Prefatory Note

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

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

Class II FOMC – Restricted (FR)

Report to the FOMC
on Economic Conditions
and Monetary Policy

Book A

Economic and Financial Conditions:
Current Situation and Outlook

January 20, 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

We have made only modest changes to our baseline domestic economic outlook relative to our December forecast. To be sure, the available indicators of both spending and production that have become available during the intermeeting period have been weaker than we had expected, even after looking through some factors that we think will unwind in the next few months.[1] Moreover, financial conditions have tightened notably, with equity prices down about 10 percent since the previous Tealbook, the dollar about 3 percent stronger, and risk spreads in debt markets wider. That said, the labor report for December was stronger than we expected, and initial claims for unemployment insurance have drifted up only slightly from very low levels late last year.

Overall, balancing the labor market data against the other indicators, we assess the cyclical position of the economy as only slightly weaker than we thought it would be at the time of the December Tealbook. In our baseline projection, we continue to forecast that real activity will move a little above its sustainable level during the next few years: At the end of 2018, we now have real GDP 1¼ percent above potential and the unemployment rate finishing that year at 4.6 percent, ½ percentage point below our estimate of its natural rate. Both of these measures are a shade less strong than in the previous projection.

At the same time, we also see the downside risks to our forecast of real activity as more pronounced than in December, mainly reflecting the greater uncertainty about global economic prospects and the financial market turbulence at home and abroad.

Our projection for total PCE inflation is lower over the first half of this year, mainly as a result of the higher dollar and the lower path for oil prices. However, we continue to project that total PCE inflation will move up to 2 percent in 2018, as energy prices bottom out and start to increase moderately, import prices turn back up, and resource utilization tightens further in an environment of stable long-term inflation expectations.

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[1] These transitory factors include a significant slowdown in inventory investment in the fourth quarter of 2015, unusually warm weather that suppressed household outlays for energy services, and a change in mortgage regulations that temporarily depressed home sales. These factors are all assumed to abate or reverse in the first half of 2016.

Comparing the Staff Projection with Other Forecasts

The staff's projection for real GDP growth in 2015 is below the Blue Chip consensus forecast and the median projection from the Survey of Professional Forecasters (SPF) (although the latter dates from mid-November). The staff's GDP forecast is close to the others in 2016 but ½ percentage point below the Blue Chip forecast for 2017. The staff's forecast for unemployment is close to the others throughout the medium term. Its inflation projections are generally lower, particularly in 2016.

Comparison of Tealbook and Outside Forecasts

|	2015	2016	2017
GDP (Q4/Q4 percent change)			
January Tealbook	1.7	2.4	2.0
Blue Chip (01/10/16)	2.1	2.6	2.4
SPF median (11/13/15)	2.3	2.6	n.a.
Unemployment rate (Q4 level)			
January Tealbook	5.0	4.7	4.6
Blue Chip (01/10/16)	5.0	4.6	4.5
SPF median (11/13/15)	5.0	4.7	n.a.
Consumer price inflation (Q4/Q4 percent change)			
January Tealbook	0.4	1.0	2.3
Blue Chip (01/10/16)	0.5	2.0	2.3
SPF median (11/13/15)	0.6	2.0	2.3
PCE price inflation (Q4/Q4 percent change)			
January Tealbook	0.4	0.7	1.7
SPF median (11/13/15)	0.6	1.8	1.9
Core PCE price inflation (Q4/Q4 percent change)			
January Tealbook	1.3	1.3	1.6
SPF median (11/13/15)	1.4	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.
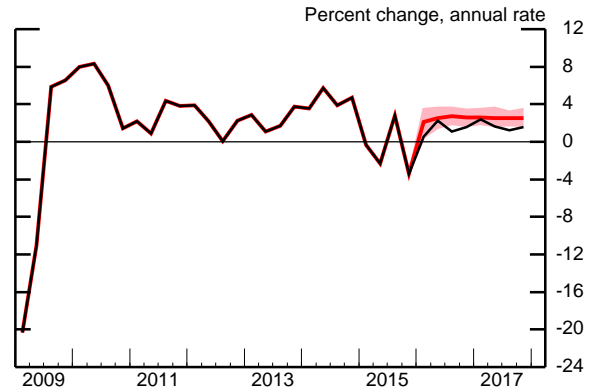
Tealbook Forecast Compared with Blue Chip
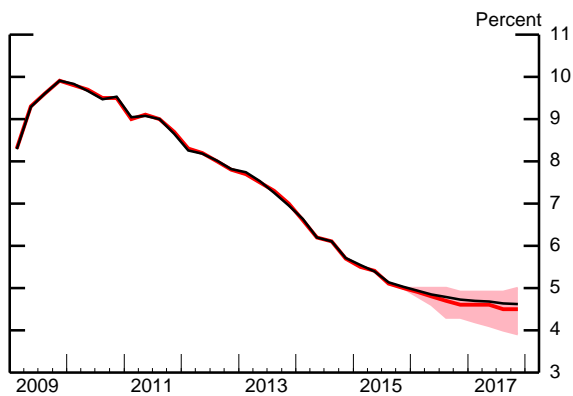(Blue Chip survey released January 10, 2016)

Real GDP

Percent change, annual rate

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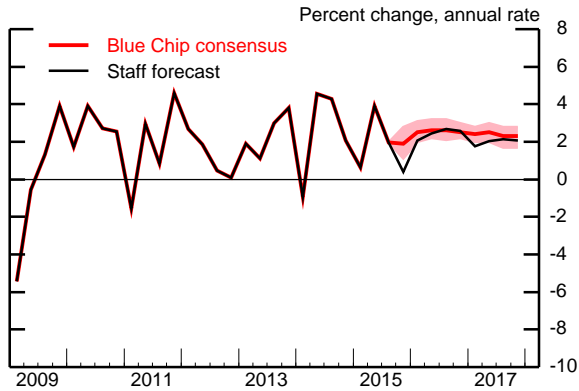
Note: The shaded area represents the area between the Blue Chip top 10 and bottom 10 averages.

Industrial Production

Percent change, annual rate

Unemployment Rate

Percent

Consumer Price Index

Percent change, annual rate
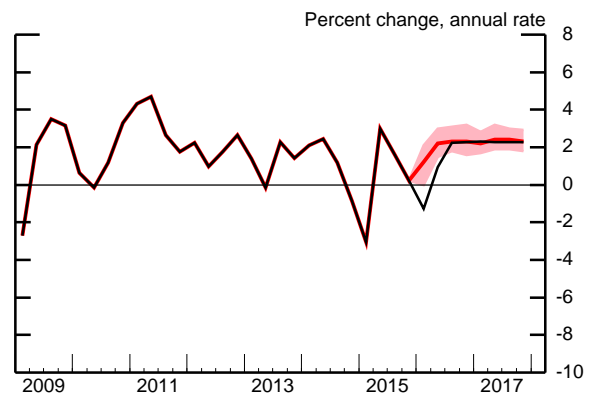
Treasury Bill Rate

Percent

10-Year Treasury Yield

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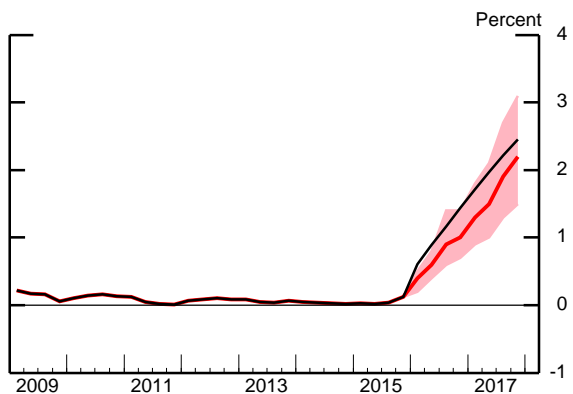
Note: The yield is for on-the-run Treasury securities. Over the forecast period, the staff's projected yield is assumed to be 15 basis points below the off-the-run yield.

