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.

Content last modified 01/14/2022.

Report to the FOMC on Economic Conditions and Monetary Policy

Book A

Economic and Financial Conditions:
Current Situation and Outlook

March 9, 2016

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

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Domestic Economic Developments and Outlook

Our near-term assessment of economic activity is little changed from the January Tealbook. Real GDP growth was modest last quarter, but the available indicators of aggregate spending and production point to a pickup this quarter, mostly as we had projected. Labor market conditions also seem to have improved roughly in line with our expectations.

Financial market conditions, which had tightened between the December and January Tealbooks, tightened further in the first half of February. However, these conditions eased later in the intermeeting period and currently are generally more accommodative than at the time of the January Tealbook. Nevertheless, corporate bond spreads remain well above their historical norms; we have accordingly built into our forecast a drag on investment spending this year that offsets a small part of the modest boost to real GDP growth from the changes in other financial conditions.

All told, real GDP is projected to increase 2¼ percent in both 2016 and 2017 and about 2 percent in 2018. At the end of 2018, real GDP is expected to be nearly 1½ percent above our estimate of its potential and the unemployment rate is expected to be 4.3 percent, ¾ percentage point below our revised estimate of 5.0 percent for its natural rate.

Our forecast for total PCE price inflation over the first half of this year is higher than in the previous Tealbook, reflecting recent unexpected increases in crude oil prices as well as a reading on core PCE price inflation in January that was stronger than we had anticipated. We have not marked up our forecast for core inflation materially over the remainder of the year, based partly on our experience in the past few years that upside surprises during the early months of the year turned out to be evanescent. We project that total PCE price inflation will move up gradually over the medium term, reaching 1.8 percent in 2018, as energy and import prices bottom out and begin to rise moderately later this year and as resource utilization tightens further in an environment of reasonably stable long-run inflation expectations. Our forecast for total PCE inflation in 2018 is a couple of tenths lower than in the previous projection, owing primarily to lower energy price inflation later in the projection but also to a slightly lower estimate of underlying inflation.

Revisions to the Staff Projection since the Previous SEP

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

Over the three-year projection period, the cumulative growth of real GDP is about unrevised from the December forecast. (Relative to December, our forecast for real GDP growth this year is revised down a little, while growth in 2017 and 2018 is a bit higher.) The unemployment rate is now forecast to decline gradually to 4.3 percent at the end of 2018, 0.2 percentage point below our December projection. The unemployment rate *gap* is only 0.1 percentage point stronger, however, with the difference being the result of our having marked down our estimate of the natural rate from 5.1 percent to 5.0 percent.

The staff's forecast for total PCE price inflation has been revised down slightly in the first half of this year, largely reflecting lower energy prices. With data through January, core PCE price inflation in the first half appears to be running above our December projection, but we expect it to slow in the second half, leaving our projection for core inflation unchanged over the year as a whole. Given our assumptions that energy prices and core import prices will start to rise later this year along with our forecast for tightening resource utilization, we continue to project that inflation will move up gradually. Both total and core inflation are projected to reach 1.8 percent in 2018. The forecast for total inflation in 2018 is 0.2 percentage point below our December forecast, mostly reflecting the flatter futures prices for oil and food commodities but also partly because of our assessment that longer-run inflation expectations relevant for wage and price setters have edged down and are now consistent with PCE price inflation of 1.75 percent rather than 1.8 percent.

Under the inertial version of the Taylor (1999) rule that we use to set the path of monetary policy, the federal funds rate rises roughly 1 percentage point (or a little less) per year and reaches an average of about 3¼ percent in the fourth quarter of 2018, around ¼ percentage point less than in our December projection. About 15 basis points of that downward revision to the terminal funds rate reflects the slightly lower inflation outlook in this forecast; the remainder reflects a complex set of factors including our recalibration of the Okun's law relationship that is discussed in "The Outlook for the Labor Market and Aggregate Supply" in this section.

Staff Economic Projections Compared with the December Tealbook

Variable	2015	2016		2016	2017	2018	Longer run
		H1	H2				
Real GDP[1]	1.9	2.0	2.4	2.2	2.2	2.0	1.9
December Tealbook	2.1	2.4	2.7	2.5	2.0	1.9	1.9
Unemployment rate[2]	5.0	4.9	4.8	4.8	4.5	4.3	5.0
December Tealbook	5.0	4.8	4.7	4.7	4.6	4.5	5.1
PCE inflation[1]	.5	.7	1.4	1.0	1.6	1.8	2.0
December Tealbook	.4	.8	1.6	1.2	1.8	2.0	2.0
Core PCE inflation[1]	1.4	1.7	1.2	1.4	1.6	1.8	n.a.
December Tealbook	1.3	1.4	1.4	1.4	1.7	1.9	n.a.
Federal funds rate[2]	.16	.89	1.45	1.45	2.34	3.18	3.25
December Tealbook	.18	.82	1.44	1.44	2.53	3.42	3.25
Memo:							
Federal funds rate, end of period	.38	.98	1.53	1.53	2.41	3.24	3.25
December Tealbook	.25	.92	1.54	1.54	2.62	3.48	3.25
GDP gap[2,3]	-.1	.1	.5	.5	1.1	1.4	n.a.
December Tealbook	-.1	.3	.8	.8	1.3	1.5	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.

Comparing the Staff Projection with Other Forecasts

The staff's projection for real GDP growth is slightly lower than the median projection from the Survey of Professional Forecasters (SPF) in 2016 and the Blue Chip consensus forecasts in both 2016 and 2017. The staff's forecast for unemployment is a little higher than the others in 2016 and the same in 2017. Its inflation projections are lower.

Comparison of Tealbook and Outside Forecasts

	2016	2017
GDP (Q4/Q4 percent change)		
March Tealbook	2.2	2.2
Blue Chip (03/10/16)	2.3	2.3
SPF median (2/12/16)	2.3	n.a.
Unemployment rate (Q4 level)		
March Tealbook	4.8	4.5
Blue Chip (03/10/16)	4.6	4.5
SPF median (02/12/16)	4.6	n.a.
Consumer price inflation (Q4/Q4 percent change)		
March Tealbook	1.4	2.1
Blue Chip (03/10/16)	1.6	2.3
SPF median (02/12/16)	1.5	2.2
PCE price inflation (Q4/Q4 percent change)		
March Tealbook	1.0	1.6
SPF median (02/12/16)	1.3	1.9
Core PCE price inflation (Q4/Q4 percent change)		
March Tealbook	1.4	1.6
SPF median (02/12/16)	1.6	1.8

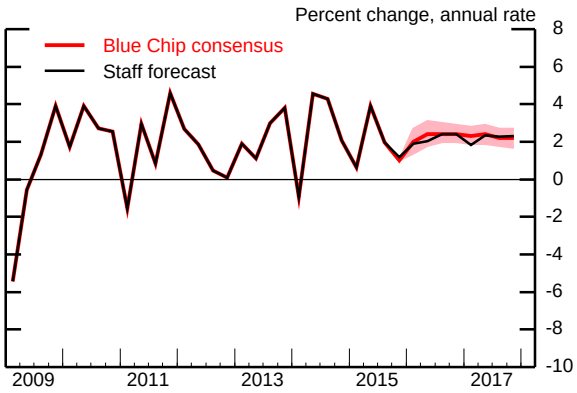
Note: SPF is the Survey of Professional Forecasters. Blue Chip does not provide results for PCE price inflation. The Blue Chip consensus forecast includes input from about 50 panelists, and the SPF about 40. Roughly 20 panelists contribute to both surveys.

n.a. Not available.

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

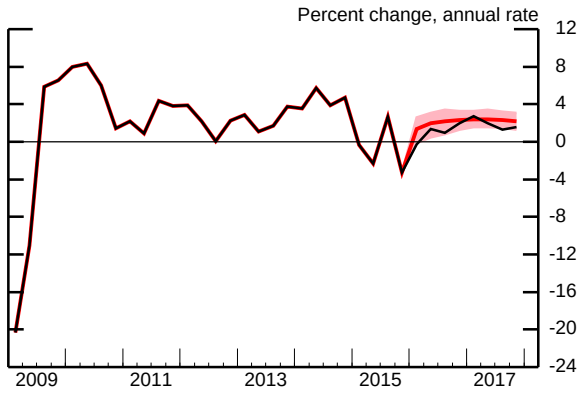
Tealbook Forecast Compared with Blue Chip
(Blue Chip survey released March 10, 2016)

Real GDP

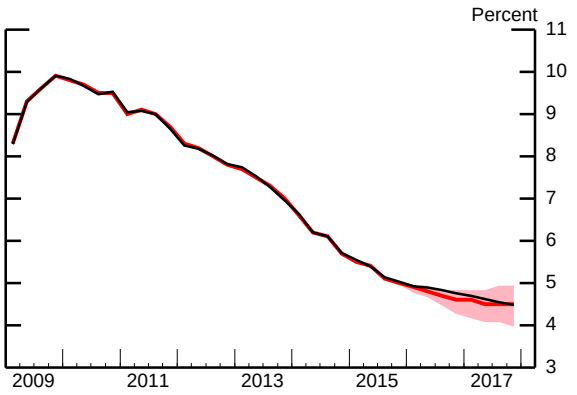


Note: The shaded area represents the area between the Blue Chip top 10 and bottom 10 averages.

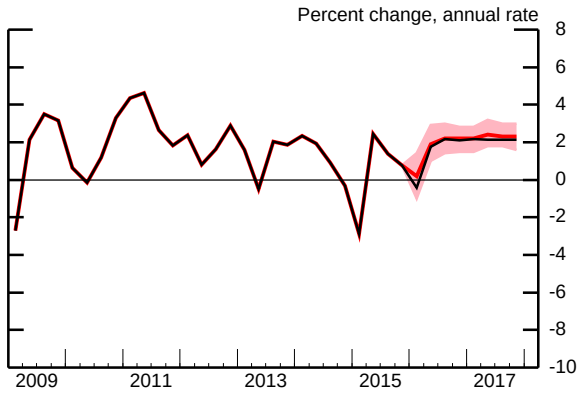
Industrial Production



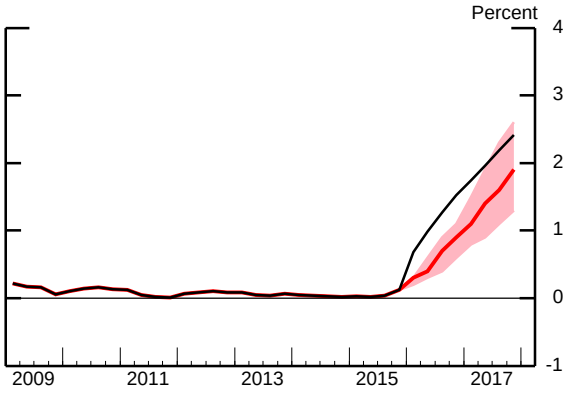
Unemployment Rate



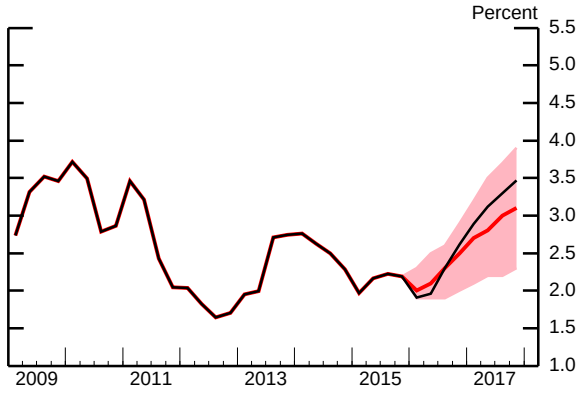
Consumer Price Index



Treasury Bill Rate



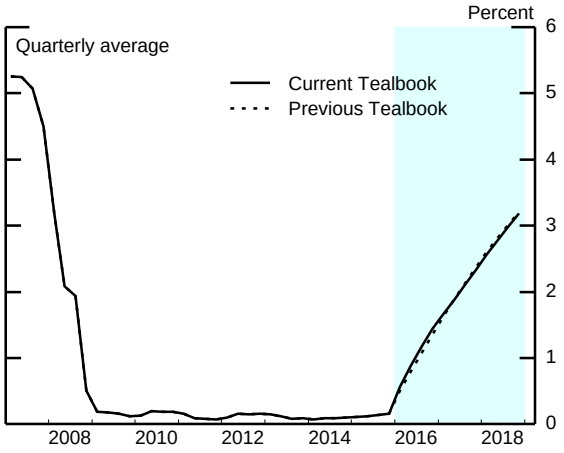
10-Year Treasury Yield



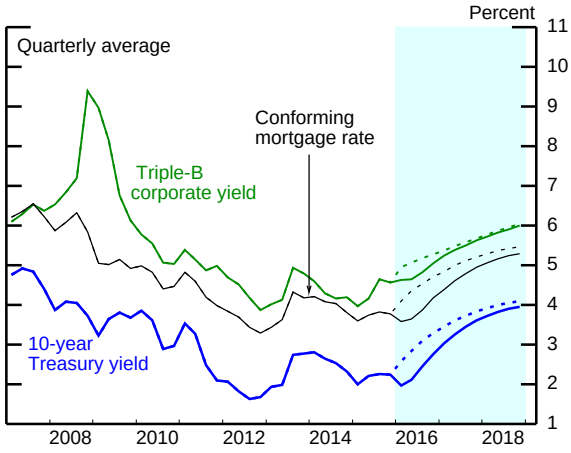
Note: The yield is for on-the-run Treasury securities. Over the forecast period, the staff's projected yield is assumed to be 15 basis points below the off-the-run yield.

Key Background Factors underlying the Baseline Staff Projection

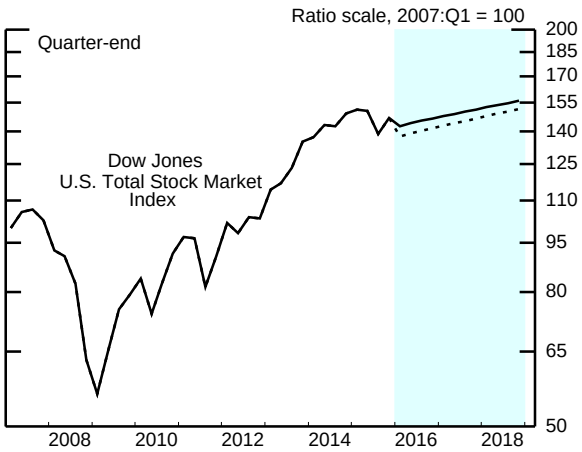
Federal Funds Rate



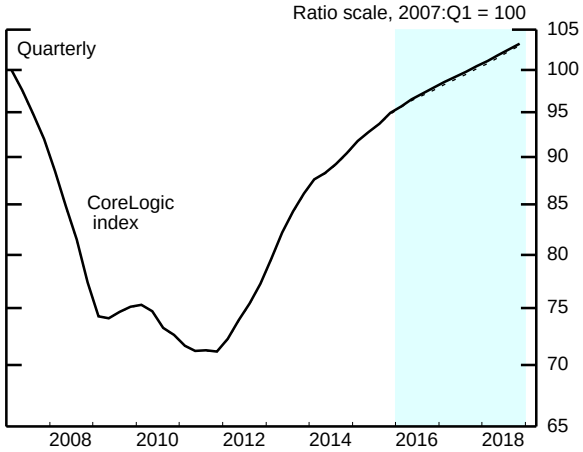
Long-Term Interest Rates



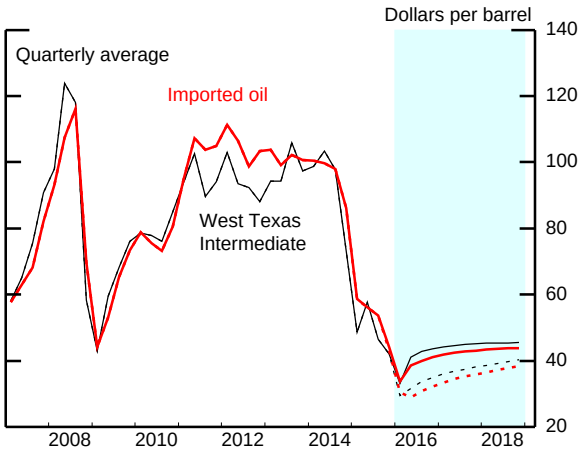
Equity Prices



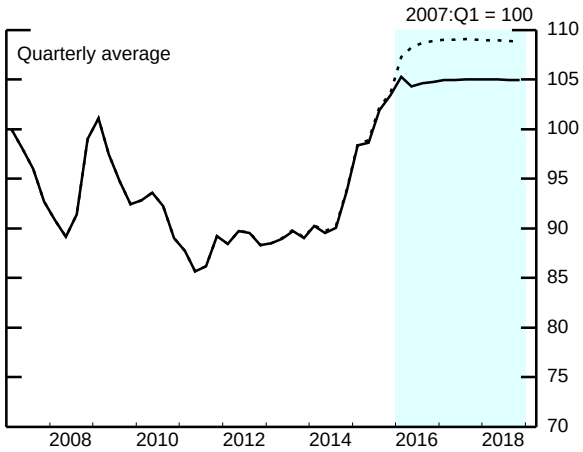
House Prices



Crude Oil Prices



Broad Real Dollar



We discuss our assessment of the risks to the outlook in the Risks and Uncertainty section of the Tealbook.

KEY BACKGROUND FACTORS

Monetary Policy

- We continue to assume that the federal funds rate will be governed by an inertial version of the Taylor (1999) policy rule. With our outlook for the output gap and core inflation little changed, this policy rule continues to prescribe a path of the federal funds rate that increases roughly 1 percentage point (or a little less) per year over the projection period, and it reaches an average of 3.2 percent in the fourth quarter of 2018. (See the box "An Alternative Path for the Federal Funds Rate" for a discussion of the macroeconomic implications of a lower path for the federal funds rate in the next couple of years.)

- We continue to assume that the SOMA portfolio will remain at its current size until the fourth quarter of 2016 and then begin to contract as the proceeds from maturing assets are no longer reinvested.

Other Interest Rates

- The 10-year Treasury yield has fallen well below our previous forecast for this quarter, and our projected path for that yield is notably lower in the near term than in the January Tealbook. A small portion of this downward revision persists well into the projection period, reflecting our assessment that term premiums will remain below historical norms for longer than we had previously thought, and that investors' expectations of short-term rates will take longer to move up to the path implied by the inertial Taylor (1999) rule. Nevertheless, our projection continues to call for the 10-year Treasury yield to rise significantly over the medium term, reflecting the movement of the 10-year valuation window through the period of extremely low short-term interest rates as well as the increase in the term premium toward a more historically normal level.

- We revised down the path for the 30-year mortgage rate broadly in line with the revision to Treasury yields. However, we revised down the path for the 10-year triple-B corporate bond rate through 2018 by less than that for the

An Alternative Path for the Federal Funds Rate

In the staff's baseline projection, the federal funds rate rises relatively steeply—roughly 1 percentage point (or a little less) per year until the end of 2018. That baseline trajectory is determined by the inertial Taylor (1999) interest rate rule, with the intercept (often interpreted as a long-run r*) set equal to 1¼ percent. Why does the rule call for increases in the federal funds rate to be as rapid as it does? Part of the answer is that the rule views the Committee as having "fallen behind the curve." For example, a non-inertial version of the rule would have set the federal funds rate at 2¼ percent in 2015:Q4, much higher than the observed average for the quarter of 0.16 percent. Even if the output and inflation gaps were to remain fixed at their 2015:Q4 levels, the inertial version of the rule would call for significant increases in the federal funds rate in the next few years to allow the policy rate to "catch up" to the level consistent with the non-inertial rule.

The Committee, however, has given no indication that it sees itself as having fallen behind the curve, and therefore it may not perceive the need to catch up. What would the consequences be for our forecast of assuming a policy rule with the catch-up aspect turned off for a while longer? One particularly simple approach to capturing this idea is to assume that policy will be on hold for 2016 and then will revert to the baseline rule starting in 2017:Q1.[1] The table below shows the implications in FRB/US of following this alternative method for setting the federal funds rate. The effects are modest, partly because transient federal funds rate shocks do not have a large influence on long-term interest rates in the model. In particular, the simulations assume that the public does not draw any independent inference from the delay in further raising the federal funds rate regarding the fundamental factors determining the outlook for economic activity and inflation or change their views regarding monetary policymakers' commitment to achieving their objectives.

Alternative Path for the Federal Funds Rate

Measure and scenario	2016 H1	2016 H2	2017	2018	2019
Real GDP					
Extended Tealbook baseline	2.0	2.4	2.2	2.0	1.8
Lower federal funds rate path	2.0	2.6	2.3	2.0	1.7
Unemployment rate[1]					
Extended Tealbook baseline	4.9	4.8	4.5	4.3	4.3
Lower federal funds rate path	4.9	4.7	4.3	4.2	4.3
Total PCE prices					
Extended Tealbook baseline	.7	1.4	1.6	1.8	1.9
Lower federal funds rate path	.7	1.4	1.7	1.9	1.9
Core PCE prices					
Extended Tealbook baseline	1.7	1.2	1.6	1.8	1.9
Lower federal funds rate path	1.7	1.2	1.6	1.9	2.0
Federal funds rate[1]					
Extended Tealbook baseline	.9	1.4	2.3	3.2	3.7
Lower federal funds rate path	.4	.4	1.9	3.1	3.7

Note: Percent change, annual rate, from end of preceding period except as noted.
1. Percent, average for the final quarter of the period.

[1] This lower path for the federal funds rate assumes the baseline path for the SOMA portfolio is unaffected.

10-year Treasury yield, reflecting our assessment that corporate bond spreads will remain above historical norms for longer than we had previously assumed.

Equity Prices and Home Prices

- The recent rally in equity prices has reversed most of the sharp drop seen earlier in the year. However, the incoming news on corporate earnings has been downbeat; as a result, we have not passed through all of the recent upward movement in equity prices into the forecast. After the current quarter, we project that equity prices will rise at a rate of 3 percent per year over the next three years, slightly slower than in the January Tealbook.

- Incoming house price data have been close to our expectations since the previous Tealbook, but we have revised up the forecast over the rest of this year slightly in response to a lower projected path for mortgage rates. After this year, we continue to expect these prices to rise about 2¾ percent per year. One simple model of housing valuation that we monitor suggests that housing is currently overvalued by 6 percent, compared with more than 40 percent a decade ago.[1] Our forecast has rents rising slightly faster than house prices; as a result, this valuation measure moves slowly back toward neutral.

Fiscal Policy

- Our fiscal policy assumptions are unrevised in this forecast. We continue to anticipate that the federal budget legislation passed at the end of last year, combined with the ongoing modest growth in state and local purchases, will provide a boost of about ½ percentage point to real GDP growth this year and make smaller contributions in 2017 and 2018.

Foreign Economic Activity and the Dollar

- The broad nominal dollar has depreciated 2¾ percent, on net, since the time of the January Tealbook, retracing the appreciation that had occurred between the December and January Tealbooks. The dollar's decline since the January

[1] As described in the memo "Staff Assessment of Housing Overvaluation" by Steven Laufer that was sent to the Committee on January 16, 2016, the model assesses the price-to-rent ratio against costs of housing investment (such as interest rates) and a linear trend that may reflect challenges associated with measuring house prices and rents.

Tealbook was most pronounced against the currencies of commodity producers, particularly those of oil exporters. We expect the nominal dollar to rise about 1 percent this year—lifted by monetary policy divergence between the United States and advanced foreign economies, and by some further depreciation of the Chinese renminbi as well as the currencies of other emerging Asian economies—and then to be little changed over the medium term. By the end of 2018, our projection for the broad real dollar is about 3½ percent weaker than in the previous Tealbook but little changed from December.

- After slowing to an annual rate of 1¾ percent in the fourth quarter, foreign real GDP growth is projected to move up to a 2 percent pace in the current quarter and then to strengthen to 2¾ percent by late 2017. This trajectory reflects both continuing slow improvement in the euro area and anticipated recoveries in Canada and Brazil that are aided by the stabilization of commodity prices. More broadly, foreign economies should benefit from ongoing U.S. growth, accommodative monetary policies, past currency depreciation, and, in some cases, low oil prices. Relative to the January Tealbook, the foreign growth outlook is lower by ¼ percentage point this year in response to some softness in the incoming data.

Oil Prices and Other Commodity Prices

- Oil prices have been highly volatile. The spot price of Brent crude oil closed at $40 per barrel on March 8, $11 above its level in the previous Tealbook and nearly matching its level in the December Tealbook. Further-dated futures quotes retraced less of their earlier declines than spot prices, with the end-2018 futures price settling at $49 a barrel, up $6 per barrel relative to the January Tealbook but $8 lower than in the December Tealbook. At the start of the year, concerns about the outlook for economic growth in China, the continued strength of global oil supply, and elevated inventories weighed on prices. Although inventories have continued to build, a combination of subsequent news about the possibility of an agreement between Russia and OPEC members to freeze production at January levels and some improvement in investor risk sentiment has supported the recent rebound in prices. Our forecast for the average price of imported oil this year has been revised up

about $8, to $38 per barrel, with prices expected to slowly move up to $44 per barrel by the end of the forecast period.

- Metals prices have rebounded strongly since the previous Tealbook, supported by an easing of concerns about Chinese demand and continuing reports of supply reductions. In contrast, the prices of agricultural goods are basically unchanged relative to the January Tealbook and have been mostly flat during the past six months.

THE OUTLOOK FOR REAL GDP

The incoming data on spending and production remain consistent with our projection for moderate GDP growth in the near term. We now estimate that real GDP increased at an annual rate of 1¼ percent in the fourth quarter—¾ percentage point more than in the January Tealbook—primarily reflecting a smaller inventory correction than we had previously estimated. Real GDP is projected to increase at an annual rate of about 2 percent in both the first and second quarters, as spending bounces back in several categories that were weak last quarter. Our near-term projection for real GDP growth is just a touch lower, on average, than in the January Tealbook, as the fourth-quarter surprise in inventory investment is anticipated to unwind during the first half of this year.[2]

- Real PCE growth is projected to pick back up to a 3 percent pace in the current quarter after slowing to 2 percent in the fourth quarter. The acceleration partly reflects a rebound in spending on energy services following the unusually warm weather in the fourth quarter, but it also reflects a rebound in January outlays on motor vehicles and other goods that had declined in December. Our forecast for solid PCE growth over the first half of this year is consistent with ongoing improvements in labor market conditions, low energy prices, and still-favorable readings on consumer sentiment.[3]

[2] As displayed in the table "Federal Reserve System Nowcasts of 2016:Q1 Real GDP Growth," the median of the projections generated by the near-term forecasting approaches used within the System, at 1.9 percent, is the same as the staff's judgmental projection.

[3] The BEA's latest NIPA release revised down the level of disposable income in the fourth quarter of last year by $70 billion; this revision led us to trim our projection of consumer spending growth this year

Federal Reserve System Nowcasts of 2016:Q1 Real GDP Growth

(Percent change at annual rate from previous quarter)

Federal Reserve entity	Type of model	Nowcast as of Mar. 8, 2016
Federal Reserve Bank		
New York	• Factor-augmented autoregressive model combination	1.2
	• Factor-augmented autoregressive model combination, financial factors only	1.6
	• Dynamic factor model	1.5
Cleveland	• Bayesian regressions with stochastic volatility	1.5
	• Tracking model	2.3
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	2.2
Chicago	• Dynamic factor models	1.7
	• Bayesian VARs	2.5
St. Louis	• Dynamic factor models	2.4
	• News index model	1.6
	• Let-the-data-decide regressions	1.9
Minneapolis	• Bayesian VARs	2.0
Kansas City	• Accounting-based tracking estimate	2.0
Board of Governors	• Board staff's forecast (judgmental tracking model)[1]	1.9
	• Dynamic factor models	2.5
Memo: Median of Federal Reserve System nowcasts		1.9

1. The March Tealbook forecast, finalized on March 9, is also 1.9 percent.

- Real residential investment spending increased at an annual rate of 10 percent in the fourth quarter, and the incoming data on housing activity remain consistent with continued solid gains this quarter.

- Total business fixed investment (BFI) fell about 2 percent at an annual rate in the fourth quarter, rather than rising moderately as we had projected, and appears to have declined again in the current quarter. We expect drilling and mining investment to continue to fall sharply this quarter—at an annual rate of more than 50 percent—reflecting continued low energy prices. Spending on equipment and intangibles is now estimated to have been about flat last quarter and is projected to rise only modestly in the current quarter, consistent with the data on orders and shipments of capital goods through January as well as weak readings from some of the business surveys. In addition, we built in a somewhat larger-than-usual response of BFI spending this year to the elevated level of corporate bond spreads; this additional adjustment takes nearly ¾ percentage point off of our BFI growth forecast.

- Exports declined 2 percent last quarter and are projected to fall another 2 percent in the current quarter, in line with past dollar appreciation and weak foreign growth. Imports continued to surprise on the downside, declining ¾ percent in the fourth quarter, which reflects in part continued weakness in imports of capital goods. Supported by past dollar appreciation and the strength of the U.S. economy, imports are projected to rise 3½ percent in the current quarter. All told, net exports are expected to deduct ¾ percentage point from real GDP growth this quarter, about ¼ percentage point less than in the January Tealbook.

- Past dollar appreciation and weak foreign activity have also been a drag on manufacturing production: Factory output has barely edged up, on net, over the past several months, and available source data point to a similar sluggish pace in February. Ongoing declines in drilling activity continue to weigh directly on mining production and indirectly, through their adverse upstream effects, on manufacturing output.

by 0.1 percentage point. In addition, we have reduced the amount of catch-up that we are assuming from the shortfall of consumption relative to income and wealth in recent years; this adjustment lowers real PCE growth nearly 0.2 percentage point this year.

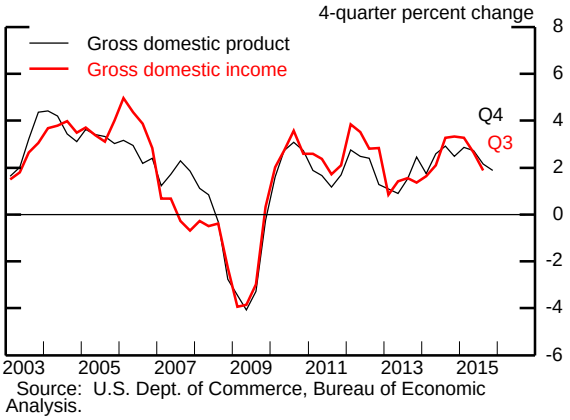
Summary of the Near-Term Outlook
(Percent change at annual rate except as noted)

Measure	2015:Q4		2016:Q1		2016:Q2	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	**.4**	**1.2**	**2.1**	**1.9**	**2.4**	**2.0**
Private domestic final purchases	2.1	1.7	2.8	2.8	3.6	3.2
Personal consumption expenditures	1.7	2.0	3.1	3.1	3.3	3.1
Residential investment	6.1	10.2	8.8	11.0	7.0	5.5
Nonres. private fixed investment	3.0	-1.9	-.3	-1.1	4.2	3.1
Government purchases	-.3	.1	3.2	3.3	2.5	1.9
Contributions to change in real GDP						
Inventory investment[1]	-.9	-.2	.2	-.3	.0	-.3
Net exports[1]	-.4	-.1	-1.0	-.7	-1.0	-.7
Unemployment rate	**5.0**	**5.0**	**4.9**	**4.9**	**4.8**	**4.9**
PCE chain price index	**.1**	**.4**	**-.9**	**.1**	**.7**	**1.3**
Ex. food and energy	1.2	1.3	1.2	1.9	1.4	1.5

1. Percentage points.

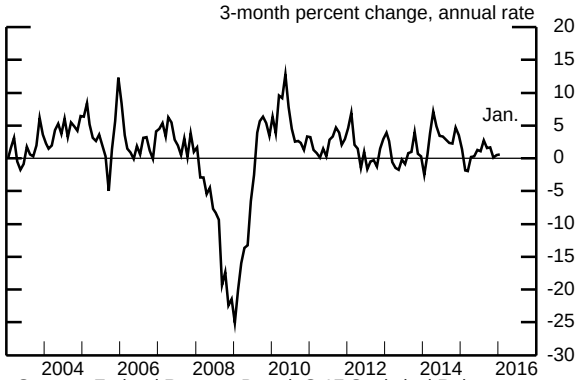
Recent Nonfinancial Developments (1)

Real GDP and GDI



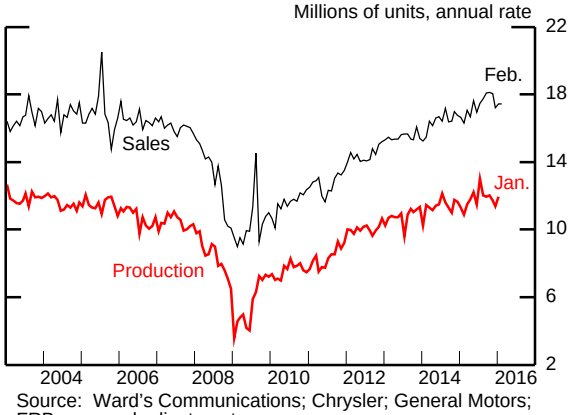
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Manufacturing IP ex. Motor Vehicles and Parts



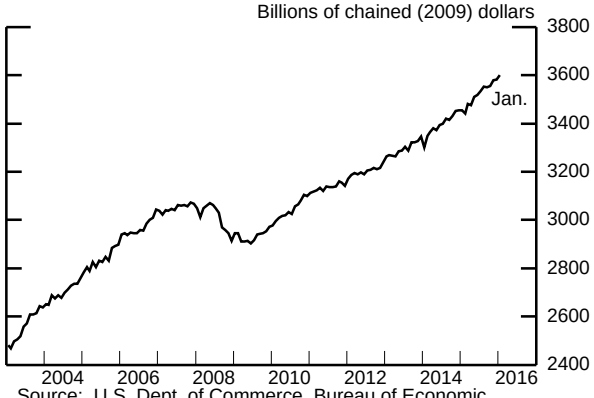
Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."

Sales and Production of Light Motor Vehicles



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

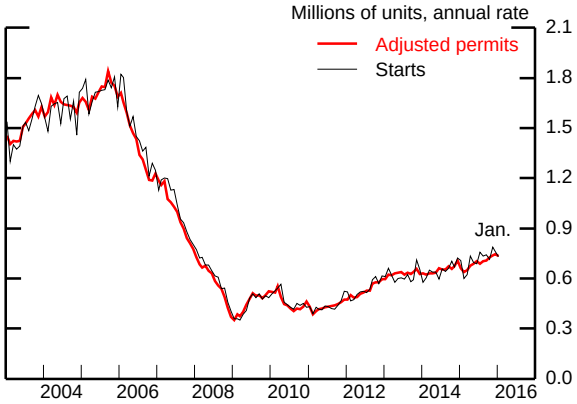
Real PCE Goods ex. Motor Vehicles



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

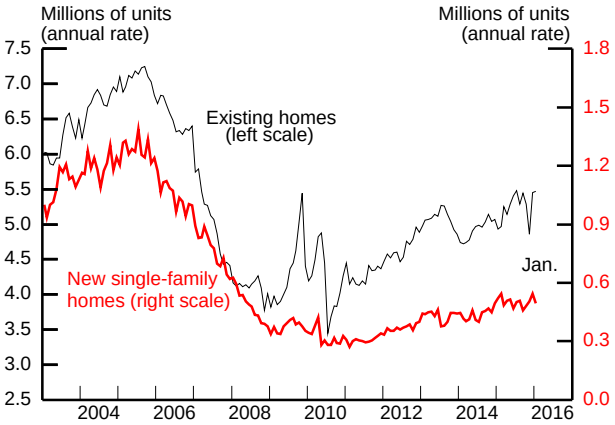
Recent Nonfinancial Developments (2)

Single-Family Housing Starts and Permits



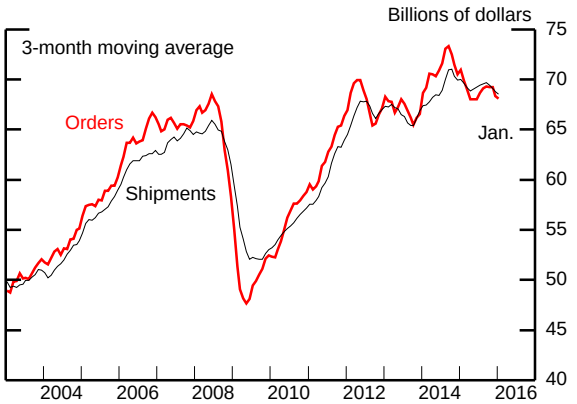
Note: Adjusted permits equal permit issuance plus total starts outside of permit-issuing areas.
Source: U.S. Census Bureau.

Home Sales



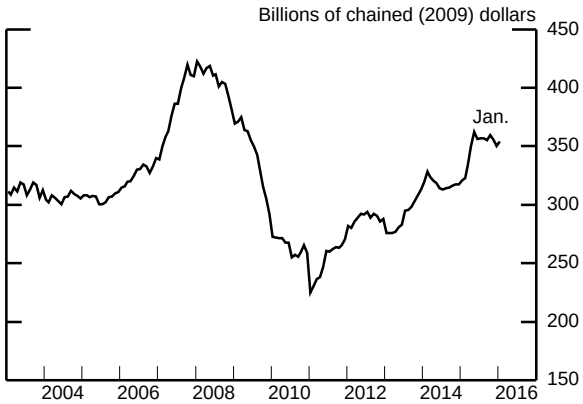
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

Nondefense Capital Goods ex. Aircraft



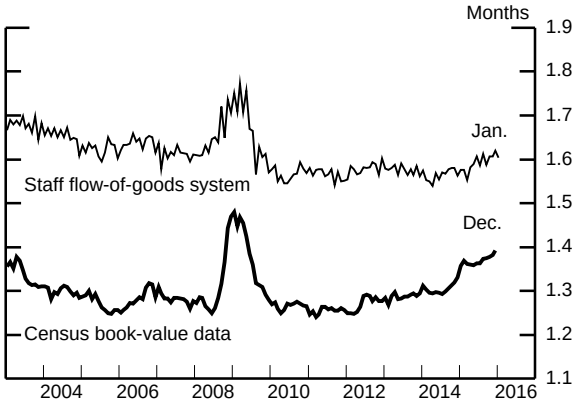
Source: U.S. Census Bureau.

Nonresidential Construction Put in Place



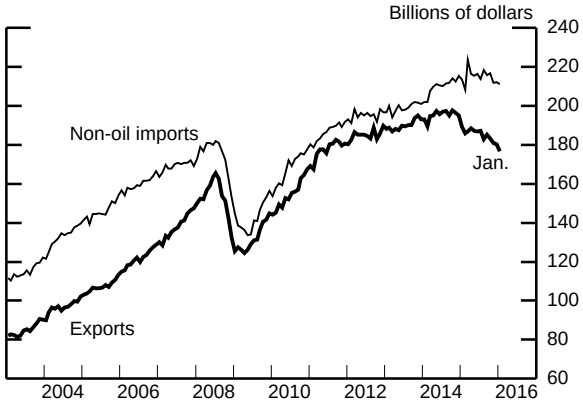
Note: Nominal CPIP deflated by BEA prices through 2015:Q3 and by the staff's estimated deflator thereafter.
Source: U.S. Census Bureau.

Inventory Ratios



Note: Flow-of-goods system inventories include manufacturing and mining industries and are relative to consumption. Census data cover manufacturing and trade, and inventories are relative to sales.
Source: U.S. Census Bureau; staff calculations.

Exports and Non-oil Imports



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

Beyond the near term, real GDP is expected to continue to expand faster than its potential, supported in part by a still-accommodative stance of monetary policy and by mildly expansionary fiscal policy. (See the box "Estimates of the Short-Run Real Natural Rate of Interest" for how this rate may evolve over the medium term.)

- Real GDP growth is projected to be 2¼ percent in 2016 and 2017 and then to slow to 2 percent in 2018. Over this period, monetary policy accommodation diminishes and fiscal impetus fades; however, the drag from net exports also lessens as the effects of past dollar appreciation wane.

- Relative to the January Tealbook, real GDP growth is revised up in 2015 and down in 2016 by similar amounts; on net, the change to the timing of inventory investment can account for these revisions. GDP growth in 2017 and 2018 is expected to be slightly higher than in the previous Tealbook, primarily reflecting the improvement seen in financial conditions, on balance, since then.

THE OUTLOOK FOR THE LABOR MARKET AND AGGREGATE SUPPLY

Taken together, the employment reports for January and February indicate that conditions in the labor market have continued to improve about as we had projected.

- Nonfarm payroll employment is estimated to have risen at an average pace of about 210,000 per month in January and February. Combined with our forecast of a similar gain in March, the average monthly increase in payrolls this quarter is roughly 30,000 lower than we expected in the January Tealbook but the same as in our December forecast. We continue to project job gains of about 200,000 per month in the second quarter.

- The unemployment rate declined to 4.9 percent in January and remained there in February, as we expected. We project the unemployment rate to hold steady at 4.9 percent through the middle of this year.

- The labor force participation rate has moved up markedly in recent months, to 62.9 percent in February, 0.3 percentage point above our projection in the January Tealbook. We now have the participation rate edging down to 62.8 percent in March and remaining there for most of the second quarter—¼ percentage point above our previous projection.

- In response to the upward surprises to the participation rate in recent months, we raised our estimate for the trend participation rate by 0.2 percentage point, reversing the downward revisions we made last year when the participation rate was surprisingly soft. Separately, we now assume the natural rate of unemployment continued to edge down through 2015 to 5.0 percent (one-tenth lower than our earlier estimate), reflecting signs of continuing improvement in matching efficiency as well as the ongoing secular downtrend in job separation rates.

- The amount of slack left in the labor market has diminished considerably in recent quarters, in our estimation. Factoring in the recent data and the revisions to our trends, we now estimate that in the first quarter, the unemployment rate will be slightly below its natural rate and the participation rate will be slightly below its trend level. The employment-to-population gap—which accounts for utilization along both of these margins—has narrowed considerably since late last year, and the employment-to-population ratio is expected to be just 0.1 percentage point below our estimate of its trend this quarter. That said, we continue to view the elevated share of employees working part time for economic reasons as indicating that a little more slack remains than suggested by the more standard measures.

