
E&I	equipment and intangibles
ELB	effective lower bound
EME	emerging market economy
EU	European Union
FOMC	Federal Open Market Committee; also, the Committee
GCF	General Collateral Finance
GDP	gross domestic product
GO	general obligation
LFPR	labor force participation rate
M&A	mergers and acquisitions
MBS	mortgage-backed securities
MMF	money market fund
NAFTA	North American Free Trade Agreement
NI	nominal income
OIS	overnight index swap

ON RRP	overnight reverse repurchase agreement
PCE	personal consumption expenditures
PMI	purchasing managers index
repo	repurchase agreement
SEP	Summary of Economic Projections
SOMA	System Open Market Account
S&P	Standard & Poor's
TIPS	Treasury Inflation-Protected Securities
VIX	One-month-ahead option-implied volatility on the S&P 500 index
WFSBI	Wells Fargo Small Business Index

Class I FOMC – Restricted Controlled (FR)

Report to the FOMC on Economic Conditions and Monetary Policy

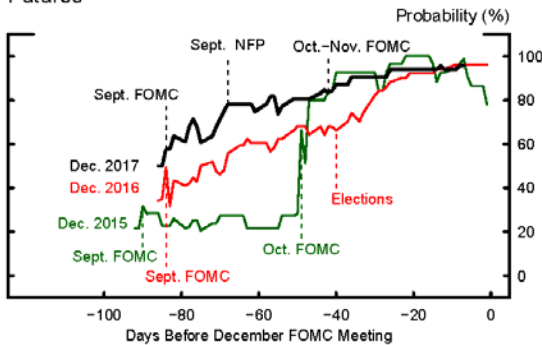


Book B Monetary Policy Alternatives

December 7, 2017

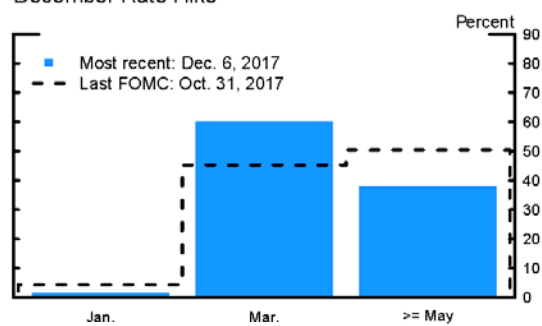
Prepared for the Federal Open Market Committee
by the staff of the Board of Governors of the Federal Reserve System

Figure 1: Market-Implied Probability of the Next Rate Increase in December Implied by Federal Funds Futures



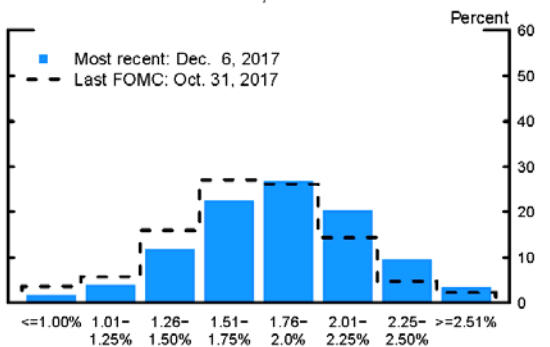
Note: Probabilities implied by a binomial tree fitted to settlement prices on fed funds futures contracts, assuming the next policy action is either no change or a 25 basis point increase in rates and no intermeeting moves. The effective federal funds rate until the next FOMC meeting is assumed to be equal to the observed rate on the previous non-month-end business day.
Source: CME Group; Federal Reserve Board staff estimates.