Domestic Econ Devel & Outlook

Key Background Factors underlying the Baseline Staff Projection

Federal Funds Rate

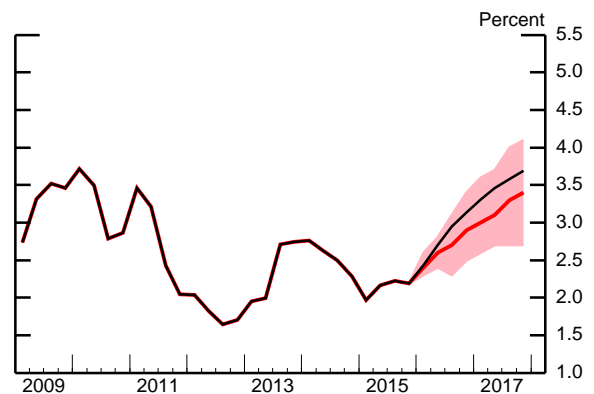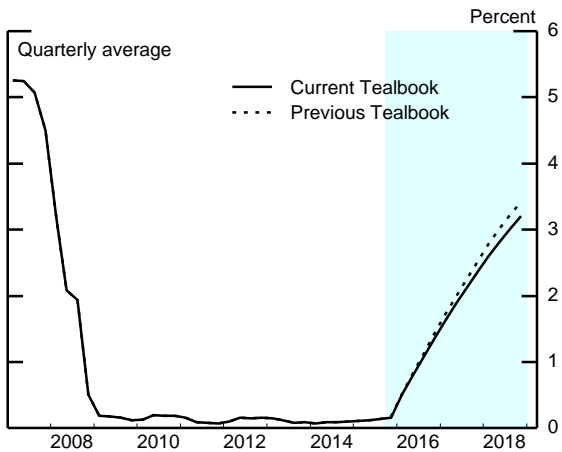Quarterly average

Percent

—— Current Tealbook
······ Previous Tealbook

Long-Term Interest Rates

Quarterly average

Percent

Conforming
mortgage rate

Triple-B
corporate yield

10-year
Treasury yield

Equity Prices

Ratio scale, 2007:Q1 = 100

Quarter-end

Dow Jones
U.S. Total Stock Market
Index

House Prices

Ratio scale, 2007:Q1 = 100

Quarterly

CoreLogic
index

Crude Oil Prices

Dollars per barrel

Quarterly average

Imported oil

West Texas
Intermediate

Broad Real Dollar

2007:Q1 = 100

Quarterly average
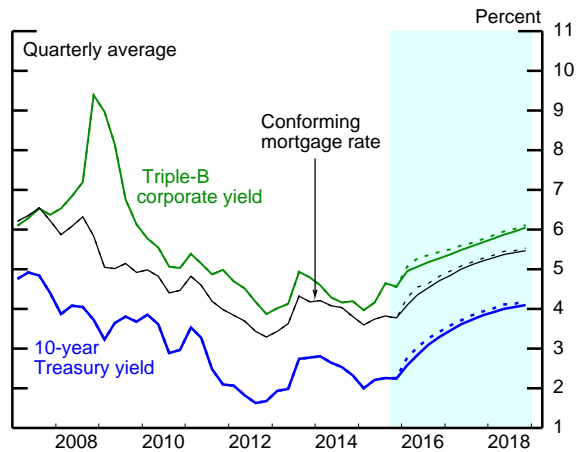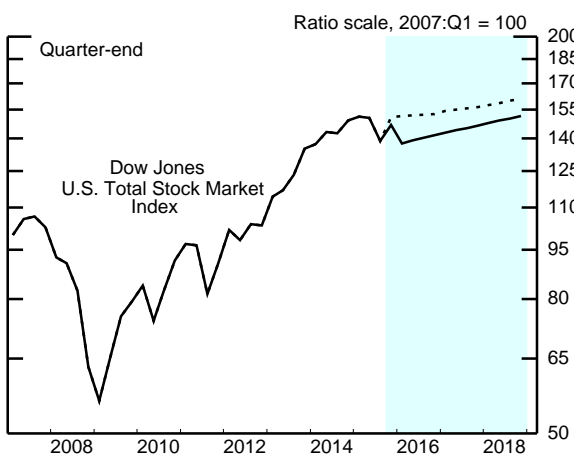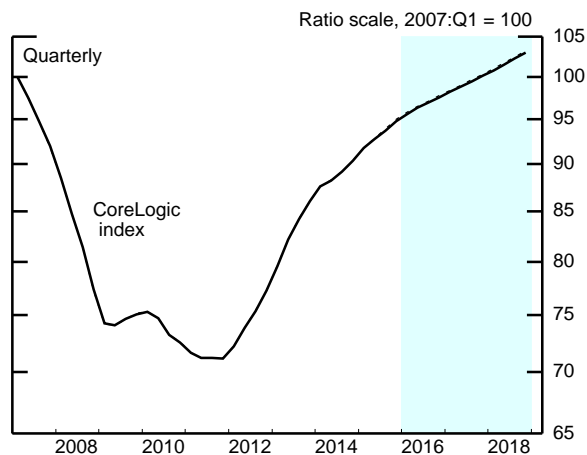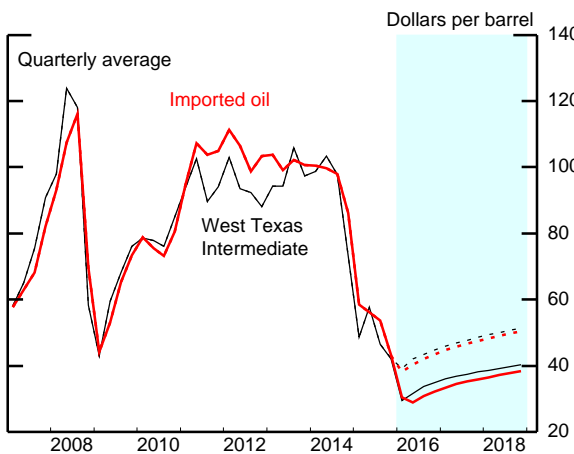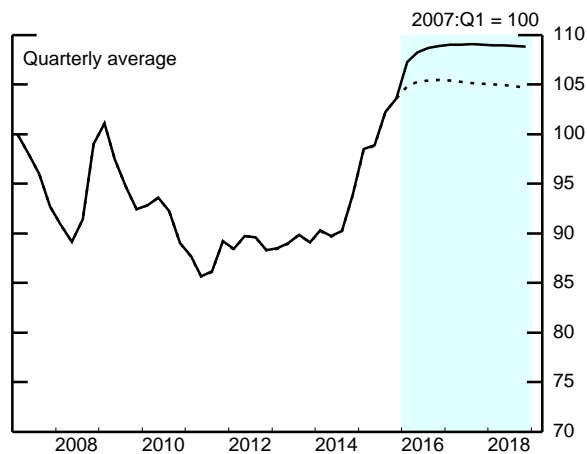
KEY BACKGROUND FACTORS

Monetary Policy

- As in previous projections, the path for the federal funds rate is governed by an inertial version of the Taylor (1999) policy rule. In this round, the federal funds rate generated by the rule averages about 3¼ percent in the fourth quarter of 2018, about ¼ percentage point lower than in the December Tealbook, mostly reflecting the downward revision to the projection for the output gap.