- In contrast to our judgmental assessment that labor market conditions have continued to improve, the staff's labor market conditions index, or LMCI—a strictly mechanical method of filtering the data—deteriorated in February and was little changed on average over the past three months.[4]

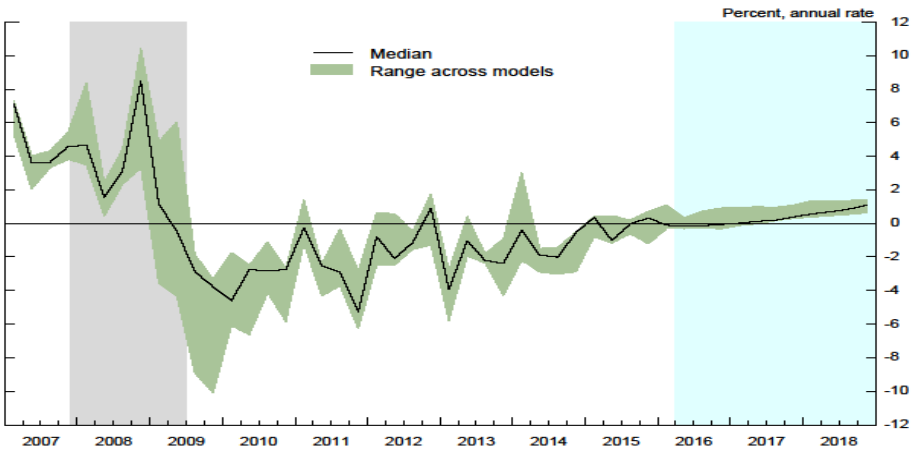
[4] The change in the LMCI reflects movements in a set of 19 detrended measures of labor market activity, with the weights given to each variable based on the historical co-movements of the detrended series. The LMCI's assessment of the change in labor market conditions can differ from the staff's judgment for at least two reasons. First, the trends in the series considered by the LMCI are estimated mechanically, and these trends differ—sometimes substantially—from the staff's own judgmental assessment of the trends. Second, the statistical filter that generates the LMCI cannot discriminate between the signal and noise in any particular realization of the data, but it instead estimates the relative weighting of the variables based on their historical average signal-to-noise ratio; in contrast, the staff spends considerable effort each month evaluating the signal quality of the incoming data.

Estimates of the Short-Run Real Natural Rate of Interest

This discussion introduces a new exhibit to the Tealbook that provides estimates of the short-run real natural rate of interest from the Federal Reserve System's dynamic stochastic general equilibrium (DSGE) modeling project. The System's DSGE project currently includes models maintained by the staff at the Federal Reserve Banks of New York and Philadelphia and at the Federal Reserve Board.

As explained in a recent memo to the FOMC, the natural rate of interest is defined as the real risk-free interest rate that would prevail in the absence of sluggish adjustment of nominal prices and wages.[1] The natural rate is therefore unaffected by monetary policy. In simple models, letting the actual real federal funds rate track the short-run natural rate at all times would close the output gap and deliver price stability. In more complex models, such as the ones used in the System's DSGE project, targeting the natural rate may not be optimal, as monetary policymakers face numerous tradeoffs—notably between stabilizing inflation and real activity. Nonetheless, following a policy rule that is informed by estimates of the short-run natural rate has been shown to deliver reasonably good performance in these models in controlling the volatility of both inflation around its target and the output gap.[2]

Estimates of the Short-Run Real Natural Rate of Interest



Note: The gray shaded bar indicates a period of business recession as defined by the National Bureau of Economic Research.
Source: Estimates from the System DSGE models of the Federal Reserve Banks of New York and Philadelphia and of the Federal Reserve Board.

[1] Hess Chung, Marco del Negro, and others (2015), "Estimates of Short-Run r* from DSGE Models," memorandum to the FOMC, October 13. A related concept to the equilibrium federal funds rate is the neutral rate of interest, which is defined as the rate that would be neither expansionary nor contractionary if the economy were operating at potential. Although the neutral and natural rates of interest are different in models with several independent nominal frictions, they tend to have similar patterns, and thus the natural rate is informative about the neutral rate.

[2] See Robert Barsky, Alejandro Justiniano, and Leonardo Melosi (2014), "The Natural Rate of Interest and Its Usefulness for Monetary Policy," *American Economic Review P&P*, vol. 104 (5), pp. 37–43, and Chung, del Negro, and others, "Short-Run r*," in note 1.

The figure on the previous page shows the most recent estimates of the short-run real natural rate of interest from the three participating models. The solid line represents the median estimate of the models, and the shaded green band provides the range at any point in time.

As the range of variation shown in the exhibit suggests, estimates of the natural rate of interest are model dependent. Furthermore, these estimates are volatile from period to period, reflecting the fact that the natural rate responds to transitory shocks buffeting the economy. Smoothing through the high-frequency variation in the median estimate of the real natural rate of interest, we observe a sharp decline during and shortly after the Great Recession. Moreover, estimates from all of the models are negative by the end of the financial crisis.

The three models attribute most of the decline in the natural rate to financial and investment shocks that restrained aggregate demand and, hence, overall economic activity. The slow unwinding of these adverse shocks has led to the gradual upward trajectory in the median estimate of the real natural rate of interest over the past several years. The median estimate is projected to rise above zero by the first quarter of 2017 and then steadily increase to around 1 percent at the end of 2018. The model estimates range from 0.6 to 1.4 percent at the end of the forecast period.

The following table shows how the models' estimates of the natural rate of interest in the first quarter of 2016 have been revised since the December Tealbook. Although the estimate from the New York model is essentially unchanged, the estimate from the Philadelphia model has been revised down 20 basis points, and the estimate from the Board model has been revised up substantially. This diversity in revisions highlights the differences across models in real-time inference about the underlying shocks driving the natural rate of interest.

Estimates of the Natural Rate for 2016:Q1

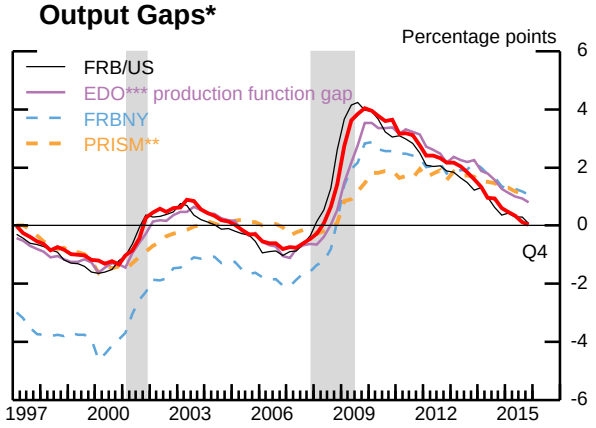
Model	Estimate as of December 2015	Estimate as of March 2016
FRBNY (New York)	-0.1	-0.1
PRISM (Philadephia)	-0.1	-0.3
EDO (Board)	-0.2	1.1

Note: Percent, annual rate.

Alternative Measures of Slack

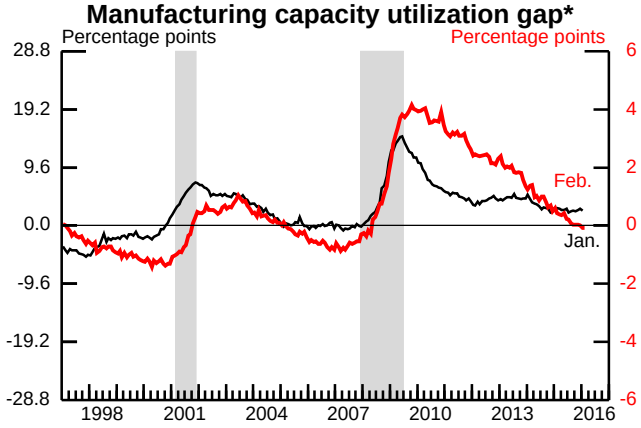
The red line in each panel is the staff's measure of the unemployment rate gap (right axis).

Output Gaps*



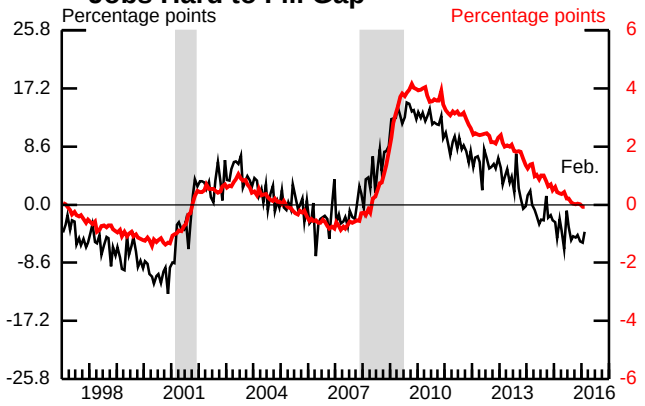
** PRISM uses a flex-price output gap.
*** EDO is Estimated, Dynamic, Optimization-based model.
Source: Federal Reserve Board; PRISM: Federal Reserve Board Bank of Philadelphia, PRISM Model Documentation (June 2011); FRBNY: Federal Reserve Bank of New York Staff Report 618 (May 2013, revised April 2014).

Manufacturing capacity utilization gap*



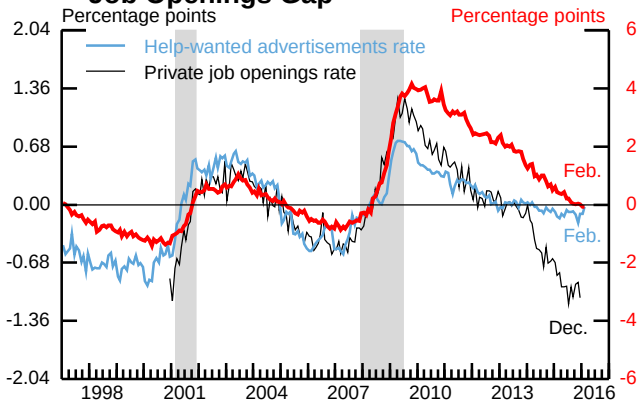
Source: Federal Reserve Board.

Jobs Hard to Fill Gap*



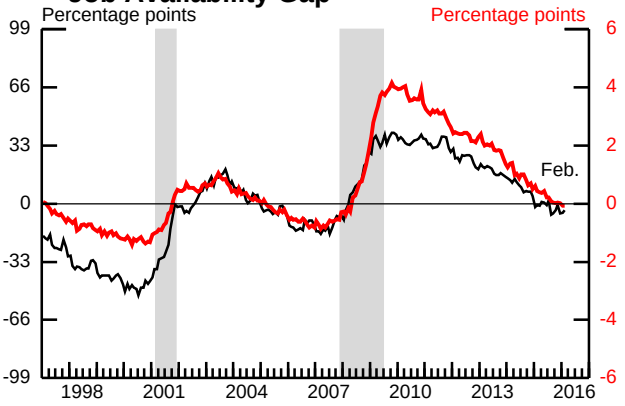
Note: Percent of small businesses surveyed with at least one "hard to fill" job opening. Seasonally adjusted by Federal Reserve Board Staff.
Source: National Federation of Independent Business, Small Business Economic Trends Survey.

Job Openings Gap*



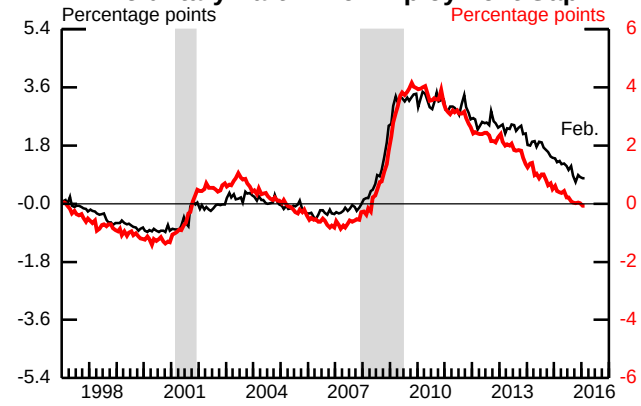
Note: Job openings rate is the number of job openings divided by employment plus job openings.
Source: Job Openings and Labor Turnover Survey; U.S. Department of Labor, Bureau of Labor Statistics, Current Employment Statistics.

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.

With real GDP growth in this forecast averaging a little higher than we projected in the January Tealbook, the medium-term outlook for the labor market is a little stronger than in our previous projection.

- We now project that the unemployment rate will fall to 4.3 percent by the end of 2018, 0.3 percentage point below our forecast in the January Tealbook. By itself, the slightly faster growth of real GDP in this projection explains most of this revision.[5] In addition, the small adjustment to our assumption regarding the natural rate contributes one-tenth to the decline in the unemployment rate.

- Payroll gains over the past year have been surprisingly strong relative to GDP growth, while productivity growth has been surprisingly weak. Given the slight deceleration projected for real GDP over the medium term, as well as an expected increase in productivity toward its structural trend, we expect job growth to slow from an average pace of about 200,000 per month over the first half this year to about 140,000 per month by 2018.

THE OUTLOOK FOR INFLATION

The BEA now reports that total PCE prices increased at an annual rate of ½ percent in the fourth quarter of last year. We project that overall PCE prices will be about flat this quarter and then rise at an annual rate of about 1¼ percent in the second quarter. These low rates of inflation reflect in large part our estimate that consumer energy prices will decline steeply and food prices will be flat, on net, over this period. Core PCE price inflation is anticipated to step up from 1¼ percent in the fourth quarter to nearly 2 percent this quarter before slowing to 1½ percent next quarter.

[5] The Alternative View box that appeared in the October 2015 Tealbook demonstrated that the unemployment rate gap has become more cyclically sensitive to the GDP gap since the mid-1980s than it had been earlier. In response, we reestimated the Okun's law relationship and found that a 1 percentage point increase in the output gap now reduces the unemployment rate after a year by 0.55 percentage point compared with our previous estimate of a 0.45 percentage point reduction. Based on the projection in the January Tealbook, the larger coefficient would have implied about a 0.1 percentage point lower unemployment rate at the end of the medium term than we had projected in January. However, for this Tealbook we offset the implications for the unemployment rate by raising our assumption for potential output growth from 2016 to 2018 by a cumulative 0.2 percent. As a result of the change in the Okun's law coefficient, the revision to the output gap at the end of the medium term is not directly comparable to the revision to the unemployment rate gap in this projection.

- The projection for headline PCE price inflation in the current quarter, weak as it is, is 1 percentage point higher than in the January Tealbook. The higher projected path for oil prices boosts the forecast of consumer energy price inflation in the near term; more importantly, however, we revised up our projection for core PCE price inflation in the first quarter by ¾ percentage point. The revision to core inflation was largely because of upside surprises in several erratic components (including nonmarket prices) where price changes in a single month have historically carried little signal about future inflation. In addition, the January jump in goods prices seems hard to square with ongoing declines in import prices. Furthermore, given difficulties in seasonal adjustment, it is our experience that upside surprises in the early months of the year often turn out to be transitory. As a result, we left our projection of core inflation for future months little changed and continue to expect it to be about 1½ percent in the second quarter.[6]

- A lower dollar and higher commodity prices led us to revise up our forecast for core import price inflation in coming months. We now expect import prices to decrease at an annual rate of 1½ percent in the first half of this year, compared with the 3 percent decline projected in the previous Tealbook. Starting in the second half of this year, core import prices are expected to rise at about a 1 percent pace.

- Some survey-based measures of longer-term inflation expectations have moved down to the lower end of their historical ranges.[7] The University of Michigan Surveys of Consumers measure of longer-run inflation expectations dropped to 2.5 percent in February, tied for the lowest reading in the history of the series. While these low readings likely reflect—at least in part—declines in gasoline prices over the past year and a half, it is possible that some of the

[6] The consumer price index (CPI) for February will be published on March 16, the second day of the FOMC meeting. In January, the 12-month change in the core CPI was 2.2 percent, compared with the 1.7 percent increase in core PCE prices over the same period. The current wedge between these two inflation measures—at ½ percentage point—has remained elevated relative to its longer-run average value of about 35 basis points. As discussed in the September 2015 Tealbook box "The Recent Gap between Core CPI and Core PCE Price Inflation Measures," the behavior of prices for housing services and for medical services, combined with the different weights for those items in the two indexes, could more than explain why core CPI inflation was unusually high relative to core PCE inflation in the middle of last year, and that remains the case in the latest data.

[7] This topic was discussed in more detail in the memo "Longer-Term Inflation Expectations: Evidence and Policy Implications" that was sent to the FOMC on March 4, 2016.

decline reflects a more persistent reduction in inflation expectations. Ten-year expectations for PCE price inflation in the Survey of Professional Forecasters moved back up to 2 percent this quarter, although CPI inflation expectations in this survey edged back down to 2.1 percent, where they have hovered over the past year at their lowest level on record. Market-based measures of longer-term inflation compensation remain at extremely low levels. On balance, we think these indicators suggest that the longer-term inflation expectations relevant for wage and price setting have edged down over the past year. Accordingly, we nudged down our estimate of underlying inflation from 1.8 percent to 1.75 percent over the medium term.[8]

We continue to expect inflation to move gradually higher over the medium term, as energy and import prices begin to turn up later this year and resource utilization tightens further.

- Core PCE price inflation is projected to increase from 1.4 percent this year to 1.8 percent in 2018. Energy and import price pass-through is anticipated to continue to hold down core inflation nearly ½ percentage point this year, but the restraint from these sources is expected to subside noticeably next year and dissipate almost entirely in 2018. In addition, the projected tightening of resource utilization over the medium term contributes about 0.1 percentage point to the pickup in core inflation.

- Beyond the near term, both food and energy prices are projected to rise just a little faster than core prices. As a result, total PCE price inflation moves up to the same rate as core inflation in 2017 and 2018.

- Compared with the January Tealbook, both overall and core PCE price inflation are slightly higher in both 2015 and 2016 and slightly lower in 2017 and 2018. The upward revision to overall inflation expected for this year reflects higher energy and import prices as well as higher core inflation in the near term. Over the medium term, core PCE price inflation was revised down 0.1 percentage point in 2018, partly reflecting the small downward revision to underlying inflation; factoring in the downward revision to energy price inflation, overall PCE price inflation is down 0.2 percentage point in 2018.

[8] We had left this assumption unrevised since the June 2014 Tealbook.

(Revisions to the inflation projection since the December Tealbook are discussed in the box "New Exhibits for Monitoring Changes to the Inflation Projection.")

In the latest data, labor compensation shows little sign of having accelerated. However, with labor and product markets expected to tighten over the projection period, we continue to project that compensation gains will pick up gradually over the medium term.

- Reflecting the latest reading from the Quarterly Census of Employment and Wages, the four-quarter change in business-sector hourly compensation was revised down noticeably in 2015 to 2½ percent, about the same as its average pace in recent years. We continue to project that gains in this measure of compensation per hour will pick up to around 3¼ percent by the end of the medium-term projection.

- The employment cost index (ECI) for private workers rose at an annual rate of 1.9 percent between September and December, a little slower than we had projected, leaving the 12-month change in 2015 at 1.9 percent, about the same as its average increase over the previous five years. We project ECI growth to pick up to about 2½ percent over the medium term.

- Average hourly earnings of all employees, a less comprehensive but more timely measure of wages, increased 2¼ percent over the 12 months ending in February, up slightly from its average pace in recent years.

THE LONG-TERM OUTLOOK

- Beyond 2018, the Federal Reserve's holdings of securities continue to put downward pressure on longer-term interest rates, albeit to a diminishing extent over time. The SOMA portfolio is projected to have returned to a normal size by 2021.

- The federal funds rate rises further after 2018. With the economy running above its potential level in the early years of the long-term outlook and inflation approaching the Committee's 2 percent objective, the federal funds rate rises above its long-run value in 2019. It reaches 4 percent in 2020 and 2021 and moves back toward its long-run value of 3¼ percent thereafter.

- The natural rate of unemployment remains at 5.0 percent, and potential GDP rises at about its long-run value of 1.9 percent per year, on average, from 2019 through 2021.

- As monetary policy continues to tighten, real GDP decelerates further and rises 1½ percent in 2020 and 2021. The unemployment rate remains at 4.3 percent in 2019 and edges back up toward its assumed natural rate thereafter.

- PCE price inflation moves up from 1.8 percent in 2018 to the Committee's long-run objective of 2.0 percent by 2020.

New Exhibits for Monitoring Changes to the Inflation Projection

The exhibits on the next three pages will be included regularly in the Tealbook to help monitor the evolution of actual and forecast inflation since the time of the Committee's decision to raise the target for the federal funds rate in December 2015.

The first exhibit, titled "Inflation Forecasts since the December 2015 Tealbook," displays the staff's current four-quarter inflation rate projection, along with projection lines for every Tealbook forecast since December 2015, for three key inflation indexes (total PCE prices, core PCE prices, and the core CPI). To provide readers with a sense of the significance of forecast revisions, the exhibit also displays the 70 percent confidence intervals surrounding the December 2015 projection.[1] The dashed vertical lines denote the most recent full quarter of data published by the official statistical agencies.

The second exhibit, titled "Sources of Inflation Forecast Revisions since the December 2015 Tealbook," provides the sources of the cumulative change in the forecast since December 2015.[2] The top panel apportions revisions in overall PCE price inflation into revisions to the subcomponents of food, energy, and core PCE prices. The lower panel applies the staff's judgmental rules of thumb to apportion revisions to core PCE price inflation into changes stemming from revisions in import prices, energy prices (specifically, their pass-through into core prices), resource utilization, and our judgmental inflation trend; an "other" category is also shown, which includes revisions to the forecast from sources other than these four categories. This "other" category includes items such as nonmarket and medical price surprises, as well as forecast surprises that we cannot readily attribute to specific sources.

As shown in the first exhibit, revisions to projected inflation over the past two Tealbooks have been relatively small and, in most cases, are thus far within the 70 percent confidence intervals. As shown in the top panel of the second exhibit, currently the largest source of revision to our total PCE price inflation forecast since December 2015 has been lower-than-expected energy prices this year. For core PCE price inflation, in the lower panel, the forecast in 2016 is a touch higher than in the December Tealbook, as a positive surprise in goods and nonmarket PCE prices for January (reflected in the "other" category) has been only partially offset by other factors, including a slight lowering of the judgmental inflation trend in reaction to declines in both market-based inflation compensation and the Michigan survey measure of longer-term inflation expectations. The adjustment to that trend contributes to the small downward revision to the core inflation forecast in 2017 and 2018.

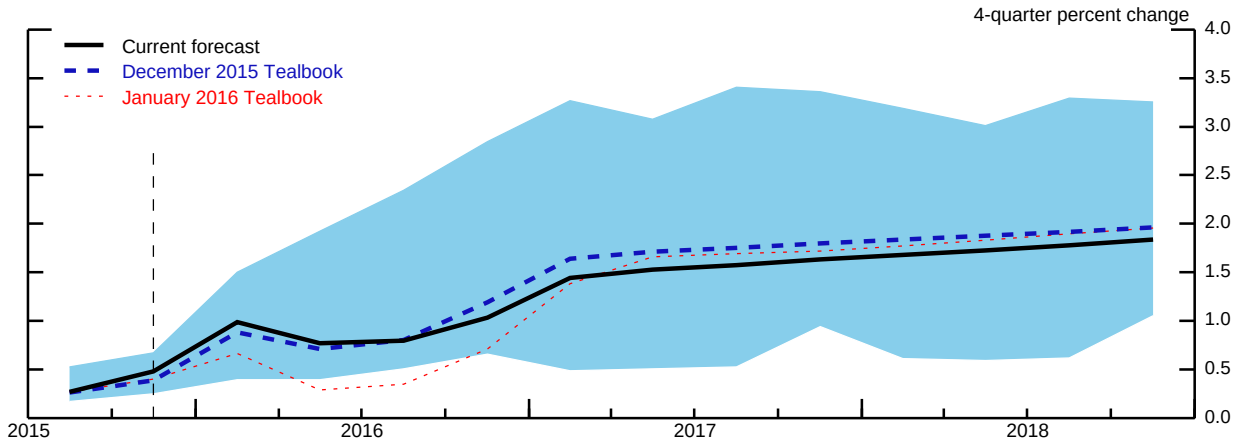
In addition to these two new exhibits, a third exhibit titled "Survey Measures of Longer-Term Inflation Expectations," which was previously included in the data sheets, will now be moved to this section to provide a more prominent tracking of survey-based inflation expectations measures.

[1] These confidence intervals are derived from staff errors from the December forecasts since 1998 and are consistent with those shown in the exhibit "Prediction Intervals Derived from Historical Tealbook Forecast Errors" in the Risks and Uncertainty section of the Tealbook.

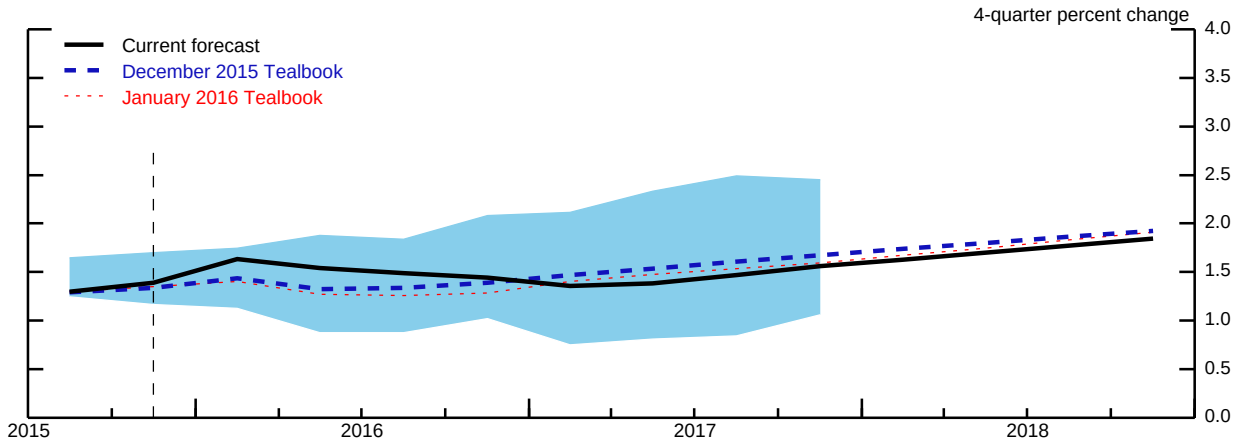
[2] The range of the vertical axes in the second exhibit were chosen to roughly represent the 70 percent confidence interval for the 2017 core PCE price inflation forecast as of the December 2015 Tealbook.

Inflation Forecasts since the December 2015 Tealbook

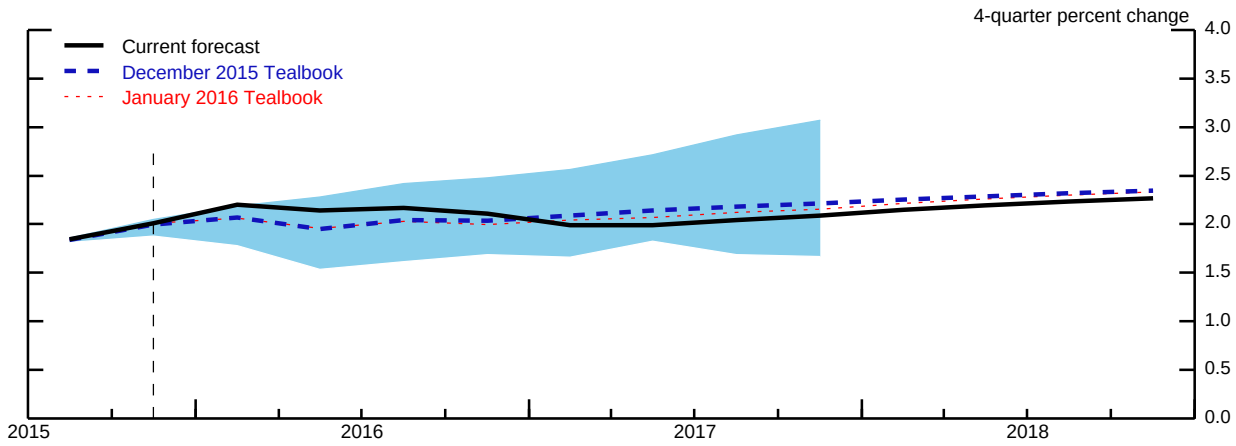
PCE Price Index



Core PCE Price Index



Core CPI

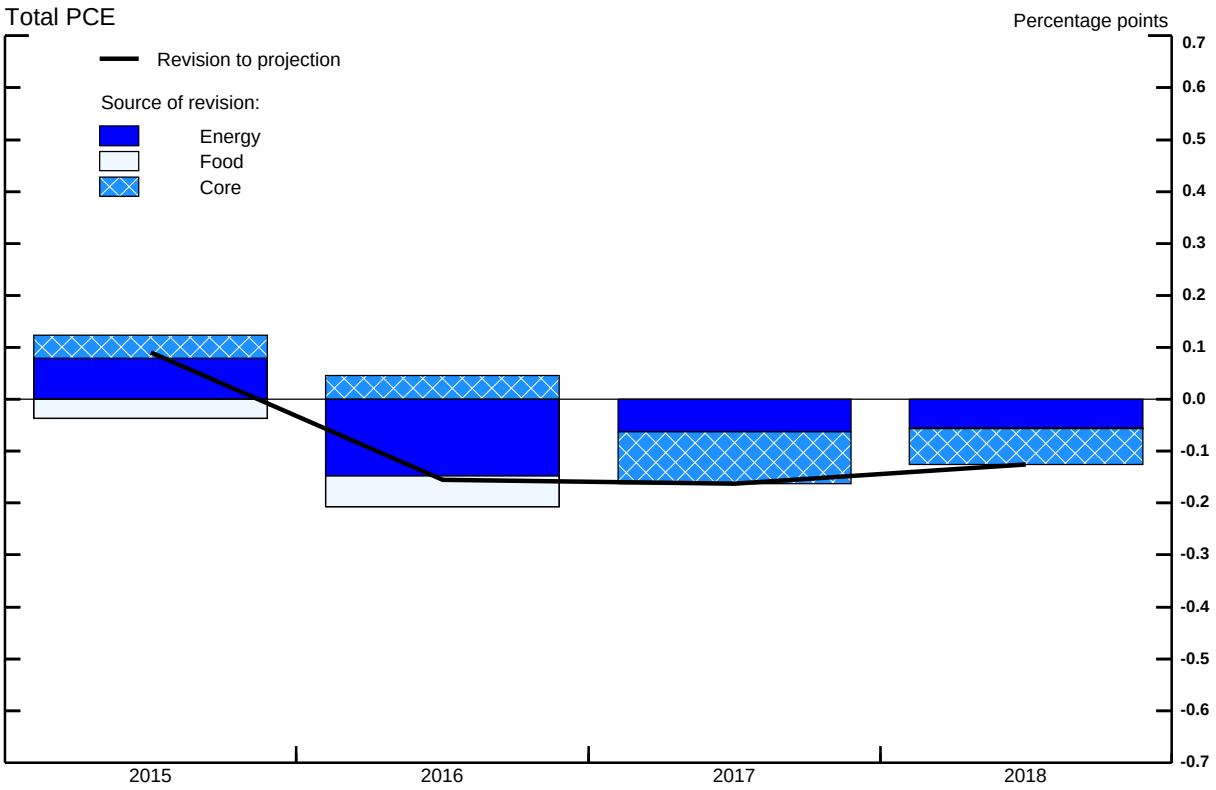


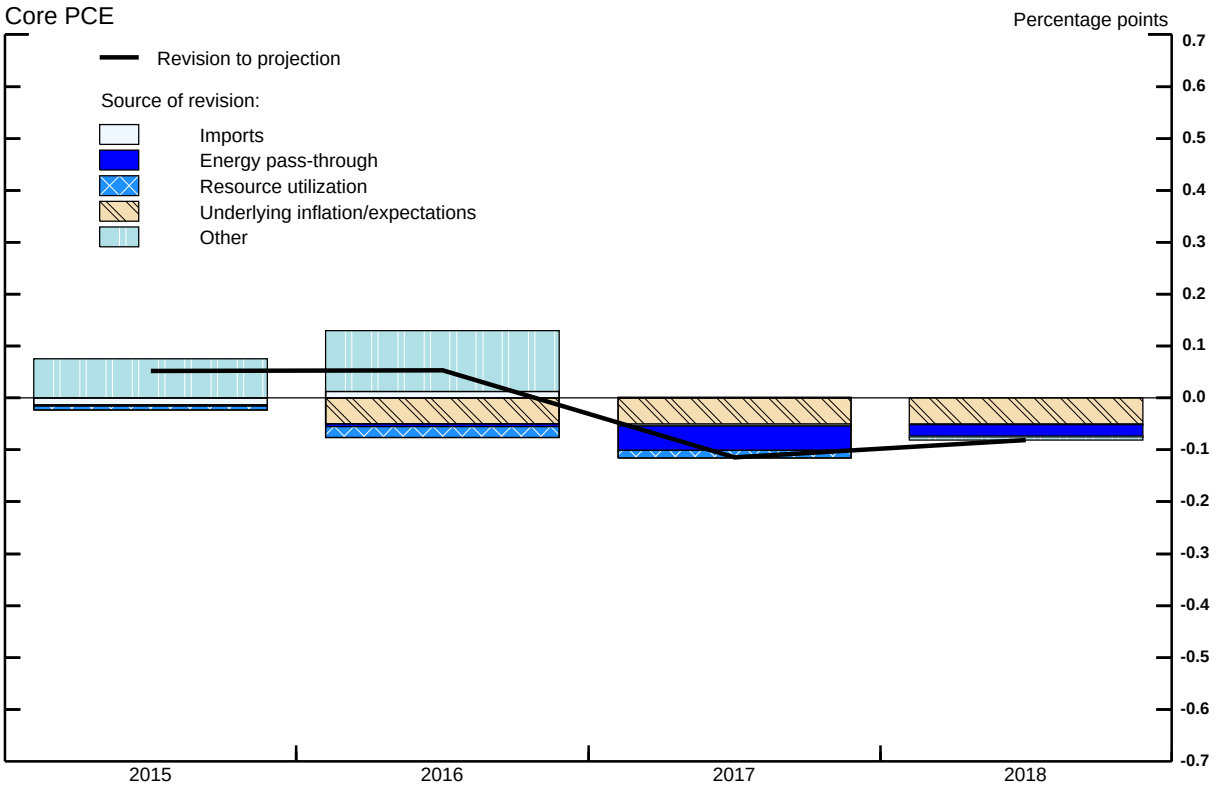
Note: Blue shading represents the 70 percent confidence interval for the December 2015 projection. Confidence intervals are computed using historical errors from December staff forecasts since 1998. See appendix, "Technical Note on Prediction Intervals Derived from Historical Tealbook Forecast Errors" in the Risks and Uncertainty section. The dotted vertical lines denote the most recent quarter of data.

Source: Staff projections and judgmental rules of thumb.

Domestic Econ Devel & Outlook

Sources of Inflation Forecast Revisions since the December 2015 Tealbook

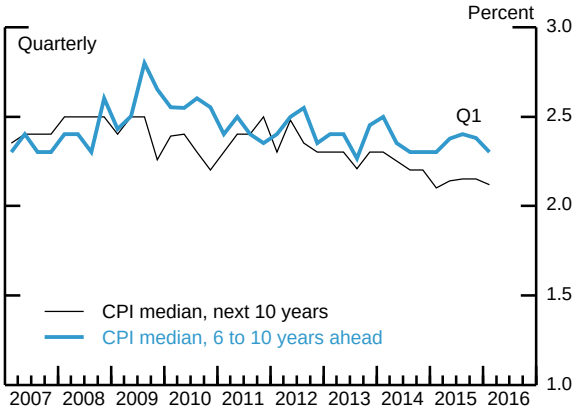




Source: Staff projections and judgmental rules of thumb.

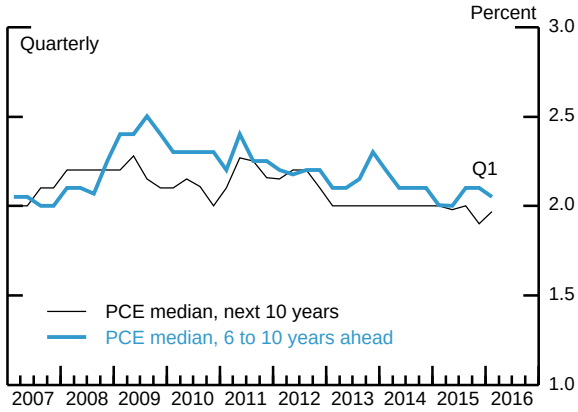
Survey Measures of Longer-Term Inflation Expectations

Survey of Professional Forecasters (CPI)



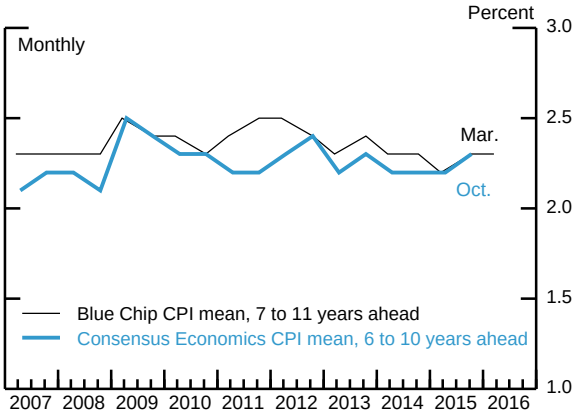
Source: Federal Reserve Bank of Philadelphia.

Survey of Professional Forecasters (PCE)



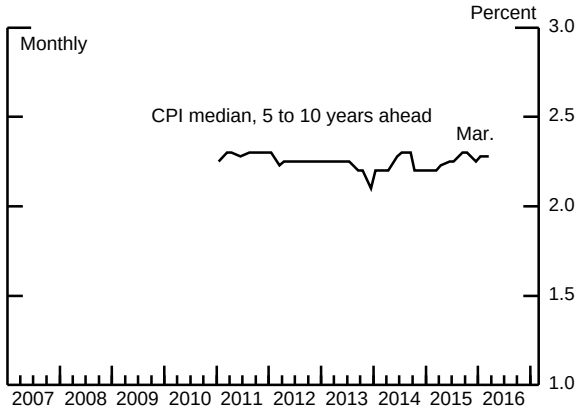
Source: Federal Reserve Bank of Philadelphia.

Blue Chip and Consensus Outlook



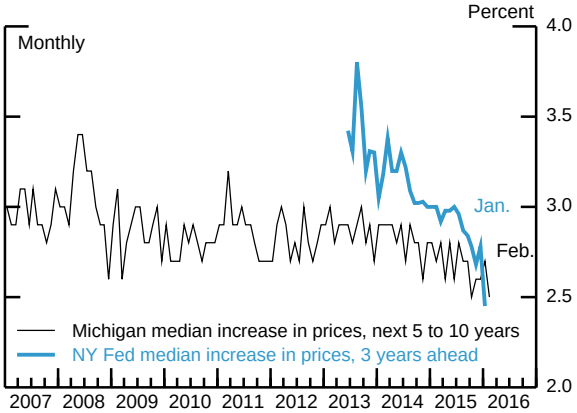
Source: Blue Chip Economic Indicators; Consensus Economics.

Survey of Primary Dealers



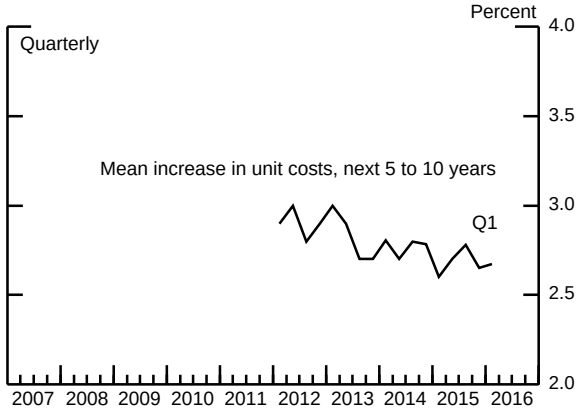
Note: Data begin in January 2011.
Source: Federal Reserve Bank of New York.

Surveys of Consumers



Note: NY Fed Survey reports expected 12-month inflation rate 3 years from the current survey date.
Source: University of Michigan Surveys of Consumers; Federal Reserve Bank of New York Survey of Consumer Expectations.