Figure 2: Market-Implied Probability Distribution of the Timing of Next Rate Increase Conditional on a December Rate Hike



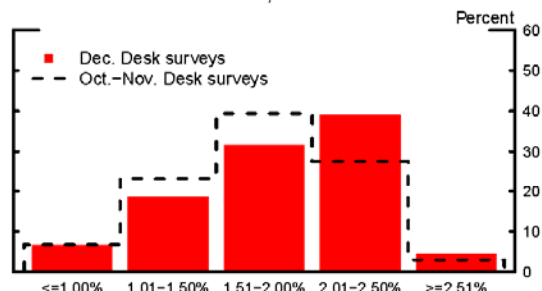
Note: Probabilities implied by a binomial tree fitted to settlement prices on fed funds futures contracts, assuming the next policy action is either no change or a 25 basis point increase in rates and no intermeeting moves. The effective federal funds rate until the next FOMC meeting is assumed to be equal to the observed rate on the previous non-month-end business day.
Source: CME Group; Federal Reserve Board staff estimates.

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



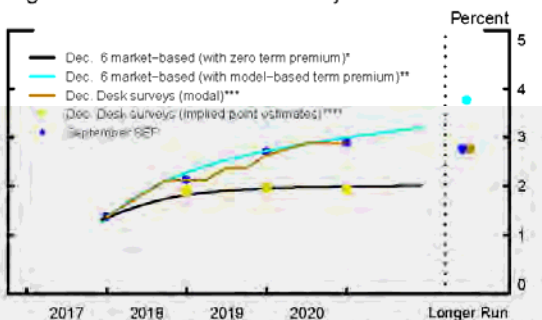
Note: Estimated from Eurodollar futures options, accounting for the differences in the levels and option-implied volatilities of LIBOR and the federal funds rate, but not adjusted for risk premiums.
Source: CME Group; Federal Reserve Board staff estimates.

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



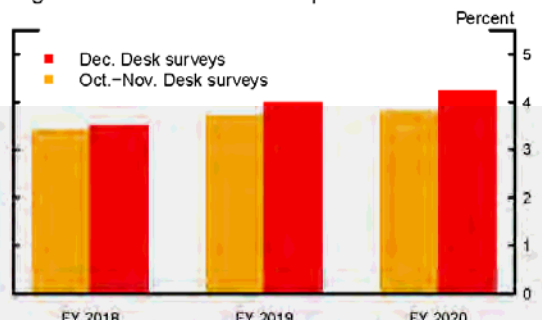
Note: Average unconditional probabilities across primary dealers and market participants for different ranges of the federal funds rate at the end of 2018.
Source: FRBNY.

Figure 5: Federal Funds Rate Projections



* Estimated using overnight index swap quotes with a spline approach and no term premium.
** Estimated using a term structure model maintained by Board staff and adjusted for term premiums. The longer-run model-implied forecast is for the expected federal funds rate 5 to 10 years ahead.
*** Median of the respondents' modal paths for the federal funds rate.
**** Estimated from respondents' conditional year-end probability distributions.
Source: Bloomberg; Federal Reserve Board staff estimates; FRBNY; Summary of Economic Projections.

Figure 6: U.S. Fiscal Deficit Expectations



Note: Median of respondents' modal forecasts for the U.S. federal fiscal deficit as a percentage of GDP for fiscal years 2018 through 2020.
Source: Surveys of Primary Dealers and Market Participants.

Redemptions and Reinvestments of SOMA Principal Payments

Projections for Treasury Securities
(Billions of dollars)

	Redemptions		Reinvestments	
	Period	Cumulative*	Period	Cumulative*
2017: Q4	18.0	18.0	27.1	27.1
2018: Q1	36.0	54.0	74.7	101.9
2018: Q2	54.0	108.0	65.7	167.6
2018: Q3	67.0	175.0	27.4	195.0
2018: Q4	72.1	247.1	29.2	224.3
2019	272.1	519.2	115.0	339.3
2020	210.3	729.4	88.4	427.6