- We now assume that the SOMA portfolio will remain at its current size until the fourth quarter of this year, at which point the portfolio will begin to contract as proceeds from maturing assets are not reinvested. Compared with the December Tealbook, the cessation of reinvestment was delayed two quarters, which we view as more consistent with the FOMC's statement that reinvestment would continue until normalization was "well under way."

Other Interest Rates

- Our projection continues to call for the 10-year Treasury yield to rise significantly, reflecting the movement of the 10-year valuation window through the period of extremely low short-term interest rates as well as an increase in the term premium from its current near-zero value toward its assumed longer-term level of ¾ percentage point. Compared with the December Tealbook, the 10-year Treasury yield is slightly lower in the medium term, reflecting both the lower path of short-term rates and the later assumed date for the cessation of reinvestment of the SOMA portfolio.[2]

- We revised the paths for the 30-year mortgage rate and the 10-year triple-B corporate bond rate mostly in line with the revision to Treasury yields. Spreads of rates on triple-B corporate bonds over those on comparable-maturity Treasury securities have been rising gradually for the past year, and we project them to remain elevated for several quarters into the projection period.

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[2] The downward revision to the federal funds rate does not persist much past the medium term and thus has only a modest effect on the 10-year Treasury yield.

Domestic Econ Devel & Outlook

Equity Prices and Home Prices

- As of the market close on January 19, stock prices had fallen about 10 percent since the time of the December Tealbook, leading us to revise down our projection for stock prices throughout the medium term. We judge that a portion of the recent drop in equity prices reflects a transitory increase in investor risk aversion and thus assume that only a little more than half of the decline persists by the end of 2018. We project that, after stock prices drop substantially in the current quarter, they will appreciate about 3½ percent per year over the medium term, a shade faster than in the previous Tealbook.

- We continue to expect house prices to decelerate further, from an increase of 5 percent last year to an average gain of around 2¾ percent per year over the medium term. One simple model of housing valuation that we monitor suggests that housing is currently overvalued by 7 percent, compared with more than 40 percent a decade ago; a second model suggests housing is about fairly valued.[3]

Fiscal Policy

- We now anticipate that fiscal policy will be a bit more expansionary than we had previously assumed, reflecting provisions of the omnibus spending bill that was enacted in mid-December. The bill contained two tax law changes that we had not anticipated: a multiyear extension of the bonus depreciation tax credit for business investment and a delay in introducing several taxes related to the Affordable Care Act. Overall, we now expect fiscal policy actions at all levels of government to provide a ½ percentage point boost to GDP growth this year and a more modest boost to growth in 2017 and 2018.[4]

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[3] Both models were described in a pair of recent memos sent to the Committee on January 16, 2016: "Staff Assessment of Housing Overvaluation," by Steven Laufer, and "Measuring Housing Overvaluation Using the Zillow Price-to-Rent Ratio," by Raven Molloy. The first 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. The second model takes a similar approach but relies on different data sources to construct price-to-rent ratios.

[4] Specifically, we project fiscal impetus to be 0.6 percentage point in 2016 (up from 0.4 percentage point in the December Tealbook), 0.3 percentage point in 2017, and 0.1 percentage point in 2018. The estimates for 2017 and 2018 are little revised.

Domestic Econ Devel & Outlook

Foreign Economic Activity and the Dollar

- The broad nominal dollar has appreciated 3 percent, on net, since the time of the December Tealbook. In the wake of the recent volatility in Chinese exchange rates and financial markets, the dollar strengthened against almost all currencies except the Japanese yen. We expect the nominal dollar to rise a touch further in the first half of this year—lifted by widening monetary policy divergences between the United States and advanced foreign economies and some further depreciation of the Chinese renminbi and other emerging Asian currencies—and then to be little changed over the medium term. By the end of 2018, our projection for the broad real dollar is about 4 percent higher than in the previous Tealbook.

- We estimate that foreign real GDP grew at an annual rate of 2 percent in the fourth quarter, slower than the 2½ percent pace of the third quarter but still up from a very subdued 1½ percent pace in the first half of 2015. Our estimate for the fourth quarter has been revised down ¼ percentage point relative to the December Tealbook, largely on account of weaker-than-expected data for Canada. Although we are attuned to the heightened risks emanating from China and global commodity markets, we continue to see growth abroad rising to about 3 percent by the end of 2016, albeit with a somewhat weaker start to the year that mainly reflects the expected near-term effect of lower oil prices on activity in Canada and other commodity exporters. We project foreign economic growth to remain near 3 percent through 2018, supported by accommodative monetary policies and depreciated currencies.

Oil Prices and Other Commodity Prices

- Oil prices have tumbled since the December Tealbook, with the spot price of Brent oil down another $12 per barrel, closing at $29 per barrel on January 19. Further-dated futures have moved down even more sharply, with the December 2018 futures quote falling $14, to $43 per barrel. Both demand and supply factors have weighed on oil prices. On the demand side, worries include the outlook for economic growth in China and its implications for the global economy. On the supply side, U.S. oil production remains near its recent peak, resulting in high and growing oil inventories; in addition, the lifting of export sanctions against Iran has firmed expectations of increased Iranian oil exports. Our forecast for the price of imported oil in the current

Domestic Econ Devel & Outlook

Federal Reserve System Nowcasts of 2015:Q4 Real GDP Growth
(Percent change at annual rate from previous quarter)

Federal Reserve entity	Type of model	Nowcast as of Jan. 19, 2016
Federal Reserve Bank		
New York	• Factor-augmented autoregressive model combination	1.7
	• Factor-augmented autoregressive model combination, financial factors only	1.8
	• Dynamic factor model	1.4
Cleveland	• Bayesian regressions with stochastic volatility	1.8
	• Tracking model	-0.8
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	0.6
Chicago	• Dynamic factor models	2.1
	• Bayesian VARs	0.9
St. Louis	• Dynamic factor models	1.5
	• News index model	2.4
	• Let-the-data-decide regressions	1.9
Minneapolis	• Bayesian VARs	2.3
Kansas City	• Accounting-based tracking estimate	-0.2
Board of Governors	• Board staff's forecast (judgmental tracking model)[1]	0.4
	• Dynamic factor models	1.1
Memo: Median of Federal Reserve System nowcasts		1.5

1. The January Tealbook forecast, finalized on January 20, is also 0.4 percent.

quarter has been revised down by almost $8 per barrel to $30, with prices expected to only slowly move up to $38 per barrel by the end of the forecast period.

- After increasing late last year, metals prices have declined significantly since then, likely reflecting, in part, increased concerns about global growth and the state of the Chinese economy. In contrast, the prices of agricultural goods are basically unchanged on net relative to the December Tealbook.

THE OUTLOOK FOR REAL GDP

The incoming data on spending and production in the fourth quarter were substantially weaker than we had expected, leading us to mark down our estimate of real GDP growth last quarter to a paltry ½ percent at an annual rate—1¼ percentage points less than in the December Tealbook and a marked deceleration from the 2 percent increase in the third quarter.[5] While downward revisions were widespread across spending categories, the largest contributions to the revision were from inventory investment and consumer spending. We expect a bounceback in some spending categories from what we judge to be transitory softness, but we also took some signal for the underlying pace of activity from weaker readings in other categories. In all, we project real GDP will increase at an annual rate of about 2 percent in the current quarter, unrevised from the December Tealbook.