Survey of Business Inflation Expectations



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

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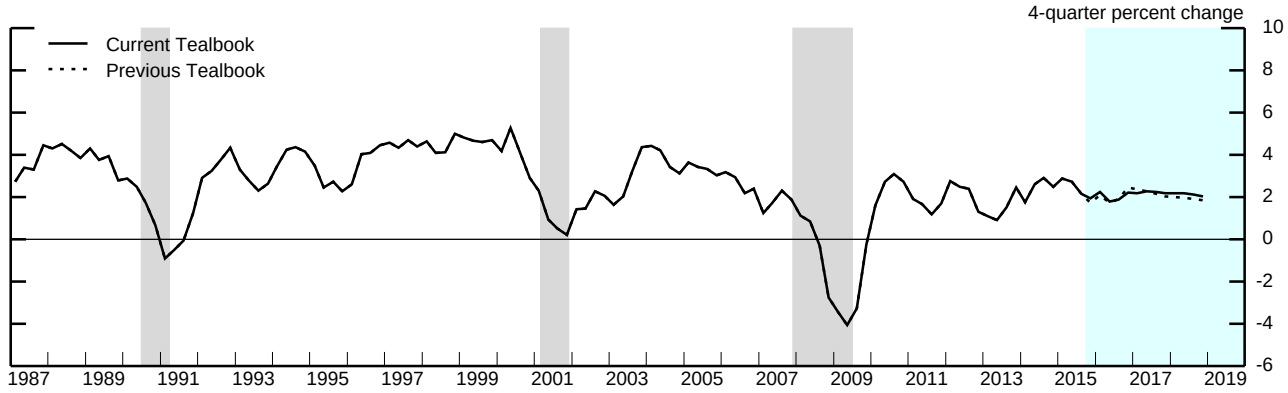
Projections of Real GDP and Related Components

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

Measure	2015	2016		2016	2017	2018
		H1	H2			
Real GDP	**1.9**	**2.0**	**2.4**	**2.2**	**2.2**	**2.0**
Previous Tealbook	1.7	2.3	2.6	2.4	2.0	1.8
Final sales	1.9	2.3	2.2	2.3	2.2	2.3
Previous Tealbook	1.9	2.2	2.3	2.3	2.1	2.2
Personal consumption expenditures	2.6	3.1	2.7	2.9	2.9	2.5
Previous Tealbook	2.5	3.2	3.3	3.2	2.9	2.5
Residential investment	9.5	8.2	10.8	9.5	5.5	6.0
Previous Tealbook	8.4	7.9	8.5	8.2	7.2	5.3
Nonresidential structures	-4.1	-6.5	1.0	-2.8	2.7	1.3
Previous Tealbook	-3.0	-2.0	.9	-.6	3.4	1.3
Equipment and intangibles	3.2	3.0	4.1	3.5	3.5	3.0
Previous Tealbook	4.5	3.0	5.2	4.1	2.7	2.6
Federal purchases	.9	4.3	1.3	2.7	-.4	-.8
Previous Tealbook	.4	4.6	.3	2.4	-.5	-1.3
State and local purchases	1.2	1.6	1.2	1.4	1.7	1.7
Previous Tealbook	1.4	1.7	1.4	1.6	1.8	1.8
Exports	-.7	-.5	1.7	.6	1.7	3.6
Previous Tealbook	-.4	-.9	.9	.0	.9	3.2
Imports	2.9	4.5	6.0	5.3	5.0	3.9
Previous Tealbook	3.6	6.3	7.3	6.8	5.5	3.7
	Contributions to change in real GDP (percentage points)					
Inventory change	.0	-.3	.2	.0	.0	-.2
Previous Tealbook	-.2	.1	.3	.2	-.1	-.3
Net exports	-.5	-.7	-.7	-.7	-.6	-.2
Previous Tealbook	-.6	-1.0	-1.0	-1.0	-.7	-.2

Real GDP

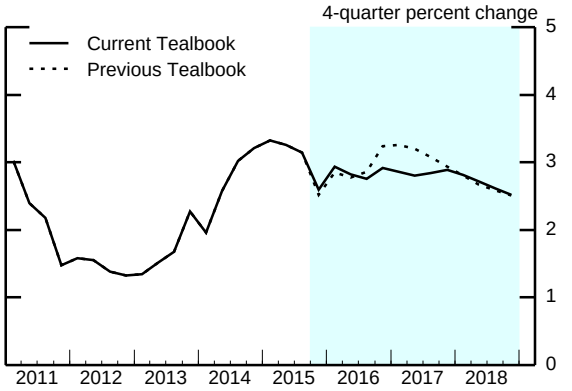


Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

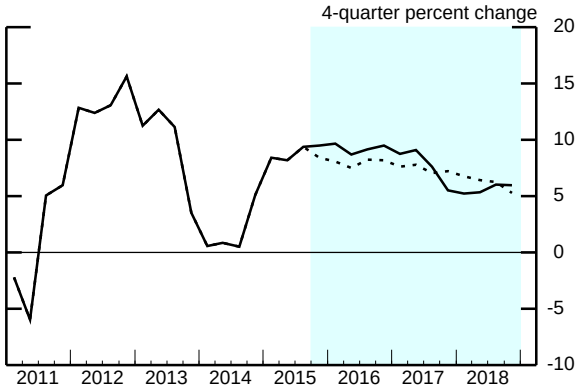
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Components of Final Demand

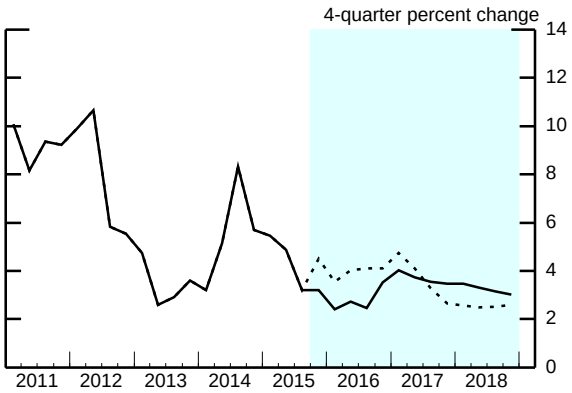
Personal Consumption Expenditures



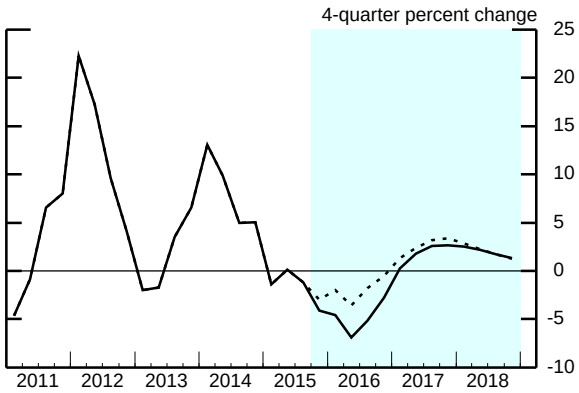
Residential Investment



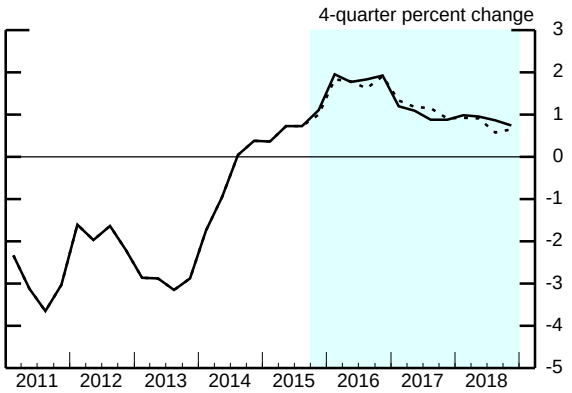
Equipment and Intangibles



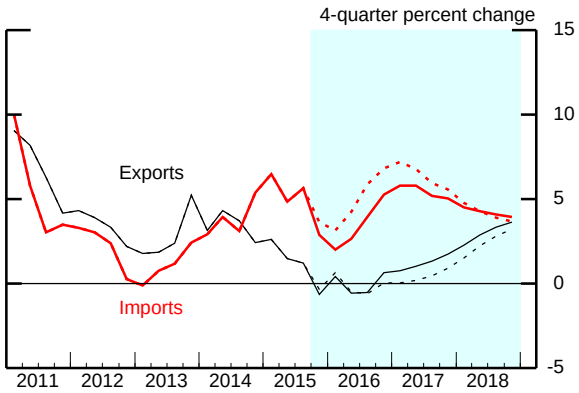
Nonresidential Structures



Government Consumption & Investment



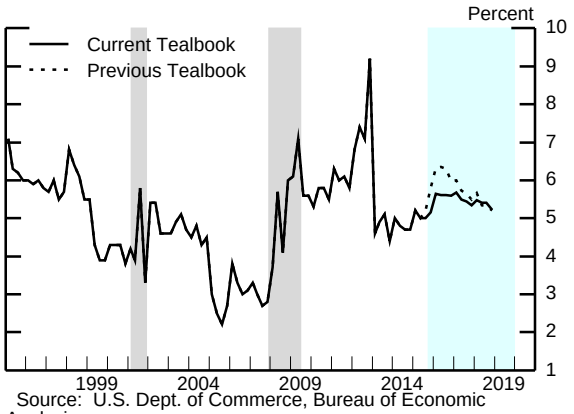
Exports and Imports



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

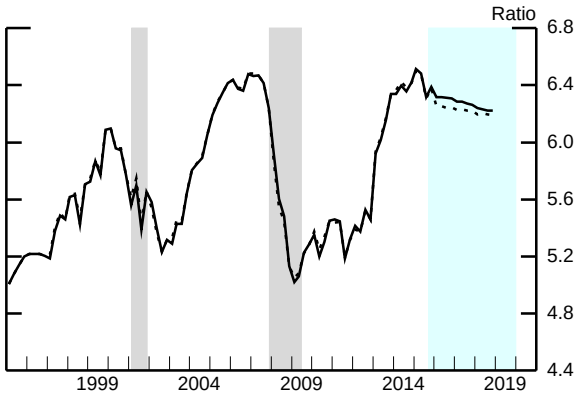
Aspects of the Medium-Term Projection

Personal Saving Rate



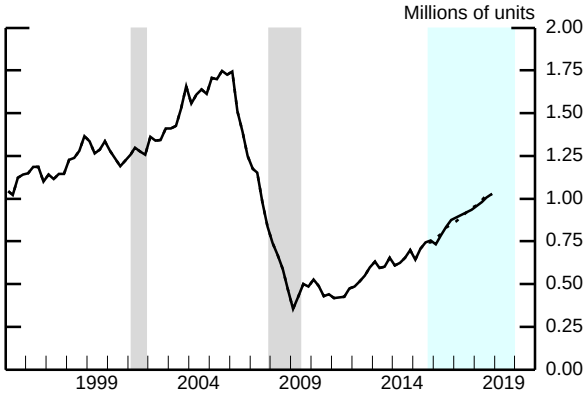
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Wealth-to-Income Ratio



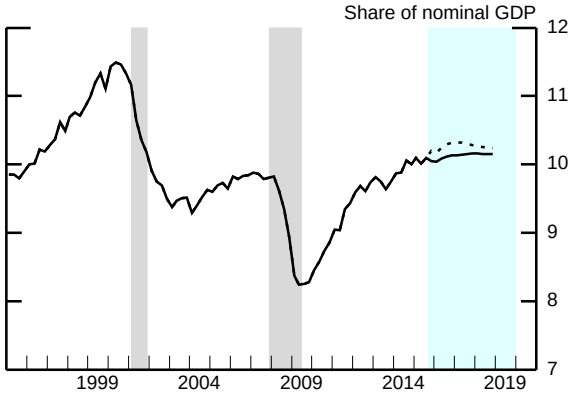
Note: Ratio of household net worth to disposable personal income.
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Single-Family Housing Starts



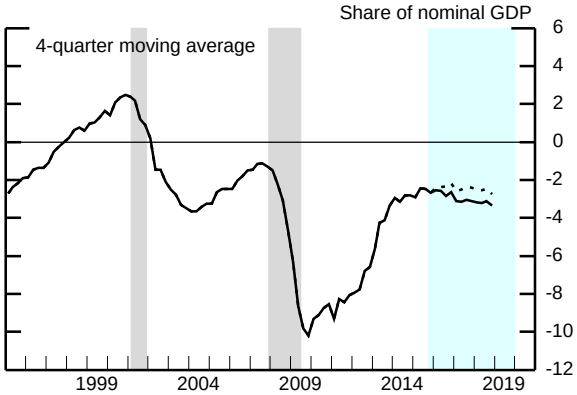
Source: U.S. Census Bureau.

Equipment and Intangibles Spending



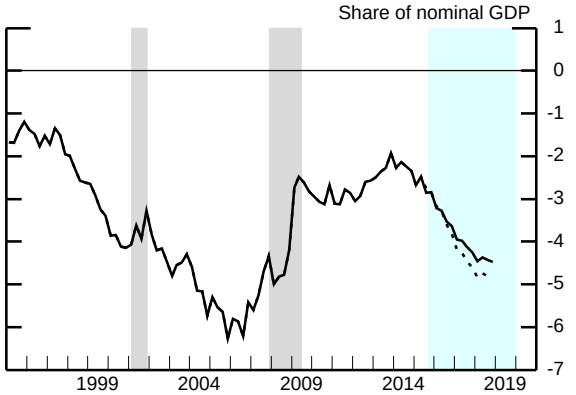
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Federal Surplus/Deficit



Source: *Monthly Treasury Statement.*

Current Account Surplus/Deficit



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

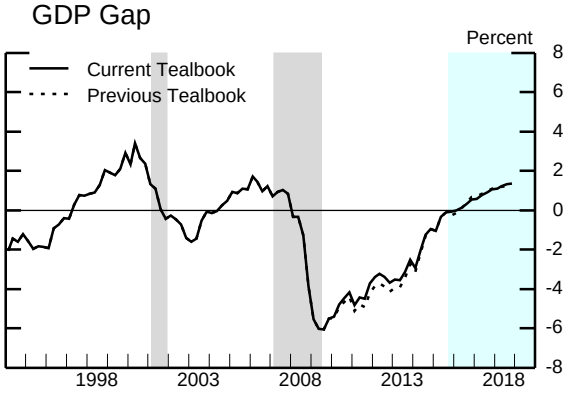
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

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

Measure	1974-95	1996-2000	2001-07	2008-10	2011-14	2015	2016	2017	2018
Potential real GDP	3.1	3.4	2.6	1.6	1.1	1.1	1.6	1.6	1.7
Previous Tealbook	3.1	3.4	2.6	1.7	1.1	1.1	1.5	1.6	1.7
Selected contributions[1]									
Structural labor productivity[2]	1.6	2.9	2.8	1.4	.9	.8	1.3	1.4	1.6
Previous Tealbook	1.6	2.9	2.8	1.5	.8	1.0	1.3	1.4	1.5
Capital deepening	.7	1.5	1.0	.3	.6	.7	.6	.6	.6
Multifactor productivity	.7	1.0	1.5	.9	.1	-.2	.5	.6	.8
Structural hours	1.6	1.2	.8	.1	.5	.7	.5	.4	.3
Previous Tealbook	1.6	1.2	.8	-.1	.6	.5	.4	.4	.3
Labor force participation	.4	-.1	-.2	-.5	-.6	-.5	-.5	-.5	-.5
Previous Tealbook	.4	-.1	-.2	-.5	-.7	-.6	-.5	-.5	-.5
Memo:									
GDP gap[3]	-1.9	2.4	.8	-4.2	-.9	-.1	.5	1.1	1.4
Previous Tealbook	-1.9	2.4	.8	-4.4	-.9	-.3	.7	1.1	1.3

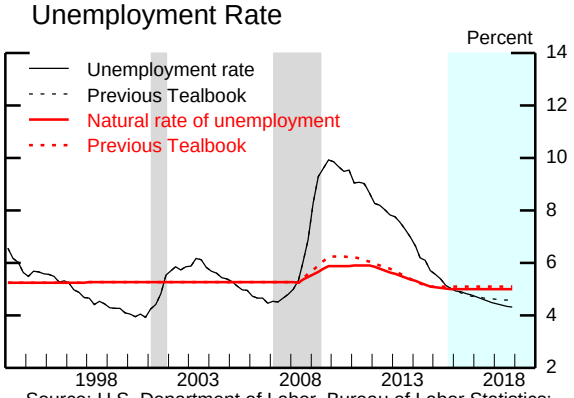
Note: For multiyear periods, the percent change is the annual average from Q4 of the year preceding the first year shown to Q4 of the last year shown.
1. Percentage points.
2. Total business sector.
3. Percent difference between actual and potential GDP in the final quarter of the period indicated. A negative number indicates that the economy is operating below potential.

GDP Gap



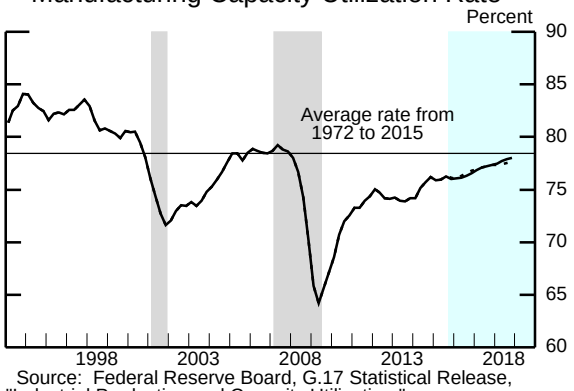
Note: The GDP gap is the percent difference between actual and potential GDP; a negative number indicates that the economy is operating below potential.
Source: U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.

Unemployment Rate



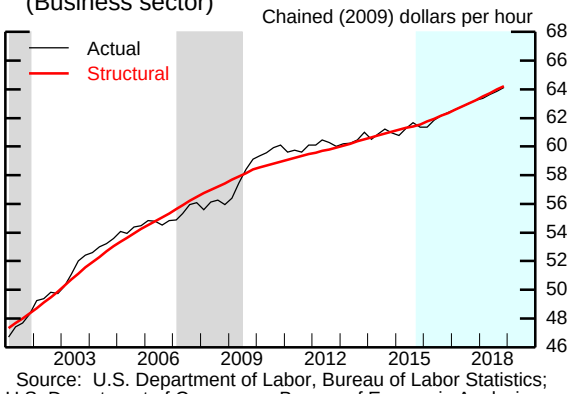
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

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	2015	2016		2016	2017	2018
		H1	H2			
Output per hour, business[1]	.6	1.7	1.8	1.7	1.3	1.4
Previous Tealbook	.6	1.6	2.1	1.9	1.7	1.4
Nonfarm payroll employment[2]	229	206	189	197	171	138
Previous Tealbook	221	221	181	201	137	108
Private employment[2]	221	197	175	186	156	123
Previous Tealbook	213	208	165	186	119	90
Labor force participation rate[3]	62.5	62.8	62.7	62.7	62.5	62.2
Previous Tealbook	62.5	62.5	62.4	62.4	62.3	62.0
Civilian unemployment rate[3]	5.0	4.9	4.8	4.8	4.5	4.3
Previous Tealbook	5.0	4.8	4.7	4.7	4.6	4.6

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.

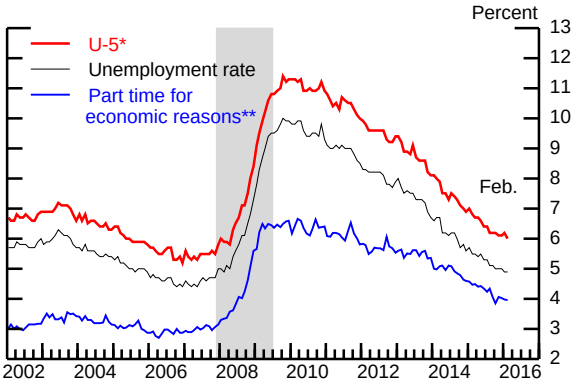
Inflation Projections
(Percent change at annual rate from final quarter of preceding period)

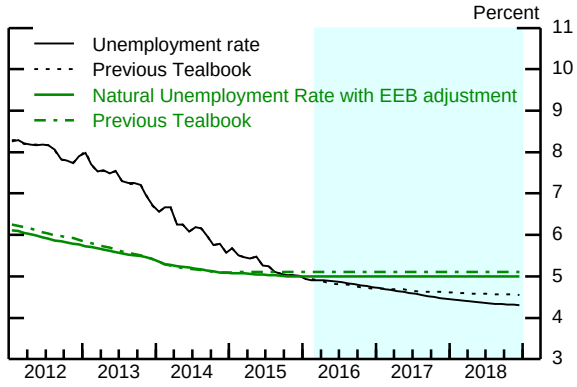
Measure	2015	2016		2016	2017	2018
		H1	H2			
PCE chain-weighted price index	.5	.7	1.4	1.0	1.6	1.8
Previous Tealbook	.4	-.1	1.5	.7	1.7	2.0
Food and beverages	.2	.0	1.8	.9	2.0	2.0
Previous Tealbook	.3	.6	1.8	1.2	2.0	2.0
Energy	-15.1	-19.2	5.4	-7.7	2.7	1.4
Previous Tealbook	-16.0	-28.4	6.7	-12.6	4.4	3.1
Excluding food and energy	1.4	1.7	1.2	1.4	1.6	1.8
Previous Tealbook	1.3	1.3	1.3	1.3	1.6	1.9
Prices of core goods imports[1]	-3.3	-1.4	1.1	-.1	1.0	1.1
Previous Tealbook	-3.2	-2.9	.2	-1.4	1.1	1.2

1. Core goods imports exclude computers, semiconductors, oil, and natural gas.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Labor Market Developments and Outlook (1)

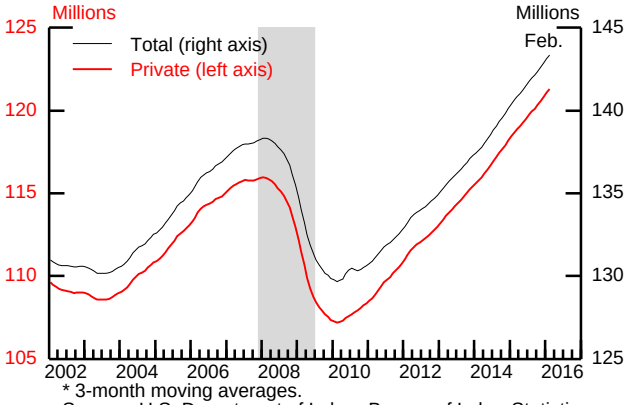
Measures of Labor Underutilization

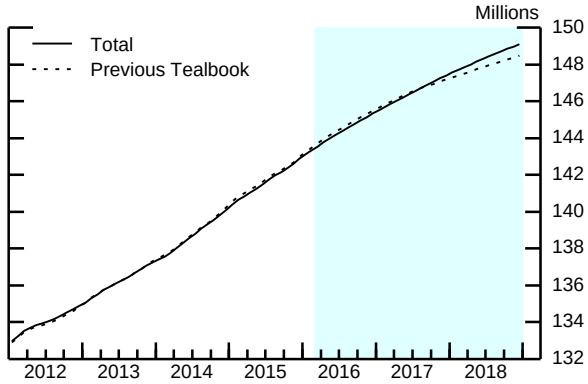




* U-5 measures total unemployed persons plus all marginally attached to the labor force, as a percent of the labor force plus persons marginally attached to the labor force.
** Percent of Current Population Survey employment.
EEB Extended and emergency unemployment benefits.
Source: U.S. Department of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

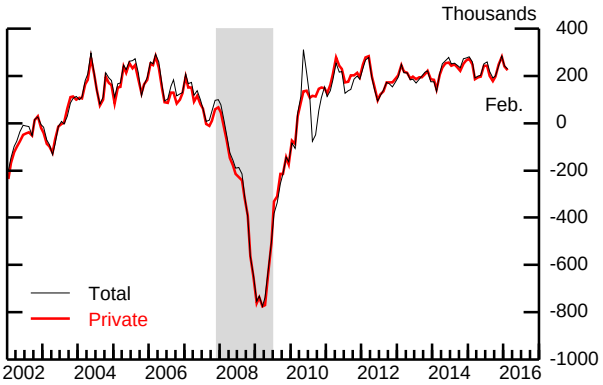
Level of Payroll Employment*

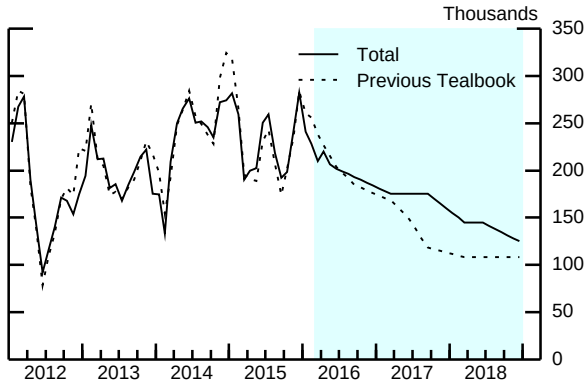




* 3-month moving averages.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Change in Payroll Employment*



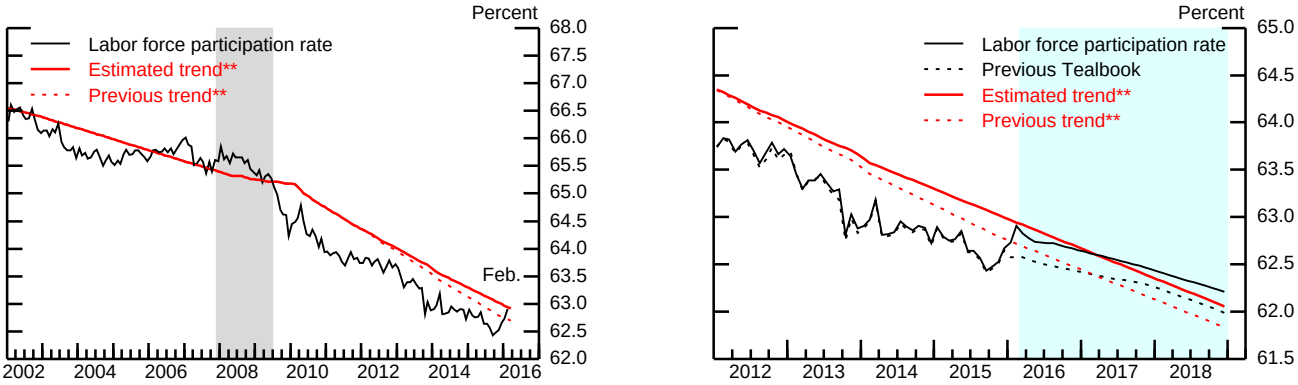


* 3-month moving averages.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

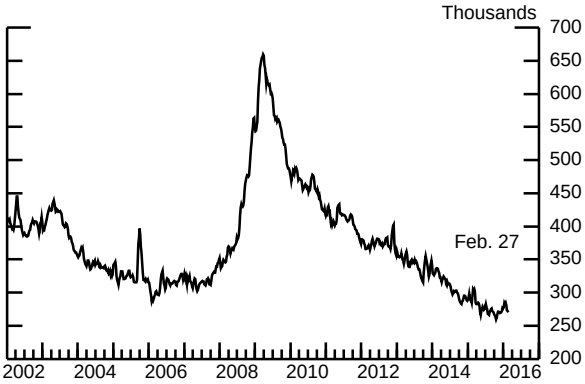
Labor Market Developments and Outlook (2)

Labor Force Participation Rate*



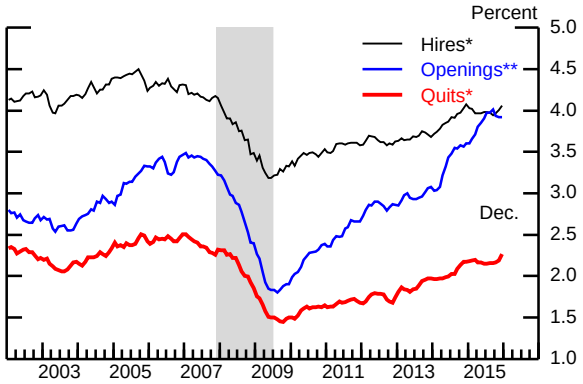
* Published data adjusted by staff to account for changes in population weights.
** Includes staff estimate of the effect of extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Initial Unemployment Insurance Claims*



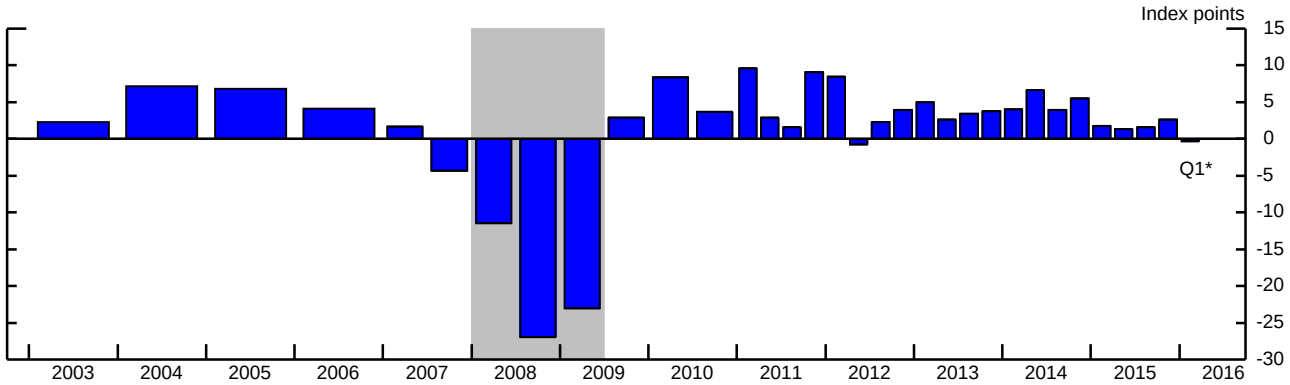
* 4-week moving average.
Source: U.S. Department of Labor, Employment and Training Administration.

Private 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.

Average Monthly Change in Labor Market Conditions Index



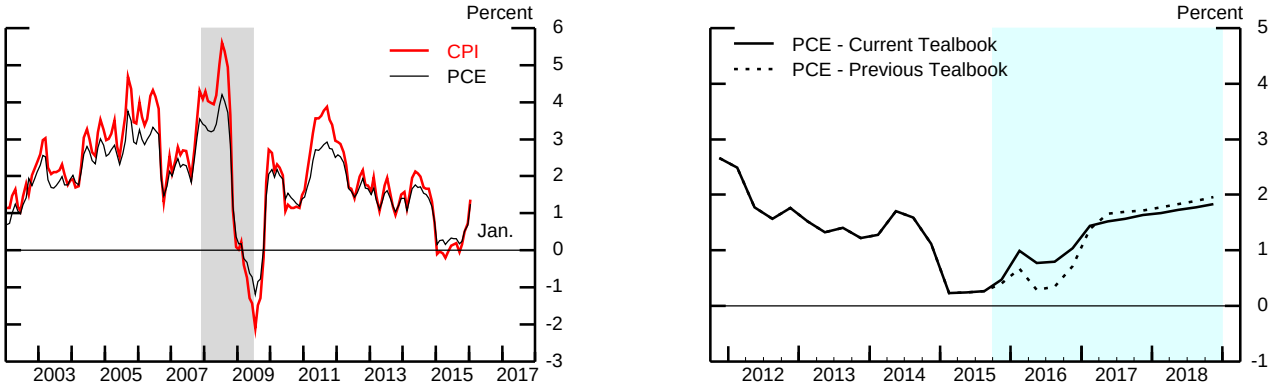
* Value shown for Q1 is an average of February and January data.
Source: Labor market conditions index estimated by staff.

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

Inflation Developments and Outlook (1)

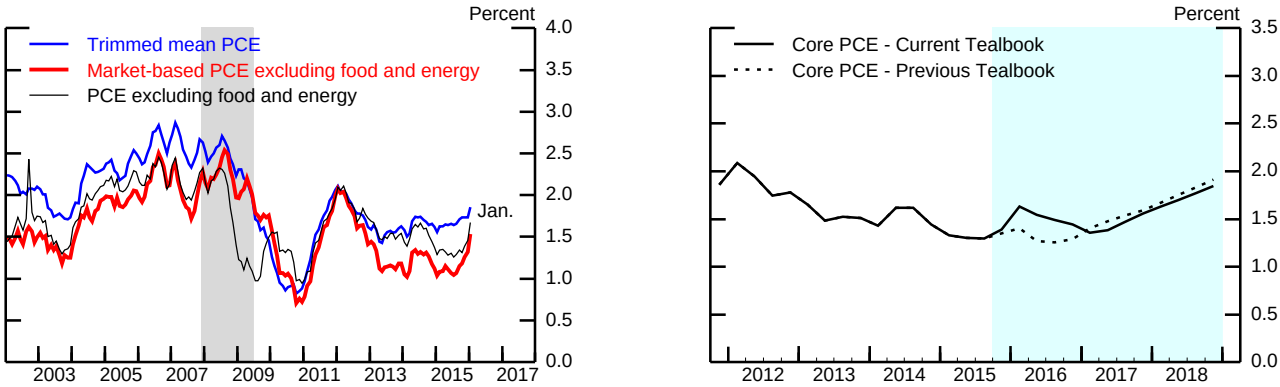
(Percent change from year-earlier period)

Headline Consumer Price Inflation



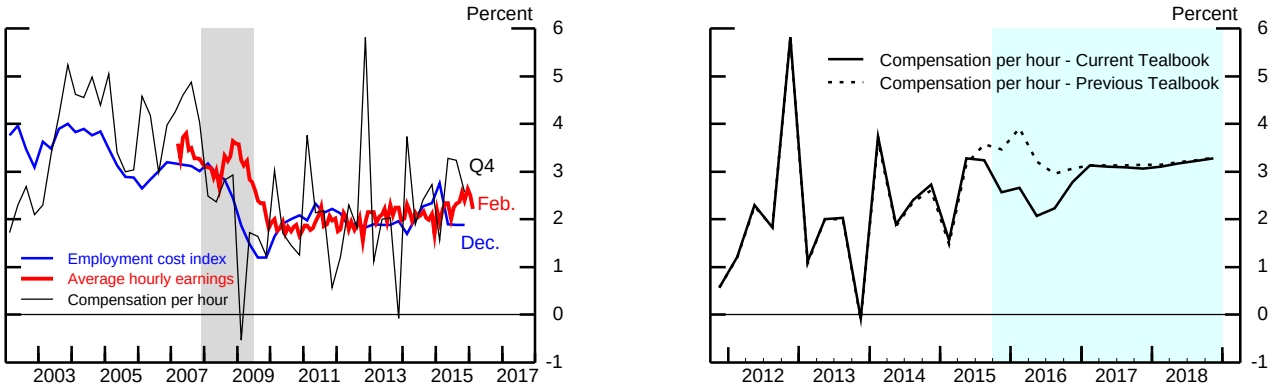
Source: For CPI, U.S. Department of Labor, Bureau of Labor Statistics; for PCE, U.S. Department of Commerce, Bureau of Economic Analysis.

Measures of Underlying PCE Price Inflation



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

Labor Cost Growth



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

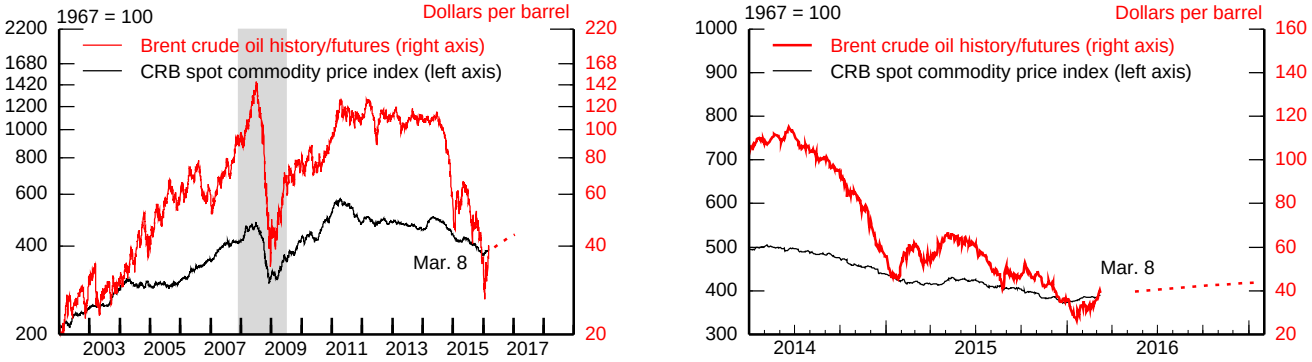
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

Inflation Developments and Outlook (2)

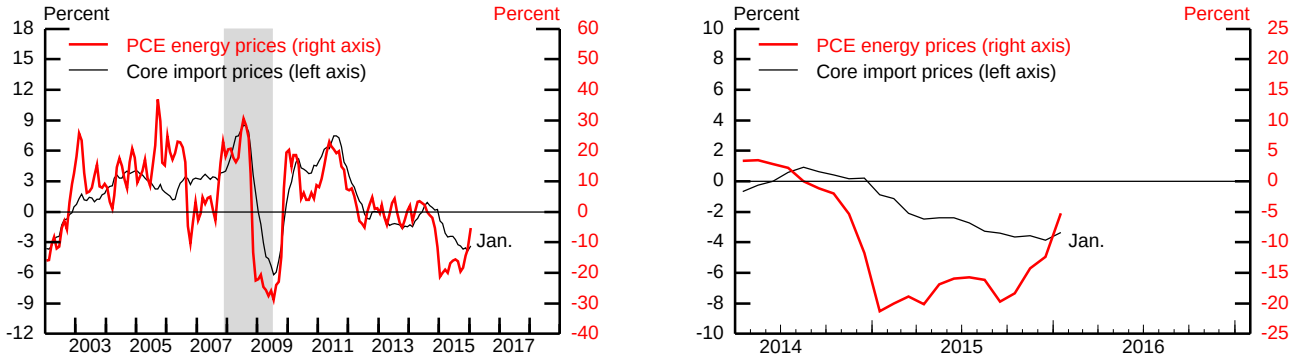
(Percent change from year-earlier period, except as noted)

Commodity and Oil Price Levels



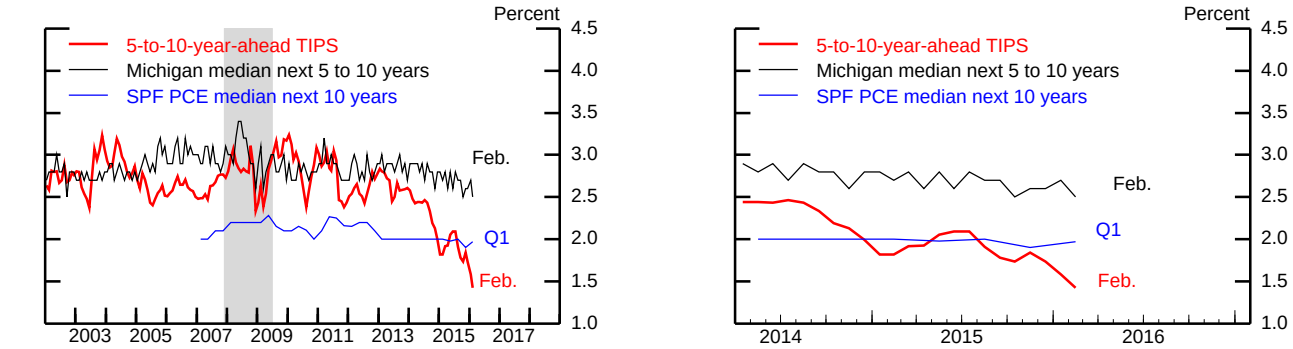
Note: Futures prices (dotted lines) are the latest observations on monthly futures contracts.
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

Energy and Import Price Inflation



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

Long-Term Inflation Expectations



Note: Based on a comparison of an estimated TIPS (Treasury Inflation-Protected Securities) yield curve with an estimated nominal off-the-run Treasury yield curve, with an adjustment for the indexation-lag effect.
SPF Survey of Professional Forecasters.
Source: For Michigan, University of Michigan Surveys of Consumers; for SPF, the Federal Reserve Bank of Philadelphia; for TIPS, Federal Reserve Board staff calculations.

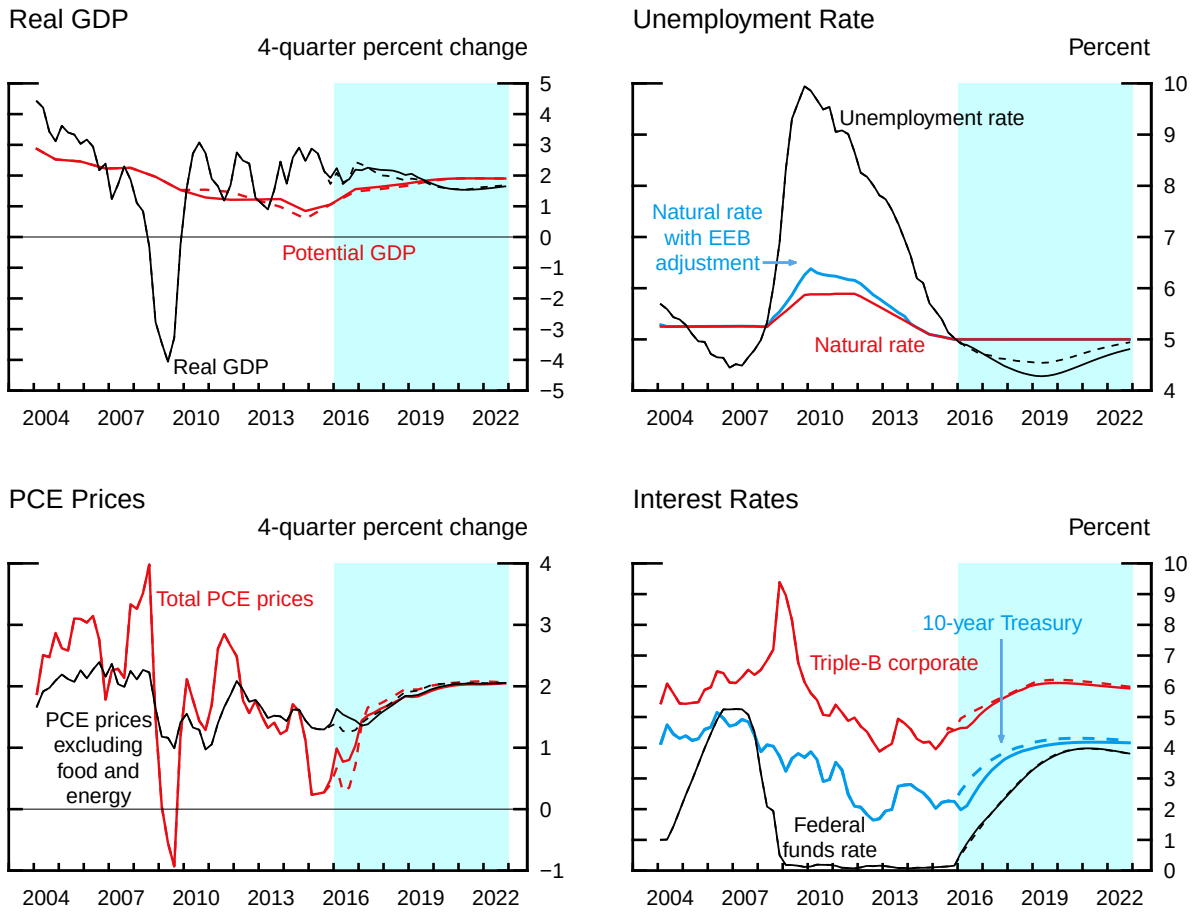
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

The Long-Term Outlook

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

Measure	2016	2017	2018	2019	2020	2021	Longer run
Real GDP	2.2	2.2	2.0	1.8	1.5	1.6	1.9
Previous Tealbook	2.4	2.0	1.8	1.7	1.6	1.6	1.9
Civilian unemployment rate[1]	4.8	4.5	4.3	4.3	4.5	4.7	5.0
Previous Tealbook	4.7	4.6	4.6	4.6	4.7	4.8	5.1
PCE prices, total	1.0	1.6	1.8	1.9	2.0	2.0	2.0
Previous Tealbook	.7	1.7	2.0	2.0	2.1	2.1	2.0
Core PCE prices	1.4	1.6	1.8	1.9	2.0	2.0	2.0
Previous Tealbook	1.3	1.6	1.9	2.0	2.0	2.1	2.0
Federal funds rate[1]	1.45	2.34	3.18	3.73	3.96	3.95	3.25
Previous Tealbook	1.35	2.37	3.21	3.76	3.96	3.93	3.25
10-year Treasury yield[1]	2.8	3.6	4.0	4.1	4.2	4.2	4.1
Previous Tealbook	3.3	3.8	4.1	4.3	4.3	4.3	4.1

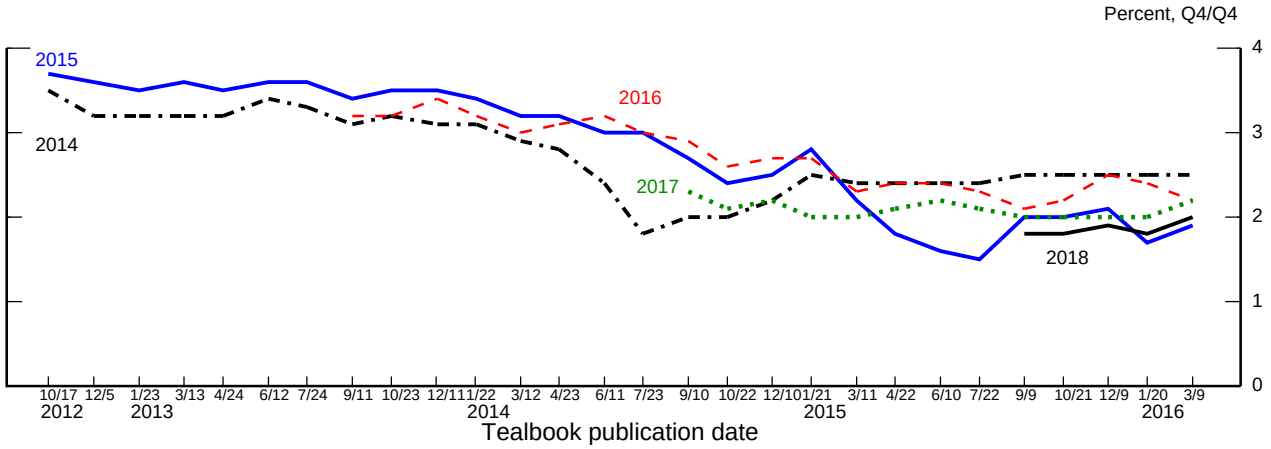
1. Percent, average for the final quarter of the period.