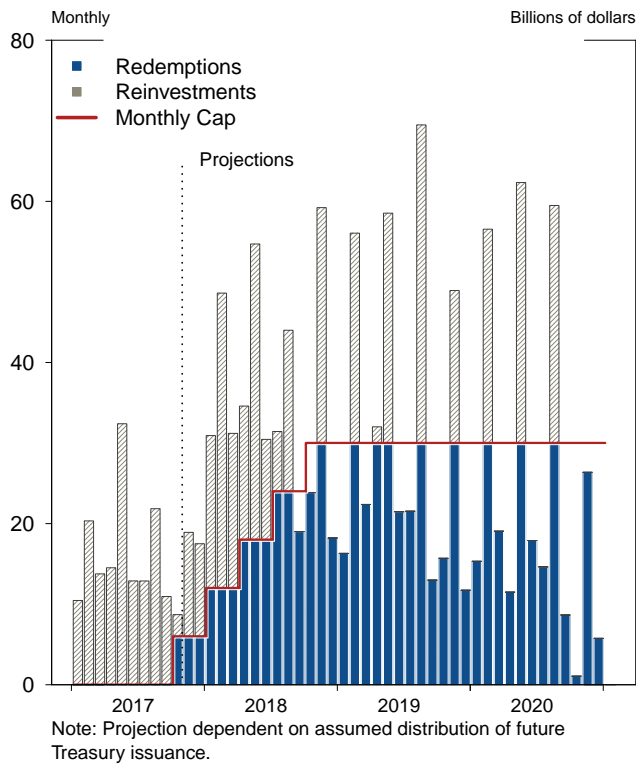
* Since October 2017.

Projections for Agency Securities
(Billions of dollars)

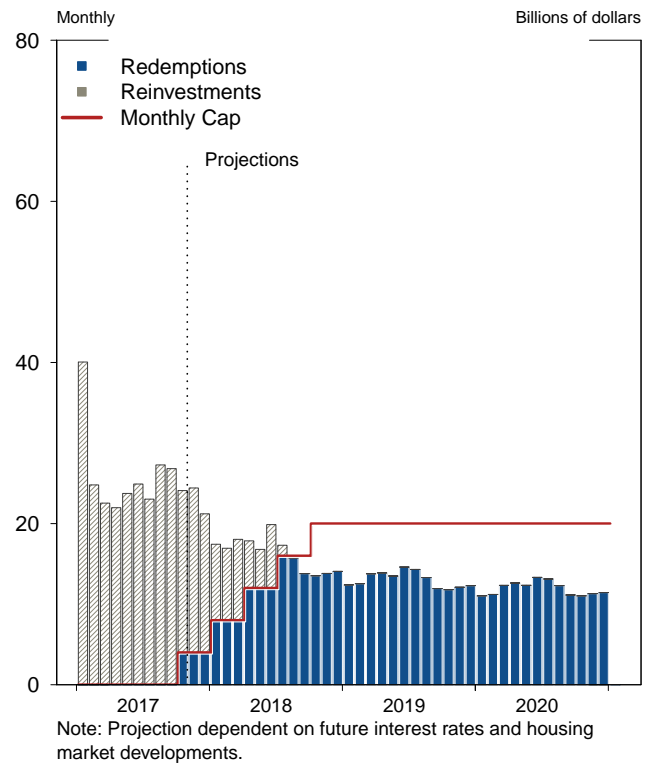
	Redemptions		Reinvestments	
	Period	Cumulative*	Period	Cumulative*
2017: Q4	12.0	12.0	57.7	57.7
2018: Q1	24.0	36.0	28.4	86.2
2018: Q2	36.0	72.0	18.5	104.7
2018: Q3	45.5	117.5	1.3	106.0
2018: Q4	41.4	158.9	0.0	106.0
2019	156.4	315.4	0.0	106.0
2020	143.2	458.6	0.0	106.0

* Since October 2017.

**SOMA Treasury Securities
Principal Payments**



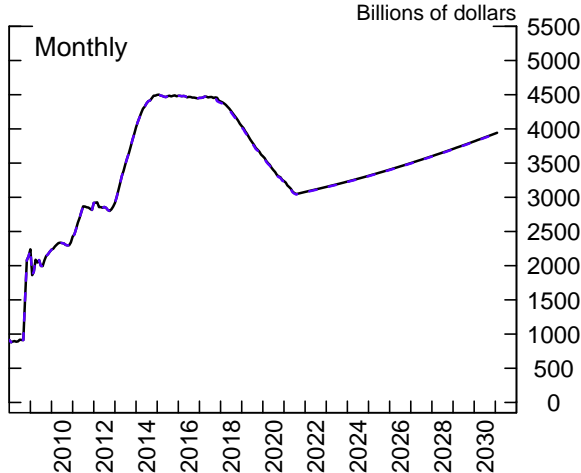
**SOMA Agency Debt and MBS
Principal Payments**