- The recent data suggest that consumer spending slowed by considerably more last quarter than we had projected, apparently advancing at an annual rate of just 1¾ percent. Part of the weakness reflected unusually warm weather, which we think held down spending for energy services in both November and December. However, the first official estimate of December retail sales was surprisingly low, motor vehicle sales fell more than we had anticipated (though to a still-strong level), and spending on services outside energy was a bit softer in November than we expected, suggesting that other factors were also at work. For the current quarter, we project PCE growth to step up to a 3 percent pace. Spending this quarter is boosted, in part, by a rebound in

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[5] As displayed in the table "Federal Reserve System Nowcasts of 2015:Q4 Real GDP Growth," the median of the projections generated by the near-term forecasting approaches used within the System, at 1.5 percent, is 1 percentage point higher than the staff's judgmental projection. For reference, the standard error from the Board staff's dynamic factor model is nearly 1½ percentage points.

Domestic Econ Devel & Outlook

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

Measure	2015:Q3		2015:Q4		2016:Q1	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	**2.1**	**2.0**	**1.7**	**.4**	**2.1**	**2.1**
Private domestic final purchases	3.3	3.2	2.8	2.1	3.2	2.8
Personal consumption expenditures	3.0	3.0	2.4	1.7	3.4	3.1
Residential investment	8.5	8.2	5.0	6.1	5.7	8.8
Nonres. private fixed investment	3.3	2.6	4.6	3.0	1.6	-.3
Government purchases	1.8	1.8	.5	-.3	3.0	3.2
Contributions to change in real GDP						
Inventory investment[1]	-.8	-.7	-.3	-.9	.2	.2
Net exports[1]	-.2	-.3	-.5	-.4	-1.3	-1.0
Unemployment rate	**5.1**	**5.1**	**5.0**	**5.0**	**4.9**	**4.9**
PCE chain price index	**1.3**	**1.3**	**.0**	**.1**	**.0**	**-.9**
Ex. food and energy	1.3	1.4	1.2	1.2	1.4	1.2

1. Percentage points.

Recent Nonfinancial Developments (1)

Real GDP and GDI

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.
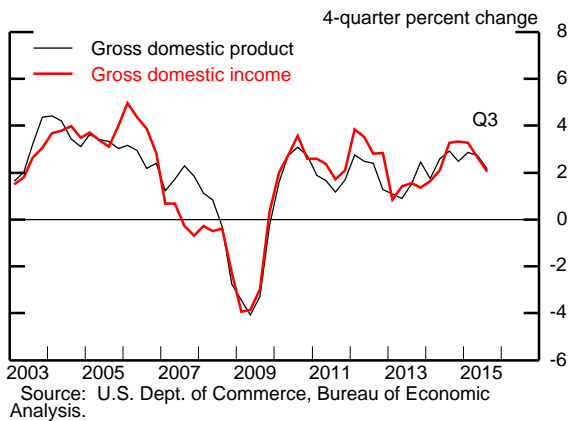
Manufacturing IP ex. Motor Vehicles and Parts

Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."
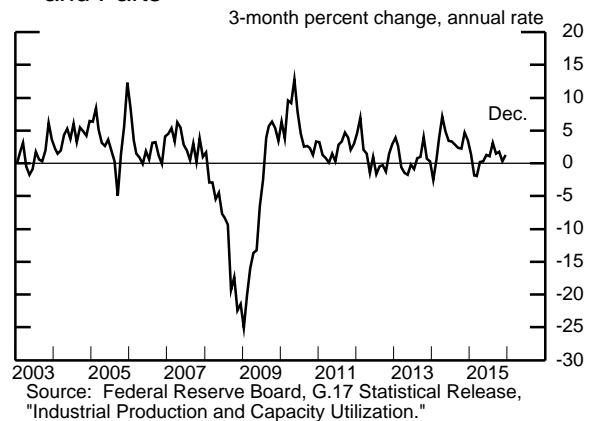
Sales and Production of Light Motor Vehicles

Source: Ward's Communications; Chrysler; General Motors; FRB seasonal adjustments.
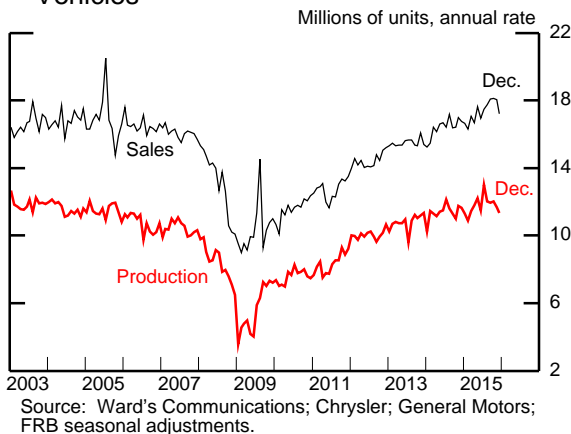
Real PCE Goods ex. Motor Vehicles

Note: Figures for October, November, and December 2015 are staff estimates based on available source data.
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Recent Nonfinancial Developments (2)

Domestic Econ Devel & Outlook
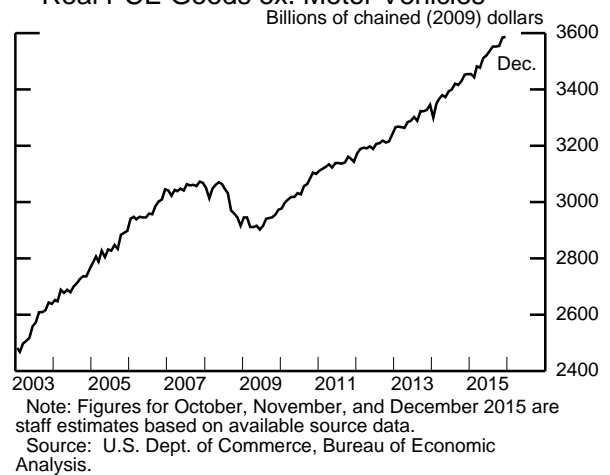
Single-Family Housing Starts and Permits

Millions of units, annual rate

— Adjusted permits
— Starts

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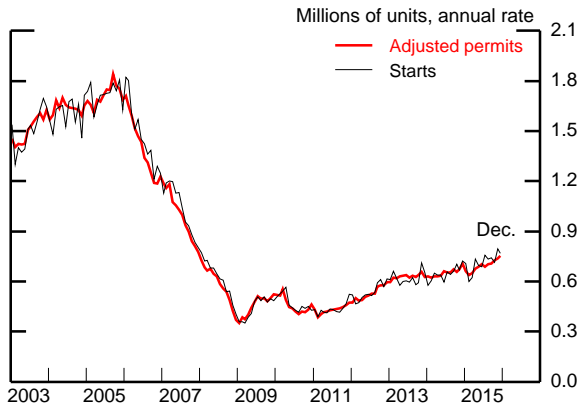
Note: Adjusted permits equal permit issuance plus total starts outside of permit-issuing areas.
Source: U.S. Census Bureau.