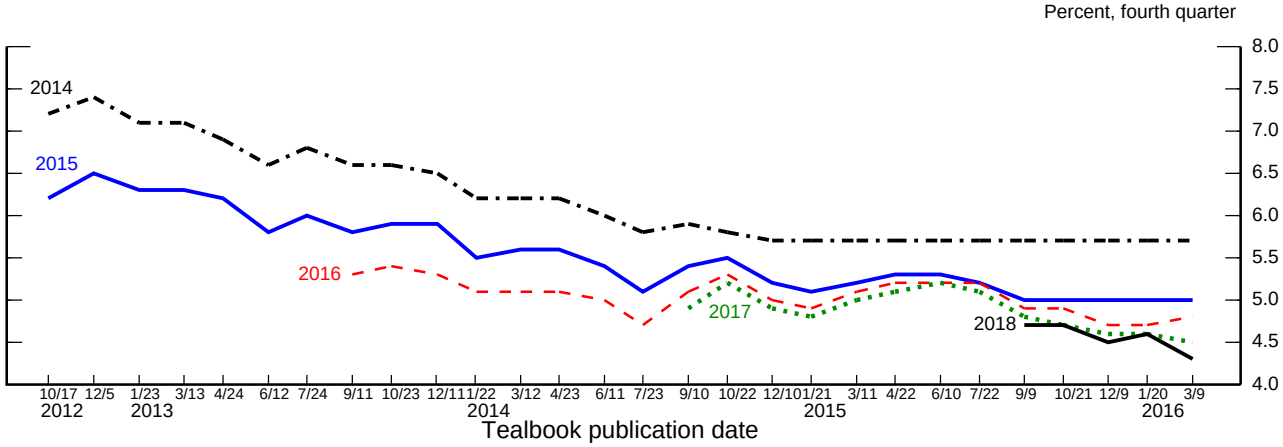
Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

Evolution of the Staff Forecast

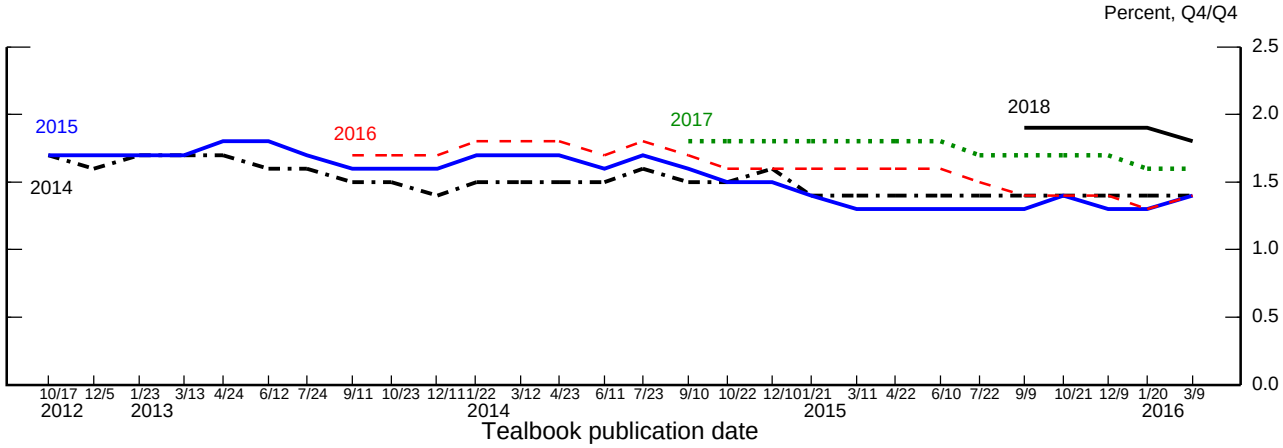
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



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International Economic Developments and Outlook

Recent data suggest that foreign growth is likely to be a bit more sluggish than we were anticipating in the January Tealbook. However, the markdown to our outlook is modest, and we continue to expect a slow but steady pickup in the pace of foreign growth over the course of this year and into 2017.

After having rallied to a near-trend 2½ percent pace in the third quarter, foreign real GDP growth fell back to 1¾ percent in the fourth quarter, ¼ percentage point below the January Tealbook estimate. The Japanese economy contracted, Canadian activity stalled, and Brazil remained mired in recession. With momentum weaker than we had previously assessed and financial market conditions in some foreign economies still depressed, we marked down the foreign growth path ¼ percentage point this year and slightly thereafter. This revision comes on the heels of a small markdown in the January Tealbook.

Despite the downward revision to the outlook, we still expect foreign growth to strengthen over the forecast period, rising to 2 percent in the current quarter and to a trend rate of 2¾ percent by 2017. This trajectory reflects anticipated recoveries in Canada and Brazil, aided by a stabilization of commodity prices, and improvement in the euro area. Foreign economies, more generally, should benefit from U.S. growth, accommodative monetary policies, and past currency depreciations.

Our confidence in this still-restrained forecast has received some support from the recent recovery of financial and commodity markets. Starting in mid-February, foreign equity indexes and oil prices mostly retraced their declines from earlier in the year. Uncertainty about China's exchange rate policy, an important contributor to market volatility early in the year, has also abated with the stabilization of the renminbi and communications by the Chinese authorities that they will attempt to keep the currency from depreciating sharply.

Nonetheless, downside risks to the foreign growth outlook remain elevated. First, despite the aforementioned recovery in financial markets, investors remain quite jittery,

and even small shocks may push them from relative calm back down into despair, with concordant effects on confidence, spending, and activity. Second, and as a related matter, the reasons for market worry—financial imbalances and a possible hard landing in China, excessive corporate debt in EMEs, effects of low oil prices on oil-exporters—have not gone away, and a new one has been added to the list: Britain's potential exit from the European Union (EU), or Brexit. We assume that the United Kingdom will vote in June to remain in the EU, but that outcome is hardly preordained. Third, over the past year, the pace of foreign economic growth has fallen to its lowest level since the global financial crisis, rendering it more vulnerable to adverse shocks. Our econometric analysis, described in the box "Estimates of World Recession Probabilities," points to a material rise in the likelihood of a global recession, though we continue to believe that is not the most likely scenario. Finally, as explored in the Risks and Uncertainty section, if a widespread foreign recession was to materialize, there is a risk that further monetary stimulus may fail to support domestic demand abroad, resulting both in a deeper foreign recession and a sharper rise in the dollar.

AFE inflation slowed to just 0.2 percent at an annual rate in the fourth quarter and an estimated 0 percent in the current quarter, reflecting further declines in retail energy prices. Inflation is estimated to have remained below zero in Japan and the euro area. With the projected firming of oil prices, AFE inflation should move up to about 1¾ percent by 2018. This forecast is a touch weaker despite the recent increase in oil prices, largely reflecting recent exchange rate appreciation, the weaker growth outlook, and lower inflation expectations in the euro area and Japan. EME inflation is expected to rise to 2 percent in the current quarter, as a rebound in local food prices is pushing up Chinese inflation, more than offsetting energy-related declines in inflation elsewhere in the region. In much of Latin America, weaker currencies are keeping inflation elevated. We expect EME inflation will rise to 3 percent by midyear and remain at about that rate through 2018.

Given the lower inflation and growth outlooks, we revised our monetary policy assumptions for some of the AFEs. We now expect the European Central Bank (ECB) to ease monetary policy this month and the Bank of England (BOE) to delay its first rate

hike to the end of the year, one quarter later than previously assumed. Following the surprise cut of the deposit rate into negative territory, the Bank of Japan (BOJ) will likely ease policy further this year. In contrast, we took back our call for a rate cut this month in Canada, and we now expect the Bank of Canada to begin raising rates in mid-2017. In the EMEs, the scope for monetary policy easing is somewhat limited by concerns about capital outflows and also, in Latin America, by inflationary pressures; policy rates are generally projected to either remain unchanged or increase over the forecast period. A notable exception is China, where the People's Bank of China cut the reserve requirement ratio, and we expect additional cuts going forward.

ADVANCED FOREIGN ECONOMIES

- ***Euro Area.*** Real GDP growth edged up to 1.3 percent in the fourth quarter, as we had expected, but indicators for the first quarter suggest that activity is not accelerating as projected in the January Tealbook. Economic sentiment and purchasing managers' indexes declined in January and February and point to only modest growth. In addition, the economy faces headwinds from recent increases in debt yield spreads for banks, lower-rated corporations, and peripheral sovereigns. As a result, we revised down our forecast for GDP growth nearly ½ percentage point in 2016 and a smaller amount thereafter. Nonetheless, accommodative ECB policy, a depreciated euro, and still-low oil prices should support a pickup in GDP growth to nearly 2 percent by late 2016.

  In February, 12-month inflation fell to minus 0.2 percent, mainly as a result of further declines in retail energy prices. Core inflation also edged down, and market-based measures of long-term inflation expectations declined to historical lows. Given the weaker inflation data, we now estimate that headline inflation declined to minus 1¼ percent at an annual rate in the current quarter. As energy prices move up, inflation is projected to rise to 1½ percent by early 2017. We expect the ECB to ease monetary policy at its March meeting, including by decreasing its deposit rate further and extending its asset purchase program by a few months.

Estimates of World Recession Probabilities

The tightening of global financial conditions earlier in the year—against the backdrop of generally lackluster economic activity data—raised concerns that the global economy may be headed toward recession. To quantify these risks, we present estimates of recession probabilities for the world economy and some key U.S. trading partners based on indicators of macroeconomic activity and financial market conditions.

We estimate the following global and country-specific probit models:

$$Y_t = \Phi(\alpha + \beta X_t + \gamma Z_t + \varepsilon_t) ,$$

where Y_t is a monthly variable that takes the value 1 if the economy is in recession sometime over the subsequent 12 months. Recession dates are obtained from the Economic Cycle Research Institute (ECRI), which follows a methodology similar to that of the National Bureau of Economic Research to date recessions abroad. We define a world recession as occurring when countries representing two-thirds of world GDP are in recession.[1] The variable X_t is the Aruoba-Diebold-Scotti (ADS) index of macroeconomic activity, which summarizes the state of business conditions by combining real-time macroeconomic indicators and GDP growth. For the global ADS, we use data on world industrial production, world retail sales, the new export orders component of the global purchasing managers index (PMI), and world GDP growth.[2] The variable Z_t is a measure of financial stress, constructed from the first principal component of country-specific financial variables such as equity prices and interest rate spreads. In the global model, our proxy for financial stress is the Gilchrist and Zakrajšek excess bond premium (EBP) series, which captures the extra compensation demanded by investors after accounting for expected losses due to default.[3] Though calculated for U.S. corporate debt, the EBP fluctuates with measures of global risk aversion and is available for a longer period.

Figure 1 shows that both the global ADS index (the black line) and the EBP series (the red line) are highly correlated with the global business cycle, with the world ADS index dropping markedly in recessions and the EBP series rising sharply. Notably, both indicators have deteriorated since last summer. Figure 2 shows historical estimates of the probability of a world recession over the next 12 months (the blue line). The probit model captures cyclical slowdowns in the world economy well, showing increases in the estimated probability ahead of recessions. Given the deterioration in macroeconomic and financial conditions through February, the estimated probability of recession has increased of late and now stands at about 48 percent, pointing to sizable downside risks to the global outlook. The model attributes two-thirds of the increase in the probability of recession relative to its unconditional value (the horizontal black line) to weak ADS readings, with

[1] This criterion identifies four recessionary episodes in the world economy since 1970.

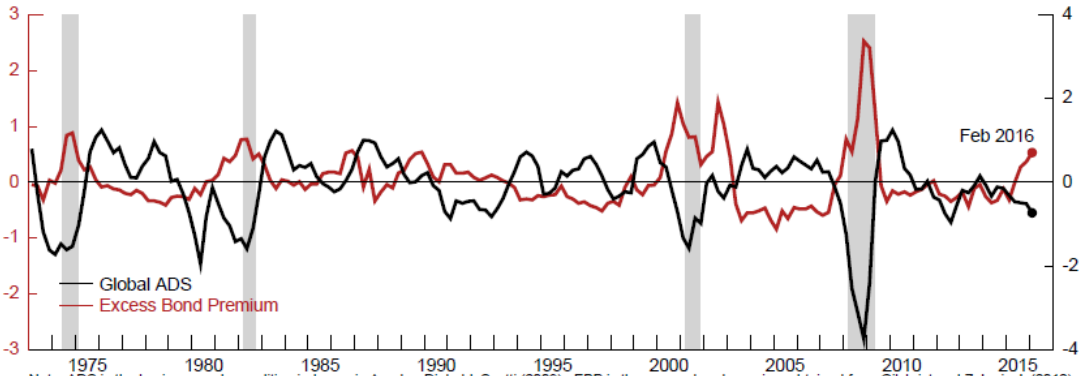
[2] S. Borağan Aruoba, Francis X. Diebold, and Chiara Scotti (2009), "Real-Time Measurement of Business Conditions," *Journal of Business and Economic Statistics,* vol. 27 (October), pp. 417–27.

[3] Simon Gilchrist and Egon Zakrajšek (2012), "Credit Spreads and Business Cycle Fluctuations," *American Economic Review,* vol. 102 (June), pp. 1692–720.

the remaining one-third explained by tighter financial conditions. The table presents country-specific recession probability estimates, comparing current estimates with those obtained with data through September 2015. Consistent with our results for the global economy, the country-specific estimates point to higher recession risks at present.

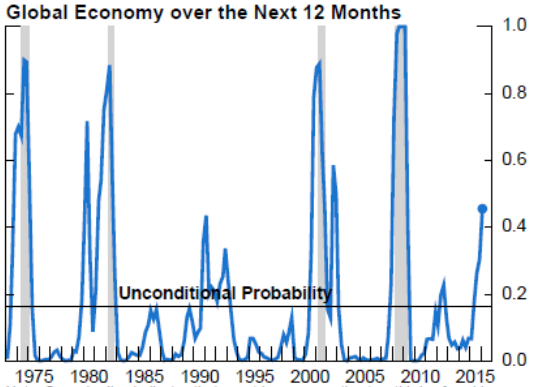
Even so, several caveats are worth noting. First, uncertainty around these probit estimates is large, reflecting the difficulty in predicting cyclical turning points given that recessions are infrequent events. Second, the model does produce some "false positives"; for example, spikes in recession probability in 1991 and 2002 were not associated with global downturns. Moreover, the model's current relatively high probability of recession may, in part, reflect its misreading of a structural slowdown in global growth. The construction of the ADS index assumes that economic growth fluctuates around a stable average, and it attributes any slowdown in the underlying variables to cyclical factors. To the extent that growth rates of potential GDP have slowed, as has likely occurred in many economies since the global financial crisis, the ADS index may mistakenly attribute this slowdown to weak cyclical conditions and push up recession probability estimates. Finally, in recent days we have seen some improvement in financial conditions and in macroeconomic data for some countries not yet captured in our indexes.

Figure 1. Global Macroeconomic and Financial Conditions



Note: ADS is the business cycle condition index as in Aruoba, Diebold, Scotti (2009). EBP is the excess bond premium obtained from Gilchrist and Zakrajsek (2012). Gray shading indicates that countries representing two-thirds of world GDP are classified as in recession.
Source: Staff calculations.

Figure 2. Estimated Probability of Recession in the Global Economy over the Next 12 Months



Note: Gray shading indicates that countries representing two-thirds of world GDP are classified as in recession.
Source: Staff calculations.

Country-Specific Estimated Probability of Recession over the Next 12 Months

	Sep. 2015	Feb. 2016
Canada	25	28
Euro area	32	40
Japan	63	71
U.K.	11	42
Korea	11	14
Mexico	39	53

Note: Country-specific recession dates follow ECRI.
Source: Staff calculations.

- ***Japan.*** Real GDP surprisingly contracted 1.1 percent in the fourth quarter, driven mainly by a drop in consumption. That said, some recent indicators, including industrial production and employment, were more encouraging. Thus, we expect growth to rebound in the current quarter and to reach 1 percent for 2016 as a whole before a second hike in the consumption tax temporarily stalls the expansion in 2017. This forecast is slightly lower than our January Tealbook projection, reflecting weaker-than-expected data as well as appreciation of the yen and higher oil prices.

  Inflation is estimated to have declined to minus ½ percent at an annual rate in the current quarter because of lower retail energy prices. We now see inflation (excluding the direct effect of the consumption tax hike) moving up quite slowly and reaching only 1¼ percent by late 2017. In late January, the BOJ surprised markets by reducing its deposit rate 20 basis points to minus 0.1 percent, just a week after Governor Haruhiko Kuroda publicly ruled out using negative policy rates as an option. Japanese bond yields declined substantially, but the yen appreciated and bank stock prices fell sharply. Despite this mixed response, we expect the BOJ to cut the deposit rate further this year amid sluggish growth and inflation.

- ***United Kingdom.*** Real GDP growth edged up to 1.9 percent in the fourth quarter but fell short of our 2¼ percent forecast, as investment and exports disappointed. More recent data, such as PMIs, were weak. Accordingly, and despite a weaker exchange value for the pound, we revised down our GDP growth forecast nearly ½ percentage point this year. Part of this revision also reflects our view that, even though we assume U.K. citizens will vote in June to remain in the EU, uncertainty about the outcome of the Brexit referendum is weighing on economic activity. Indeed, confidence indicators have edged down recently, and we expect consumer and business spending to be curtailed ahead of the referendum. In the unlikely scenario that the referendum results in Britain leaving the EU, the negotiations on the new terms of the relations with the EU will likely be protracted, further damaging confidence and disrupting economic activity. With uncertainty about

Brexit expected to be resolved in June, GDP growth is projected to edge up to 2¼ percent by the end of 2016 and beyond.

After turning negative in the fourth quarter, inflation is expected to rebound to ½ percent in the current quarter. With energy prices projected to continue to rise, we expect inflation to increase to about 2 percent in the second quarter and beyond. Recent BOE communications have focused on concerns about weak wage growth and downside risks to the global economy. Accordingly, we now expect the BOE to delay raising its policy rate until the fourth quarter of 2016, one quarter later than assumed in the January Tealbook.

- ***Canada.*** Following a 2.4 percent expansion in the third quarter, real GDP increased only 0.8 percent in the fourth quarter. This drop-off mainly reflected oil-related declines in business investment, although inventories were also a drag. Indicators for the current quarter, such as the manufacturing PMIs, suggest that output is expanding at a slightly faster pace. We expect growth to rise to 1¾ percent in 2016 and to be around 2 percent thereafter, as oil prices move up further, monetary policy remains accommodative, and fiscal stimulus boosts activity. Our forecast for 2016 and 2017 is a bit below the January Tealbook projection, as the drag from the recent currency appreciation and the slightly weaker U.S. growth outlook is only partly offset by the boost from higher oil prices.

EMERGING MARKET ECONOMIES

- ***China.*** Recent indicators suggest that growth will step down to 6 percent in the current quarter from 7 percent in the fourth. In particular, a notable decline in exports, together with a slightly weaker PMI, points to slowing manufacturing growth in the current quarter. Declining turnover in China's stock market leads us to expect a further retrenchment in financial services growth. Our assessment is that Chinese authorities will keep the renminbi broadly stable against their preferred currency basket over the forecast period (see the box "Will China Devalue the Renminbi?" in the Financial Developments section).

We now see growth rising to 6½ percent in the third quarter—the bottom of the authorities' newly announced target range of 6.5 to 7 percent for this year—before slowing to about 6 percent in 2017. Policymakers signaled further monetary and fiscal easing to support growth, causing us to mark up our outlook a bit in the second half of this year. That said, further stimulus could exacerbate existing imbalances within the economy, potentially leading to more painful adjustments in the future. Indeed, after several years of decline, credit growth has risen notably since the middle of last year and surged in January.

We estimate that inflation, after turning negative in the fourth quarter, is rising to an annual rate of just under 1 percent in the first quarter, owing primarily to a normalization of food price inflation. Rising oil prices led us to revise up inflation over the next few quarters. We now see inflation rising to 2¾ percent by the end of this year before settling at 2½ percent in 2017 and beyond.

- ***Other Emerging Asia.*** Real GDP growth slowed to 3 percent in the fourth quarter, a bit below our January Tealbook forecast. The deceleration in activity is, in part, a result of weaker growth in **Korea**, where the fiscal stimulus enacted following the MERS (Middle-East Respiratory Syndrome) outbreak has faded, and in **Hong Kong**, where reduced tourism spending from mainland China weighed on activity. In contrast, domestic demand strengthened in many other economies in the region, leading to surprisingly robust growth in **Taiwan**, **Indonesia**, the **Philippines**, and **Malaysia**, even as exports remained weak. The weakness in exports has persisted into the current quarter, but PMI readings through February edged up above their fourth-quarter levels. We expect growth in the region to pick up to 3½ percent in the current quarter and 4 percent by midyear, supported by stronger growth in the advanced economies and accommodative policies. This projection is ¼ percentage point lower this year, dragged down in part by weaker growth in the United States and the AFEs, and little changed thereafter.

- ***Latin America.*** **Mexican** real GDP growth slowed to 2.2 percent in the fourth quarter, as we had expected. Demand-side components have not been

released, but monthly data suggest that external demand softened, as U.S. manufacturing production stagnated and petroleum shipments declined. We expect growth to remain at 2¼ percent this quarter but to rise to almost 3 percent by 2017, supported by a depreciated peso and past economic reforms. This projection is revised down slightly this year—particularly in the first half—in response to the downward revision to U.S. manufacturing production. We revised current-quarter inflation down ½ percentage point to 2½ percent because of declines in transport prices. Inflation should move up to 3¼ percent in the third quarter and beyond. Despite inflation that remains squarely within its target range, the Bank of Mexico raised its policy rate 50 basis points in mid-February, citing concerns about the effect of peso depreciation on inflation going forward.

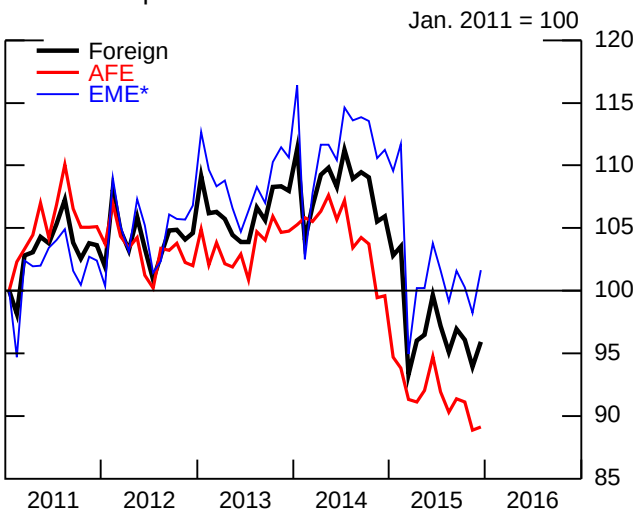
In **Brazil**, real GDP plummeted a somewhat larger-than-expected 5.7 percent in the fourth quarter, marking the fourth consecutive quarter of declining activity and closing out a year in which GDP fell 6 percent. Fixed investment continued to plunge, and private consumption weakened amid rising unemployment. In the current quarter, we expect the economy to continue contracting, albeit at a slower pace. Although still depressed, both consumer and business confidence have improved a bit so far this year, and the manufacturing PMI and industrial production have edged up. We do not see Brazilian growth turning positive until 2017, as political tensions weigh on the economy and obstruct policy responses to the recession. Former President Lula was questioned in relation to the corruption scandal at Petrobras, adding fuel to the growing expectation that current President Dilma Rousseff will be forced to step down. Despite the weak economy, the substantial depreciation of the *real* and hikes in administered prices pushed inflation up to an estimated 11 percent at an annual rate in the current quarter. We see inflation declining to 5½ percent by mid-2017, as monetary policy remains tight.

Argentina's newly elected government has taken major strides to address the country's economic problems and mend its relationship with the international community. Most recently, Argentina reached agreement in principle with the

remaining holdout creditors who had refused to participate in the 2005 and 2010 debt restructurings. The Argentine congress is expected to approve the agreement, which will remove the last hurdle in the country's path toward renormalizing its access to international capital markets. We expect the economic reforms of the new government, including fiscal consolidation, to restrain growth this year, but further out, improved confidence in the government's commitment to the reforms will begin to bear fruit. Thus, we lowered growth a bit to 1¾ percent this year and raised it almost 1 percentage point thereafter to almost 3½ percent. Elsewhere in South America, **Venezuela**'s real GDP plunged 7.3 percent in the fourth quarter, and growth is estimated to have come in weaker than expected in **Chile** and **Colombia**. The region's economic malaise reflects, in part, the challenges posed by low commodity prices, which are proving more difficult than previously expected.

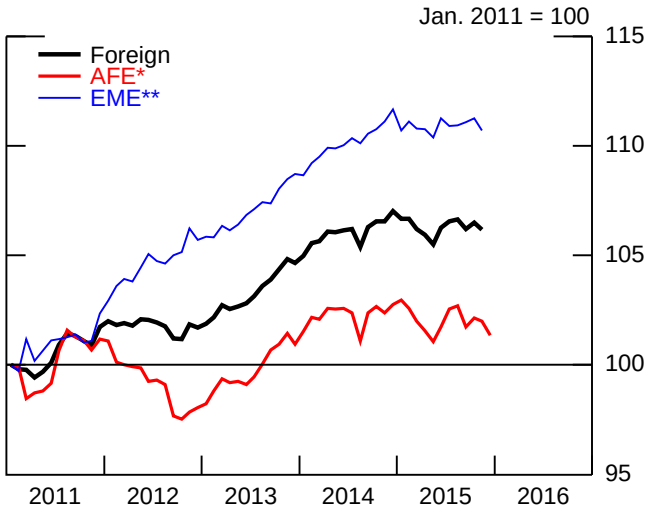
Recent Foreign Indicators

Nominal Exports



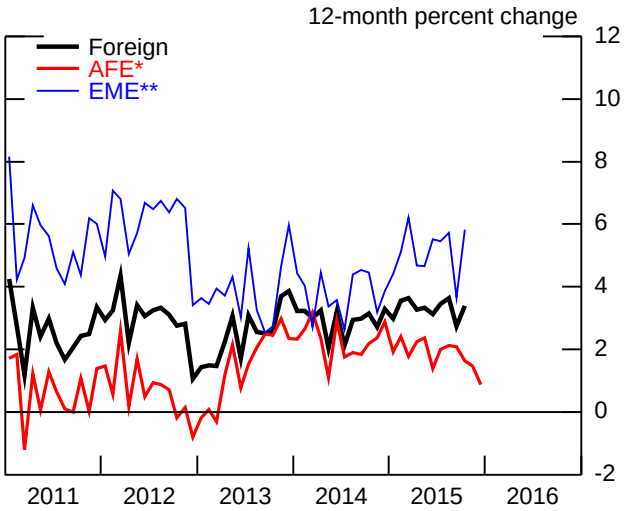
* Excludes Venezuela and Argentina.

Industrial Production



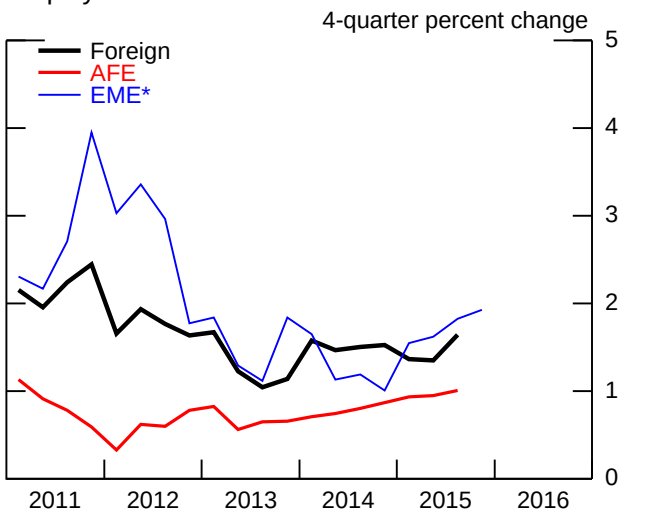
* Excludes Australia and Switzerland.
** Excludes Venezuela, Hong Kong, and Colombia.

Retail Sales



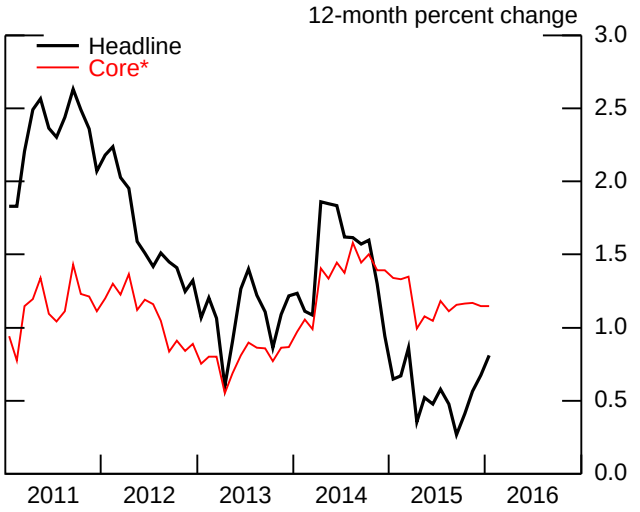
* Excludes Australia.
** Includes Brazil, Chile, China, Indonesia, Korea, Mexico, Singapore, and Taiwan.

Employment



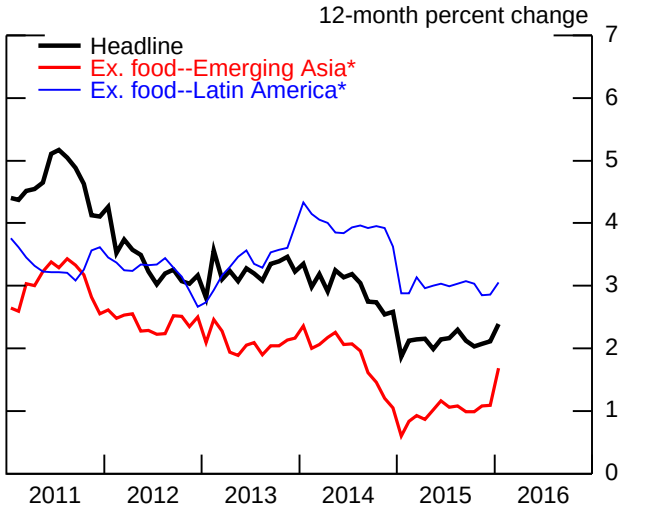
* Excludes Argentina, China, and Venezuela.

Consumer Prices: Advanced Foreign Economies



Note: Excludes Australia, Sweden, and Switzerland.
* Excludes all food and energy; staff calculation.
Source: Haver Analytics and CEIC.

Consumer Prices: Emerging Market Economies



* Excludes all food; staff calculation. Excludes Argentina and Venezuela.

Int'l Econ Devel & Outlook

The Foreign GDP Outlook

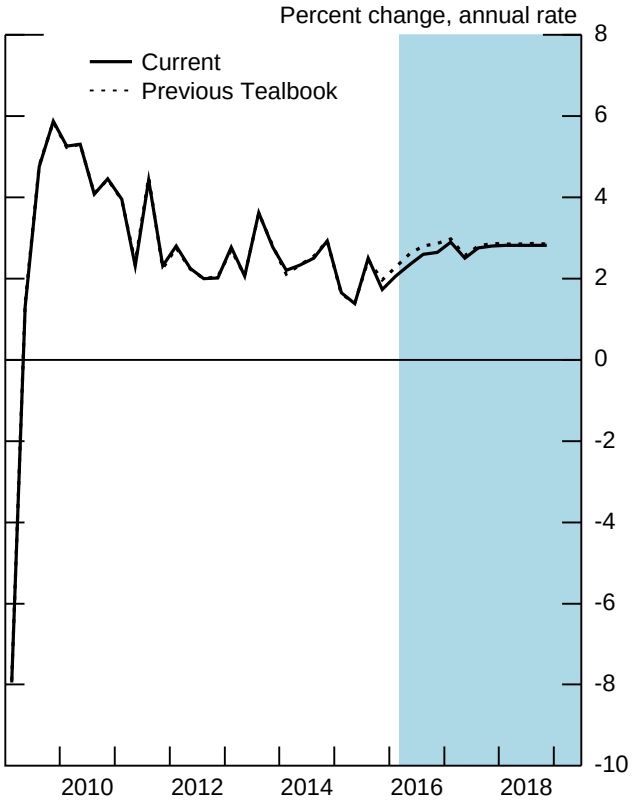
Real GDP*

Percent change, annual rate

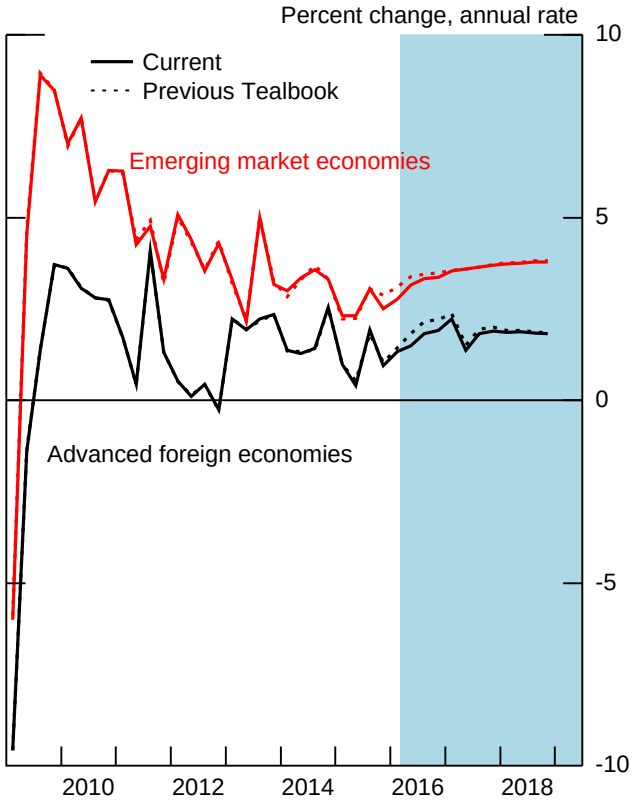
	2015			2016			2017	2018
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	**1.5**	**2.5**	**1.7**	**2.1**	**2.3**	**2.6**	**2.7**	**2.8**
Previous Tealbook	*1.5*	*2.5*	*2.0*	*2.3*	*2.6*	*2.8*	*2.8*	*2.9*
2. Advanced Foreign Economies	**0.7**	**1.9**	**0.9**	**1.3**	**1.5**	**1.9**	**1.8**	**1.9**
Previous Tealbook	*0.8*	*1.8*	*1.0*	*1.4*	*1.8*	*2.2*	*2.0*	*1.9*
3. Canada	-0.6	2.4	0.8	1.2	1.5	2.0	2.0	1.8
4. Euro Area	1.9	1.2	1.3	1.4	1.5	1.8	2.0	2.0
5. Japan	1.5	1.4	-1.1	0.8	0.9	0.9	-0.4	1.0
6. United Kingdom	2.1	1.7	1.9	1.9	1.9	2.2	2.3	2.2
7. Emerging Market Economies	**2.3**	**3.1**	**2.5**	**2.8**	**3.2**	**3.4**	**3.6**	**3.8**
Previous Tealbook	*2.2*	*3.1*	*2.9*	*3.1*	*3.4*	*3.5*	*3.6*	*3.8*
8. China	6.5	7.2	7.0	6.0	6.3	6.4	6.1	6.0
9. Emerging Asia ex. China	2.7	3.6	2.9	3.6	3.9	4.0	4.1	4.1
10. Mexico	2.3	3.3	2.2	2.3	2.6	2.7	2.8	2.9
11. Brazil	-5.7	-6.7	-5.7	-3.0	-1.0	-0.1	1.4	2.1

* 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

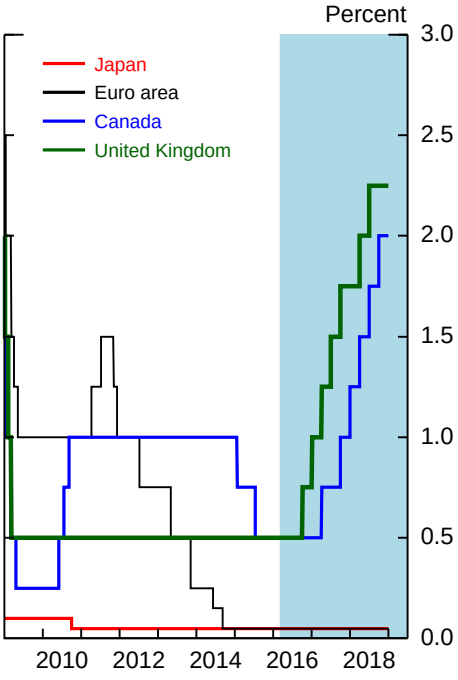
	2015			2016			2017	2018
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	**1.4**	**2.0**	**1.1**	**1.2**	**2.1**	**2.3**	**2.5**	**2.4**
Previous Tealbook	*1.4*	*2.0*	*1.0*	*1.4*	*2.0*	*2.3*	*2.5*	*2.5*
2. Advanced Foreign Economies	**0.6**	**0.6**	**0.2**	**-0.0**	**0.9**	**1.3**	**1.8**	**1.7**
Previous Tealbook	*0.6*	*0.7*	*0.1*	*-0.1*	*0.9*	*1.4*	*1.9*	*1.7*
3. Canada	1.1	2.0	0.9	1.7	1.6	1.7	2.0	2.0
4. Euro Area	0.5	-0.2	-0.1	-1.3	0.7	1.2	1.5	1.5
5. Japan	0.6	0.0	-0.1	-0.6	-0.1	0.6	2.4	1.3
6. United Kingdom	-0.3	1.0	-0.3	0.5	2.2	1.9	2.0	2.0
7. Emerging Market Economies	**2.0**	**3.0**	**1.7**	**2.1**	**3.0**	**3.1**	**3.0**	**3.0**
Previous Tealbook	*2.0*	*3.0*	*1.7*	*2.5*	*2.8*	*3.0*	*3.0*	*3.0*
8. China	1.4	3.1	-0.2	0.9	2.6	2.7	2.6	2.5
9. Emerging Asia ex. China	1.4	1.4	2.5	1.9	2.7	3.0	3.1	3.2
10. Mexico	1.9	2.8	2.4	2.5	3.0	3.2	3.2	3.2
11. Brazil	10.6	10.1	10.3	11.1	6.9	6.2	5.5	5.4

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

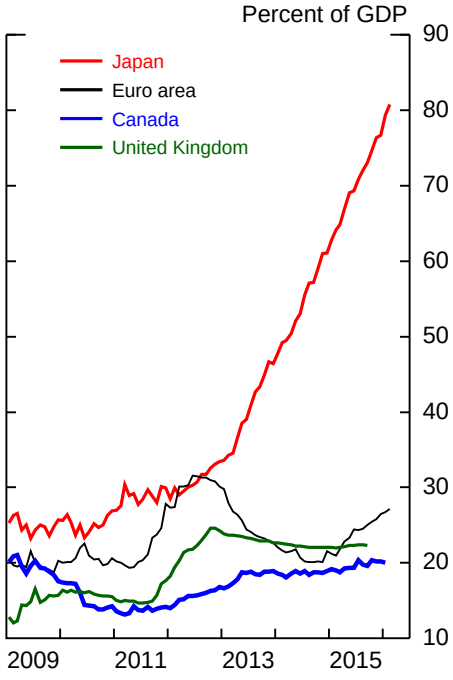
Int'l Econ Devel & Outlook

Foreign Monetary Policy

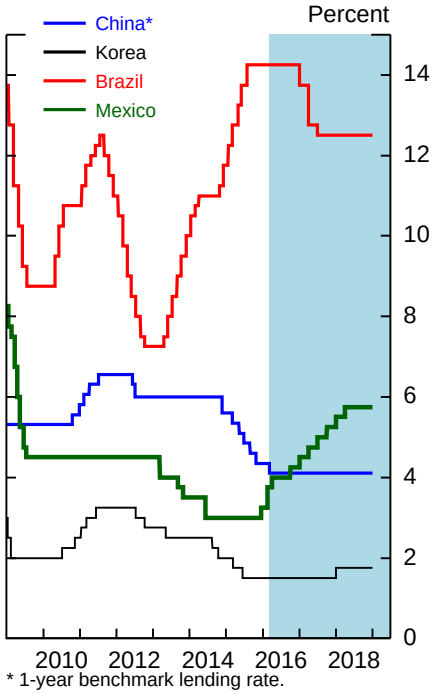
AFE Policy Rates



AFE Central Bank Balance Sheets



EME Policy Rates

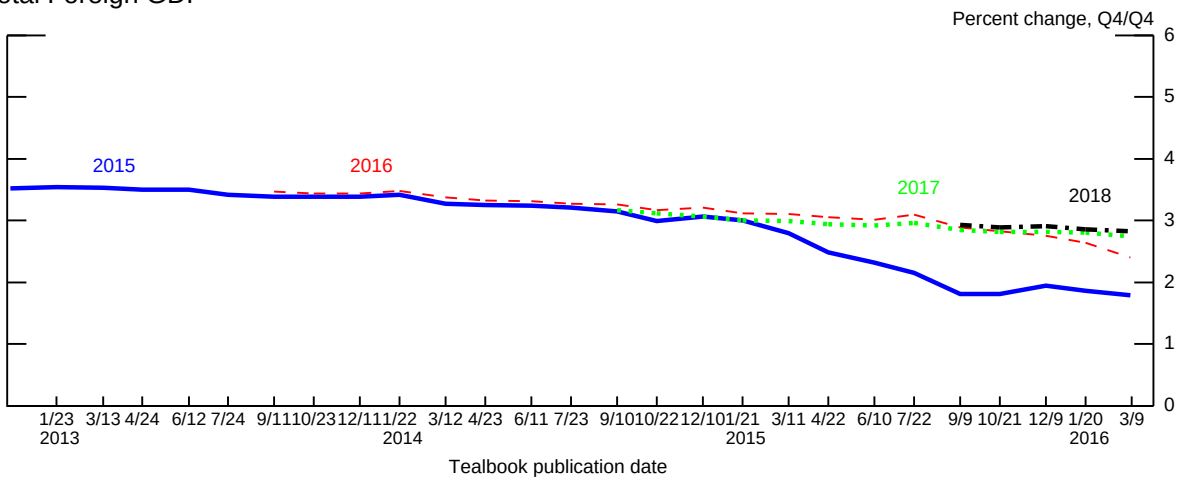


* 1-year benchmark lending rate.