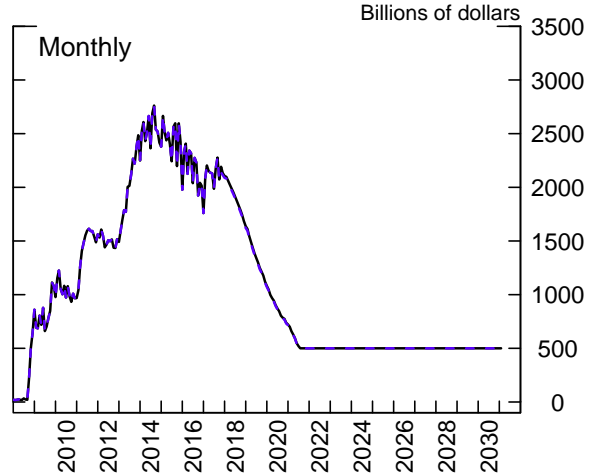
Total Assets and Selected Balance Sheet Items

— December Tealbook baseline — October Tealbook baseline

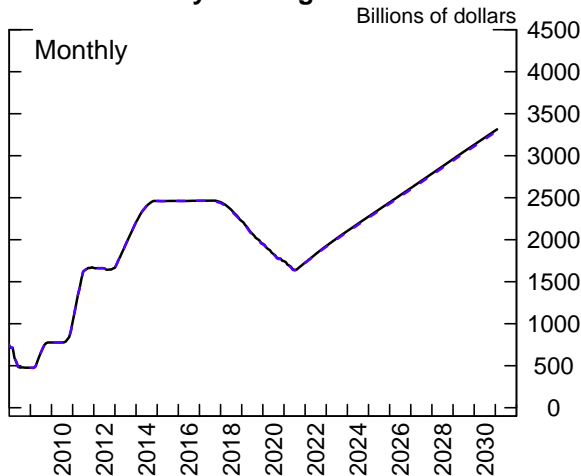
Total Assets



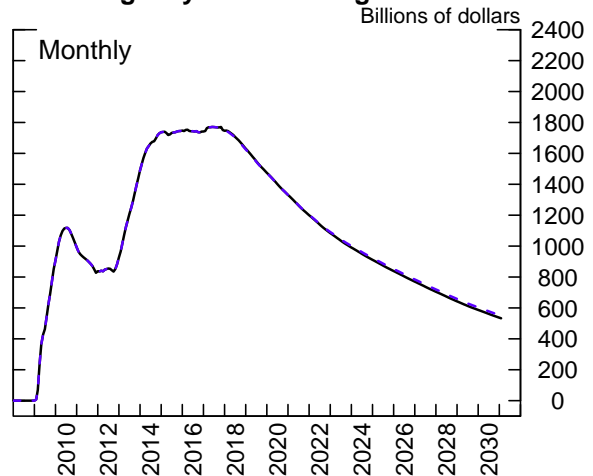
Reserve Balances



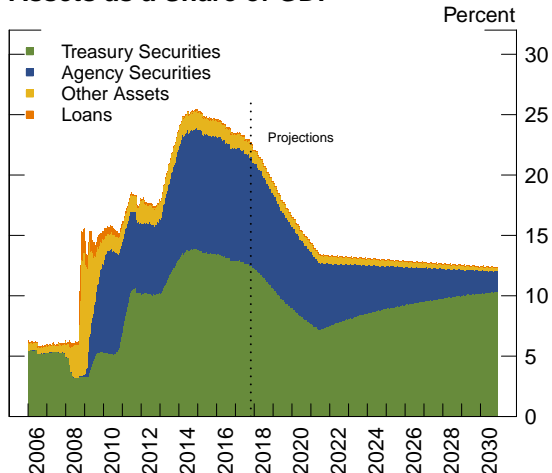
SOMA Treasury Holdings



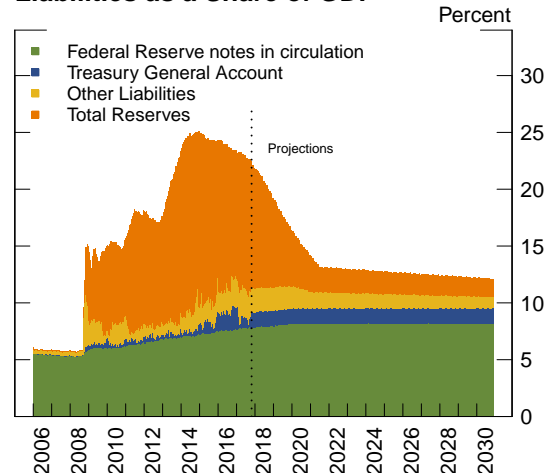
SOMA Agency MBS Holdings



Assets as a Share of GDP



Liabilities as a Share of GDP



Federal Reserve Balance Sheet
End-of-Year Projections -- December Tealbook
 (Billions of dollars)

	Oct 31, 2017	2017	2019	2021	2023	2025	2030
Total assets	4,456	4,401	3,600	3,078	3,229	3,404	3,933
Selected assets							
Loans and other credit extensions*	2	0	0	0	0	0	0
Securities held outright	4,237	4,198	3,428	2,930	3,097	3,285	3,839
U.S. Treasury securities	2,460	2,448	1,952	1,728	2,104	2,444	3,300
Agency debt securities	7	4	2	2	2	2	2
Agency mortgage-backed securities	1,771	1,746	1,474	1,200	991	839	537
Unamortized premiums	161	159	125	99	82	68	41