Home Sales

Millions of units (annual rate)

Millions of units (annual rate)

Existing homes (left scale)

New single-family homes (right scale)

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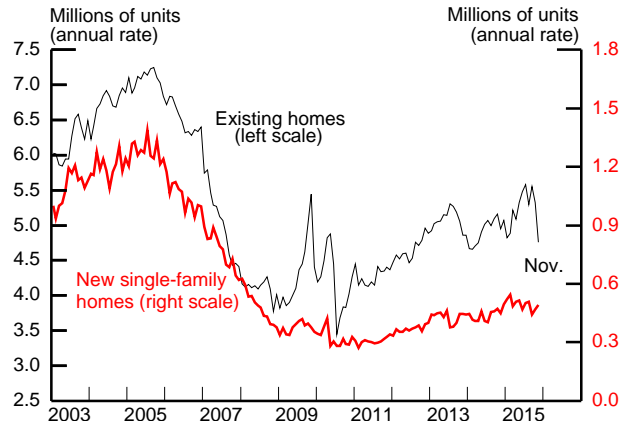
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

Nondefense Capital Goods ex. Aircraft

Billions of dollars

3-month moving average

Orders

Shipments

Nov.
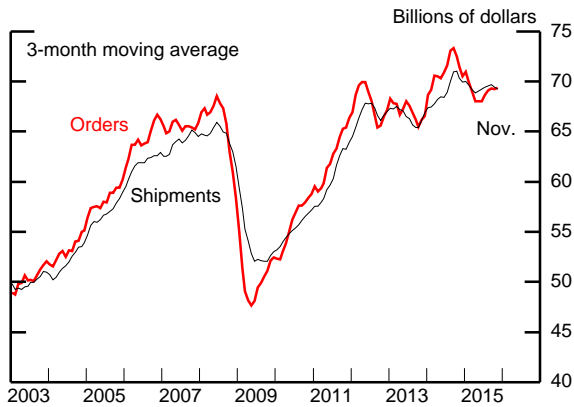
Source: U.S. Census Bureau.

Nonresidential Construction Put in Place

Billions of chained (2009) dollars

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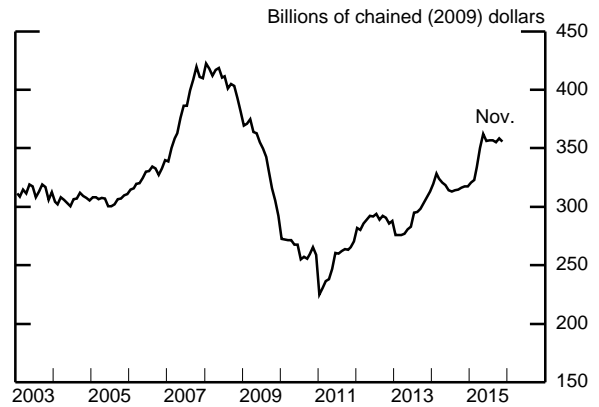
Note: Nominal CPIP deflated by BEA prices through 2015:Q3 and by the staff's estimated deflator thereafter.
Source: U.S. Census Bureau.

Inventory Ratios

Months

Staff flow-of-goods system

Nov.

Census book-value data

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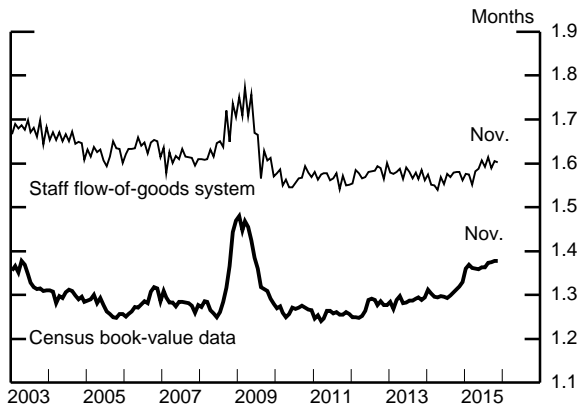
Note: Flow-of-goods system inventories include manufacturing and mining industries and are relative to consumption. Census data cover manufacturing and trade, and inventories are relative to sales.
Source: U.S. Census Bureau; staff calculations.

Exports and Non-oil Imports

Billions of dollars

Non-oil imports

Nov.

Exports

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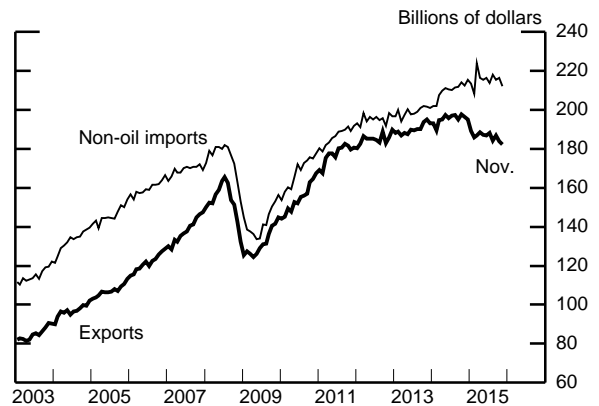
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis; U.S. Census Bureau.

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outlays on energy services as temperatures are assumed to return to normal, but the pickup also reflects our expectation that spending growth will return to levels consistent with household incomes, wealth, and consumer sentiment (which seems to be holding up reasonably well). Excluding outlays for energy, the anticipated pickup in PCE growth is more modest, from about 2¼ percent in the fourth quarter to about 2¾ percent in the current quarter; the latter figure is revised down about ½ percentage point from the December Tealbook.

- Incoming data on housing activity remain consistent with a sector that continues to recover gradually from its very subdued levels of recent years. Here, too, a transitory factor—related to recently implemented mortgage-lending reporting rules—held down residential investment growth last quarter.[6]

- Business fixed investment appears to have risen moderately in the fourth quarter but is likely to decelerate sharply in the current quarter. Business purchases of motor vehicles are anticipated to fall after a couple of strong quarters. Moreover, we now expect spending on other equipment to rise only modestly in the near term, given data on orders and shipments through November that were somewhat disappointing as well as negative readings from some of the business surveys. In addition, we expect drilling and mining investment to continue falling sharply this quarter (nearly 40 percent at an annual rate), reflecting the further decreases in energy prices. In all, business fixed investment is projected to be about flat in the first quarter after increasing at an annual rate of nearly 3 percent over the second half of 2015.

- After subtracting an estimated ¾ percentage point from real GDP growth in the third quarter, inventory investment appears to have deducted nearly 1 percentage point from real GDP growth last quarter, a drag more than ½ percentage point larger than we had projected in December. With limited

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[6] Residential investment in the fourth quarter, as measured in the NIPA, will be held down by a sharp fall in the sales of existing homes in November. The drop reportedly reflects delays in mortgage closings related to new reporting rules for mortgage lenders implemented by the Consumer Financial Protection Bureau in October as part of the Truth-in-Lending Act/RESPA disclosures. We expect these delays will be relatively short-lived—indeed, we expect a solid rebound in sales in the coming months—but the effect of sales closings on brokers' commissions, all else being equal, lowers residential investment in the fourth quarter and raises it in the current quarter.

evidence that inventory ratios remain uncomfortably high except for energy products, we see this inventory slowdown as behind us, and we project inventory accumulation to move up a little in the near term, making a small positive contribution to GDP growth.

- We estimate that net exports subtracted almost ½ percentage point from real GDP growth in the fourth quarter, as exports declined slightly while imports grew modestly. In the first half of 2016, net exports are expected to reduce GDP growth by 1 percentage point, as past dollar appreciation pushes exports down further and boosts import growth.

- Industrial production declined in December for the third consecutive month. The sizable downdraft in oil and gas drilling continues to subtract from mining activity, and utilities output fell sharply as a result of the unusually warm temperatures in recent months. Manufacturing output only edged up at an annual rate of ½ percent in the fourth quarter, reflecting a pullback in motor vehicle assemblies from the elevated levels seen earlier in the year, weakness in exports, and adverse upstream effects of the reduction in oil drilling. With these same forces continuing to weigh on the sector, manufacturing IP is expected to increase just ½ percent in the current quarter, a tepid outlook that is consistent with the low readings of the national and regional manufacturing surveys.

Beyond the near term, real GDP growth is expected to run above our estimate of its potential, supported by the still-accommodative stance of monetary policy and by expansionary fiscal policy.