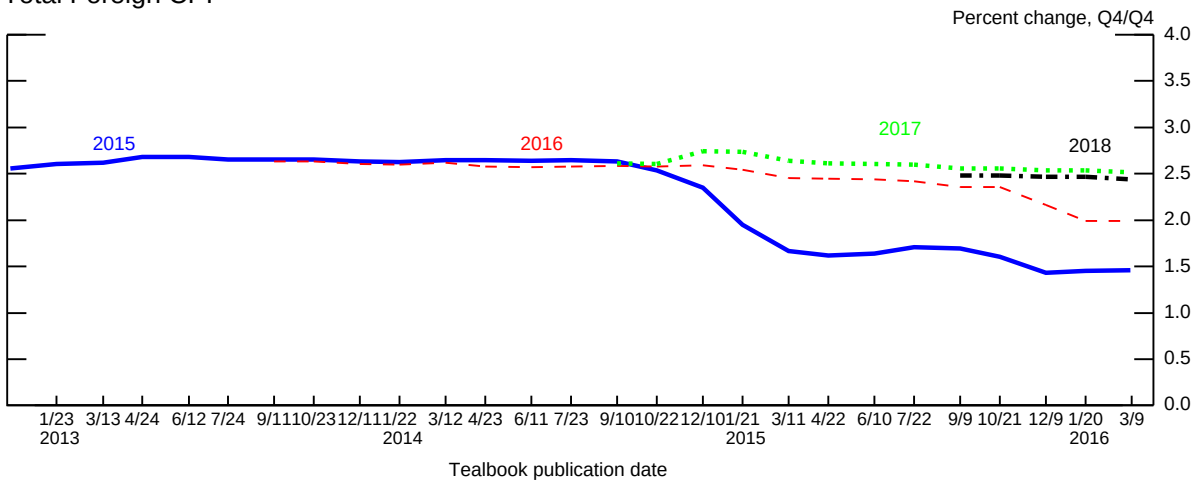
Int'l Econ Devel & Outlook

Evolution of Staff's International Forecast

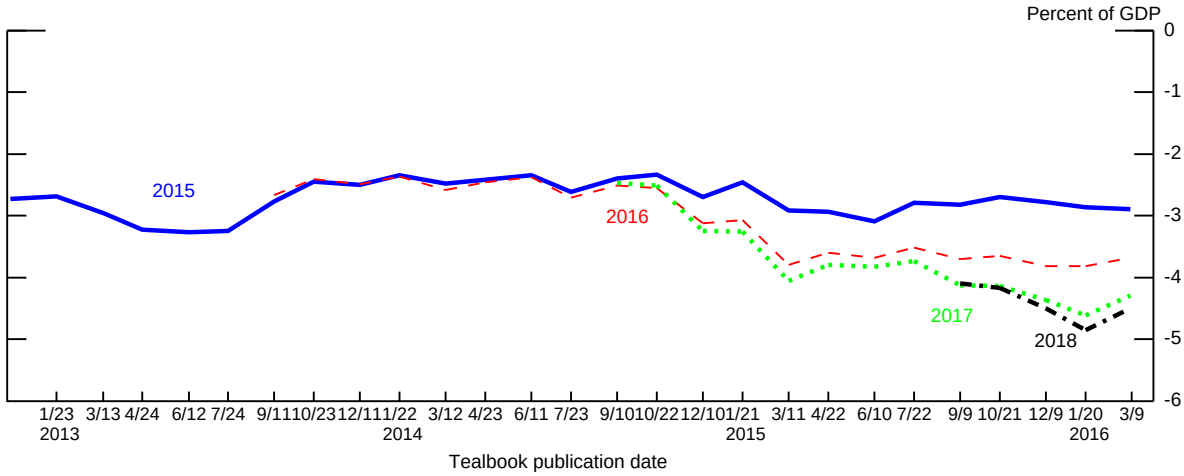
Total Foreign GDP



Total Foreign CPI



U.S. Current Account Balance



Financial Developments

Investor risk sentiment improved, on net, over the intermeeting period, with domestic stock prices up, the VIX down, and credit spreads on speculative-grade bonds narrower. However, yields on longer-dated nominal Treasury securities declined, reflecting in part expectations of more accommodative foreign monetary policy and perceptions of an increased possibility of a lower or even negative domestic policy rate.

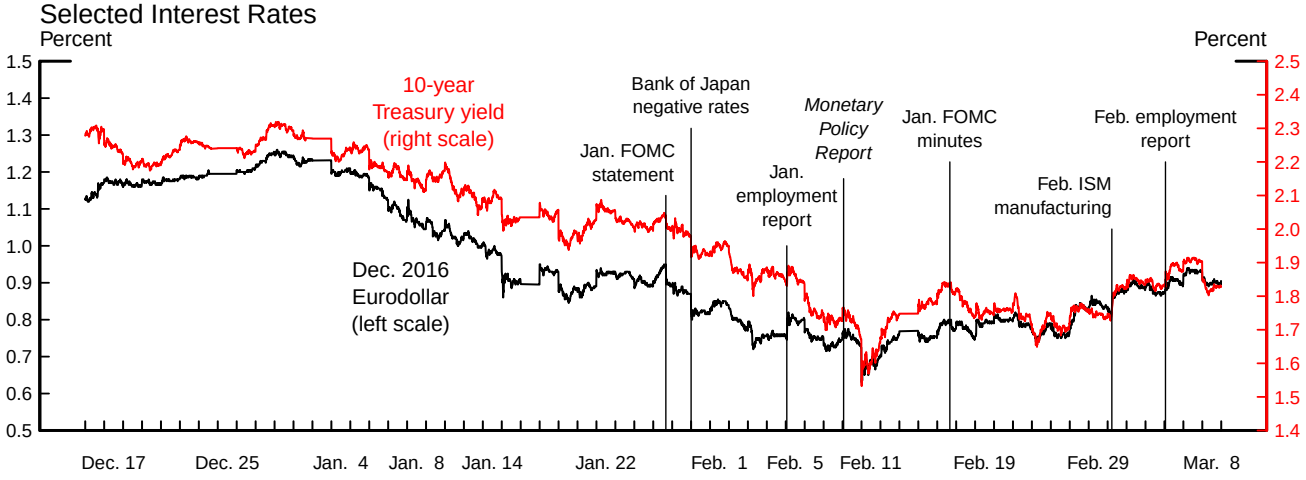
In particular, the net changes in financial markets over the current intermeeting period were as follows:

- The S&P 500 index increased 4 percent over the period, and the VIX declined to a level close to its long-run historical median.
- Spreads on investment-grade bonds were about unchanged, while speculative-grade risk spreads dropped, more so for the lowest-rated credits.
- Oil prices climbed appreciably, apparently contributing to a rise in medium-term market-based measures of inflation compensation.
- Longer-term nominal Treasury yields moved down, on net, while domestic policy rate expectations declined a bit. The risk-neutral probability of a policy tightening at the March meeting ebbed further over the period and currently stands at about 6 percent.

To extend the time frame to late last year, markets seemed to take the FOMC's decision to tighten policy at the December meeting in stride, and financial markets were fairly quiet through year-end. However, in early January, investors seemed to become much more concerned about the global economic outlook and associated downside risks. Uncertainties about the Chinese economy and exchange rate policy triggered a sharp reduction in risk-taking, and global equity prices decreased. Those moves were accompanied by declining oil prices and concerns about the possibility and implications of widespread negative rates. The angst in global financial markets—reinforced by some unsettling news about the health of European banks—extended through mid-February, with investors marking down the expected path of policy in the United States and many other countries, sovereign yields moving appreciably lower, and risk spreads widening.

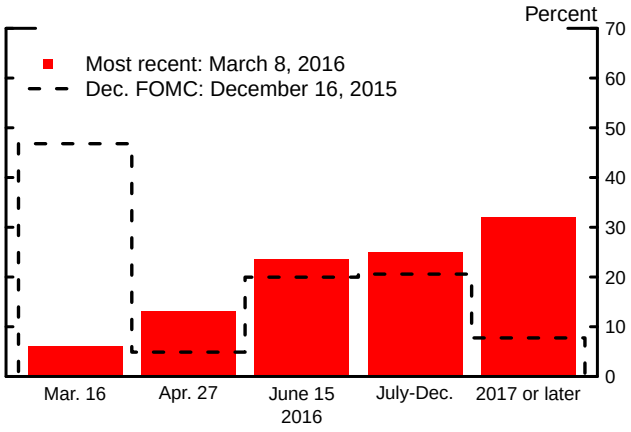
Policy Expectations and Treasury Yields

Selected Interest Rates



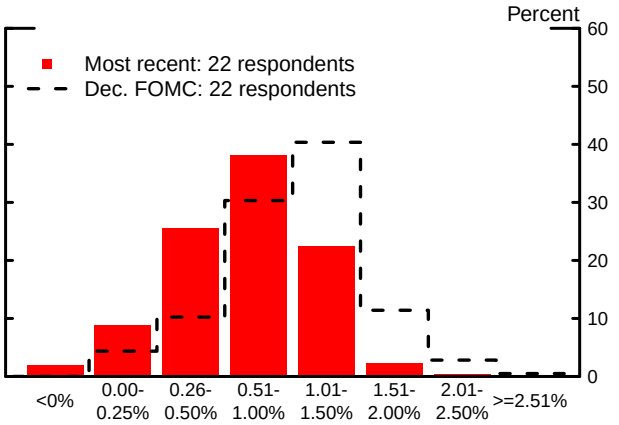
Note: 5−minute intervals, 8:00 a.m. to 4:00 p.m.
Source: Bloomberg.

Implied Probability Distribution of Timing of the Next Rate Increase



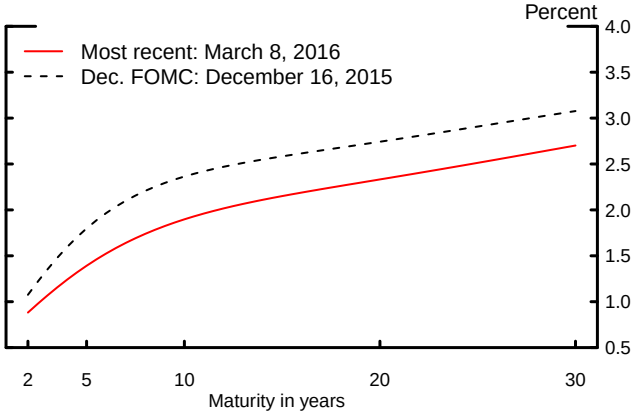
Note: Implied by federal funds futures. Assumes that investors expect the federal funds rate to trade at the expected rate implied by futures contracts until the next FOMC meeting.
Source: CME Group; Federal Reserve Board staff estimates.

Survey Responses on Target Federal Funds Rate by Year-End 2016



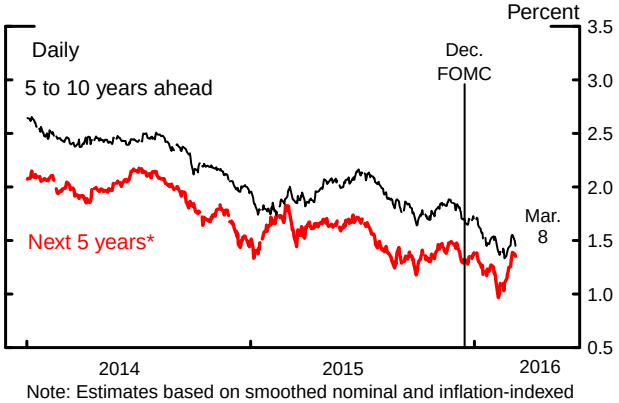
Note: Unconditional distribution of the federal funds rate.
Source: Desk's primary dealer survey from March 8, 2016.

Treasury Yield Curve



Note: Smoothed yield curve estimated from off-the-run Treasury coupon securities. Yields shown are those on notional par Treasury securities with semiannual coupons.
Source: Federal Reserve Bank of New York; 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.

Financial Developments

Since mid-February, however, investor concerns about the global economic outlook have abated somewhat. Equity and oil prices have rebounded notably, and risk spreads have narrowed. The factors underlying the improvement in investor sentiment are not completely clear. In part, investors may have concluded that increased risk aversion earlier in the year was overdone and not fully consistent with fundamentals. In addition, central banks have generally signaled a willingness to provide more accommodation as needed, while incoming economic data in the United States have been somewhat better than expected.

On balance since the December FOMC meeting, domestic stock prices are down and Treasury yields are markedly lower, suggesting lingering concerns about global growth and inflation prospects. Domestic policy expectations are also notably lower. In addition, speculative-grade debt issuance remained relatively light, aggregate corporate earnings forecasts were marked down significantly, and corporate credit quality showed signs of weakening further, even outside the energy sector. In contrast, credit conditions for households stayed accommodative overall.

POLICY EXPECTATIONS AND TREASURY YIELDS

FOMC communications were mostly seen as in line with expectations over the current intermeeting period. However, policy expectations declined somewhat following the release of the January FOMC statement, as investors reportedly interpreted it as suggesting that the Committee was concerned about recent global developments and their potential implications for the U.S. economic outlook. The Chair's congressional testimony and the release of the January FOMC minutes elicited limited market reaction.

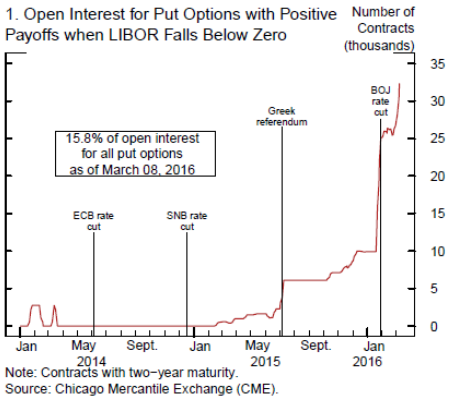
Early in the intermeeting period, the Bank of Japan introduced a negative deposit rate, after which market participants became increasingly attentive to the possibility of negative short-term interest rates in the United States. (See the box "The Prospect of Negative Interest Rates in the United States and Implications for Longer-Term Yields.") The odds of a policy hike at the March meeting, which were already low at the beginning of the intermeeting period, receded further to less than 10 percent. The path of the federal funds rate implied by OIS quotes was roughly unchanged for 2016 but declined at longer horizons, with projected rates at the end of 2016 and the end of 2017 at about 60 basis points and 80 basis points, respectively.

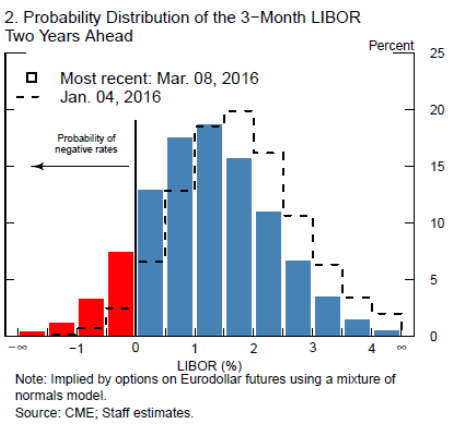
The Prospect of Negative Interest Rates in the United States and Implications for Longer-Term Yields

Following the recent decisions by the Bank of Japan (BOJ) and the Riksbank to cut key policy rates either into or further into negative territory, market participants have speculated about the possibility that the Federal Reserve might similarly adopt a negative rate policy should the U.S. economic outlook deteriorate sharply. Such speculation is likely to be reflected in asset prices and has indeed shown up in traders' positions. As shown in figure 1, the number of outstanding contracts, or "open interest," on Eurodollar futures options with a two-year horizon that pay off when the three-month LIBOR rate falls below zero had begun to move up around the Greek bailout referendum in July 2015 but surged around the BOJ's unexpected announcement on January 29.[1] Currently, the number of contracts placed on negative rates accounts for a nontrivial 16 percent of all outstanding Eurodollar futures put options of the same maturity.

Figure 2 shows the implied risk-neutral probability distribution for the three-month LIBOR rate two years ahead.[2] This so-called risk-neutral probability reflects not only the actual perceived odds of negative rates, but also the premiums that investors are willing to pay to insure against such outcomes.[3] The figure shows that the distribution has shifted notably to the left since the beginning of the year. As highlighted by the red bars, current option prices embed a substantial risk-neutral probability of the three-month LIBOR rate being negative in two years' time.

The evolution over time of the risk-neutral probability of negative rates is shown in figure 3 on the next page, with the red dot representing the sum of the red bars in figure 2. The probability of negative rates was low and relatively stable throughout the second half of last year, including during the market turmoil last summer. However, since the beginning of the year, the probability has risen substantially amid renewed market stress and the BOJ's unexpected move. The probability peaked at just over 20 percent in early February and, although subsiding somewhat of late, remains above its level at the time of the December and January FOMC meetings.





[1] We use Eurodollar futures options because, for the two-year horizon that we consider, federal funds futures options are less liquid and the data on those contracts are therefore less reliable.

[2] The distribution is estimated using all outstanding Eurodollar futures options with this maturity.

[3] Although it is difficult to quantify the size of these premiums, the premiums are likely to be negative because of the insurance value of these contracts. Therefore, our risk-neutral probabilities likely overestimate the true probability of rates being negative at the options' maturity date.

The prospect of negative short-term interest rates could also have an effect on longer-term yields. First, the possibility of the policy rate turning negative in the future would lower the average expected future short rate component of longer-dated yields, even when the modal expected policy path remains unchanged. Second, the potential for negative rates could also push down term premiums through at least two channels: (1) Fixed-income investors might be prompted to extend the duration of their assets to maintain positive yields, and (2), with negative rates, Treasury prices could be pushed higher than would otherwise be possible in the event of an adverse shock to the economy. This potential for larger price gains in adverse scenarios could make Treasury securities more attractive as hedging instruments against losses on other financial assets and enhance their "safe haven" value. These effects could in part explain some of the increases in implied volatility of longer-dated Treasury securities since early February.

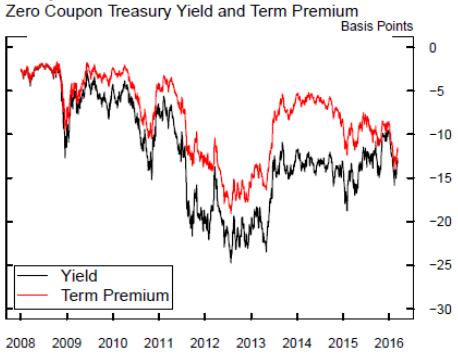
Figure 4 shows results from staff analysis that explores the effect on the 10-year zero-coupon nominal Treasury yield and its term premium component should the FOMC have unexpectedly announced at any given time since 2008 that it would allow the target range for the federal funds rate to fall to between negative 25 and negative 50 basis points.[4] The black line shows that such an announcement would have pushed down yields by as much as 25 basis points in 2012 and 2013. Its current effect is estimated to be around minus 15 basis points. The red line shows that the decline in yields would have occurred mainly through the term premium channel during most of the sample, with a smaller negative contribution from declines in average expected rates (not shown).

All told, market participants appear to be pricing in a nonnegligible probability of short-term rates turning negative in the United States in the medium term. This development is likely putting downward pressure on longer-dated Treasury yields through the expectations components and, more importantly, through the term premium components of yields, which may help explain some of the recent decline in longer-term yields.

3. Probability of the 3-Month LIBOR Rate Turning Zero or Negative, Two Years Ahead

Note: Implied by options on Eurodollar futures using a mixture of normals model.
Source: CME; Staff estimates.

4. Projected Announcement Effect on 10-Year Nominal Zero Coupon Treasury Yield and Term Premium

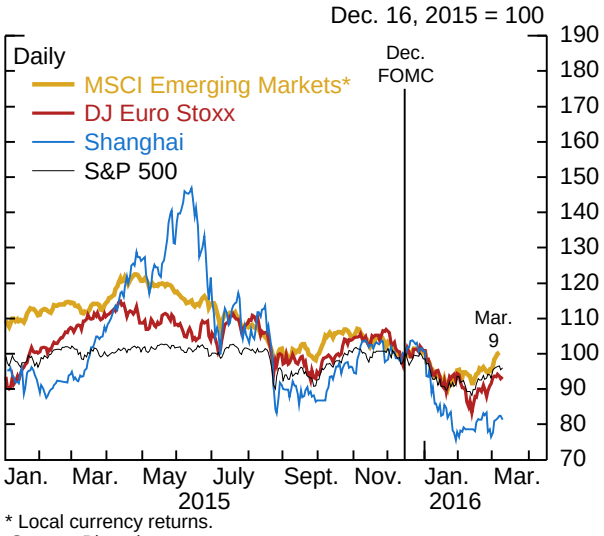


Source: Staff estimates.

[4] The analysis is based on a shadow-rate model of U.S. Treasury yields, a variant of the model discussed in appendix B of Marcel A. Priebsch (2013), "Computing Arbitrage-Free Yields in Multi-Factor Gaussian Shadow-Rate Term Structure Models," Finance and Economics Discussion Series 2013-63 (Washington: Board of Governors of the Federal Reserve System, September), www.federalreserve.gov/pubs/feds/2013/201363/201363pap.pdf. For each date, the model-implied change in yields and term premiums resulting from a reduction in the lower bound to minus 37½ basis points is computed, holding the expected path of the shadow short rate fixed. For greater (lesser) hypothetical reductions in the lower bound, the results will correspondingly be more (less) pronounced.

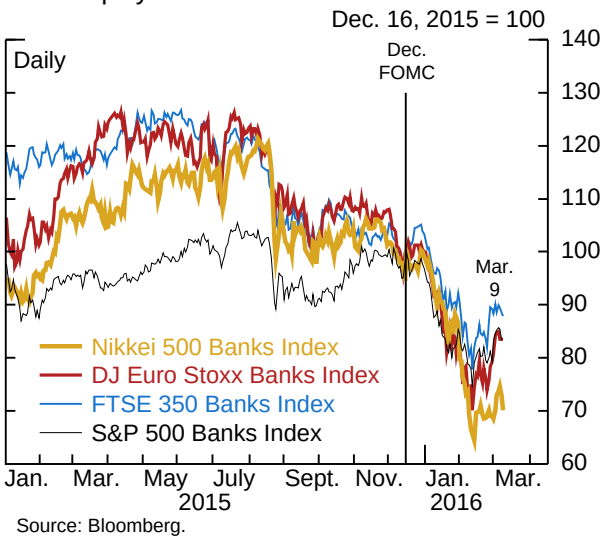
Foreign Developments

Stock Price Indexes



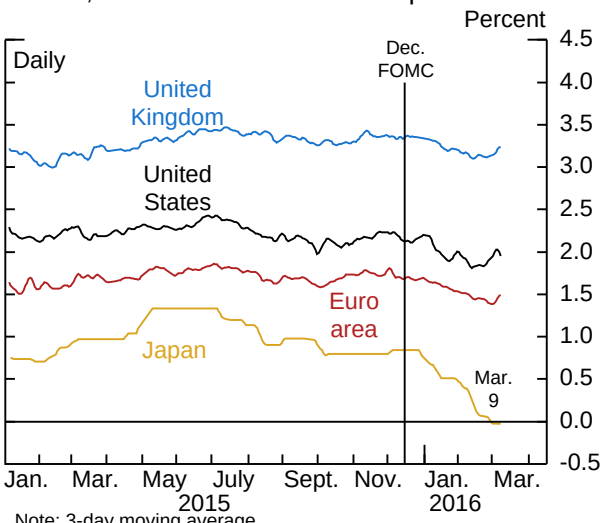
* Local currency returns.
Source: Bloomberg.

Bank Equity Indexes



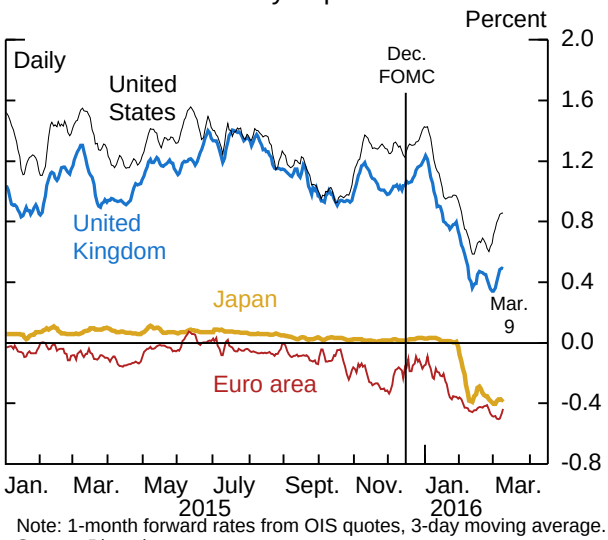
Source: Bloomberg.

5-Year, 5-Year-Ahead Inflation Expectations



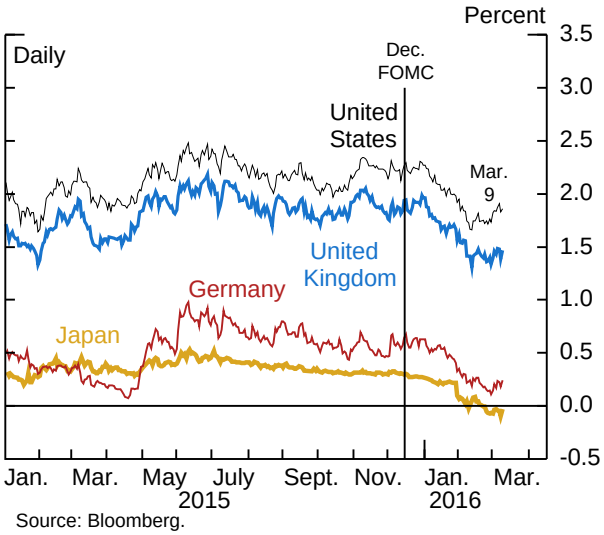
Note: 3-day moving average.
Source: Barclays.

24-Month-Ahead Policy Expectations



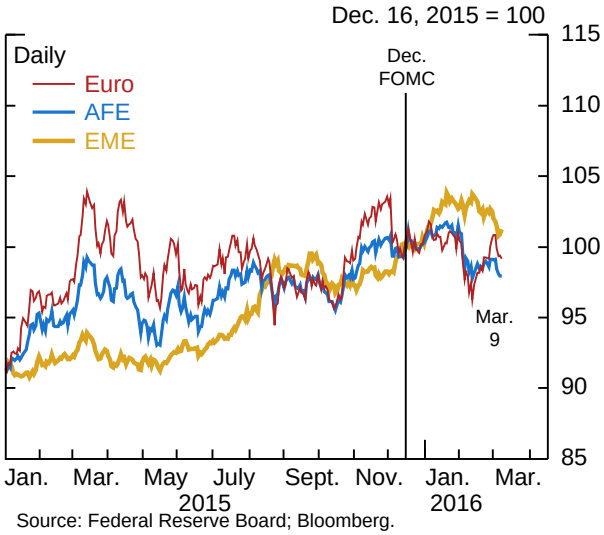
Note: 1-month forward rates from OIS quotes, 3-day moving average.
Source: Bloomberg.

AFE and U.S. 10-Year Nominal Benchmark Yields



Source: Bloomberg.

Dollar Exchange Rate Indexes



Source: Federal Reserve Board; Bloomberg.

The median dealer in the Desk's March Survey of Primary Dealers judged that the federal funds rate could fall to as low as negative 12½ basis points in a future lower-bound episode. Since the January survey, the median dealer's probability estimate of an increase in the target federal funds range at the FOMC's March meeting has fallen to 5 percent, and the year-end expectations for the federal funds rate for 2016 and 2017 have declined 25 basis points and 50 basis points, respectively.

Yields on medium- and long-term Treasury securities fell early in the intermeeting period, continuing a trend that began around the turn of the year. While the 10-year Treasury yield has recently risen a little, it ended the period down 16 basis points.[1] Staff models attribute roughly two-thirds of the decline in longer-dated Treasury yields to lower term premiums. Near-term uncertainty about longer-term interest rates, as measured by swaption-implied volatilities, remained elevated following notable spikes in early February, possibly reflecting in part increased investor speculation about negative rates in the United States.

TIPS-based inflation compensation for the next five years rose 13 basis points over the intermeeting period, boosted by somewhat stronger-than-expected economic data releases in recent weeks. Even so, 5-to-10-year TIPS-based inflation compensation is about 25 basis points below its level at the time of the December FOMC meeting. Measures of forward inflation compensation based on inflation swaps are about unchanged over the current intermeeting period.

FOREIGN DEVELOPMENTS

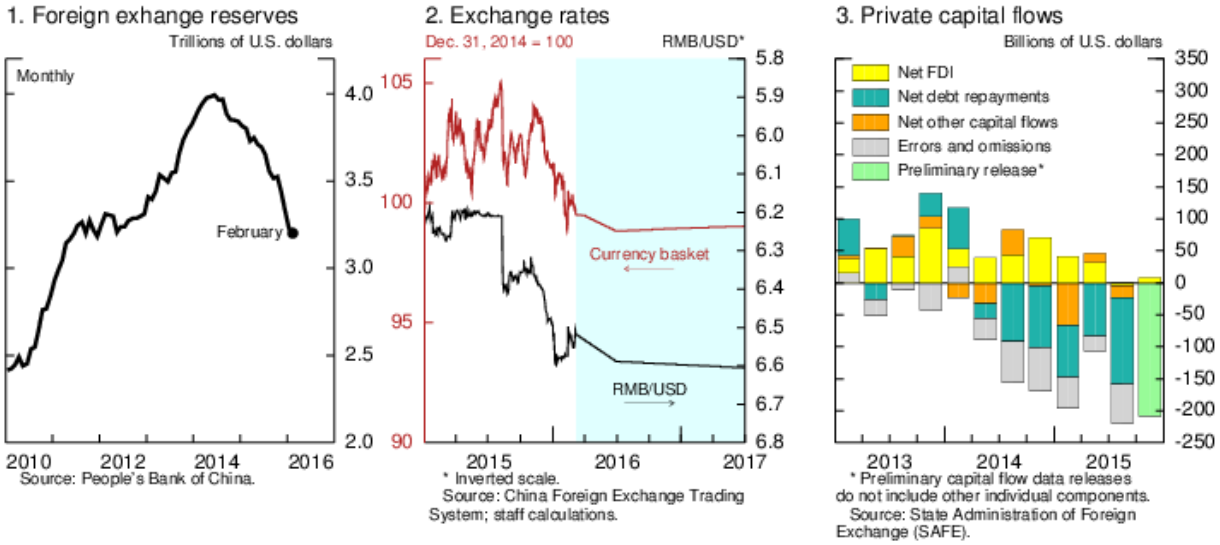
Although global financial conditions have improved since mid-February, they are still worse than at the time of the December FOMC meeting. In early January, developments in Chinese financial markets and declining oil prices ignited fears of a global growth slowdown, which were followed in early February by heightened concerns about stresses in advanced-economy banking sectors. Recent renminbi stability seems to have calmed investors, as has the rebound in oil prices. (See the box "Will China Devalue the Renminbi?") Although global risk assets have largely recovered from their

[1] Since the January FOMC meeting, the Treasury auctioned to the public $238 billion of Treasury nominal fixed-rate securities, $7 billion of Treasury Inflation-Protected Securities, and $28 billion of two-year Floating Rate Notes.

Will China Devalue the Renminbi?

Although calm has returned to Chinese markets in recent weeks, many market participants remain focused on the possibility that the Chinese authorities will be forced to allow a sharp depreciation of the renminbi (RMB) not just against the dollar but against a broad range of currencies. Implied volatilities and risk reversals also suggest that markets continue to attach a significant probability to such an outcome. In particular, many view China's foreign exchange intervention, which has been supporting the RMB at the cost of a significant loss of international reserves, as unsustainable in the face of accelerating capital outflows (figure 1). As described below, we believe that these outflows will remain sufficiently contained to allow the authorities to maintain the stability of the RMB, although we acknowledge that this is an uncertain call.

One key factor behind the recent pickup in capital outflows is that the Chinese authorities have guided the RMB lower—first with a surprise devaluation in August and then again from November through early January, as can be seen in figure 2—creating confusion about the authorities' motives and raising expectations of further depreciation. However, more recently, the People's Bank of China (PBOC) has stepped up its intervention, leading the RMB against the dollar, the black line in figure 2, to bottom out and then rise somewhat. This move was followed by PBOC communications that it saw no need for a large depreciation of the currency, and that while its long-term goal is to move to a managed float, its near-term goal is to maintain a roughly stable currency managed with reference to its announced currency basket (the red line in figure 2). Although the authorities continue to struggle to clearly articulate their exchange rate strategy, these actions appear to have helped reduce downward pressure on the currency: Since Chinese markets reopened after the Lunar New Year holiday in February, the RMB has remained relatively stable against the PBOC's basket. We expect RMB stability to lessen the impetus for capital outflows, as fears of a sharper devaluation subside.



Another reason to expect capital outflows to abate is that a significant share of the uptick in these flows reflect repayments of debt, particularly short-term bank loans, owed to nonresidents (see the teal bars in figure 3). The stock of this debt accumulated rapidly from 2010 to early 2014 as the gradual appreciation of the RMB against the dollar fueled bets on further appreciation. This dynamic reversed in mid-2014 as the RMB stopped appreciating against the dollar, and the reversal accelerated as the risk of depreciation increased. Bank for International Settlements (BIS) banking statistics suggest that short-term claims of foreign banks on Chinese residents have declined about $250 billion since mid-2014, bringing the stock of these claims to about $600 billion, around its mid-2013 level.

To be sure, as shown in figure 3, other capital outflows have picked up as well. Although the vast majority of China's domestic savings are essentially locked up in the domestic banking system by the authorities' vast arsenal of capital controls, a pickup in the net errors and omissions component of the balance of payments, the gray bars, suggests that these controls are nonetheless quite leaky. These outflows are potentially more volatile, and because they are more likely to occur through unregulated channels, the potential magnitude of such outflows is difficult to assess.

The authorities should be able to avoid a large devaluation, however, even if private capital continues to flow out at a moderate pace. China's current account surplus ($300 billion in 2015) provides a substantial buffer, as does its $3.2 trillion in reserves.[1] Moreover, the authorities face strong disincentives to attempt to devalue the RMB in an effort to stanch the loss of reserves. First, it would undermine a prior commitment to exchange rate stability, reducing Chinese authorities' credibility and leading markets to expect further depreciation. Second, bearing this in mind, markets would likely interpret such a move as a sign that the underlying strength of the Chinese economy is much weaker than the GDP data suggest. This interpretation in turn would likely have destabilizing consequences for global financial markets, which, at least in the short run, would adversely affect demand for Chinese exports.

In light of these considerations, while we see a sharp devaluation as a risk, our assessment is that a devaluation is neither warranted nor very likely, barring a pronounced deterioration in economic conditions. Accordingly, our best guess is that the RMB will remain broadly stable against the PBOC's currency basket in the near term, although this means we expect the RMB to depreciate somewhat against the dollar. But if the risks of a pronounced slowing of China's economy, possibly turning into a hard landing, should materialize, a depreciation would be more likely. As such, we will continue to closely monitor risks associated with the Chinese economy and their implications for both the U.S. and global economies.

[1] These reserves are above the upper end of the International Monetary Fund's reserve adequacy range for China, which we estimate to be roughly $2.5 trillion, although it bears noting that investors often get nervous when reserves get near some perceived adequacy threshold.

mid-February lows as these concerns have eased, advanced-economy sovereign yields and policy expectations remain noticeably lower.

Global equity price indexes have been volatile since year-end. Equity indexes fell through the middle of February but subsequently recovered as investor sentiment improved. Since the January FOMC meeting, equity prices are up, on average, 13 percent in the emerging market economies and as much as 8 percent in advanced economies. However, most equity indexes in advanced economies are still lower on the year. Bank stocks have been especially affected, reflecting concerns about weak economic growth, poor asset quality, and the effect on margins of low and negative policy interest rates. Litigation costs and risks to investors from enhanced bail-in rules have been an additional drag on the stock and debt prices of European banks.

Amid low oil prices and worries about global growth, inflation compensation has moved lower in the euro area and particularly in Japan. Market-based measures of policy expectations also declined markedly. U.K. and Japanese 24-month-ahead policy expectations have moved down about 35 basis points since the January FOMC meeting, while euro-area equivalents have decreased about 8 basis points. Some of the downward shift in policy expectations is the result of central bank actions. The Bank of Japan introduced a negative deposit rate at its January policy meeting, and Sweden's Riksbank cut its repo rate in February deeper into negative territory. Market reaction to the negative rate moves was mixed, as investors weighed the benefits of additional stimulus against the effect on bank profitability and fears that central banks are running out of tools to boost growth and inflation. Long-term yields in advanced economies declined accordingly, with U.K. and German 10-year yields lower by about 25 basis points over the intermeeting period, while the 10-year yield in Japan fell to a remarkable minus 7 basis points.

The broad dollar index has weakened by about 2½ percent since the January FOMC meeting but is little changed, on net, since year-end. Over the intermeeting period, the dollar is about 5 percent weaker against the currencies of commodity-exporting countries and about 3 percent weaker against the advanced-economy currencies. The dollar fell 5 percent against the Japanese yen, driven by flight-to-safety flows and the unwinding of currency carry trades, but strengthened against the pound on the possibility of a U.K. exit from the European Union.

Corporate Asset Prices and Earnings

Over the intermeeting period, the S&P 500 index rose 4 percent, and the VIX ended the period close to its historical median level. However, since the December FOMC meeting, the S&P 500 has declined 5 percent and the S&P 500 bank index is 17 percent lower. The swings in equities appeared to reflect movements in oil prices and fears about a slowdown in global economic activity.

The correlation between stock and oil prices has been strongly positive, which is difficult to explain. Such a correlation is typically associated with periods when movements in oil prices are driven by global demand. However, recently, the correlation has been positive even on days with significant news about the global oil supply.

Analysts' forecasts for year-ahead earnings across sectors were revised down notably over the intermeeting period. Stock prices for sectors with more pronounced downward revisions to expected earnings declined relatively more than those for sectors with smaller revisions, suggesting that earnings news weighed on share prices.

Over the intermeeting period, spreads on investment-grade corporate debt were little changed, while those on speculative-grade debt narrowed roughly 10 basis points. However, spreads on corporate bonds remain higher than at the time of the December FOMC meeting.

Business and Municipal Finance

Corporate bond issuance for investment-grade firms was robust in January and February, while that for speculative-grade issuers stayed subdued. C&I loan growth at banks was also strong, mostly driven by the origination of large loans to investment-grade borrowers. Refinancings of institutional leveraged loans were near zero in February, as was equity issuance through initial public offerings.