Unamortized discounts	-14	-14	-11	-9	-7	-6	-4
Total other assets	70	58	58	58	58	58	58
Total liabilities	4,415	4,359	3,556	3,030	3,177	3,347	3,862
Selected liabilities							
Federal Reserve notes in circulation	1,541	1,565	1,763	1,897	2,023	2,169	2,612
Reverse repurchase agreements	415	340	340	240	240	240	240
Deposits with Federal Reserve Banks	2,524	2,449	1,448	888	909	932	1,004
Reserve balances held by depository institutions	2,192	2,105	1,082	500	500	500	500
U.S. Treasury, General Account	177	264	286	308	328	352	424
Other deposits	77	80	80	80	80	80	80
Earnings remittances due to the U.S. Treasury	2	0	0	0	0	0	0
Total Federal Reserve Bank capital**	41	41	44	48	52	57	71

Source: Federal Reserve H.4.1 statistical releases and staff calculations.

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

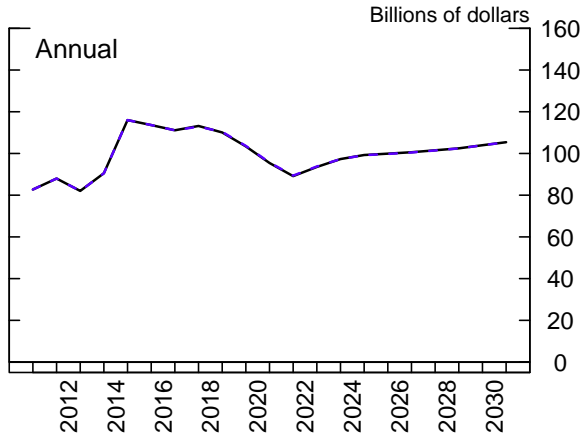
*Loans and other credit extensions includes primary, secondary, and seasonal credit; central bank liquidity swaps; and net portfolio holdings of Maiden Lane LLC.