- After rising 1¾ percent in 2015, real GDP is projected to increase 2½ percent this year, with the pickup reflecting a solid gain in PCE and a boost from federal purchases. Consumption growth in 2016 is projected to be bolstered by ongoing gains in real disposable personal income that reflect further improvements in the labor market. In addition, the effects of earlier increases in the wealth-to-income ratio are anticipated to support spending growth slightly this year.

- Real GDP growth then slows over the rest of the projection period, to 2 percent in 2017 and to 1¾ percent in 2018, as consumer and business

spending decelerates in response to the tightening of monetary policy and as fiscal impetus diminishes. This deceleration in real GDP is attenuated by a waning drag from net exports as the effects of the past appreciation of the dollar fade.

- Our forecast for output growth over the next three years is slightly more subdued than in the December Tealbook. The weaker equity price path and the stronger dollar built into this projection are less favorable for growth; these factors are partly offset by the positive impetus from more expansionary fiscal policy and the lower path for oil prices. With the downward revision to GDP growth in the final quarter of last year and growth rates that are revised down slightly thereafter, the projected level of real GDP at the end of 2018 is almost ½ percent lower than in our previous forecast.

- The adjustments that we made to the baseline forecast in response to the recent movements in financial and commodity prices, which were triggered in part by developments in China, only reflect conventional channels such as the wealth effect operating on consumption spending, higher borrowing costs for businesses, and the dollar appreciation acting to restrain net exports. We assumed no additional contribution in the baseline from effects operating through confidence or financial market disruptions, based on the following considerations: We see the direct financial linkages between China and the United States as modest, we assume in the baseline that financial conditions in China and most other emerging markets will not worsen materially further, and we view the U.S. financial system as being relatively well positioned to absorb commodity-related shocks. (For additional detail on how we assessed the implications of developments in China for the staff baseline forecast, see the box "Recent Developments in China and Implications for the Outlook" in the International Economic Developments and Outlook section.)

THE OUTLOOK FOR THE LABOR MARKET AND AGGREGATE SUPPLY

In contrast to the incoming data on spending and production, the December employment report was stronger than we had projected.

- Nonfarm payroll employment is now estimated to have risen nearly 285,000 per month last quarter, about 45,000 more than we expected and 110,000

faster than the third-quarter pace. In response to this faster pace of employment gains, we boosted our expectation for first-quarter hiring by 25,000, to 240,000 per month.[7]

- The unemployment rate held steady at 5.0 percent in December, whereas we had expected it to tick down to 4.9 percent. However, the labor force participation rate moved back up to 62.6 percent, and the employment-to-population ratio edged up and was a touch stronger than we had projected. We expect the unemployment rate to decline to 4.9 percent in January and to remain there through March.

- With its latest increase, the labor force participation rate now appears to have reversed much of the puzzling drop that occurred last summer. In response, we raised our projection for the current quarter slightly, putting the participation rate just 0.1 percentage point below our estimate of its trend. (See the box "The Scope for Cyclical Recovery in Labor Force Participation" for more information.)

- The staff's labor market conditions index, or LMCI, an alternative, strictly mechanical method of filtering the data, rose moderately in December.

- In light of the still-strong tenor of the data coming out of the labor market, we think the very weak reading on GDP growth in the fourth quarter overstates the deterioration in the cyclical position of the economy. Accordingly, we lowered our estimates of structural productivity growth and potential output growth in 2015 by 0.2 percentage point, to 1.0 percent and 1.1 percent, respectively. After this adjustment, the GDP gap in the current quarter is just a touch weaker than in our previous projection.

Reflecting the deceleration projected for real GDP, the pace of recovery in the labor market slows over the medium term. In addition, given the slight downward revision in projected GDP growth from here forward, we now have the labor market improving by a little less than in the December Tealbook.

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[7] We think the warm weather in December may have provided a small boost to the reported employment gains, most likely in construction.

The Scope for Cyclical Recovery in Labor Force Participation

Most key measures of labor market conditions—including the unemployment rate and payroll employment—have improved markedly since the end of the Great Recession. In contrast, the labor force participation rate at the end of last year was 2 percentage points below its level at the end of 2009 (figure 1). We estimate that structural factors—including demographically driven trends and other secular changes in the labor market—have been pushing the participation rate down during the past six years, even as cyclical forces have been pushing it up; on net, the structural factors have predominated. In particular, informed by a cohort-based model of labor force participation developed by the staff, we currently estimate that structural factors have pushed down the trend participation rate by about 2½ percentage points since 2009.[1] Thus, we estimate that there has been a cyclical improvement in the participation rate gap—the difference between the actual participation rate and its trend—of about ½ percentage point since 2009.

In the staff's assessment, the participation rate was still ¼ percentage point below its trend at the end of last year, even as the unemployment rate had moved below our estimate of its natural rate (figure 2). This estimate of the cyclical shortfall in labor force participation is in line with our cohort-based model and is also consistent with the still-elevated number of individuals who are out of the labor force but report they want a job.

Figure 1. Labor Force Participation Rate and Its Trend
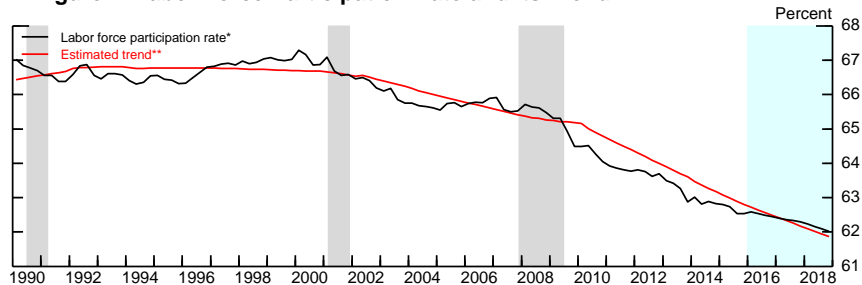
* Published data adjusted by staff to account for changes in population weights.
** Includes staff estimate of the effect of extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Figure 2. Delayed Response of Labor Force Participation to the Cycle
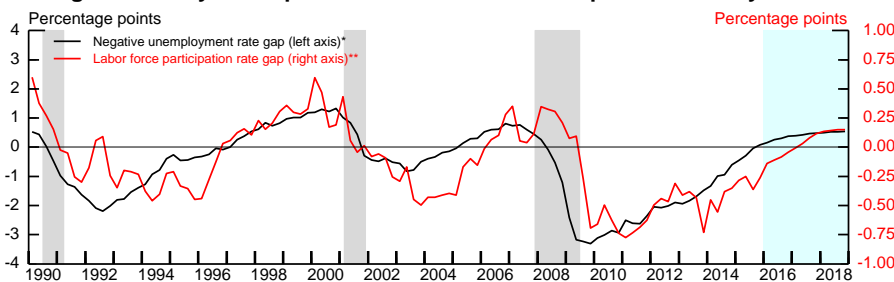
* Difference between the natural rate of unemployment and the actual unemployment rate. The natural rate of unemployment includes staff estimate of the effect of extended and emergency unemployment benefits.
** Difference between the actual labor force participation rate and its estimated trend. The estimated trend includes staff estimate of the effect of extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

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[1] A variant of this model is described in Stephanie Aaronson, Tomaz Cajner, Bruce Fallick, Felix Galbis-Reig, Christopher Smith, and William Wascher (2014), "Labor Force Participation: Recent Developments and Future Prospects," *Brookings Papers on Economic Activity,* Fall, pp. 197–275, www.brookings.edu/~/media/projects/bpea/fall-2014/fall2014bpea_aaronson_et_al.pdf.