The credit quality of nonfinancial corporations continued to show signs of deterioration, primarily driven by developments in the energy sector. (See the box "Recent Developments in Speculative-Grade Corporate Debt Markets" for a somewhat longer perspective.) The default rate on nonfinancial bonds has remained somewhat elevated compared with typical levels outside recession periods. In addition, the volume of corporate bonds downgraded by Moody's Investors Service significantly outpaced that of upgrades, even for investment-grade securities, with most of the downgrades in

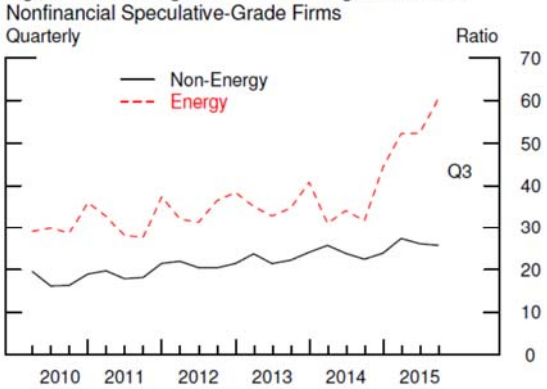
Recent Developments in Speculative-Grade Corporate Debt Markets

In contrast with the relatively stable financing conditions for investment-grade firms, conditions in U.S. speculative-grade corporate debt markets have deteriorated markedly since the third quarter of 2015. In the primary market, gross issuance of speculative-grade bonds and leveraged loans has slowed sharply over the past few months, now reaching the lowest quartile of the distribution since 2005. In the secondary market, credit spreads have widened notably, reaching the highest quartile of the distributions since 2005. Retail investor appetite for risk has continued to wane, with speculative-grade bond funds and loan mutual funds experiencing persistent outflows. Formation of collateralized loan obligations, which typically buy speculative-grade debt, has been reduced. While conditions have worsened sharply in the energy sector, market participants are reportedly concerned that the deterioration in the credit fundamentals of speculative-grade firms is becoming more widespread.[1] The following discussion provides a forward-looking view on fundamentals of speculative-grade companies by examining their profitability, trends in downgrades and expected corporate defaults, and the ability of speculative-grade companies to refinance maturing debt over the medium term.

In terms of profitability, company filings show a sharp increase since mid-2014 in the share of U.S. speculative-grade energy firms with negative operating incomes, but only a slight increase in the fraction among non-energy firms (figure 1). Nonetheless, earnings forecasts by Wall Street analysts for speculative-grade non-energy companies in the first quarter of 2016 were revised down substantially amid concerns of a deterioration in the global economic outlook. As a result, the ability to service debt, measured by the interest coverage ratio, weakened somewhat as compared with its previous year level (figure 2).

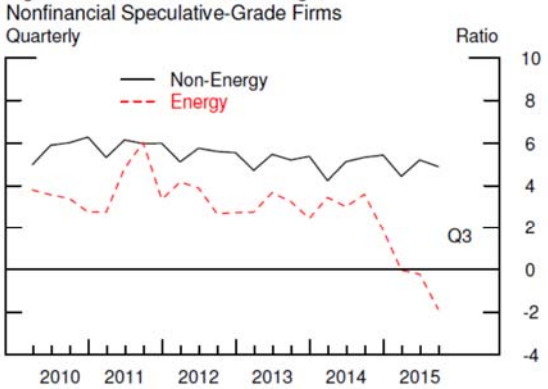
Measures of corporate credit quality have also shown some signs of deterioration, with modest but notable declines even outside the energy sector. The dollar volume of speculative-grade nonfinancial corporate debt that was downgraded by Moody's Investors Service has outpaced the volume of upgrades since mid-2015, and in February it reached its fastest monthly pace since 2001. Although downgrades continue to be concentrated in the energy sector, other industries

Figure 1. Percentage of Firms with Negative OIBDP, Nonfinancial Speculative-Grade Firms



Note: OIBDP is operating income before depreciation.
Source: Compustat.

Figure 2. Median Interest Coverage, Nonfinancial Speculative-Grade Firms



Note: Interest coverage is calculated as the ratio of operating income before depreciation divided by total interest expense.
Source: Compustat.

[1] As of year-end, the energy sector accounts for about 5 percent of the leveraged loan market and 18 percent of the high-yield bond market.

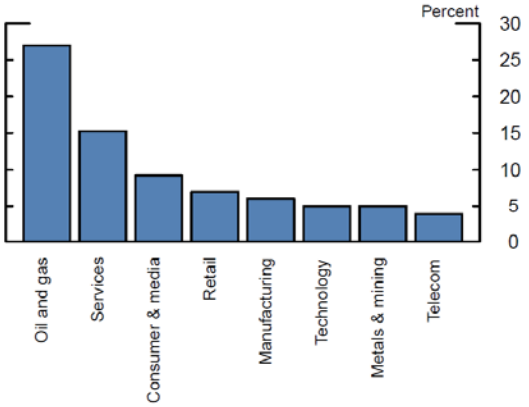
showed some weakness as well. The number of companies added this year to the Moody's list of corporates rated B3 or lower with a negative outlook (a signal of higher risk of default) has increased to a six-year high. Apart from the significant number of energy firms on the list, there are firms in other industries, including services as well as consumer and media (figure 3).

The large number of recent downgrades is consistent with expectations of increasing corporate defaults over the next 12 to 24 months. Indeed, aggregate expected year-ahead default rates for U.S. nonfinancial firms based on the Moody's KMV model increased to over 1 percent, about double the level that prevailed a year ago. For speculative-grade firms, the staff's estimates also suggest a pickup in expected year-ahead defaults, consistent with market participants' perceptions that expected default rates over the next 12 to 24 months could range from 3 to 6 percent.[2] Even though expectations of defaults are highly concentrated in the energy sector, the staff's estimates indicate a slight increase in expected defaults among non-energy firms, pointing to more widespread vulnerabilities.

As a result of recent developments in speculative-grade debt markets, market participants have expressed concerns about the amount of speculative-grade debt that will be maturing in coming years and the ability of such issuers to roll over their debt. Indeed, the staff estimates that about $1 trillion of debt issued by nonfinancial speculative-grade firms (composed of both leveraged loans and speculative-grade bonds) will mature between 2017 and 2020 (figure 4).

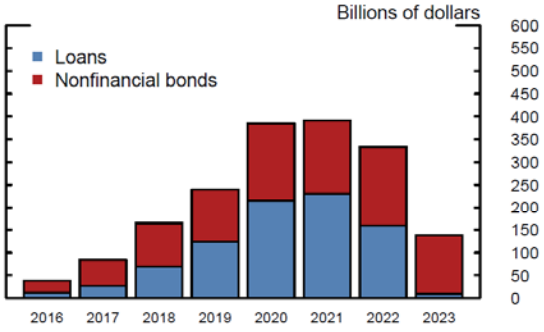
All told, should credit quality continue to deteriorate, speculative-grade companies in the energy sector may face challenges in accessing debt markets going forward. Conditions for non-energy firms are not as dire, but tighter financial conditions may result in increased debt burdens and thus higher defaults, with potentially negative implications for the broader economy.

Figure 3. Sector Distribution of Negative Rating Watches



Note: Includes bonds with a rating of B3 or lower. Updated through February 2, 2016.
Source: Moody's.

Figure 4. Dollar Amount Outstanding by Maturity: High Yield and Unrated

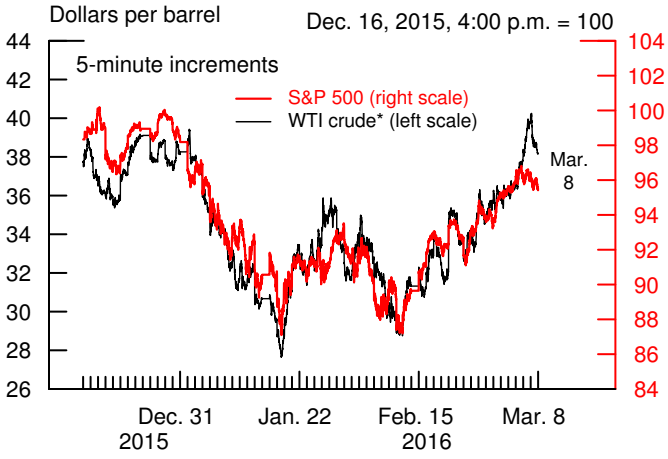


Source: S&P LCD; Mergent.

[2] The staff's survey of the research from eight firms (S&P, four dealers, and three buy-side firms) shows that all eight expected an increase in default rates for speculative-grade firms from the previous year level, citing persistently low oil prices, the amount of leverage among some of these firms, the beginning of tighter Fed monetary policy, and slowing global economic growth.

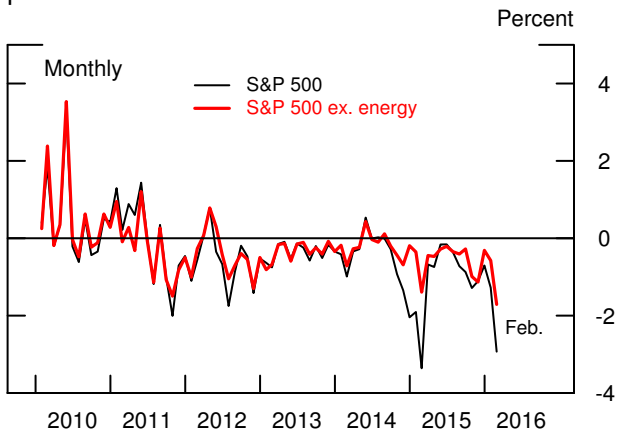
Corporate Asset Prices and Earnings

Intraday S&P 500 Futures and WTI 2-Month Futures



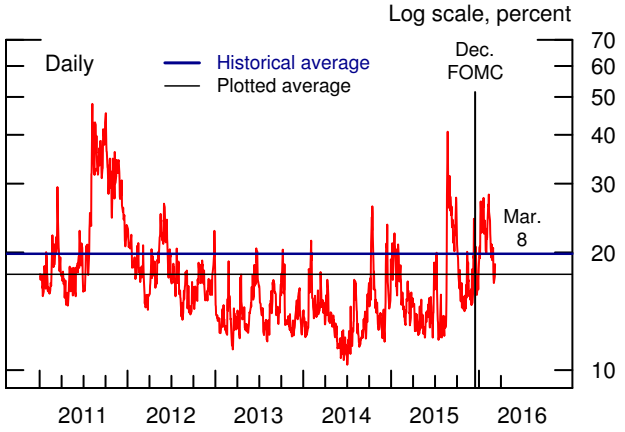
* 2-month West Texas intermediate (WTI) futures.
Source: Bloomberg.

Revisions to S&P 500 Year-Ahead Earnings per Share



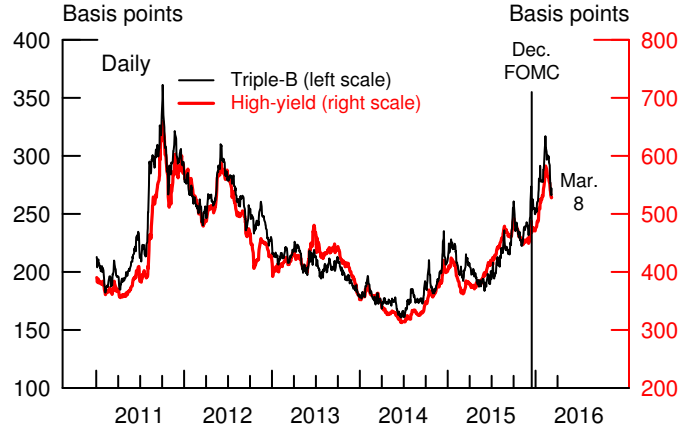
Note: Weighted average of the percent change in the consensus forecasts of current-year and following-year earnings per share.
Source: Thomson Reuters Financial.

Implied Volatility on S&P 500 (VIX)



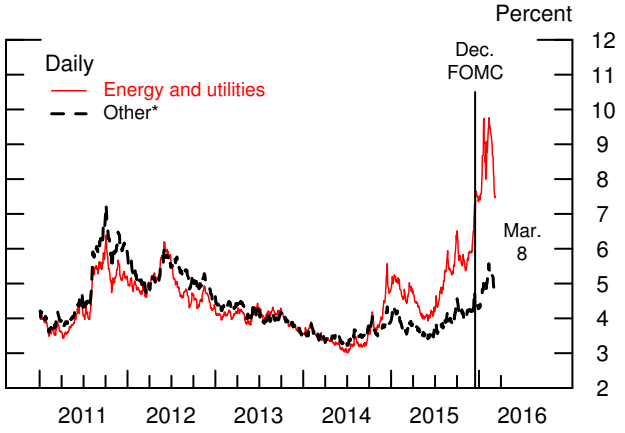
Note: Historical average is taken from 1990 onward; plotted average is taken from 2011 onward.
Source: Chicago Board Options Exchange.

10-Year Corporate Bond Spreads



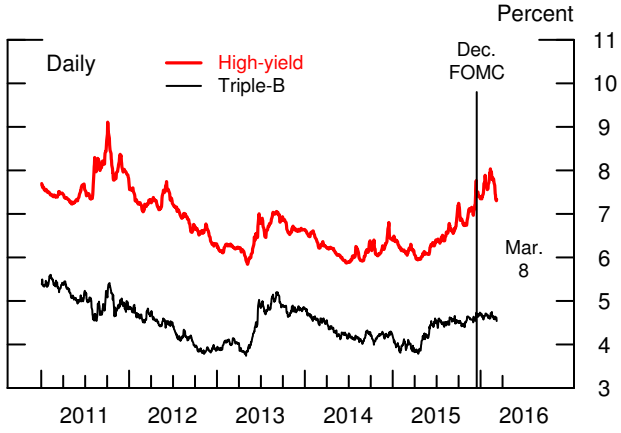
Note: Spreads over 10-year Treasury yield.
Source: Staff estimates of smoothed yield curves based on Merrill Lynch bond data and smoothed Treasury yield curve.

High-Yield Spreads, by Sector



Note: Spreads over 10-year Treasury yield.
* Includes high-yield firms that are not in the energy, utility, or telecommunications sectors.
Source: Staff estimates of smoothed corporate yield curves based on Merrill Lynch data and smoothed Treasury yield curve.

10-Year Corporate Bond Yields

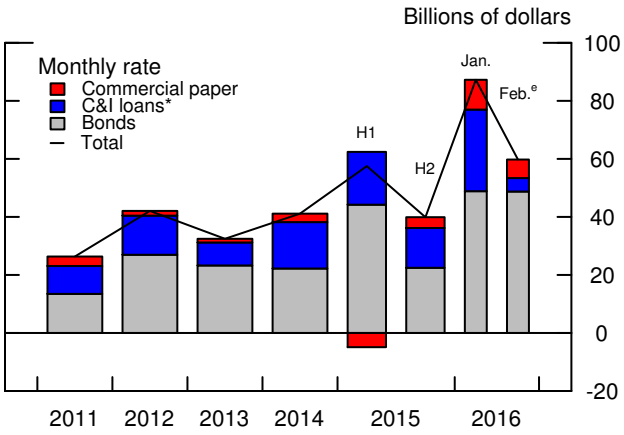


Source: Staff estimates of smoothed yield curves based on Merrill Lynch bond data.

Financial Developments

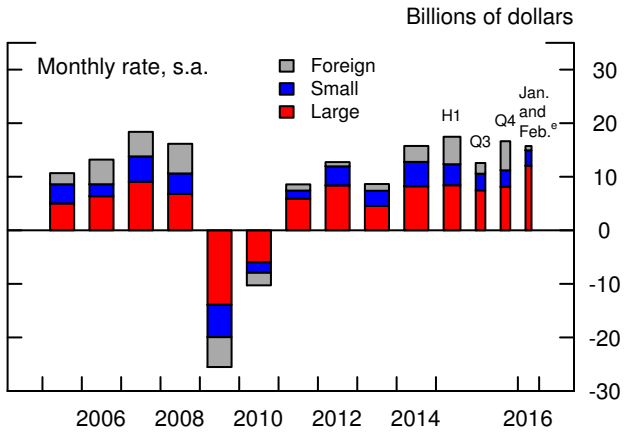
Business and Municipal Finance

Selected Components of Net Debt Financing, Nonfinancial Firms



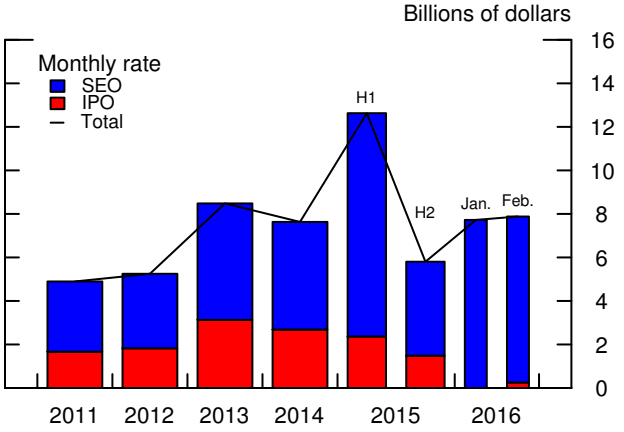
e Estimate for commercial and industrial (C&I) loans.
* Period-end basis, seasonally adjusted.
Source: Depository Trust & Clearing Corporation; Mergent Fixed Income Securities Database; Federal Reserve Board.

Commercial and Industrial Loans



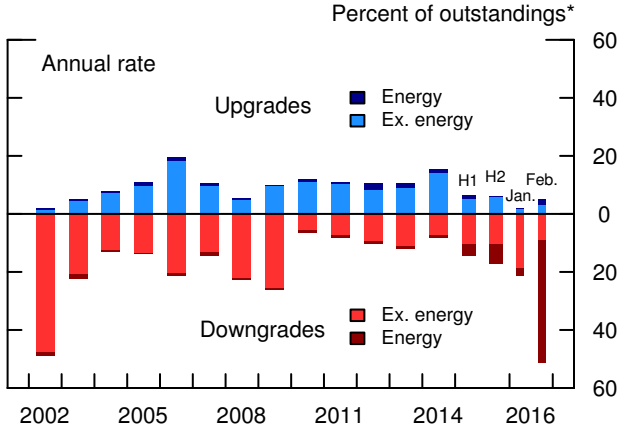
e Estimate.
Source: Federal Reserve Board, FR 2644, Weekly Report of Selected Assets and Liabilities of Domestically Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks.

Nonfinancial Equity Issuance: IPO and SEO



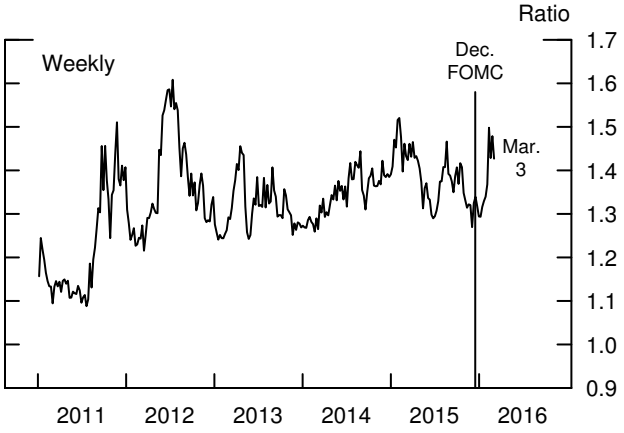
Note: IPO is initial public offering; SEO is seasoned equity offering.
Source: Securities Data Company.

Nonfinancial Rating Changes, by Sector



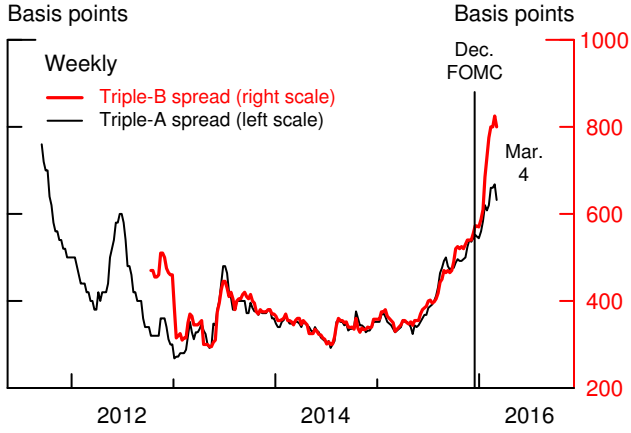
* Calculated as percent of the dollar value of all nonfinancial bonds outstanding.
Source: Calculated using Moody's ratings from Mergent Fixed Income Securities Database.

Municipal Bond Spread



Note: Bond Buyer general obligation 20-year index over 20-year Treasury yields.
Source: Bond Buyer; Merrill Lynch.

10-Year CMBS Spreads over Swaps

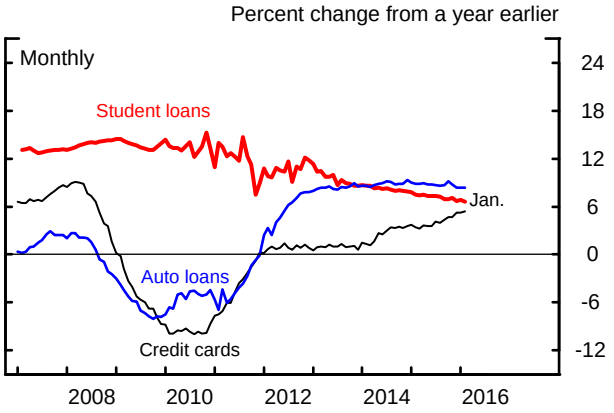


Note: CMBS is commercial mortgage-backed securities.
Source: J.P. Morgan.

Financial Developments

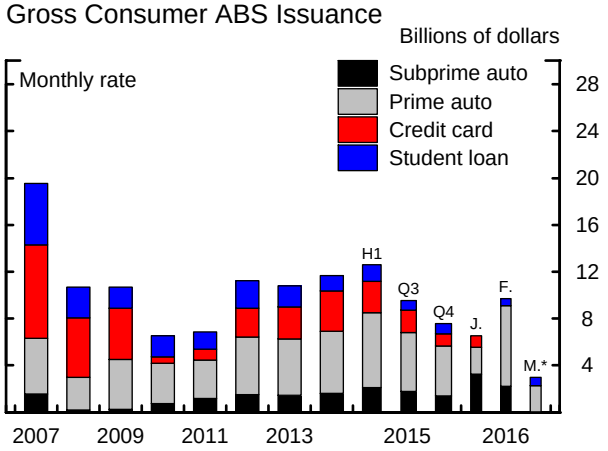
Household Finance

Consumer Credit



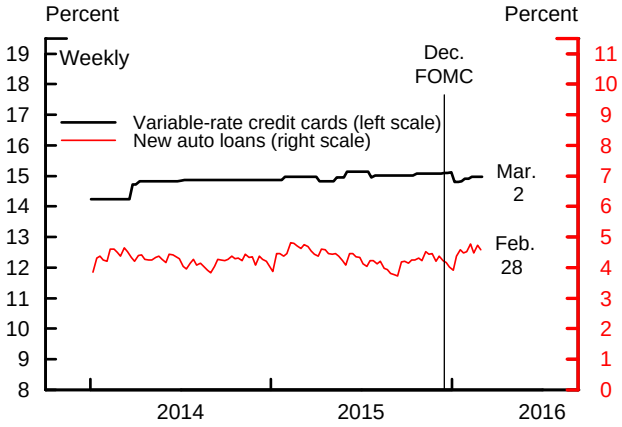
Note: The data are not seasonally adjusted.
Source: Federal Reserve Board.

Gross Consumer ABS Issuance



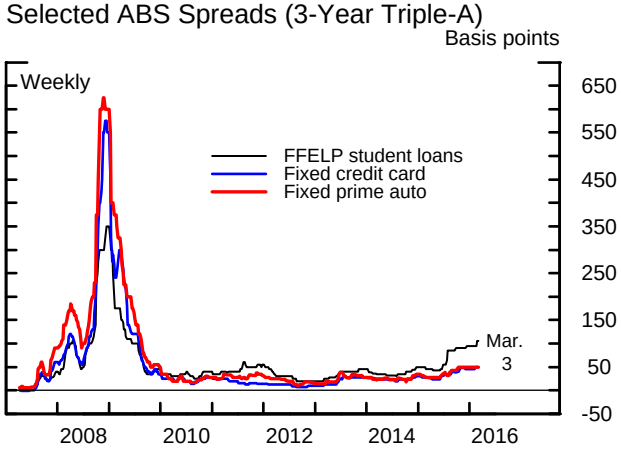
* Month to date.
Source: Inside MBS & ABS; Merrill Lynch; Federal Reserve Board.

Consumer Interest Rates



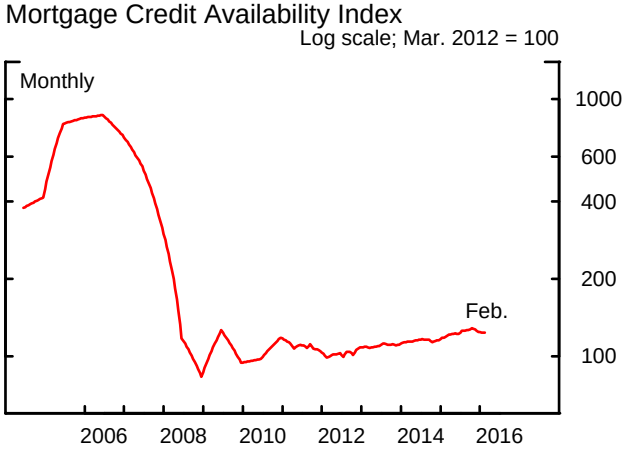
Source: For variable-rate credit cards, Bankrate Monitor; for new auto loans, J.D. Power and Associates.

Selected ABS Spreads (3-Year Triple-A)



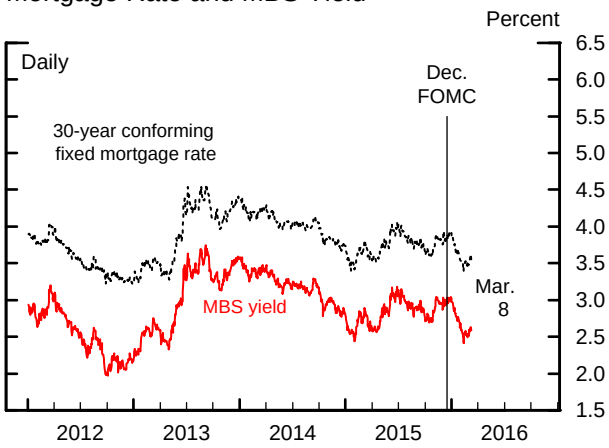
Note: Spreads are to swap rate for credit card and auto asset-backed securities (ABS) and to 3-month LIBOR for student loans. FFELP is Federal Family Education Loan Program.
Source: J.P. Morgan.

Mortgage Credit Availability Index



Source: Mortgage Bankers Association.

Mortgage Rate and MBS Yield



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

Financial Developments

February accounted for by energy firms. Banks increased their loan loss reserves in recent months and reported doing so primarily for C&I loans to borrowers in the oil and gas industry.

On balance, credit conditions in the broader municipal bond market remained stable despite Puerto Rico's ongoing fiscal crisis. After defaulting on a small fraction of payments in January, Puerto Rico met all of its February debt payments. However, the near-term default outlook for the commonwealth is still uncertain, and Puerto Rico continues to look for a viable debt-restructuring agreement.

Financing conditions in CRE tightened somewhat over the intermeeting period but remain accommodative. Spreads on CMBS continued to widen despite the narrowing of spreads in broader bond markets. Reportedly in response, CMBS issuance was down somewhat over the first two months of the year. However, CRE loans on banks' balance sheets continued to increase at a robust pace through February.

HOUSEHOLD FINANCE

Financing conditions in consumer credit markets generally remained accommodative, with outstanding student and auto debt continuing to grow at robust paces in January.

Mortgage rates declined, on net, over the intermeeting period and are down notably since the December FOMC meeting, with interest rates on 30-year fixed-rate mortgages currently standing at 3.5 percent. However, lending conditions in residential real estate markets were little changed.

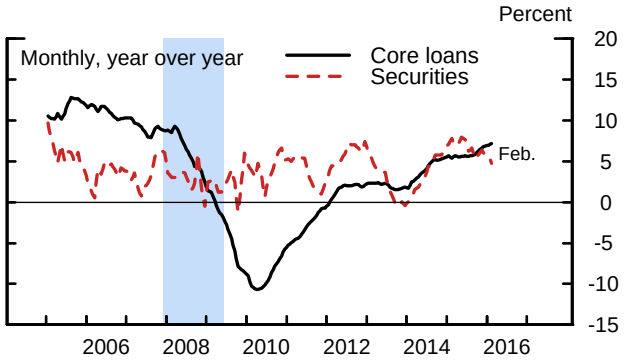
BANKING DEVELOPMENTS AND MONEY

Overall, bank credit continued to increase moderately in January and February. Spreads on credit default swaps for banks were about unchanged, on net, over the intermeeting period and remain wider than at the time of the December FOMC meeting. Concerns over banks' future net interest margins, a deterioration in global macroeconomic conditions, and banks' exposure to the energy sector were reportedly the main drivers behind the downbeat sentiment.

In line with historical norms, interest rates on banks' retail deposits remained about flat in the wake of the increase in the target range for the federal funds rate. Even

Banking Developments and Money

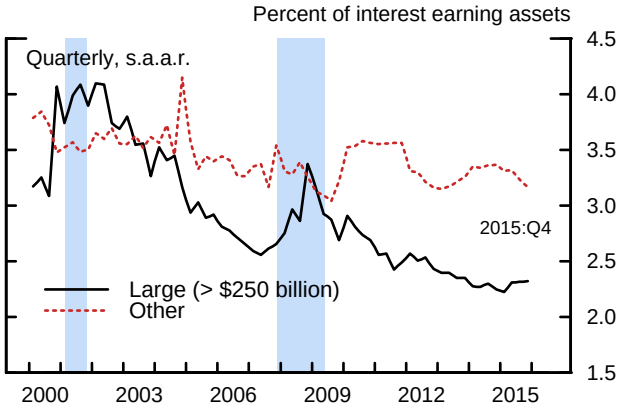
Core Loans and Securities



Note: Growth rates based on average (not seasonally adjusted) monthly levels.

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

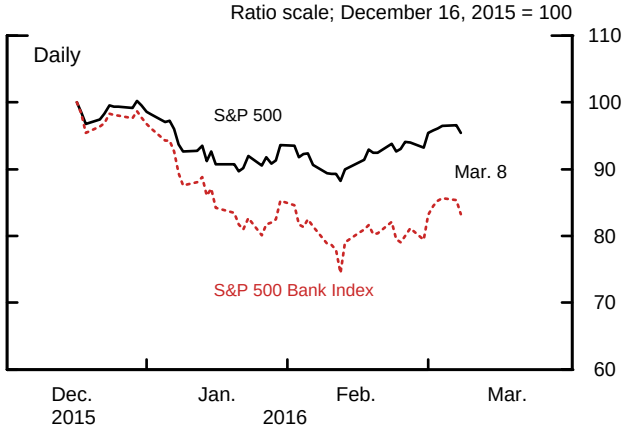
Net interest margin, by BHC type



Note: Net interest margin is equal to net interest income divided by average earning assets. BHC is bank holding company.

Source: Federal Reserve Board, FR Y9C, Consolidated Financial Statements for Holding Companies.

S&P 500 Bank Price Indexes



Source: Bloomberg.

Growth of M2 and Its Components

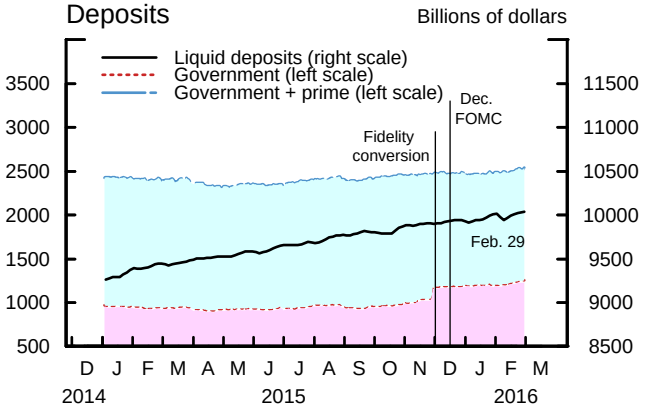
Percent, s.a.a.r.

	M2	Liquid deposits	Small time deposits	Retail MMFs	Curr.
2015	5.8	7.5	-20.3	-.6	7.3
2015:H1	6.1	7.9	-17.7	-4.7	7.7
2015:Q3	5.6	7.4	-29.4	3.9	6.4
2015:Q4	4.9	6.0	-22.4	3.4	6.7
2016:Jan.-Feb.	8.4	4.2	-4.4	89.4	5.5

Note: Retail MMFs are retail money market funds.

Source: Federal Reserve Board.

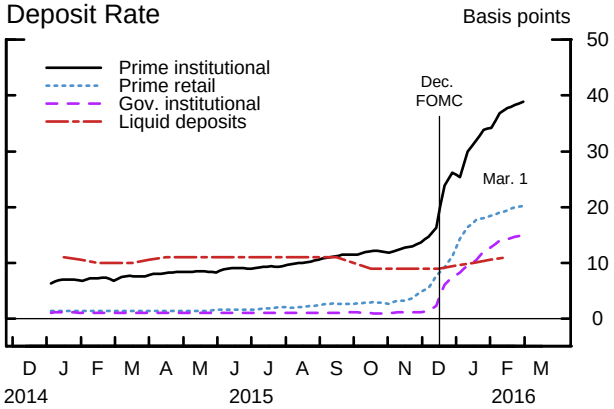
Money Market Funds AUM and Liquid Deposits



Note: AUM is assets under management. Money Market Funds AUM has daily frequency, while liquid deposits have weekly frequency.

Source: iMoneyNet; Call Report; Federal Reserve Board, FR 2900, Report of Transaction Accounts, Other Deposits and Vault Cash.

Money Market Fund Net Yields and Liquid Deposit Rate



Note: Net yields are the asset-weighted average annualized income, after expenses, earned over the past 7 days without reinvesting dividends, at the weekly frequency. Liquid deposit rate is constructed from quarterly data and interpolated to monthly frequency.

Source: iMoneyNet; Call Report; RateWatch.

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

so, deposit volumes on banks' books have been little changed, and MMFs have experienced only small net inflows since the December FOMC meeting.

FEDERAL RESERVE OPERATIONS AND SHORT-TERM FUNDING MARKETS

Over the intermeeting period, short-term rates were generally stable, and the effective federal funds rate traded within the target range.[2] Triparty repo rates remained above the ON RRP rate throughout the intermeeting period. In addition, triparty Treasury repo volumes increased, apparently reflecting foreign central bank selling of Treasury securities as well as higher bill issuance by the Treasury. Daily take-up of ON RRPs declined markedly since the year-end, dropping at times to less than $40 billion.[3] The foreign RP pool increased, which was largely attributed to portfolio rebalancing by a small number of central banks.

The Desk reinvested $37 billion of maturing Treasury securities in February, in contrast to previous months, when maturing Treasury securities were roughly zero.[4] The Desk purchased $24 billion of 15- and 30-year MBS under the reinvestment program and rolled $0.5 billion in expected settlements over the intermeeting period. The ratio of monthly settlements for these reinvestment operations to gross issuance of MBS was roughly unchanged in January at about 32 percent.

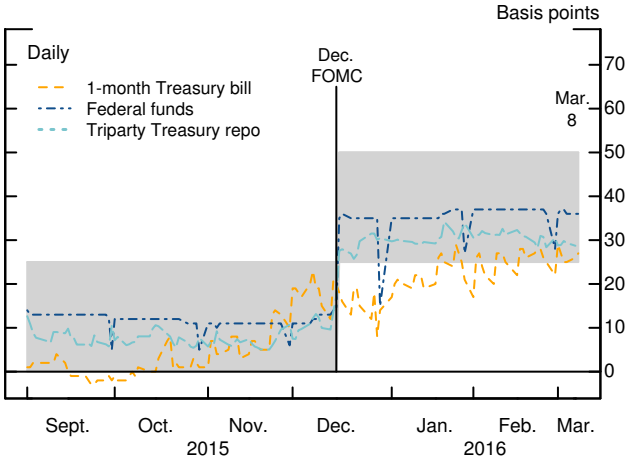
[2] The effective federal funds rate has averaged 37 basis points since January 4, with low intraday volatility except for significant declines on month-ends. On March 2, the data source for calculating the effective federal funds rate moved from using aggregated data provided by federal funds brokers to using individual federal funds transactions reported by depository institutions in the Report of Selected Money Market Rates (FR 2420). The effective federal funds rate is now calculated as a volume-weighted median rate, as opposed to the previous volume-weighted average rate.

[3] On February 18, the Federal Reserve conducted a test Term Deposit Facility operation as part of routine quarterly testing of the facility that offered seven-day deposits at a rate of 1 basis point over IOER, with a maximum counterparty cap of $5 billion. Take-up totaled $63.9 billion, with 40 banks participating and eight maximum bids.

[4] On February 23, the Desk conducted a test outright coupon purchase of $226 million in Treasury securities, the first outright purchases since the end of the purchase program in October 2014.

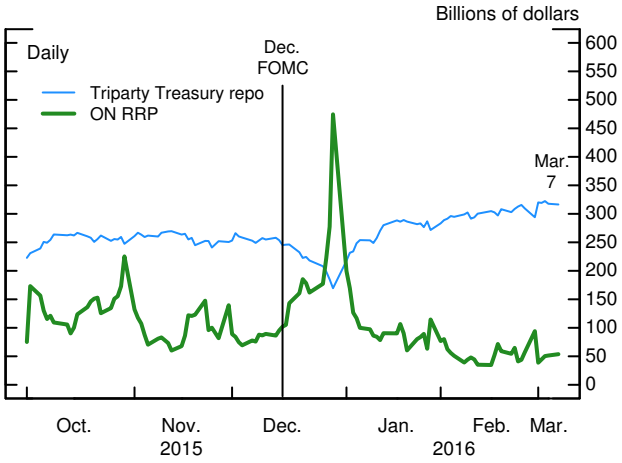
Federal Reserve Operations and Short-Term Funding Markets

Money Market Rates



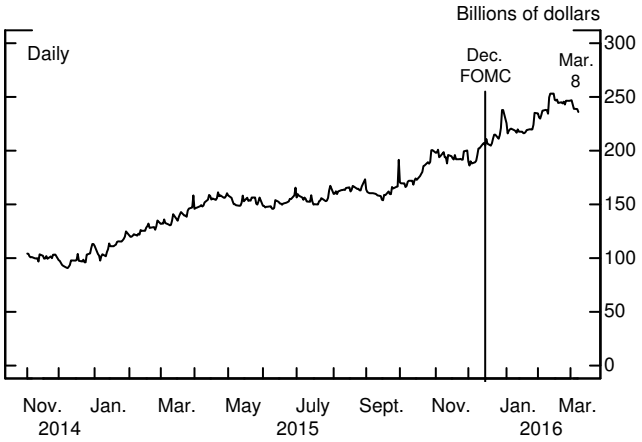
Note: Shaded area is the target range for the federal funds rate; repo is repurchase agreement.
Source: Depository Trust & Clearing Corporation; Federal Reserve Bank of New York; Federal Reserve Board.

Selected Money Market Volumes



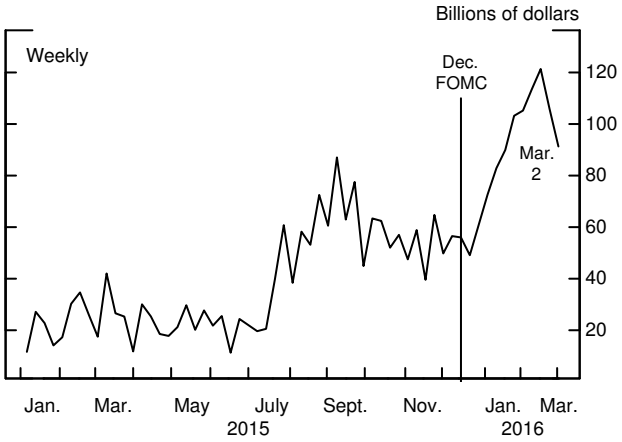
Note: Repo is repurchase agreement; ON RRP is overnight reverse repurchase agreement.
Source: Federal Reserve Bank of New York.

Foreign RP Pool



Note: RP is repurchase agreement.
Source: Federal Reserve Board, Statistical Release H.4.1, "Factors Affecting Reserve Balances."

Primary Dealer Net Treasury Positioning



Note: Excludes floating-rate notes.
Source: Federal Reserve Board, FR 2004, Government Securities Dealers Reports.

Financial Developments

Risks and Uncertainty

Assessment of Risks

We continue to view the uncertainty around our projections for real GDP growth and the unemployment rate as broadly in line with the average over the past 20 years (the benchmark used by the FOMC). We have also maintained our assumption that the risks to our GDP projection are tilted to the downside in part because we view neither monetary nor fiscal policy as well positioned to offset large adverse shocks. In addition, while there has been some improvement in global financial conditions during the past few weeks, downside risks emanating from abroad remain substantial; global financial risks could presumably flare up again as quickly as they recently receded. We view the risks around our unemployment rate projection as aligned with those for GDP and, therefore, as tilted to the upside.

With regard to inflation, we see considerable uncertainty around our projection, but we do not view the current level of uncertainty as unusually high. At the same time, we continue to view the risks around our inflation projection as tilted to the downside. Market-based measures of inflation compensation remain very low, and some survey-based measures of longer-term inflation expectations have edged down further in recent months. In addition, the realization of the downside risks to economies abroad could put upward pressure on the foreign exchange value of the dollar.