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

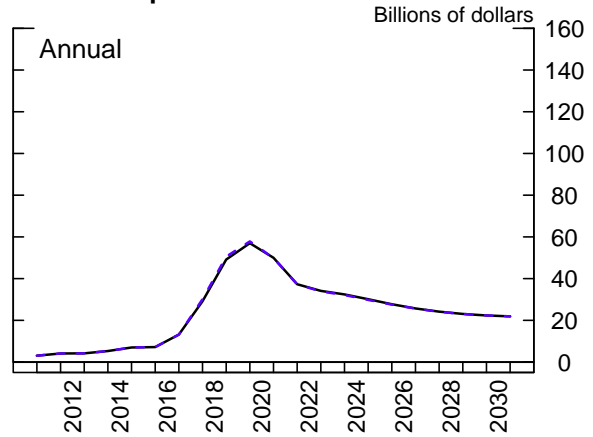
Income Projections

— December Tealbook baseline — October Tealbook baseline

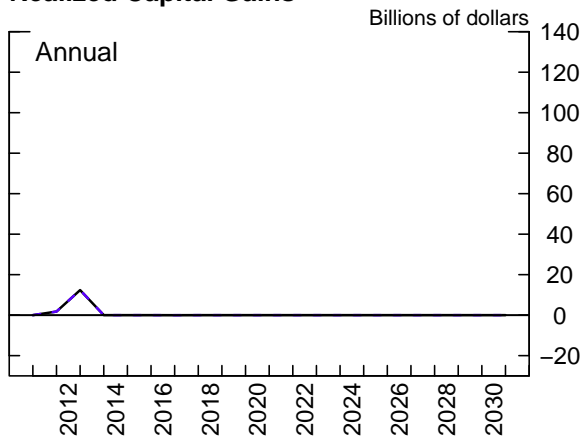
Interest Income



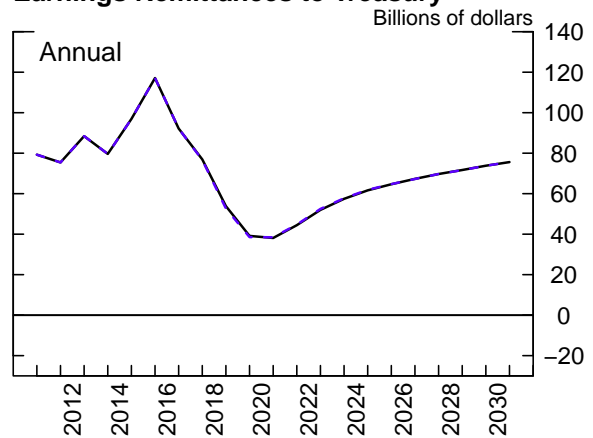
Interest Expense