The staff anticipates that there is some further scope for cyclical improvement in labor force participation, and we expect that the participation rate gap will improve almost ½ percentage point during the next three years. The somewhat delayed recovery in the participation rate is in line with evidence indicating that the cyclical recovery in labor force participation is typically a late-cycle phenomenon.[2] As shown in figure 2, during the previous two recoveries the negative participation rate gap persisted well into the recovery. Indeed, the turning point for the cyclical rebound in labor force participation during the past two recoveries seems to have roughly coincided with the period when the unemployment rate approached its natural rate. At its cyclical peak, the participation rate seems to have been about ½ percentage point above its estimated trend.

Several factors can contribute to a delayed cyclical recovery in labor force participation. First, labor supply decisions tend to be persistent. For instance, decisions to attend school or care for children may entail multiyear commitments, and thus it may take time before individuals react to improved labor market conditions. Second, wage growth typically strengthens as the labor market recovery progresses, and these higher wages might persuade individuals on the sidelines of the job market to join the labor force. In fact, subdued wage growth in recent years may be one reason why the cyclical rebound in participation has not been stronger so far. Third, employers' hiring behavior is likely to change as labor market slack diminishes, leading to increased recruiting efforts and lower screening standards. Changes in hiring patterns and attitudes can help pull in individuals who have low qualifications, lack recent work experience, or possess criminal records.

The staff's assessment of the cyclical shortfall in participation is subject to considerable uncertainty, especially in real time. On the one hand, the severity of the Great Recession and the sluggishness of the subsequent recovery may have resulted in more permanent labor market damage than we currently estimate, and thus the trend in participation could be lower than currently assumed by the staff. On the other hand, the protracted labor market weakness since the end of the Great Recession might have also led to unusually large temporary exits from the labor force, implying that the delayed cyclical rebound in the participation rate might be longer and larger than in previous cyclical episodes. All told, while it is difficult to precisely quantify the relevant amount of uncertainty—which is, to a large extent, related to model specification uncertainty—different models consulted by the staff yield a range of participation gap estimates at the end of last year from near zero (the FRB/US model) to negative ¾ percentage point (a variant of the cohort-based model). A comprehensive measure of uncertainty would surely be wider.

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[2] Regression results based on state-level data suggest that the full response of the participation rate to changes in labor market conditions materializes only after a period as long as a few years. See Aaronson and others, "Labor Force Participation," in note 1; Christopher J. Erceg and Andrew T. Levin (2014), "Labor Force Participation and Monetary Policy in the Wake of the Great Recession," *Journal of Money, Credit and Banking,* vol. 46 (October), pp. 3–49; and Daniel Aaronson, Luojia Hu, Arian Seifoddini, and Daniel G. Sullivan (2014), "Declining Labor Force Participation and Its Implications for Unemployment and Employment Growth," Federal Reserve Bank of Chicago, *Economic Perspectives,* vol. 38 (Fourth Quarter), pp. 100–38, https://www.chicagofed.org/publications/economic-perspectives/2014/4q-aaronson-etal.

- Monthly payroll gains in 2015, at 220,000, were surprisingly strong relative to GDP growth; concomitantly, productivity gains have been disappointing, and actual productivity in late 2015 was below our estimate of its structural level. We expect productivity to move up toward its trend over the forecast period and job growth to slow to a pace of 175,000 per month by the end of this year and to 110,000 per month by 2018.

- All told, projected monthly job gains are little changed this year and are revised down about 15,000 in 2017 and 10,000 in 2018.

- With output increasing faster than its potential rate over the medium term, the unemployment rate moves down further, reaching 4.6 percent by 2018, ½ percentage point below our estimate of its natural rate. The cumulative reduction in the unemployment rate is 0.1 percentage point less than in the December projection.

THE OUTLOOK FOR INFLATION

Since the December Tealbook, we have received the CPI for November and December and PCE prices through November.[8] We now estimate total PCE prices to have been about flat last quarter, and we expect them to decline nearly 1 percent at an annual rate this quarter; the low level of both figures primarily reflects the pass-through to consumer energy prices of the continued declines in oil prices. We estimate that core PCE prices rose 1¼ percent in the fourth quarter, and we project a similar rate of increase this quarter.

- The projection for headline PCE price inflation in the current quarter is 1 percentage point lower than in the December Tealbook, largely reflecting the lower oil price path. In addition, we have revised down our projection for core PCE price inflation in the first quarter in response to lower import prices as well as our translation of the December CPI and PPI data.

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[8] The November CPI was published on December 15, after the December projection closed but in time for the December FOMC meeting.

Some of the recent weakness in inflation performance carries forward into the next few quarters, but otherwise our inflation projection is about unrevised from the December Tealbook.

- The higher projected path for the dollar and lower commodity prices led us to revise down our forecast for core import prices in 2016 relative to the December Tealbook. We now expect core import prices to decline at an annual rate of 3 percent in the first half of 2016, 1¼ percentage points more negative than in the previous Tealbook. We expect core import prices to edge up at a ¼ percent pace over the second half, as the effects of the higher dollar fade and commodity prices stabilize, and then rise at around a 1 percent pace over the remainder of the forecast period, little changed from the December projection.

- Core PCE price inflation is projected to average 1.3 percent this year, the same as last year. The greater tightness in resource utilization this year relative to last contributes 0.1 percentage point to the pickup in core inflation, but energy price pass-through into core is anticipated to have a roughly offsetting effect. Starting next year, the transitory restraint from import and energy prices is expected to begin subsiding, and the tightening of resource utilization puts a bit more upward pressure on core inflation.

- Energy prices are projected to decline at an annual rate of 28 percent over the first half of this year and then to rise somewhat faster than core prices over the remainder of the projection period. Meanwhile, after running below core inflation in 2015 and early 2016, food prices are expected to rise slightly faster than core prices over the medium term. As a result, total PCE inflation, at 0.7 percent, runs below core PCE inflation this year but moves a little above core inflation thereafter and reaches 2 percent in 2018.

- Compared with the December Tealbook, core PCE inflation is 0.1 percentage point lower in both 2016 and 2017; total PCE inflation is 0.5 percentage point lower in 2016 and 0.1 percentage point lower in 2017. The downward revisions to inflation mainly reflect the lower import and energy prices in this projection.

- As shown in "Survey Measures of Longer-Term Inflation Expectations" in the nonfinancial Data Sheets section, survey-based measures of longer-term inflation expectations remain near the lower end of their ranges of recent years. Market-based measures of longer-term inflation compensation have edged lower since the December Tealbook.

We have received little data on labor compensation during the intermeeting period.

- Average hourly earnings were unchanged in December and rose 2½ percent over 2015 as a whole, about ½ percentage point more than in 2014. In the near term, we expect the 12-month change in this measure to be between 2¼ and 2½ percent.

- We continue to expect business-sector hourly compensation, which rose an outsized 3½ percent over the four quarters ending in 2015:Q3, to decelerate over the next few quarters. By the end of the medium-term projection, gains in compensation per hour pick back up to around 3¼ percent, little changed from the previous projection.

THE LONG-TERM OUTLOOK

As described in the box "Changes to the Long-Term Outlook Procedure," we have simplified the model used to generate the long-term outlook in this Tealbook. The changes in procedure had no material effect on the projection of the key variables we highlight here.

- 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 return to a normal size by the end of 2021.

- The federal funds rate rises further after 2018. With real GDP above its potential level in the medium term and inflation having essentially reached the Committee's 2 percent objective, the federal funds rate moves above its long-run normal value in 2019 and 2020.

- The natural rate of unemployment remains at 5.1 percent, and potential GDP growth reaches its long-run value of 1.9 percent in 2020.

- As monetary policy continues to tighten, real GDP decelerates further and rises 1½ percent in 2020. The unemployment rate starts to rise toward its assumed natural rate in 2019.