Alternative Scenarios

To illustrate some of the risks to the outlook, we construct a number of alternatives to the baseline projection using simulations of staff models. The first two scenarios consider the possibility of a global recession but differ in the degree of effectiveness of the countervailing monetary policy actions taken by foreign central banks. In the third scenario, domestic aggregate demand is persistently weaker than in the baseline, consistent with a substantially lower long-run equilibrium real interest rate. To illustrate the heightened risks of returning to the effective lower bound in a low interest rate environment, the fourth scenario adds a pronounced near-term slowdown on top of the longer-term malaise of the third scenario. In contrast, in the last scenario, recent strong job gains and upbeat consumer confidence signal that economic activity is

Alternative Scenarios

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

Measure and scenario	2016		2017	2018	2019-20
	H1	H2			
Real GDP					
Extended Tealbook baseline	2.0	2.4	2.2	2.0	1.7
Global recession	1.7	1.5	1.5	2.0	1.9
Less effective foreign monetary policy	1.4	.9	1.1	2.1	2.1
Lower equilibrium funds rate	1.5	1.9	2.0	2.2	1.9
Lower equilibrium funds rate with downturn	1.2	-.5	1.3	2.6	2.5
Faster growth with higher inflation	3.3	3.6	2.0	1.7	1.5
Unemployment rate[1]					
Extended Tealbook baseline	4.9	4.8	4.5	4.3	4.5
Global recession	4.9	4.9	5.0	4.9	4.9
Less effective foreign monetary policy	5.0	5.1	5.3	5.3	5.1
Lower equilibrium funds rate	5.0	4.9	4.7	4.5	4.5
Lower equilibrium funds rate with downturn	5.0	5.5	5.5	5.2	4.7
Faster growth with higher inflation	4.5	4.1	4.0	4.0	4.3
Total PCE prices					
Extended Tealbook baseline	.7	1.4	1.6	1.8	2.0
Global recession	.5	.8	1.2	1.7	2.0
Less effective foreign monetary policy	.2	.2	.8	1.5	1.9
Lower equilibrium funds rate	.7	1.4	1.6	1.9	2.0
Lower equilibrium funds rate with downturn	.7	1.4	1.6	1.8	1.9
Faster growth with higher inflation	.9	2.0	2.2	2.3	2.3
Core PCE prices					
Extended Tealbook baseline	1.7	1.2	1.6	1.8	2.0
Global recession	1.6	.8	1.2	1.6	1.9
Less effective foreign monetary policy	1.5	.4	.8	1.5	1.9
Lower equilibrium funds rate	1.7	1.2	1.6	1.9	2.0
Lower equilibrium funds rate with downturn	1.7	1.2	1.5	1.8	1.9
Faster growth with higher inflation	2.0	1.8	2.1	2.3	2.3
Federal funds rate[1]					
Extended Tealbook baseline	.9	1.4	2.3	3.2	4.0
Global recession	.9	1.3	1.6	2.2	3.3
Less effective foreign monetary policy	.9	1.3	1.0	1.4	2.9
Lower equilibrium funds rate	.5	.7	1.1	1.8	2.7
Lower equilibrium funds rate with downturn	.5	.4	.1	.5	1.8
Faster growth with higher inflation	1.0	2.0	3.5	4.3	4.9

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

stronger than in the baseline; in addition, inflation is more sensitive to tighter resource utilization.

We generate the first and second scenarios using the multicountry SIGMA model. The next two scenarios are generated using the FRB/US model, and the final scenario uses the Board staff's EDO model.[1] In each of the scenarios, the federal funds rate is governed—as in the baseline forecast—by an inertial version of the Taylor (1999) rule.[2] In all cases, we assume that the size and composition of the SOMA portfolio follow their baseline paths.

Global Recession

Notwithstanding some improvement in global financial conditions during the past month, the financial turbulence earlier this year and somewhat disappointing data abroad have heightened concerns about a global recession. In this scenario, the foreign economies experience a sharp tightening of financial conditions and fall in confidence that would depress their GDP more than 5 percent below baseline in the absence of additional foreign monetary stimulus. However, this scenario assumes that foreign central banks take aggressive actions that are effective in depressing bond yields significantly and in supporting domestic demand. This stimulus to domestic demand in foreign economies and to their net exports from a modest depreciation of their currencies mitigates the contraction in foreign GDP so that foreign output falls only about 3 percent below baseline. The foreign shocks are assumed to have modest financial spillovers to the United States, with U.S. corporate bond spreads rising about 50 basis points.

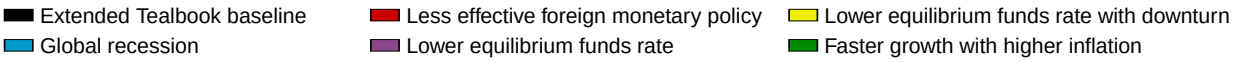
Weaker external demand, an appreciation of the broad real dollar of about 4 percent, and some tightening of U.S. financial conditions cause U.S. real GDP to expand by only around 1½ percent in 2016 and 2017, ¾ percentage point lower than in the baseline, while the unemployment rate remains close to 5 percent through 2018. The

[1] The confidence intervals in the exhibit titled "Forecast Confidence Intervals and Alternative Scenarios" are based on a new procedure for stochastic simulations. The procedure uses a version of the FRB/US model that, with the exception of the effective lower bound on interest rates, is linear. The new procedure eliminates certain undesirable asymmetries in the confidence intervals, notably the downward skew around the projection for the unemployment rate. The new procedure also affects the exhibits "Selected Tealbook Projections and 70 Percent Confidence Intervals" and "Assessment of Key Macroeconomic Risks."

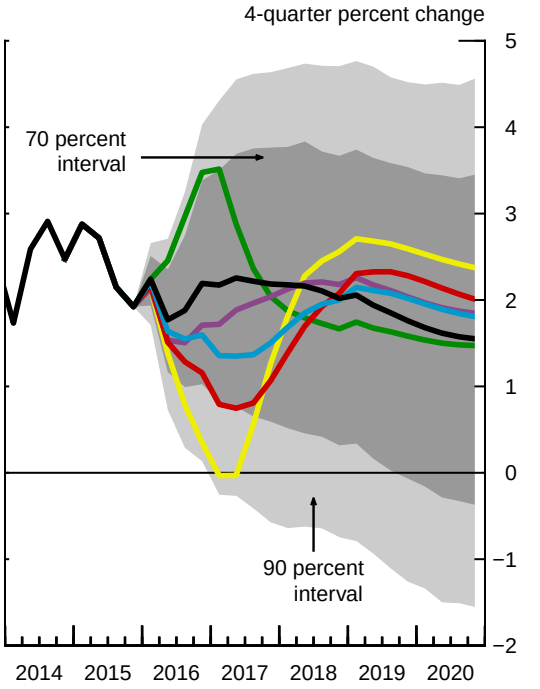
[2] For the scenarios run in SIGMA, we assume a policy rule broadly similar to the FRB/US and EDO simulations. One key difference relative to the FRB/US and EDO simulations is that the policy rule in SIGMA uses a measure of slack equal to the difference between actual output and the model's estimate of the level of output that would occur in the absence of slow adjustment of wages and prices.

Forecast Confidence Intervals and Alternative Scenarios

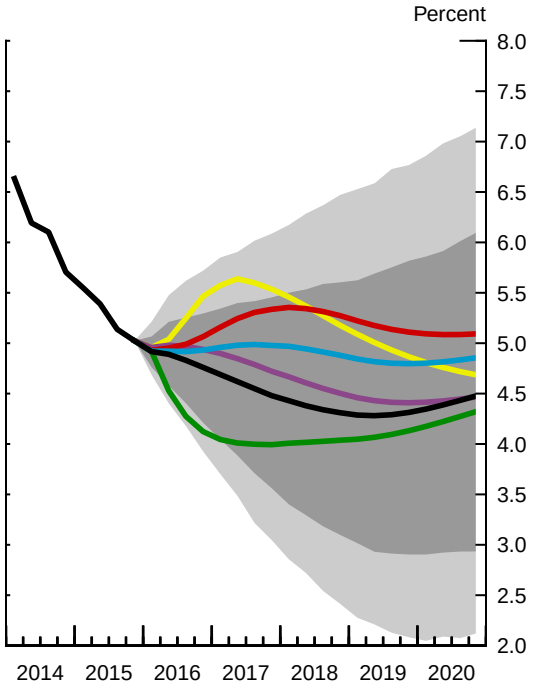
Confidence Intervals Based on FRB/US Stochastic Simulations



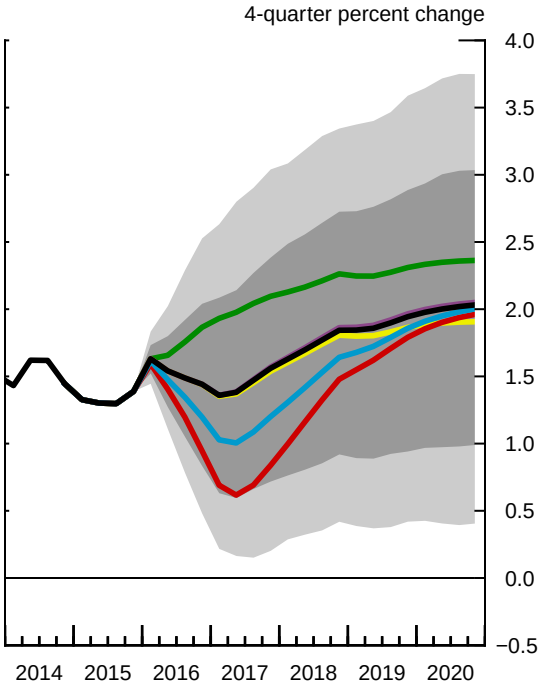
Real GDP



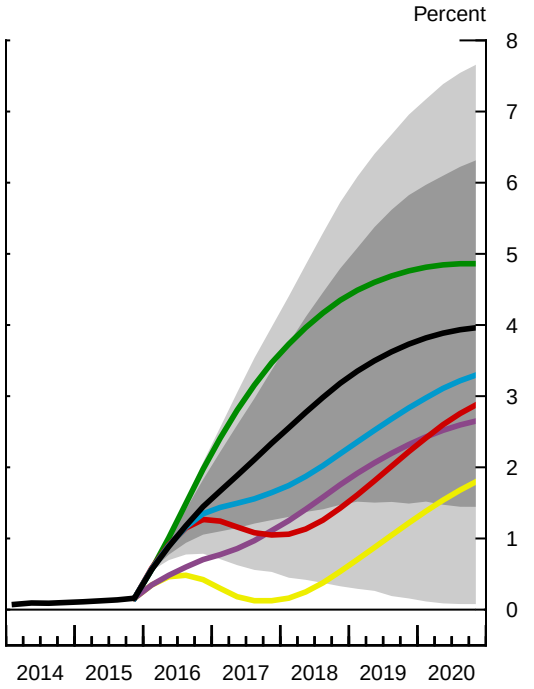
Unemployment Rate



PCE Prices excluding Food and Energy



Federal Funds Rate



Risks & Uncertainty

combination of dollar appreciation and greater resource slack pushes down core PCE inflation to around 1¼ percent in 2017. The federal funds rate rises more gradually than in the baseline.

Less Effective Foreign Monetary Policy

Monetary policy in the foreign economies may well be less effective in providing support for domestic demand than in our previous scenario. This reduced effectiveness may reflect that pass-through to private yields is very low, or, alternatively, that even if these actions succeed in reducing private yields, households and firms might not respond by increasing their spending and investment. In this scenario, we examine the effects of a global recession that is similar to that in the previous scenario, but we assume that any given monetary policy action by AFE central banks is less effective in providing support for domestic demand. Accordingly, although our scenario has AFE central banks taking even more aggressive policy actions to push down interest rates, most of the boost to GDP comes through exchange rate depreciation and expenditure-switching effects toward their exports. In addition, we assume that EME central banks face capital flow and exchange rate pressures that limit their ability to ease policy rates by as much as in the previous scenario. All told, foreign GDP falls to more than 5 percent below baseline in our scenario, and the broad real dollar appreciates by almost 9 percent.

In this environment, U.S. real GDP growth falls to around 1 percent in 2017 in response to much weaker global economic activity and a strong appreciation of the dollar. The unemployment rate climbs to around 5¼ percent in 2017, nearly 1 percentage point higher than in the baseline. Core PCE inflation declines to ¾ percent in 2017, reflecting both dollar appreciation and lower resource utilization. The federal funds rate follows a much shallower path than in the baseline forecast, hovering around 1 percent through early 2018.

Lower Long-Run Equilibrium Federal Funds Rate

Aggregate demand has been weak during the recent recovery, reflecting both domestic and global factors. In the baseline, these factors are expected to dissipate, causing the equilibrium real federal funds rate to rise over time. However, some observers have argued that the factors depressing demand are essentially permanent. Accordingly, this scenario assumes persistently weaker domestic aggregate demand over the next decade than in the baseline, consistent with a long-run equilibrium real federal

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

Measure	2016	2017	2018	2019	2020
Real GDP					
(percent change, Q4 to Q4)					
Projection	2.2	2.2	2.0	1.8	1.5
Confidence interval					
Tealbook forecast errors	.5–3.8	-.2–3.7	-.9–3.4	. . .	. . .
FRB/US stochastic simulations	1.0–3.4	.6–3.8	.3–3.7	-.1–3.5	-.4–3.5
Civilian unemployment rate					
(percent, Q4)					
Projection	4.8	4.5	4.3	4.3	4.5
Confidence interval					
Tealbook forecast errors	4.3–5.2	3.5–5.7	3.0–6.0	. . .	. . .
FRB/US stochastic simulations	4.2–5.3	3.6–5.5	3.1–5.6	2.9–5.8	2.9–6.1
PCE prices, total					
(percent change, Q4 to Q4)					
Projection	1.0	1.6	1.8	1.9	2.0
Confidence interval					
Tealbook forecast errors	.5–1.9	.9–3.3	1.1–3.4	. . .	. . .
FRB/US stochastic simulations	.4–1.7	.7–2.5	.8–2.8	.9–2.9	.9–3.1
PCE prices excluding					
food and energy					
(percent change, Q4 to Q4)					
Projection	1.4	1.6	1.8	1.9	2.0
Confidence interval					
Tealbook forecast errors	1.1–1.9	.9–2.4	. . .	. . .	. . .
FRB/US stochastic simulations	.8–2.0	.7–2.4	.9–2.7	.9–2.9	1.0–3.0
Federal funds rate					
(percent, Q4)					
Projection	1.4	2.3	3.2	3.7	4.0
Confidence interval					
FRB/US stochastic simulations	1.1–1.8	1.3–3.4	1.5–4.8	1.5–5.8	1.4–6.3

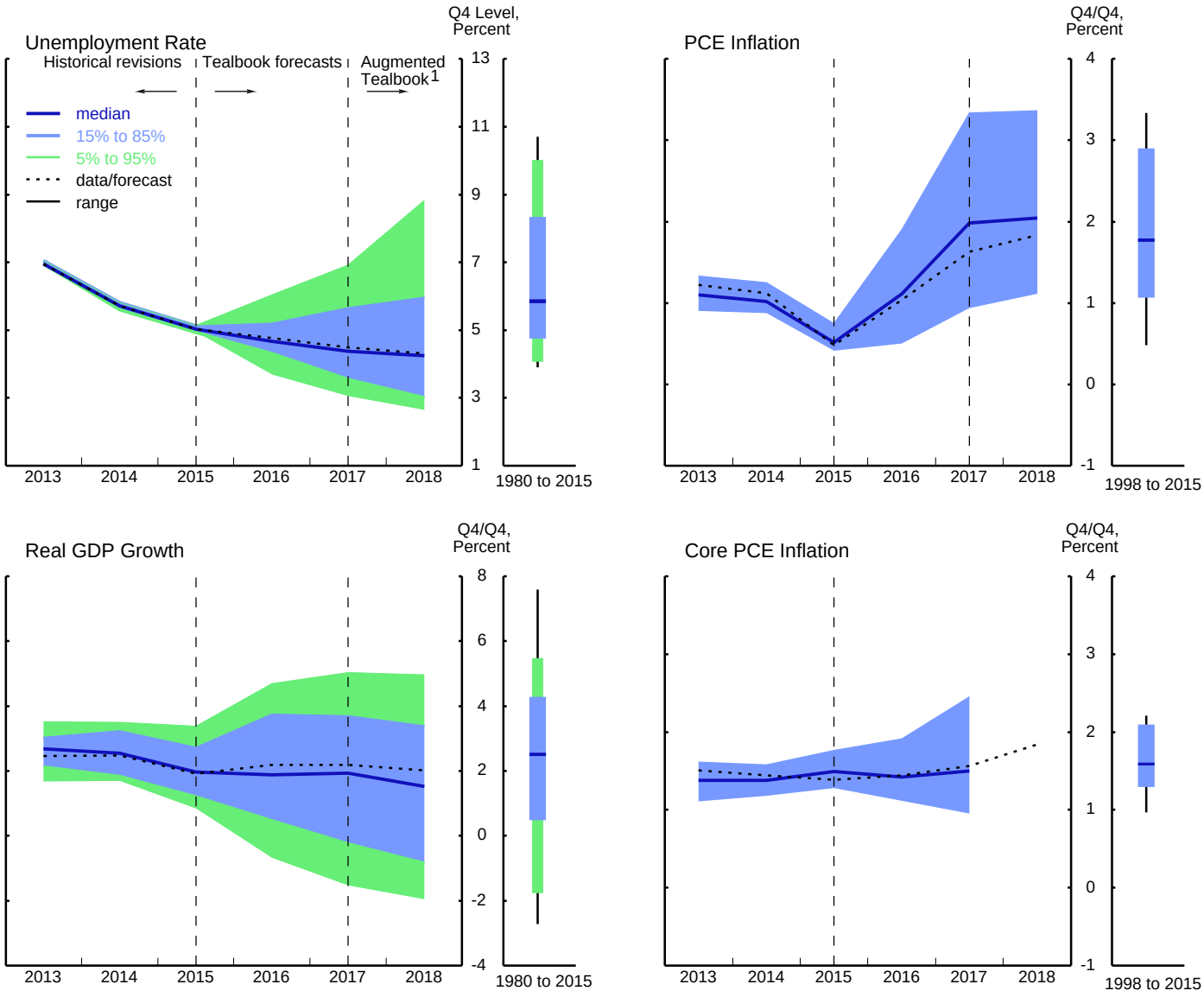
Note: Shocks underlying FRB/US stochastic simulations are randomly drawn from the 1969–2014 set of model equation residuals. Intervals derived from Tealbook forecast errors are based on projections made from 1980 to 2014 for real GDP and unemployment and from 1998 to 2014 for PCE prices. The intervals for real GDP, unemployment, and total PCE prices are extended into 2018 using information from the Blue Chip survey and forecasts from the CBO and CEA.

. . . Not applicable.

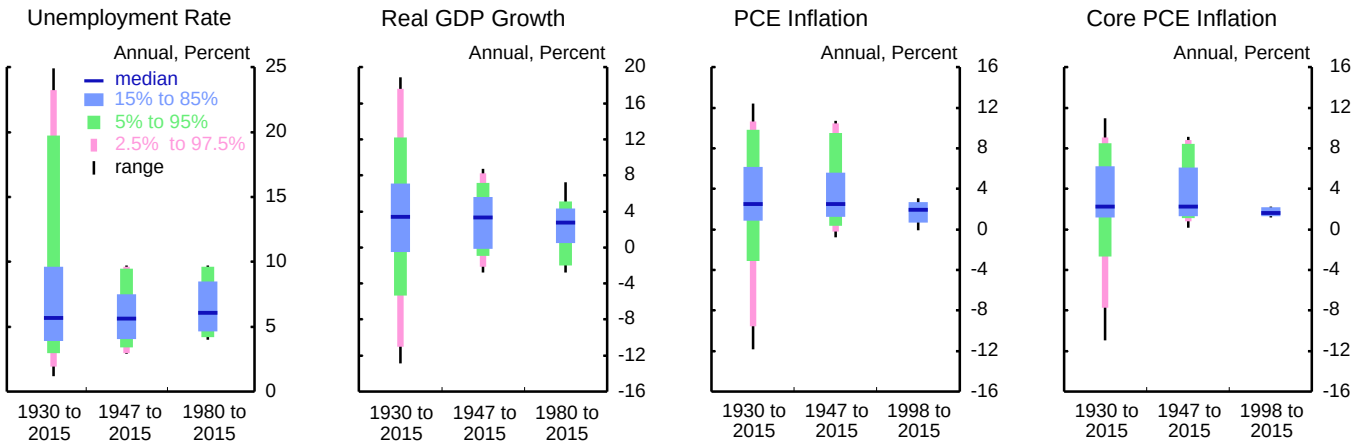
Prediction Intervals Derived from Historical Tealbook Forecast Errors

Forecast Error Percentiles

Historical Distributions



Historical Distributions



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

1. Augmented Tealbook prediction intervals use 1- and 2-year-ahead forecast errors from Blue Chip, CBO, and CEA to extend the Tealbook prediction intervals through 2018.

funds rate of 0 percent.[3] We assume that policymakers immediately recognize the lower trajectory of the equilibrium interest rate.

In the longer run, there is enough room between the baseline path for the federal funds rate and the effective lower bound that monetary policy can fully accommodate the fall in the equilibrium real federal funds rate. By 2020, the federal funds rate is almost 1½ percentage points lower than in the baseline and the unemployment rate has returned to baseline.

In the short run, however, the federal funds rate does not fall enough to fully offset the weaker aggregate demand because of the inertial component of the policy rule. As a result, output expands more slowly, and the path for the unemployment rate is slightly higher than in the baseline. Real GDP growth through 2016 and 2017 is ¼ percentage point lower than in the baseline projection; the unemployment rate is ¼ percentage point higher in 2017 and 2018. With resource utilization only slightly weaker, inflation remains close to the baseline.

Lower Long-Run Equilibrium Federal Funds Rate with Near-Term Downturn

As many commentators have pointed out, with a lower long-run value of the federal funds rate (such as the value that prevails in the previous scenario), the effective lower bound may become binding more often. To illustrate this risk, in this scenario we layer a near-term slowdown of economic activity on top of the persistent demand weakness that was featured in the previous scenario.

In particular, we assume that investment spending weakens significantly, which in turn reduces hiring. Weaker employment and incomes gradually depress household spending relative to the baseline, further reducing aggregate demand. As in the previous scenario, policymakers recognize the lower long-run equilibrium federal funds rate and take it into account, but they otherwise continue to follow the prescriptions of the inertial Taylor (1999) interest rate rule.

[3] This very low level of the long-run equilibrium real federal funds rate is consistent with the estimates in Thomas Laubach and John C. Williams (2016), "Measuring the Natural Rate of Interest Redux," Finance and Economics Discussion Series 2016-011 (Washington: Board of Governors of the Federal Reserve System, February), http://dx.doi.org/10.17016/FEDS.2016.011.

Real GDP declines for three consecutive quarters starting in the second half of 2016. The unemployment rate rises above 5½ percent before a gradual recovery begins. The path for inflation is lower than in the baseline projection, with core PCE inflation still below 2 percent in 2020. Given this weaker outlook and the lower long-run equilibrium level of the federal funds rate, the federal funds rate is substantially below baseline and becomes constrained by the effective lower bound in late 2017.[4] Had the long-run equilibrium federal funds rate remained at its baseline level, this near-term slowdown in activity would not have brought the federal funds rate to the effective lower bound.

As in our other alternative scenarios, we assume that the behavior of monetary policy is determined by the inertial Taylor (1999) interest rate rule and that the size and composition of the SOMA portfolio follow their baseline paths. However, additional asset purchases, forward guidance, or other unconventional tools could be deployed to mitigate the adverse effects outlined in this scenario.

Faster Growth with Higher Inflation

Although some indicators of production have recently been weak, real PCE and the labor market have posted solid gains. Moreover, consumer confidence has remained reasonably upbeat in recent months, and low prices of gasoline and other forms of energy have provided a boost to real incomes, which may augur larger gains in consumption in the near future. Accordingly, in this scenario, we assume faster consumer spending growth that, in turn, spurs production and higher business investment. In addition, we assume that inflation is more sensitive to resource slack than in the standard version of the EDO model. This greater sensitivity is consistent with the estimates of some other DSGE models.[5] It is also consistent with the view that the Phillips curve is steeper at higher rates of resource utilization than when economic activity is relatively weak.[6]

Real GDP rises 3½ percent in 2016, compared with 2¼ percent in the baseline projection. The unemployment rate falls rapidly, bottoming out at 4 percent by mid-

[4] The federal funds rate does not hit the effective lower bound until the second half of 2017 despite a contraction in activity starting in mid-2016 as a mechanical result of inertia in the interest rate rule.

[5] See, for example, Frank Smets and Rafael Wouters (2007), "Shocks and Frictions in U.S. Business Cycles: A Bayesian DSGE Approach," *American Economic Review*, vol. 97 (June), pp. 586–606.

[6] See, for example, Richard Fisher and Evan Koenig (2014), "Are We There Yet? Assessing Progress toward Full Employment and Price Stability," Federal Reserve Bank of Dallas, *Economic Letter*, vol. 9 (13), www.dallasfed.org/assets/documents/research/eclett/2014/el1413.pdf.

2017; it edges up after 2018 but remains lower than in the baseline. With resource utilization running tighter and the Phillips curve assumed to be steeper than in the standard version of the model, inflation is higher than in the baseline, rising above 2¼ percent.[7] The federal funds rate exceeds 4 percent at the end of 2018 and reaches almost 5 percent in 2020. Given enough time, this path for the federal funds rate would eventually drive the unemployment rate up to its assumed natural rate and bring inflation back down to 2 percent. Unemployment does not need to exceed the natural rate in order to bring inflation back down—simply returning to the natural rate is enough—because inflation expectations remain anchored throughout the scenario.

[7] The larger rise in inflation depends importantly on the substantially smaller adjustment costs for wages and prices in this scenario; the smaller costs lead to a steeper Phillips curve. Had we used our standard coefficients in the wage and price equations, inflation would have peaked at only about 2 percent.

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

Measure and projection	2016		2017		2018	
	December Tealbook	Current Tealbook	December Tealbook	Current Tealbook	December Tealbook	Current Tealbook
Real GDP						
Staff	2.5	2.2	2.0	2.2	1.9	2.0
FRB/US	2.5	2.5	1.7	2.6	1.5	2.4
EDO	2.7	2.3	2.6	2.2	2.7	2.4
Unemployment rate[1]						
Staff	4.7	4.8	4.6	4.5	4.5	4.3
FRB/US	4.8	4.3	5.1	4.0	5.3	3.9
EDO	4.9	4.8	5.0	5.0	5.0	5.1
Total PCE prices						
Staff	1.2	1.0	1.8	1.6	2.0	1.8
FRB/US	1.4	1.4	1.6	1.7	1.3	1.5
EDO	1.8	1.7	2.2	2.4	2.2	2.3
Core PCE prices						
Staff	1.4	1.4	1.7	1.6	1.9	1.8
FRB/US	1.6	1.8	1.5	1.6	1.3	1.5
EDO	1.8	2.1	2.2	2.4	2.2	2.3
Federal funds rate[1]						
Staff	1.4	1.4	2.5	2.3	3.4	3.2
FRB/US	1.0	1.4	1.0	2.3	.5	2.8
EDO	1.7	2.0	2.8	2.9	3.4	3.4

1. Percent, average for Q4.

Assessment of Key Macroeconomic Risks (1)

Probability of Inflation Events

(4 quarters ahead)

Probability that the 4-quarter change in total PCE prices will be ...	Staff	FRB/US	EDO	BVAR
Greater than 3 percent				
Current Tealbook	.03	.08	.10	.06
Previous Tealbook	.01	.02	.04	.05
Less than 1 percent				
Current Tealbook	.28	.12	.02	.18
Previous Tealbook	.66	.48	.07	.21

Probability of Unemployment Events

(4 quarters ahead)

Probability that the unemployment rate will ...	Staff	FRB/US	EDO	BVAR
Increase by 1 percentage point				
Current Tealbook	.04	.01	.15	.01
Previous Tealbook	.02	.02	.17	.02
Decrease by 1 percentage point				
Current Tealbook	.08	.29	.14	.36
Previous Tealbook	.12	.09	.12	.14

Probability of Near-Term Recession

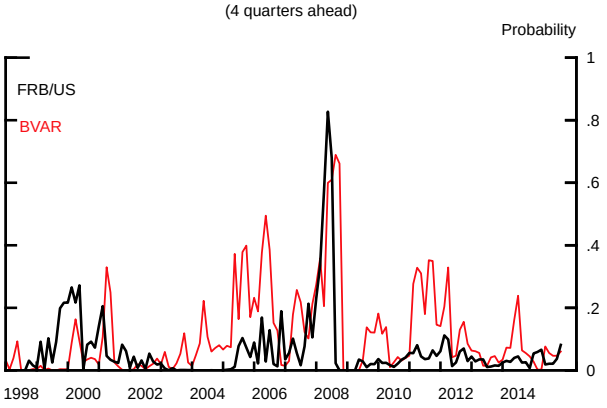
Probability that real GDP declines in the next two quarters	Staff	FRB/US	EDO	BVAR	Factor Model[1]
Current Tealbook	.02	.02	.05	.02	.00
Previous Tealbook	.02	.01	.05	.06	.07

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.

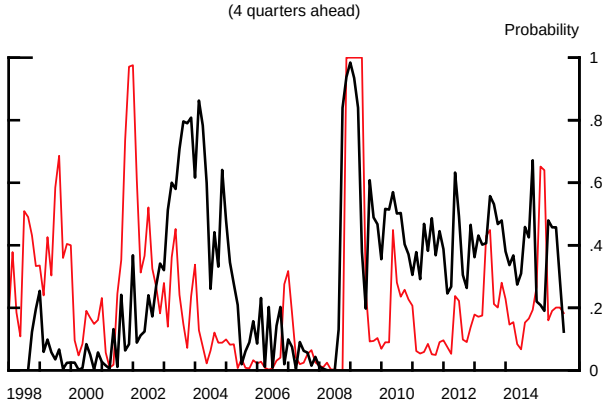
[1] The computation of the recession probability from the factor model has been adjusted in the March Tealbook, and the new procedure will be used in future Tealbooks. The "Previous Tealbook" value reports the probability consistent with the current algorithm, given data as of the January 2016 Tealbook.

Assessment of Key Macroeconomic Risks (2)

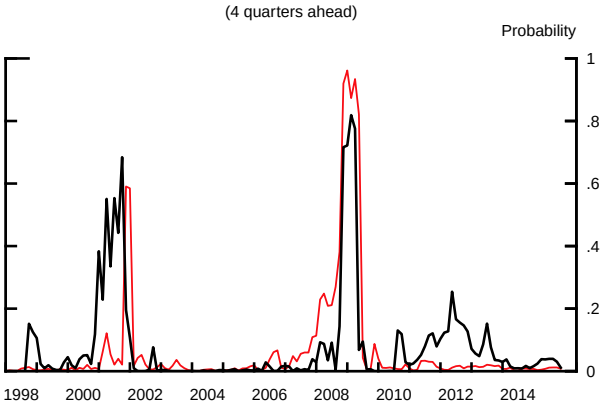
Probability that Total PCE Inflation Is above 3 Percent



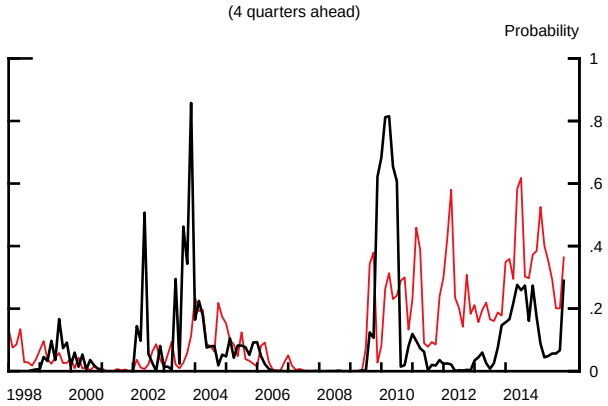
Probability that Total PCE Inflation Is below 1 Percent



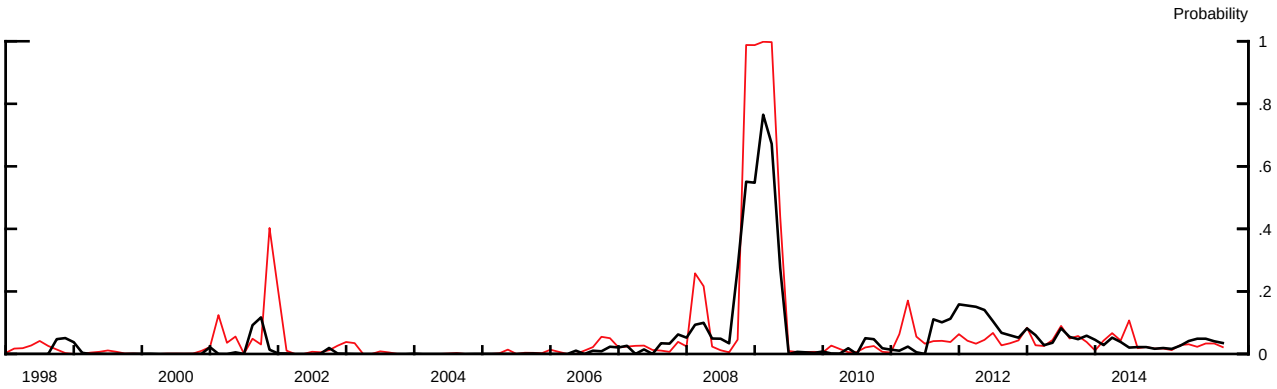
Probability that the Unemployment Rate Increases 1 ppt



Probability that the Unemployment Rate Decreases 1 ppt



Probability that Real GDP Declines in Each of the Next Two Quarters



Note: See notes on facing page. Recession and inflation probabilities for FRB/US and the BVAR are real-time estimates. See Robert J. Tetlow and Brian Ironside (2007), "Real−Time Model Uncertainty in the United States: The Fed, 1996−2003," *Journal of Money, Credit and Banking*, vol. 39 (October), pp. 1533−61.

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Appendix

Technical Note on "Prediction Intervals Derived from Historical Tealbook Forecast Errors"

This technical note provides additional details about the exhibit "Prediction Intervals Derived from Historical Tealbook Forecast Errors." In the four large fan charts, the black dotted lines show staff projections and current estimates of recent values of four key economic variables: average unemployment rate in the fourth quarter of each year and the Q4/Q4 percent change for real GDP, total PCE prices, and core PCE prices. (The GDP series is adjusted to use GNP for those years when the staff forecast GNP and to strip out software and intellectual property products from the currently published data for years preceding their introduction. Similarly, the core PCE inflation series is adjusted to strip out the "food away from home" component for years before it was included in core.)

The historical distributions of the corresponding series (with the adjustments described above) are plotted immediately to the right of each of the fan charts. The thin black lines show the highest and lowest values of the series during the indicated time period. At the bottom of the page, the distributions over three different time periods are plotted for each series. To enable the use of data for years prior to 1947, we report annual-average data in this section. The annual data going back to 1930 for GDP growth, PCE inflation, and core PCE inflation are available in the conventional national accounts; we used estimates from Lebergott (1957) for the unemployment rate from 1930 to 1946.[1]

The prediction intervals around the current and one-year-ahead forecasts are derived from historical staff forecast errors, comparing staff forecasts with the latest published data. For the unemployment rate and real GDP growth, errors were calculated for 1980 through 2014, yielding percentiles of the sizes of the forecast errors. For PCE and core PCE inflation, errors for 1998 through 2014 were used. This shorter range reflects both more limited data on staff forecasts of PCE inflation and the staff judgment that the distribution of inflation since the mid-1990s is more appropriate for the projection period than distributions of inflation reaching further back. In all cases, the prediction intervals are computed by adding the percentile bands of the errors onto the forecast. The blue bands encompass 70 percent prediction-interval ranges; adding the green bands expands this range to 90 percent. The dark blue line plots the median of the prediction intervals. There is not enough historical forecast data to calculate meaningful 90 percent ranges for the two inflation series. A median line above the staff forecast means that forecast errors were positive more than half of the time.

[1] Stanley Lebergott (1957), "Annual Estimates of Unemployment in the United States, 1900–1954," in National Bureau of Economic Research, *The Measurement and Behavior of Unemployment* (Princeton, N.J.: Princeton University Press), pp. 213–41.

Because the staff has produced two-year-ahead forecasts for only a few years, the intervals around the two-year-ahead forecasts are constructed by augmenting the staff projection errors with information from outside forecasters: the Blue Chip consensus, the Council of Economic Advisers, and the Congressional Budget Office. Specifically, we calculate prediction intervals for outside forecasts in the same manner as for the staff forecasts. We then calculate the change in the error bands from outside forecasts from one year ahead to two years ahead and apply the average change to the staff's one-year-ahead error bands. That is, we assume that any deterioration in the performance between the one- and two-year-ahead projections of the outside forecasters would also apply to the Tealbook projections. Limitations on the availability of data mean that a slightly shorter sample is used for GDP and unemployment, and the outside projections may only be for a similar series, such as total CPI instead of total PCE prices or annual growth rates of GDP instead of four-quarter changes. In particular, because data on forecasts for core inflation by these outside forecasters are much more limited, we did not extrapolate the staff's errors for core PCE inflation two years ahead.

The intervals around the historical data in the four fan charts are based on the history of data revisions for each series. The previous-year, two-year-back, and three-year-back values as of the current Tealbook forecast are subtracted from the corresponding currently published estimates (adjusted as described earlier) to produce revisions, which are then combined into distributions and revision intervals in the same way that the prediction intervals are created.