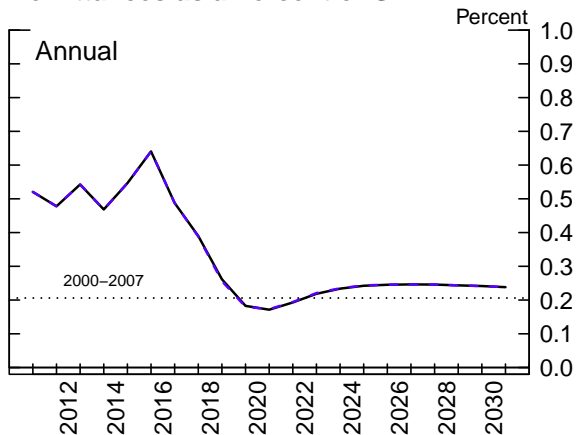
Realized Capital Gains



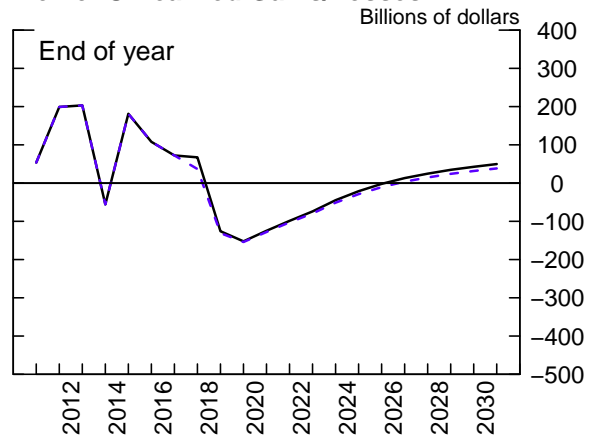
Earnings Remittances to Treasury



Remittances as a Percent of GDP



Memo: Unrealized Gains/Losses

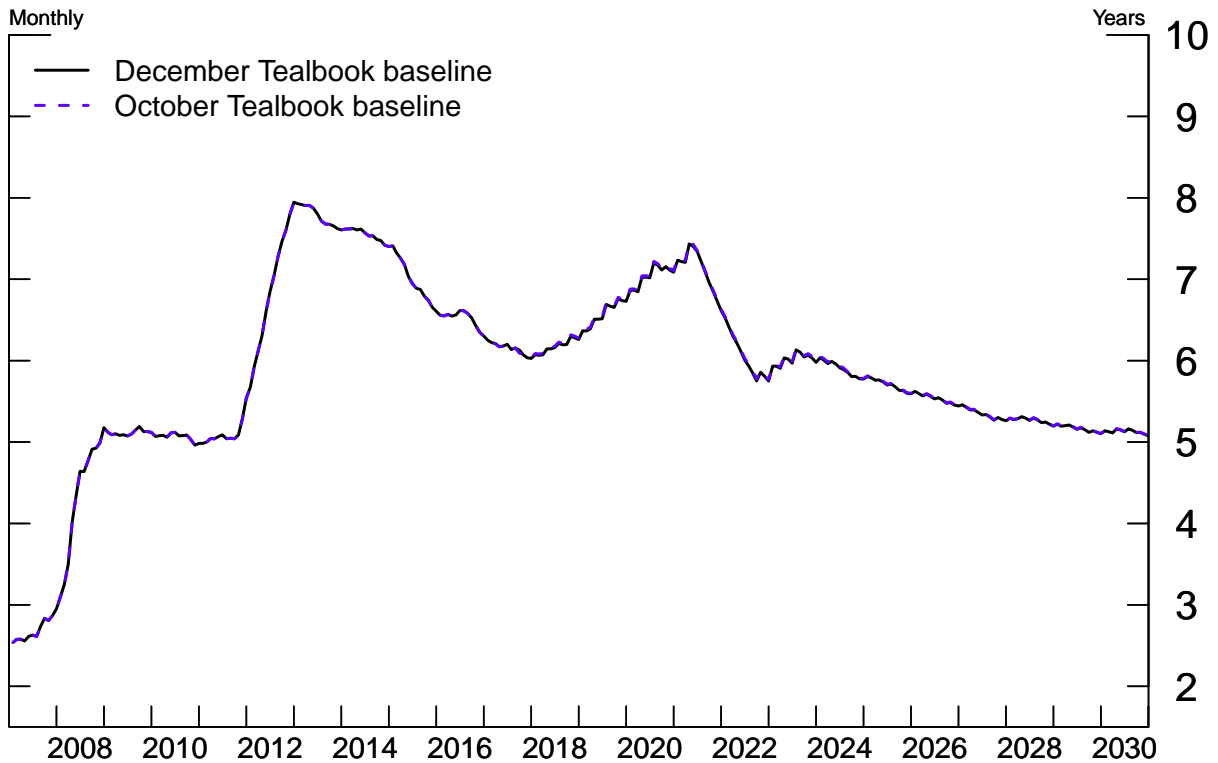


Projections for the 10-Year Treasury Term Premium Effect
(Basis Points)