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

Interval	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate[1]	
	01/20/16	03/09/16	01/20/16	03/09/16	01/20/16	03/09/16	01/20/16	03/09/16	01/20/16	03/09/16
Quarterly										
2015:Q1	.8	.8	.6	.6	-1.9	-1.9	1.0	1.0	5.5	5.5
Q2	6.1	6.1	3.9	3.9	2.2	2.2	1.9	1.9	5.4	5.4
Q3	3.3	3.3	2.0	2.0	1.3	1.3	1.4	1.4	5.1	5.1
Q4	1.1	2.1	.4	1.2	.1	.4	1.2	1.3	5.0	5.0
2016:Q1	2.0	2.4	2.1	1.9	-.9	.1	1.2	1.9	4.9	4.9
Q2	3.1	2.8	2.4	2.0	.7	1.3	1.4	1.5	4.8	4.9
Q3	4.3	3.8	2.7	2.4	1.5	1.4	1.3	1.2	4.8	4.8
Q4	4.2	3.8	2.6	2.4	1.5	1.3	1.3	1.2	4.7	4.8
2017:Q1	3.8	3.7	1.8	1.8	1.8	1.7	1.6	1.6	4.7	4.7
Q2	3.9	4.1	2.0	2.3	1.8	1.7	1.6	1.6	4.7	4.6
Q3	3.9	4.0	2.2	2.3	1.7	1.6	1.5	1.5	4.6	4.6
Q4	3.9	4.0	2.1	2.3	1.7	1.6	1.5	1.5	4.6	4.5
Two-quarter[2]										
2015:Q2	3.4	3.4	2.3	2.3	.1	.1	1.4	1.4	-.3	-.3
Q4	2.2	2.7	1.2	1.6	.7	.8	1.3	1.4	-.4	-.4
2016:Q2	2.5	2.6	2.3	2.0	-.1	.7	1.3	1.7	-.2	-.1
Q4	4.2	3.8	2.6	2.4	1.5	1.4	1.3	1.2	-.1	-.1
2017:Q2	3.8	3.9	1.9	2.1	1.8	1.7	1.6	1.6	.0	-.2
Q4	3.9	4.0	2.1	2.3	1.7	1.6	1.5	1.5	-.1	-.1
Four-quarter[3]										
2014:Q4	3.9	3.9	2.5	2.5	1.1	1.1	1.4	1.4	-1.3	-1.3
2015:Q4	2.8	3.0	1.7	1.9	.4	.5	1.3	1.4	-.7	-.7
2016:Q4	3.4	3.2	2.4	2.2	.7	1.0	1.3	1.4	-.3	-.2
2017:Q4	3.9	4.0	2.0	2.2	1.7	1.6	1.6	1.6	-.1	-.3
2018:Q4	3.9	4.0	1.8	2.0	2.0	1.8	1.9	1.8	.0	-.2
Annual										
2014	4.1	4.1	2.4	2.4	1.4	1.4	1.5	1.5	6.2	6.2
2015	3.4	3.4	2.4	2.4	.3	.3	1.3	1.3	5.3	5.3
2016	2.9	3.0	2.0	2.0	.5	.9	1.3	1.5	4.8	4.8
2017	3.9	3.8	2.2	2.2	1.6	1.5	1.5	1.4	4.7	4.6
2018	3.9	4.0	1.9	2.1	1.9	1.8	1.8	1.7	4.6	4.4

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

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

Item	2015			2016				2017							
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2015[1]	2016[1]	2017[1]	2018[1]
Real GDP	3.9	2.0	1.2	1.9	2.0	2.4	2.4	1.8	2.3	2.3	2.3	1.9	2.2	2.2	2.0
Previous Tealbook	3.9	2.0	.4	2.1	2.4	2.7	2.6	1.8	2.0	2.2	2.1	1.7	2.4	2.0	1.8
Final sales	3.9	2.7	1.4	2.2	2.4	2.0	2.4	1.8	2.3	2.3	2.5	1.9	2.3	2.2	2.3
Previous Tealbook	3.9	2.7	1.3	1.9	2.4	2.2	2.5	1.7	2.4	2.1	2.2	1.9	2.3	2.1	2.2
Priv. dom. final purch.	3.9	3.2	1.7	2.8	3.2	3.2	3.1	3.2	3.1	3.0	2.9	2.7	3.1	3.1	2.7
Previous Tealbook	3.9	3.2	2.1	2.8	3.6	3.9	3.5	3.3	3.3	3.0	2.8	2.8	3.4	3.1	2.6
Personal cons. expend.	3.6	3.0	2.0	3.1	3.1	2.8	2.6	2.9	2.9	2.9	2.8	2.6	2.9	2.9	2.5
Previous Tealbook	3.6	3.0	1.7	3.1	3.3	3.4	3.3	3.1	3.1	2.8	2.7	2.5	3.2	2.9	2.5
Durables	8.0	6.6	3.4	6.7	3.8	4.0	4.3	4.8	5.4	5.0	5.5	5.0	4.7	5.2	4.3
Nondurables	4.3	4.2	1.2	3.1	3.7	2.4	2.4	2.7	2.5	2.5	2.7	2.6	2.9	2.6	2.7
Services	2.7	2.1	2.1	2.6	2.8	2.7	2.5	2.7	2.6	2.7	2.4	2.2	2.6	2.6	2.2
Residential investment	9.3	8.2	10.2	11.0	5.5	10.0	11.7	8.0	6.7	4.1	3.2	9.5	9.5	5.5	6.0
Previous Tealbook	9.3	8.2	6.1	8.8	7.0	11.1	6.1	6.4	7.7	8.0	6.7	8.4	8.2	7.2	5.3
Nonres. priv. fixed invest.	4.1	2.6	-1.9	-1.1	3.1	3.4	3.4	3.1	3.4	3.5	3.3	1.6	2.2	3.3	2.7
Previous Tealbook	4.1	2.6	3.0	-.3	4.2	4.5	4.2	3.2	3.1	2.6	2.3	2.8	3.1	2.8	2.3
Equipment & intangibles	3.5	5.5	-.4	1.2	4.8	4.4	3.7	3.2	3.6	3.6	3.5	3.2	3.5	3.5	3.0
Previous Tealbook	3.5	5.5	4.7	.6	5.5	5.7	4.8	3.0	2.9	2.5	2.3	4.5	4.1	2.7	2.6
Nonres. structures	6.2	-7.2	-7.4	-9.3	-3.5	-.2	2.3	2.5	2.7	3.0	2.5	-4.1	-2.8	2.7	1.3
Previous Tealbook	6.2	-7.2	-3.0	-3.6	-.4	-.1	2.0	3.9	3.7	3.2	2.7	-3.0	-.6	3.4	1.3
Net exports[2]	-535	-546	-552	-585	-617	-662	-679	-725	-753	-778	-783	-544	-636	-760	-816
Previous Tealbook[2]	-535	-546	-565	-610	-657	-715	-747	-805	-841	-874	-886	-547	-682	-852	-923
Exports	5.1	.7	-2.1	-1.9	1.0	.8	2.6	-1.4	2.0	2.0	4.4	-.7	.6	1.7	3.6
Imports	3.0	2.3	-.8	3.4	5.6	7.5	4.5	5.6	5.5	5.2	3.8	2.9	5.3	5.0	3.9
Gov't. cons. & invest.	2.6	1.8	.1	3.3	1.9	2.0	.5	.4	1.5	1.2	.5	1.1	1.9	.9	.7
Previous Tealbook	2.6	1.8	-.3	3.2	2.5	1.1	.8	.9	1.9	1.0	-.2	1.0	1.9	.9	.6
Federal	.0	.2	2.2	5.4	3.1	3.2	-.7	-.5	-.6	.5	-.8	.9	2.7	-.4	-.8
Defense	.3	-1.4	2.7	2.5	1.1	1.6	-1.7	.0	-2.1	-.2	-.7	.6	.9	-.7	-.5
Nondefense	-.5	2.8	1.4	9.9	6.2	5.6	.9	-1.2	1.5	1.4	-.9	1.2	5.6	.2	-1.2
State & local	4.3	2.8	-1.2	2.0	1.1	1.3	1.2	.9	2.9	1.6	1.2	1.2	1.4	1.7	1.7
Change in priv. inventories[2]	114	85	78	66	52	69	70	73	73	74	65	97	64	71	39
Previous Tealbook[2]	114	85	49	57	57	77	81	84	71	73	70	90	68	75	35

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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Real GDP	-.2	2.7	1.7	1.3	2.5	2.5	1.9	2.2	2.2	2.0
Previous Tealbook	-.2	2.7	1.7	1.3	2.5	2.5	1.7	2.4	2.0	1.8
Final sales	-.4	2.0	1.5	1.7	1.9	2.6	1.9	2.3	2.2	2.3
Previous Tealbook	-.4	2.0	1.5	1.7	1.9	2.6	1.9	2.3	2.1	2.2
Priv. dom. final purch.	-2.4	3.5	2.6	2.3	2.6	3.6	2.7	3.1	3.1	2.7
Previous Tealbook	-2.4	3.5	2.6	2.3	2.6	3.6	2.8	3.4	3.1	2.6
Personal cons. expend.	-.2	3.1	1.5	1.3	2.3	3.2	2.6	2.9	2.9	2.5
Previous Tealbook	-.2	3.1	1.5	1.3	2.3	3.2	2.5	3.2	2.9	2.5
Durables	2.5	9.3	4.8	7.2	4.6	7.5	5.0	4.7	5.2	4.3
Nondurables	.2	3.3	.4	.8	2.6	2.3	2.6	2.9	2.6	2.7
Services	-.8	2.0	1.4	.6	1.8	2.8	2.2	2.6	2.6	2.2
Residential investment	-10.8	-5.2	6.0	15.7	3.5	5.1	9.5	9.5	5.5	6.0
Previous Tealbook	-10.8	-5.2	6.0	15.7	3.5	5.1	8.4	8.2	7.2	5.3
Nonres. priv. fixed invest.	-12.2	8.1	9.0	5.2	4.2	5.5	1.6	2.2	3.3	2.7
Previous Tealbook	-12.2	8.1	9.0	5.2	4.2	5.5	2.8	3.1	2.8	2.3
Equipment & intangibles	-6.0	12.0	9.2	5.5	3.6	5.7	3.2	3.5	3.5	3.0
Previous Tealbook	-6.0	12.0	9.2	5.5	3.6	5.7	4.5	4.1	2.7	2.6
Nonres. structures	-27.1	-4.0	8.0	4.1	6.5	5.0	-4.1	-2.8	2.7	1.3
Previous Tealbook	-27.1	-4.0	8.0	4.1	6.5	5.0	-3.0	-.6	3.4	1.3
Net exports[1]	-395	-459	-459	-447	-417	-443	-544	-636	-760	-816
Previous Tealbook[1]	-395	-459	-459	-447	-417	-443	-547	-682	-852	-923
Exports	.8	10.1	4.2	2.2	5.2	2.4	-.7	.6	1.7	3.6
Imports	-6.2	12.0	3.5	.3	2.4	5.4	2.9	5.3	5.0	3.9
Gov't. cons. & invest.	2.3	-1.1	-3.0	-2.2	-2.9	.4	1.1	1.9	.9	.7
Previous Tealbook	2.3	-1.1	-3.0	-2.2	-2.9	.4	1.0	1.9	.9	.6
Federal	3.9	3.2	-4.0	-2.1	-6.8	-.8	.9	2.7	-.4	-.8
Defense	3.6	2.0	-4.1	-3.9	-7.4	-2.9	.6	.9	-.7	-.5
Nondefense	4.6	5.5	-3.9	1.0	-5.9	2.7	1.2	5.6	.2	-1.2
State & local	1.3	-4.0	-2.3	-2.3	-.2	1.1	1.2	1.4	1.7	1.7
Change in priv. inventories[1]	-148	58	38	55	61	68	97	64	71	39
Previous Tealbook[1]	-148	58	38	55	61	68	90	68	75	35

1. Billions of chained (2009) dollars.

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

Item	2015			2016				2017							
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2015[1]	2016[1]	2017[1]	2018[1]
Real GDP	3.9	2.0	1.2	1.9	2.0	2.4	2.4	1.8	2.3	2.3	2.3	1.9	2.2	2.2	2.0
Previous Tealbook	3.9	2.0	.4	2.1	2.4	2.7	2.6	1.8	2.0	2.2	2.1	1.7	2.4	2.0	1.8
Final sales	3.9	2.7	1.3	2.2	2.3	2.0	2.4	1.8	2.3	2.3	2.5	1.9	2.2	2.2	2.3
Previous Tealbook	3.9	2.7	1.3	1.9	2.4	2.2	2.5	1.7	2.3	2.1	2.1	1.9	2.2	2.1	2.2
Priv. dom. final purch.	3.3	2.6	1.5	2.4	2.7	2.7	2.7	2.7	2.7	2.6	2.5	2.3	2.6	2.6	2.3
Previous Tealbook	3.3	2.6	1.8	2.4	3.0	3.3	3.0	2.8	2.8	2.6	2.4	2.4	2.9	2.7	2.3
Personal cons. expend.	2.4	2.0	1.4	2.1	2.1	1.9	1.8	2.0	2.0	2.0	2.0	1.8	2.0	2.0	1.7
Previous Tealbook	2.4	2.0	1.2	2.1	2.2	2.3	2.2	2.2	2.1	2.0	1.9	1.7	2.2	2.0	1.7
Durables	.6	.5	.3	.5	.3	.3	.3	.3	.4	.4	.4	.4	.3	.4	.3
Nondurables	.6	.6	.2	.5	.5	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4
Services	1.2	1.0	1.0	1.2	1.3	1.2	1.2	1.3	1.2	1.3	1.2	1.0	1.2	1.2	1.0
Residential investment	.3	.3	.3	.4	.2	.3	.4	.3	.3	.2	.1	.3	.3	.2	.2
Previous Tealbook	.3	.3	.2	.3	.2	.4	.2	.2	.3	.3	.3	.3	.3	.3	.2
Nonres. priv. fixed invest.	.5	.3	-.2	-.1	.4	.4	.4	.4	.4	.4	.4	.2	.3	.4	.3
Previous Tealbook	.5	.3	.4	.0	.5	.6	.5	.4	.4	.3	.3	.4	.4	.4	.3
Equipment & intangibles	.4	.5	.0	.1	.5	.4	.4	.3	.4	.4	.3	.3	.4	.4	.3
Previous Tealbook	.4	.5	.5	.1	.5	.6	.5	.3	.3	.3	.2	.4	.4	.3	.3
Nonres. structures	.2	-.2	-.2	-.3	-.1	.0	.1	.1	.1	.1	.1	-.1	-.1	.1	.0
Previous Tealbook	.2	-.2	-.1	-.1	.0	.0	.1	.1	.1	.1	.1	-.1	.0	.1	.0
Net exports	.2	-.3	-.1	-.7	-.7	-1.0	-.4	-1.0	-.6	-.6	-.1	-.5	-.7	-.6	-.2
Previous Tealbook	.2	-.3	-.4	-1.0	-1.0	-1.3	-.7	-1.2	-.8	-.7	-.2	-.6	-1.0	-.7	-.2
Exports	.6	.1	-.3	-.2	.1	.1	.3	-.2	.2	.2	.5	-.1	.1	.2	.4
Imports	-.5	-.4	.1	-.5	-.8	-1.1	-.7	-.8	-.8	-.8	-.6	-.5	-.8	-.8	-.6
Gov't. cons. & invest.	.5	.3	.0	.6	.3	.4	.1	.1	.3	.2	.1	.2	.3	.2	.1
Previous Tealbook	.5	.3	-.1	.6	.4	.2	.1	.2	.3	.2	.0	.2	.3	.2	.1
Federal	.0	.0	.1	.4	.2	.2	.0	.0	.0	.0	-.1	.1	.2	.0	-.1
Defense	.0	-.1	.1	.1	.0	.1	-.1	.0	-.1	.0	.0	.0	.0	.0	.0
Nondefense	.0	.1	.0	.3	.2	.2	.0	.0	.0	.0	.0	.0	.2	.0	.0
State & local	.5	.3	-.1	.2	.1	.1	.1	.1	.3	.2	.1	.1	.2	.2	.2
Change in priv. inventories	.0	-.7	-.2	-.3	-.3	.4	.0	.1	.0	.0	-.2	.0	.0	.0	-.2
Previous Tealbook	.0	-.7	-.9	.2	.0	.5	.1	.1	-.3	.1	-.1	-.2	.2	-.1	-.3

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	2015			2016				2017							
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2015[1]	2016[1]	2017[1]	2018[1]
GDP chain-wt. price index	2.1	1.3	.9	.5	.8	1.4	1.4	1.9	1.7	1.7	1.7	1.1	1.0	1.7	1.9
Previous Tealbook	2.1	1.3	.8	-.1	.6	1.6	1.6	2.0	1.8	1.8	1.7	1.1	.9	1.8	2.0
PCE chain-wt. price index	2.2	1.3	.4	.1	1.3	1.4	1.3	1.7	1.7	1.6	1.6	.5	1.0	1.6	1.8
Previous Tealbook	2.2	1.3	.1	-.9	.7	1.5	1.5	1.8	1.8	1.7	1.7	.4	.7	1.7	2.0
Energy	15.1	-1.9	-17.2	-32.4	-3.4	6.7	4.2	3.9	2.8	2.1	1.9	-15.1	-7.7	2.7	1.4
Previous Tealbook	15.1	-1.9	-20.7	-38.7	-16.4	7.0	6.4	5.6	4.4	3.8	3.7	-16.0	-12.6	4.4	3.1
Food	-1.1	2.2	.0	-1.4	1.5	1.7	1.9	1.9	1.9	2.0	2.0	.2	.9	2.0	2.0
Previous Tealbook	-1.1	2.2	.3	-.3	1.6	1.7	1.9	1.9	1.9	2.0	2.0	.3	1.2	2.0	2.0
Ex. food & energy	1.9	1.4	1.3	1.9	1.5	1.2	1.2	1.6	1.6	1.5	1.5	1.4	1.4	1.6	1.8
Previous Tealbook	1.9	1.4	1.2	1.2	1.4	1.3	1.3	1.6	1.6	1.5	1.5	1.3	1.3	1.6	1.9
Ex. food & energy, market based	1.8	1.2	1.4	1.7	1.5	1.2	1.2	1.6	1.6	1.5	1.5	1.3	1.4	1.5	1.8
Previous Tealbook	1.8	1.2	1.2	1.0	1.3	1.3	1.3	1.6	1.6	1.5	1.5	1.2	1.2	1.6	1.9
CPI	2.4	1.4	.8	-.4	1.8	2.2	2.1	2.2	2.1	2.1	2.1	.4	1.4	2.1	2.2
Previous Tealbook	3.0	1.6	.2	-1.3	1.0	2.2	2.3	2.3	2.3	2.3	2.3	.4	1.0	2.3	2.4
Ex. food & energy	2.3	1.8	2.2	2.5	2.1	1.9	1.9	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.3
Previous Tealbook	2.5	1.7	2.1	1.9	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.0	2.0	2.2	2.3
ECI, hourly compensation[2]	.0	2.6	1.9	2.5	2.2	2.2	2.2	2.5	2.5	2.5	2.5	1.9	2.3	2.5	2.6
Previous Tealbook[2]	.0	2.6	2.4	2.4	2.4	2.4	2.4	2.6	2.6	2.6	2.6	2.0	2.4	2.6	2.6
Business sector															
Output per hour	3.4	2.4	-2.0	.0	3.4	2.1	1.4	1.0	1.6	1.3	1.4	.6	1.7	1.3	1.4
Previous Tealbook	3.7	2.5	-2.4	1.0	2.2	2.5	1.8	1.3	1.8	1.8	1.9	.6	1.9	1.7	1.4
Compensation per hour	5.5	2.4	.9	1.9	3.1	3.1	3.1	3.3	3.0	3.0	3.0	2.6	2.8	3.1	3.3
Previous Tealbook	5.9	4.1	2.7	3.0	3.1	3.1	3.1	3.3	3.1	3.1	3.1	3.5	3.1	3.1	3.3
Unit labor costs	2.1	.0	3.0	1.9	-.3	.9	1.7	2.3	1.4	1.7	1.6	1.9	1.0	1.7	1.9
Previous Tealbook	2.1	1.6	5.1	2.0	.9	.6	1.3	2.0	1.2	1.2	1.2	2.8	1.2	1.4	1.8
Core goods imports chain-wt. price index[3]	-3.1	-2.1	-3.6	-2.2	-.6	1.3	.9	1.0	1.0	1.0	1.1	-3.3	-.1	1.0	1.1
Previous Tealbook[3]	-3.1	-2.1	-3.0	-3.1	-2.7	-.2	.7	1.0	1.1	1.1	1.2	-3.2	-1.4	1.1	1.2

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.

Changes in Prices and Costs

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

Item	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
GDP chain-wt. price index	.4	1.8	1.9	1.9	1.6	1.3	1.1	1.0	1.7	1.9
Previous Tealbook	.4	1.8	1.9	1.9	1.6	1.3	1.1	.9	1.8	2.0
PCE chain-wt. price index	1.2	1.3	2.7	1.8	1.2	1.1	.5	1.0	1.6	1.8
Previous Tealbook	1.2	1.3	2.7	1.8	1.2	1.1	.4	.7	1.7	2.0
Energy	2.3	6.4	12.0	2.3	-2.5	-6.4	-15.1	-7.7	2.7	1.4
Previous Tealbook	2.3	6.4	12.0	2.3	-2.5	-6.4	-16.0	-12.6	4.4	3.1
Food	-1.8	1.3	5.1	1.2	.8	2.8	.2	.9	2.0	2.0
Previous Tealbook	-1.8	1.3	5.1	1.2	.8	2.8	.3	1.2	2.0	2.0
Ex. food & energy	1.4	1.0	1.9	1.8	1.5	1.4	1.4	1.4	1.6	1.8
Previous Tealbook	1.4	1.0	1.9	1.8	1.5	1.4	1.3	1.3	1.6	1.9
Ex. food & energy, market based	1.8	.7	1.9	1.5	1.2	1.2	1.3	1.4	1.5	1.8
Previous Tealbook	1.8	.7	1.9	1.5	1.2	1.2	1.2	1.2	1.6	1.9
CPI	1.5	1.2	3.3	1.9	1.2	1.2	.4	1.4	2.1	2.2
Previous Tealbook	1.5	1.2	3.3	1.9	1.2	1.2	.4	1.0	2.3	2.4
Ex. food & energy	1.8	.6	2.2	1.9	1.7	1.7	2.0	2.1	2.1	2.3
Previous Tealbook	1.8	.6	2.2	1.9	1.7	1.7	2.0	2.0	2.2	2.3
ECI, hourly compensation[1]	1.2	2.1	2.2	1.8	2.0	2.3	1.9	2.3	2.5	2.6
Previous Tealbook[1]	1.2	2.1	2.2	1.8	2.0	2.3	2.0	2.4	2.6	2.6
Business sector										
Output per hour	5.6	1.7	.0	-.2	1.6	-.1	.6	1.7	1.3	1.4
Previous Tealbook	5.6	1.7	.0	-.2	1.6	-.2	.6	1.9	1.7	1.4
Compensation per hour	1.2	1.3	.6	5.8	-.1	2.7	2.6	2.8	3.1	3.3
Previous Tealbook	1.3	1.2	.6	5.8	-.1	2.6	3.5	3.1	3.1	3.3
Unit labor costs	-4.2	-.4	.6	6.0	-1.7	2.8	1.9	1.0	1.7	1.9
Previous Tealbook	-4.2	-.4	.6	6.0	-1.7	2.8	2.8	1.2	1.4	1.8
Core goods imports chain-wt. price index[2]	-1.9	2.3	4.3	.1	-1.1	.5	-3.3	-.1	1.0	1.1
Previous Tealbook[2]	-1.9	2.3	4.3	.1	-1.1	.5	-3.2	-1.4	1.1	1.2

1. Private-industry workers.
2. Core goods imports exclude computers, semiconductors, oil, and natural gas.

Other Macroeconomic Indicators

Item	2015 Q2	2015 Q3	2015 Q4	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2015[1]	2016[1]	2017[1]	2018[1]
Employment and production															
Nonfarm payroll employment[2]	.7	.7	.7	.7	.6	.6	.6	.5	.5	.5	.5	2.8	2.5	2.1	1.7
Unemployment rate[3]	5.4	5.1	5.0	4.9	4.9	4.8	4.8	4.7	4.6	4.6	4.5	5.0	4.8	4.5	4.3
Previous Tealbook[3]	5.4	5.1	5.0	4.9	4.8	4.8	4.7	4.7	4.7	4.6	4.6	5.0	4.7	4.6	4.6
Natural rate of unemployment[3]	5.1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Previous Tealbook[3]	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Employment-to-Population Ratio[3]	59.4	59.3	59.4	59.7	59.7	59.7	59.7	59.7	59.7	59.7	59.7	59.4	59.7	59.7	59.5
Employment-to-Population Trend[3]	60.0	59.9	59.9	59.8	59.7	59.6	59.6	59.5	59.4	59.4	59.3	59.9	59.6	59.3	59.0
GDP gap[4]	-.3	-.1	-.1	.0	.1	.3	.5	.6	.8	.9	1.1	-.1	.5	1.1	1.4
Previous Tealbook[4]	-.3	-.1	-.3	-.1	.1	.4	.7	.7	.8	1.0	1.1	-.3	.7	1.1	1.3
Industrial production[5]	-2.3	2.7	-3.3	-.2	1.4	1.0	2.0	2.8	2.0	1.3	1.6	-.8	1.0	1.9	2.0
Previous Tealbook[5]	-2.3	2.8	-3.4	.6	2.3	1.1	1.6	2.4	1.6	1.3	1.6	-.9	1.4	1.7	1.7
Manufacturing industr. prod.[5]	1.5	3.0	.0	1.5	1.4	1.9	2.6	2.4	2.4	1.9	1.6	1.0	1.9	2.1	1.8
Previous Tealbook[5]	1.5	3.2	.5	.4	2.9	2.5	2.2	1.9	1.9	1.9	1.6	1.1	2.0	1.8	1.5
Capacity utilization rate - mfg.[3]	75.9	76.3	76.0	76.1	76.1	76.3	76.6	76.8	77.1	77.3	77.4	76.0	76.6	77.4	78.0
Previous Tealbook[3]	75.9	76.3	76.1	76.0	76.3	76.6	76.8	76.9	77.1	77.2	77.3	76.1	76.8	77.3	77.7
Housing starts[6]	1.2	1.2	1.1	1.1	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.1	1.2	1.4	1.6
Light motor vehicle sales[6]	17.1	17.8	17.8	17.4	17.3	17.2	17.2	17.0	17.0	16.9	16.8	17.4	17.3	16.9	16.7
Income and saving															
Nominal GDP[5]	6.1	3.3	2.1	2.4	2.8	3.8	3.8	3.7	4.1	4.0	4.0	3.0	3.2	4.0	4.0
Real disposable pers. income[5]	2.6	3.2	2.5	5.3	3.0	2.8	2.6	3.3	2.1	2.7	2.4	3.1	3.4	2.6	2.4
Previous Tealbook[5]	2.6	3.8	4.5	5.5	3.5	3.1	1.8	3.2	1.9	2.5	2.0	3.7	3.5	2.4	2.2
Personal saving rate[3]	5.0	5.0	5.1	5.6	5.6	5.6	5.6	5.7	5.5	5.4	5.3	5.1	5.6	5.3	5.2
Previous Tealbook[3]	5.0	5.2	5.8	6.3	6.4	6.3	6.0	6.0	5.7	5.6	5.5	5.8	6.0	5.5	5.2
Corporate profits[7]	14.7	-6.2	-12.9	4.2	-2.1	-2.5	-3.0	-1.5	-.6	-.2	.3	-7.3	-.9	-.5	1.7
Profit share of GNP[3]	11.5	11.2	10.8	10.9	10.7	10.6	10.4	10.3	10.1	10.1	10.0	10.8	10.4	10.0	9.8
Gross national saving rate[3]	18.7	18.3	18.8	18.8	18.8	18.4	18.2	18.1	18.1	18.0	17.8	18.8	18.2	17.8	17.6
Net national saving rate[3]	3.8	3.3	3.9	3.9	3.8	3.4	3.2	2.9	3.0	2.8	2.6	3.9	3.2	2.6	2.3

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

Other Macroeconomic Indicators

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

Item	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Employment and production										
Nonfarm payroll employment[1]	-5.6	.8	2.1	2.1	2.4	2.8	2.8	2.5	2.1	1.7
Unemployment rate[2]	9.9	9.5	8.7	7.8	7.0	5.7	5.0	4.8	4.5	4.3
Previous Tealbook[2]	9.9	9.5	8.7	7.8	7.0	5.7	5.0	4.7	4.6	4.6
Natural rate of unemployment[2]	5.9	5.9	5.9	5.6	5.4	5.1	5.0	5.0	5.0	5.0
Previous Tealbook[2]	6.2	6.2	6.0	5.8	5.4	5.1	5.1	5.1	5.1	5.1
Employment-to-Population Ratio[2]	58.4	58.3	58.5	58.7	58.5	59.2	59.4	59.7	59.7	59.5
Employment-to-Population Trend[2]	61.5	61.1	60.7	60.3	60.2	60.1	59.9	59.6	59.3	59.0
GDP gap[3]	-5.5	-4.2	-3.7	-3.7	-2.5	-.9	-.1	.5	1.1	1.4
Previous Tealbook[3]	-5.5	-4.4	-4.2	-4.2	-2.8	-.9	-.3	.7	1.1	1.3
Industrial production[4]	-5.4	5.9	2.8	2.1	2.3	4.5	-.8	1.0	1.9	2.0
Previous Tealbook[4]	-5.4	5.9	2.8	2.1	2.3	4.5	-.9	1.4	1.7	1.7
Manufacturing industr. prod.[4]	-6.1	6.0	2.7	1.5	1.3	3.4	1.0	1.9	2.1	1.8
Previous Tealbook[4]	-6.1	6.0	2.7	1.5	1.3	3.4	1.1	2.0	1.8	1.5
Capacity utilization rate - mfg.[2]	67.1	72.5	74.4	74.1	74.2	76.2	76.0	76.6	77.4	78.0
Previous Tealbook[2]	67.1	72.5	74.4	74.1	74.2	76.2	76.1	76.8	77.3	77.7
Housing starts[5]	.6	.6	.6	.8	.9	1.0	1.1	1.2	1.4	1.6
Light motor vehicle sales[5]	10.4	11.6	12.7	14.4	15.5	16.4	17.4	17.3	16.9	16.7
Income and saving										
Nominal GDP[4]	.1	4.6	3.6	3.2	4.1	3.9	3.0	3.2	4.0	4.0
Real disposable pers. income[4]	-.7	2.6	1.7	5.1	-2.9	3.6	3.1	3.4	2.6	2.4
Previous Tealbook[4]	-.7	2.6	1.7	5.1	-2.9	3.6	3.7	3.5	2.4	2.2
Personal saving rate[2]	5.6	5.5	5.8	9.2	4.4	4.7	5.1	5.6	5.3	5.2
Previous Tealbook[2]	5.6	5.5	5.8	9.2	4.4	4.7	5.8	6.0	5.5	5.2
Corporate profits[6]	53.7	18.0	6.8	.6	4.1	3.4	-7.3	-.9	-.5	1.7
Profit share of GNP[2]	10.6	12.0	12.3	12.0	12.0	11.9	10.8	10.4	10.0	9.8
Gross national saving rate[2]	14.6	15.2	16.1	18.0	18.1	18.8	18.8	18.2	17.8	17.6
Net national saving rate[2]	-1.7	-.3	.8	2.9	3.1	3.9	3.9	3.2	2.6	2.3

1. Change, millions.
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 Federal Sector Accounts and Related Items
(Billions of dollars except as noted)

Item	Fiscal year				2015				2016				2017			
	2015	2016	2017	2018	Q1[a]	Q2[a]	Q3[a]	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Unified budget					Not seasonally adjusted											
Receipts	3,249	3,395	3,503	3,632	680	1,027	802	766	712	1,068	849	775	749	1,110	868	805
Outlays	3,688	3,914	4,084	4,246	943	904	924	981	958	949	1,026	958	1,088	1,002	1,035	1,004
Surplus/deficit	-439	-519	-581	-614	-263	123	-123	-216	-246	119	-177	-183	-339	108	-167	-200
Previous Tealbook	*-439*	*-427*	*-452*	*-485*	*-263*	*123*	*-123*	*-216*	*-218*	*124*	*-117*	*-189*	*-298*	*134*	*-100*	*-195*
Means of financing:																
Borrowing	337	883	719	737	67	-16	46	552	252	-73	153	238	366	-75	190	234
Cash decrease	-40	-100	-18	-3	123	-154	56	-135	23	-42	54	-25	2	-3	7	-5
Other[1]	142	-264	-120	-120	73	47	21	-202	-28	-4	-30	-30	-30	-30	-30	-30
Cash operating balance, end of period	199	299	317	320	100	254	199	333	311	352	299	324	321	324	317	321
NIPA federal sector					Seasonally adjusted annual rates											
Receipts	3,390	3,516	3,646	3,796	3,356	3,440	3,468	3,479	3,491	3,527	3,568	3,603	3,625	3,661	3,698	3,736
Expenditures	3,988	4,142	4,374	4,586	3,936	4,015	4,080	4,063	4,120	4,147	4,239	4,297	4,380	4,377	4,443	4,492
Consumption expenditures	956	992	1,022	1,039	957	957	961	967	990	1,000	1,011	1,013	1,022	1,025	1,030	1,032
Defense	594	606	616	625	595	595	595	598	607	609	612	611	617	616	617	618
Nondefense	362	386	407	414	362	362	366	369	383	392	399	402	405	409	412	414
Other spending	3,032	3,150	3,352	3,547	2,979	3,057	3,118	3,096	3,130	3,147	3,228	3,285	3,358	3,352	3,413	3,460
Current account surplus	-598	-626	-728	-790	-579	-574	-612	-585	-629	-621	-671	-695	-755	-716	-745	-756
Gross investment	263	272	277	280	262	264	263	268	271	273	276	276	277	277	278	277
Gross saving less gross investment[2]	-590	-621	-722	-783	-569	-567	-603	-577	-622	-615	-667	-690	-750	-710	-739	-748
Fiscal indicators																
High-employment (HEB) surplus/deficit[3]	-543.8	-631.3	-771.6	-866.8	-498.2	-534.9	-591.7	-574.8	-626.9	-629.1	-694.4	-730.4	-790.8	-762.3	-803.0	-823.7
Change in HEB, percent of potential GDP	.4	.4	.6	.3	-.3	.2	.3	-.1	.3	.0	.3	.2	.3	-.2	.2	.1
Fiscal impetus (FI), percent of GDP[4]	.4	.6	.3	.2	.0	.7	.5	.3	.8	.6	.6	.3	.2	.4	.3	.2
Previous Tealbook	*.4*	*.6*	*.3*	*.1*	*.0*	*.7*	*.5*	*.2*	*.8*	*.7*	*.4*	*.4*	*.3*	*.4*	*.3*	*.1*
Federal purchases	.1	.2	.0	-.1	.1	.0	.0	.1	.4	.2	.2	.0	.0	.0	.0	-.1
State and local purchases	.1	.1	.2	.2	-.1	.5	.3	-.1	.2	.1	.1	.1	.1	.3	.2	.1
Taxes and transfers	.2	.2	.1	.0	.0	.2	.2	.2	.2	.2	.2	.2	.1	.1	.1	.1

1. Other means of financing include checks issued less checks paid, accrued items, and changes in other financial assets and liabilities.
2. Gross saving is the current account surplus plus consumption of fixed capital of the general government as well as government enterprises.
3. HEB is gross saving less gross investment (NIPA) of the federal government in current dollars, with cyclically sensitive receipts and outlays adjusted to the staff's measure of potential output and the natural rate of unemployment. The sign on Change in HEB, as a percent of nominal potential GDP, is reversed. Quarterly figures for change in HEB are not at annual rates.
4. Fiscal impetus measures the contribution to growth of real GDP from fiscal policy actions at the general government level (excluding multiplier effects). It equals the sum of the direct contributions to real GDP growth from changes in federal purchases and state and local purchases, plus the estimated contribution from real consumption and investment that is induced by discretionary policy changes in transfers and taxes.
a Actual.

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

					Projected							
	2015				2016				2017			
Measure and country	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP[1]												
Total foreign	1.7	1.4	2.5	1.7	2.1	2.3	2.6	2.6	2.9	2.5	2.8	2.8
Previous Tealbook	*1.6*	*1.4*	*2.5*	*2.0*	*2.3*	*2.6*	*2.8*	*2.9*	*3.0*	*2.6*	*2.8*	*2.9*
Advanced foreign economies	1.0	.4	1.9	.9	1.3	1.5	1.8	1.9	2.2	1.4	1.8	1.9
Canada	-.9	-.4	2.4	.8	1.2	1.5	2.0	2.0	2.2	2.1	2.0	1.8
Japan	4.6	-1.4	1.4	-1.1	.8	.9	.9	1.0	3.0	-4.9	-.3	1.1
United Kingdom	1.7	2.4	1.7	1.9	1.9	1.9	2.1	2.3	2.3	2.3	2.3	2.3
Euro area	2.3	1.6	1.2	1.3	1.4	1.5	1.7	1.9	2.0	2.0	2.0	2.1
Germany	1.6	1.6	1.1	1.1	1.5	1.6	1.8	1.9	2.0	2.0	2.0	2.0
Emerging market economies	2.3	2.3	3.1	2.5	2.8	3.2	3.3	3.4	3.5	3.6	3.6	3.7
Asia	4.2	4.2	5.0	4.5	4.5	4.8	4.9	4.9	4.9	4.9	4.9	4.8
Korea	3.3	1.3	5.3	2.3	3.0	3.5	3.8	3.8	3.8	3.8	3.8	3.8
China	5.7	7.2	7.2	7.0	6.0	6.3	6.5	6.3	6.2	6.1	6.1	6.1
Latin America	1.1	.6	1.5	.7	1.4	1.9	2.1	2.1	2.4	2.6	2.6	2.7
Mexico	2.1	2.6	3.3	2.2	2.3	2.6	2.7	2.7	2.8	2.8	2.8	2.9
Brazil	-3.2	-8.2	-6.7	-5.7	-3.0	-1.0	-.2	.0	.5	1.5	1.8	2.0
Consumer prices[2]												
Total foreign	.3	2.5	2.0	1.1	1.2	2.1	2.3	2.4	2.4	2.8	2.4	2.4
Previous Tealbook	*.3*	*2.5*	*2.0*	*1.0*	*1.4*	*2.0*	*2.3*	*2.4*	*2.4*	*2.8*	*2.5*	*2.5*
Advanced foreign economies	-.6	1.8	.6	.2	.0	.9	1.2	1.4	1.5	2.5	1.6	1.7
Canada	-.1	2.4	2.0	.9	1.7	1.6	1.7	1.8	1.9	2.0	2.0	2.0
Japan	.0	1.2	.0	-.1	-.6	-.1	.3	.9	1.1	6.4	1.1	1.2
United Kingdom	-1.4	.9	1.0	-.3	.5	2.2	1.9	2.0	2.0	2.0	2.0	2.1
Euro area	-1.1	2.0	-.2	-.1	-1.3	.7	1.2	1.3	1.4	1.5	1.5	1.5
Germany	-1.4	2.1	-.2	.3	-1.2	.8	1.2	1.5	1.5	1.6	1.6	1.6
Emerging market economies	1.0	3.1	3.0	1.7	2.1	3.0	3.1	3.1	3.0	3.0	3.0	3.0
Asia	.2	2.7	2.5	.8	1.3	2.7	2.8	2.9	2.8	2.7	2.8	2.8
Korea	.1	1.5	.9	1.9	1.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0
China	.3	2.6	3.1	-.2	.9	2.6	2.6	2.8	2.6	2.5	2.5	2.5
Latin America	2.4	3.8	4.2	4.0	4.0	3.8	3.8	3.7	3.6	3.6	3.6	3.6
Mexico	1.1	2.7	2.8	2.4	2.5	3.0	3.2	3.2	3.2	3.2	3.2	3.2
Brazil	10.9	10.2	10.1	10.3	11.1	6.9	6.2	6.2	5.7	5.4	5.4	5.4

[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	2010	2011	2012	2013	2014	2015	2016	2017	2018
						Projected			
Real GDP[1]									
Total foreign	4.8	3.3	2.3	2.8	2.5	1.8	2.4	2.7	2.8
Previous Tealbook	*4.8*	*3.3*	*2.3*	*2.8*	*2.5*	*1.9*	*2.6*	*2.8*	*2.9*
Advanced foreign economies	3.1	1.9	.2	2.2	1.7	1.1	1.6	1.8	1.9
Canada	3.6	3.1	.7	3.1	2.4	.5	1.7	2.0	1.8
Japan	3.6	.3	.0	2.1	-.9	.8	.9	-.4	1.0
United Kingdom	1.8	2.1	1.0	2.8	2.8	1.9	2.0	2.3	2.2
Euro area	2.4	.5	-1.1	.6	1.0	1.6	1.6	2.0	2.0
Germany	4.5	2.4	.1	1.3	1.5	1.3	1.7	2.0	1.8
Emerging market economies	6.6	4.7	4.3	3.4	3.3	2.5	3.2	3.6	3.8
Asia	8.2	5.0	5.7	5.3	5.0	4.5	4.8	4.9	4.8
Korea	6.1	2.9	2.1	3.4	2.7	3.0	3.5	3.8	3.8
China	10.0	8.6	7.9	7.6	7.2	6.8	6.3	6.1	6.0
Latin America	4.7	4.2	3.4	1.6	2.0	1.0	1.8	2.6	2.9
Mexico	4.4	4.2	3.4	1.1	2.6	2.5	2.6	2.8	2.9
Brazil	5.7	2.5	2.6	2.4	-.7	-6.0	-1.1	1.4	2.1
Consumer prices[2]									
Total foreign	3.2	3.4	2.3	2.3	2.0	1.5	2.0	2.5	2.4
Previous Tealbook	*3.2*	*3.4*	*2.3*	*2.3*	*2.0*	*1.5*	*2.0*	*2.5*	*2.5*
Advanced foreign economies	1.7	2.2	1.3	1.0	1.1	.5	.9	1.8	1.7
Canada	2.2	2.7	1.0	1.0	1.9	1.3	1.7	2.0	2.0
Japan	-.3	-.3	-.2	1.4	2.5	.3	.1	2.4	1.3
United Kingdom	3.4	4.6	2.6	2.1	.9	.1	1.6	2.0	2.0
Euro area	2.0	2.9	2.3	.8	.2	.2	.5	1.5	1.5
Germany	1.6	2.6	2.0	1.3	.4	.2	.6	1.6	1.7
Emerging market economies	4.3	4.3	3.1	3.4	2.7	2.2	2.8	3.0	3.0
Asia	4.3	4.5	2.6	3.0	1.8	1.5	2.4	2.8	2.8
Korea	3.2	3.9	1.7	1.1	1.0	1.1	2.4	3.0	3.0
China	4.6	4.6	2.0	2.9	1.5	1.5	2.2	2.6	2.5
Latin America	4.4	4.0	4.3	4.1	4.9	3.6	3.8	3.6	3.6
Mexico	4.3	3.5	4.1	3.6	4.2	2.3	3.0	3.2	3.2
Brazil	5.6	6.7	5.6	5.9	6.6	10.4	7.5	5.5	5.4

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

U.S. Current Account

Quarterly Data

	2015				2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	Billions of dollars, s.a.a.r.											
U.S. current account balance	**-473.3**	**-444.5**	**-516.0**	**-515.9**	**-587.6**	**-602.3**	**-653.9**	**-679.6**	**-746.7**	**-759.8**	**-796.4**	**-827.0**
Previous Tealbook	*-473.2*	*-444.4*	*-496.5*	*-517.9*	*-577.6*	*-600.6*	*-667.2*	*-713.6*	*-792.4*	*-813.8*	*-858.4*	*-896.5*
Current account as percent of GDP	-2.7	-2.5	-2.9	-2.8	-3.2	-3.3	-3.5	-3.6	-3.9	-4.0	-4.1	-4.2
Previous Tealbook	*-2.7*	*-2.5*	*-2.7*	*-2.9*	*-3.2*	*-3.3*	*-3.6*	*-3.8*	*-4.2*	*-4.3*	*-4.5*	*-4.6*
Net goods & services	-537.3	-532.4	-554.3	-535.0	-559.7	-600.9	-649.6	-674.1	-723.9	-743.5	-771.9	-783.1
Investment income, net	208.8	221.2	194.6	169.2	139.5	147.9	144.9	149.0	144.6	133.0	124.7	110.6
Direct, net	278.8	288.4	258.6	234.1	220.3	238.0	248.4	268.4	281.3	289.7	304.0	313.2
Portfolio, net	-70.0	-67.2	-64.1	-64.9	-80.8	-90.1	-103.4	-119.4	-136.7	-156.8	-179.3	-202.7
Other income and transfers, net	-144.8	-133.3	-156.3	-150.1	-167.5	-149.3	-149.2	-154.5	-167.5	-149.3	-149.2	-154.5

Annual Data

	2010	2011	2012	2013	2014	2015	2016	2017	2018
	Billions of dollars								
U.S. current account balance	**-442.0**	**-460.4**	**-449.7**	**-376.8**	**-389.5**	**-487.4**	**-630.8**	**-782.5**	**-884.4**
Previous Tealbook	*-442.0*	*-460.4*	*-449.7*	*-376.8*	*-389.5*	*-483.0*	*-639.7*	*-840.3*	*-958.6*
Current account as percent of GDP	-3.0	-3.0	-2.8	-2.3	-2.2	-2.7	-3.4	-4.1	-4.4
Previous Tealbook	*-3.0*	*-3.0*	*-2.8*	*-2.3*	*-2.2*	*-2.7*	*-3.5*	*-4.4*	*-4.8*
Net goods & services	-494.7	-548.6	-536.8	-478.4	-508.3	-539.8	-621.1	-755.6	-814.3
Investment income, net	185.7	229.0	220.8	233.6	247.4	198.4	145.3	128.2	85.0
Direct, net	288.0	298.6	290.2	301.7	300.5	265.0	243.8	297.1	345.6
Portfolio, net	-102.3	-69.5	-69.4	-68.1	-53.1	-66.6	-98.4	-168.9	-260.6
Other income and transfers, net	-133.0	-140.8	-133.7	-132.0	-128.6	-146.1	-155.1	-155.1	-155.1

Abbreviations

AFE	advanced foreign economy
BEA	Bureau of Economic Analysis
BFI	business fixed investment
BOE	Bank of England
BOJ	Bank of Japan
C&I	commercial and industrial
CMBS	commercial mortgage-backed securities
CPI	consumer price index
CRE	commercial real estate
Desk	Open Market Desk
DSGE	dynamic stochastic general equilibrium
ECB	European Central Bank
ECI	employment cost index
EME	emerging market economy
EU	European Union
FOMC	Federal Open Market Committee; also, the Committee
GDP	gross domestic product
LMCI	labor market conditions index
MBS	mortgage-backed securities
MERS	Middle East Respiratory Syndrome
MMF	money market fund
NIPA	national income and product accounts
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
PMI	purchasing managers index
repo	repurchase agreement; also, RP

SOMA	System Open Market Account
S&P	Standard & Poor's
TIPS	Treasury Inflation-Protected Securities