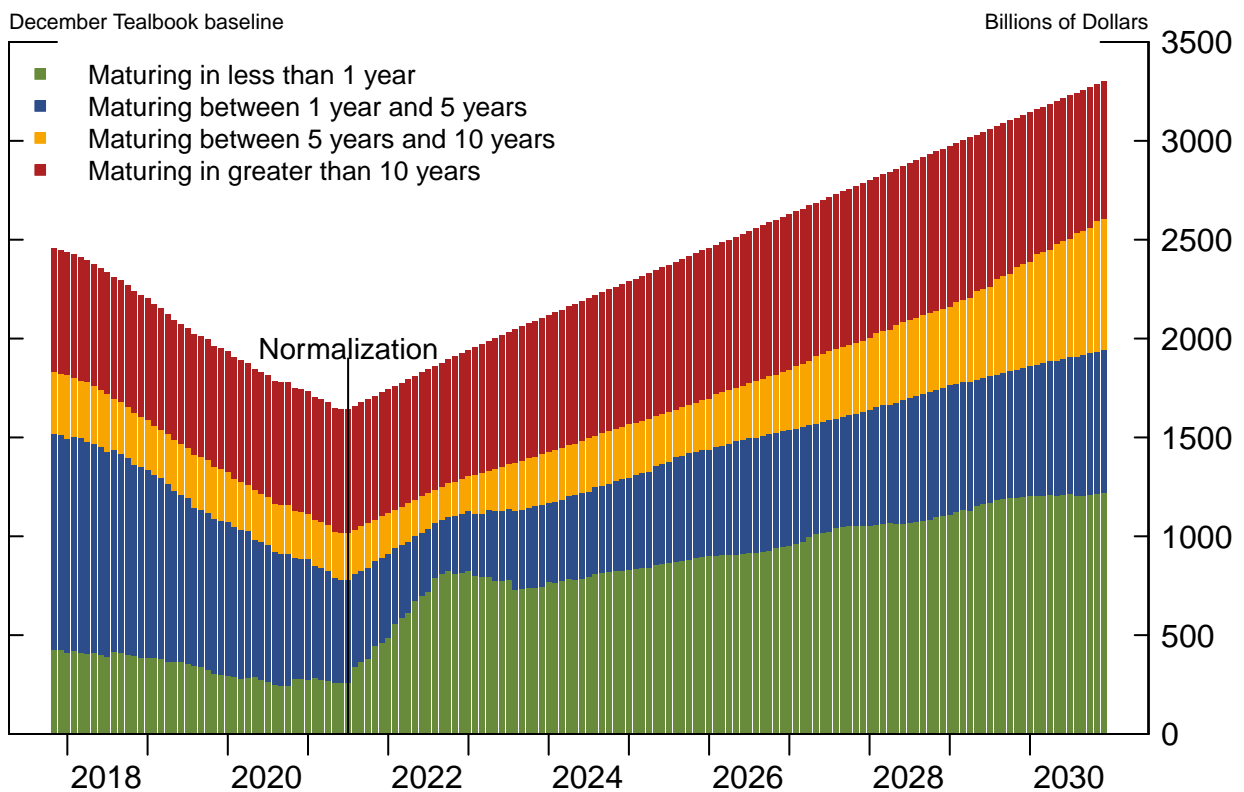
Date	December Tealbook	October Tealbook
Quarterly Averages		
2017:Q4	-87	-87
2018:Q4	-75	-75
2019:Q4	-64	-65
2020:Q4	-57	-57
2021:Q4	-51	-51
2022:Q4	-48	-48
2023:Q4	-45	-45
2024:Q4	-42	-42
2025:Q4	-39	-39
2026:Q4	-36	-37
2027:Q4	-34	-35
2028:Q4	-32	-33
2029:Q4	-31	-31
2030:Q4	-29	-29

Projections for the Characteristics of SOMA Treasury Securities Holdings

SOMA Weighted-Average Treasury Duration



Maturity Composition of SOMA Treasury Portfolio



Abbreviations

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

LSAPs	large-scale asset purchases
MBS	mortgage-backed securities
MMFs	money market funds
NBER	National Bureau of Economic Research
NI	nominal income
NIPA	national income and product accounts
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
PCE	personal consumption expenditures
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)
TGA	U.S. Treasury's General Account
TIPS	Treasury inflation-protected securities
TPE	Term premium effects
ZLB	zero lower bound