- PCE price inflation is near the Committee's long-run objective in both 2019 and 2020.

Domestic Econ Devel & Outlook

Changes to the Long-Term Outlook Procedure

In this Tealbook, the staff has introduced a new model to produce the long-term outlook for the U.S. economy—currently, for 2019 and beyond. The following discussion explains the motivation for changing the model and describes the new procedure.

Previously, the long-term outlook was based on a version of the FRB/US model that had been adapted to more closely mimic some aspects of the staff's framework for the medium run, particularly Okun's law and the Phillips curve. However, with the hundreds of variables and exogenous factors in the FRB/US model, the task of creating a long-horizon forecast was challenging and time consuming.

Given that detailed aspects of the outlook many years ahead are generally not of interest, it seemed advantageous to develop a simpler model that focuses on a few key variables and a small set of factors that determine the values of those variables over the long run. Our new procedure generates a long-term projection with the same standards of quality as before but at a much lower cost. The new model is focused on the variables currently in the "Long-Term Outlook" exhibit in DEDO: real and potential GDP, the unemployment rate and its natural rate, overall and core PCE price inflation, the federal funds rate, the 10-year Treasury yield, and the triple-B corporate bond rate.

The model has five main components. First, the model uses an Okun's law relationship to link the unemployment rate to the output gap. Second, the model includes a Phillips curve in which core inflation is determined by the unemployment gap and long-term inflation expectations. Third, the model uses a Taylor rule to generate the path of the federal funds rate; this rule is the same as the one we use in putting together the medium-term forecast. Fourth, the model builds a forecast of long-term interest rates using the expectations hypothesis of the term structure (assuming model-consistent expectations) and a term premium that moves with the business cycle. These four components are largely unchanged from the previous model we used. The major change relative to our previous procedure concerns the relationship between aggregate spending and long-term real interest rates. Rather than relying on a large number of spending equations in the FRB/US model, the new procedure links the output gap directly to long-term real interest rates using a relationship analogous to a textbook "forward-looking IS curve." A key advantage of the new approach is that the forces influencing the outlook can be summarized by a handful of easily interpretable factors rather than the many driving forces embedded in the FRB/US model.

Importantly, we have compared the results from our new procedure with those from the previous model for the current and several previous Tealbooks. For the key macroeconomic variables in the long-term outlook, the results from the two models are very similar.

The Long-Term Outlook

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

Measure	2015	2016	2017	2018	2019	2020	Longer run
Real GDP	1.7	2.4	2.0	1.8	1.7	1.6	1.9
Previous Tealbook	2.1	2.5	2.0	1.9	1.6	1.5	1.9
Civilian unemployment rate[1]	5.0	4.7	4.6	4.6	4.6	4.7	5.1
Previous Tealbook	5.0	4.7	4.6	4.5	4.5	4.7	5.1
PCE prices, total	.4	.7	1.7	2.0	2.0	2.1	2.0
Previous Tealbook	.4	1.2	1.8	2.0	2.0	2.1	2.0
Core PCE prices	1.3	1.3	1.6	1.9	2.0	2.0	2.0
Previous Tealbook	1.3	1.4	1.7	1.9	2.0	2.1	2.0
Federal funds rate[1]	.16	1.35	2.37	3.21	3.76	3.96	3.25
Previous Tealbook	.18	1.44	2.53	3.42	3.94	4.10	3.25
10-year Treasury yield[1]	2.3	3.3	3.8	4.1	4.3	4.3	4.1
Previous Tealbook	2.3	3.4	3.9	4.2	4.3	4.3	4.1

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

Real GDP

4-quarter percent change

Unemployment Rate

Percent

PCE Prices

4-quarter percent change

Interest Rates
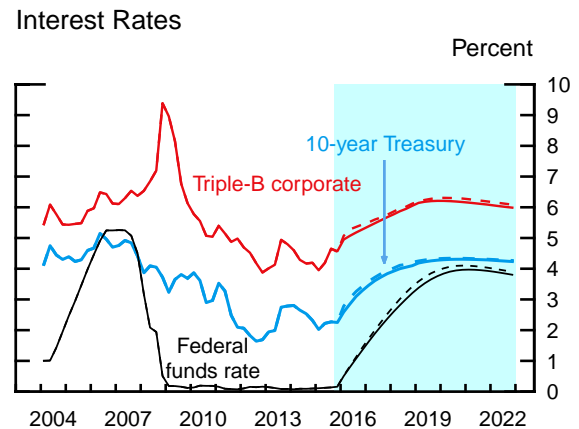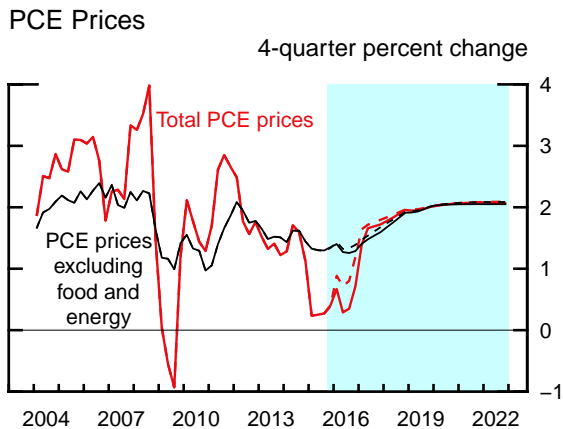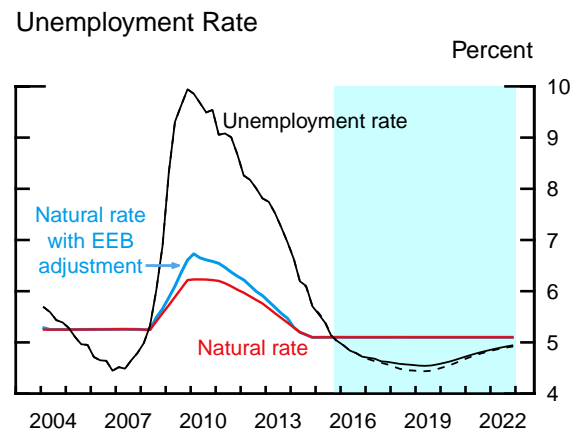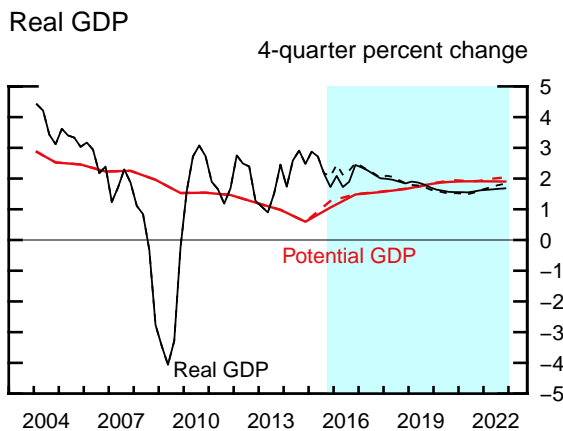
Percent

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

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January 20, 2016

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

Domestic Econ Devel & Outlook

Measure	2015	2016		2016	2017	2018
		H1	H2			
Real GDP	**1.7**	**2.3**	**2.6**	**2.4**	**2.0**	**1.8**
Previous Tealbook	2.1	2.4	2.7	2.5	2.0	1.9
Final sales	1.9	2.2	2.3	2.3	2.1	2.2
Previous Tealbook	2.1	2.3	2.6	2.5	2.2	2.2
Personal consumption expenditures	2.5	3.2	3.3	3.2	2.9	2.5
Previous Tealbook	2.7	3.5	3.6	3.5	2.8	2.3
Residential investment	8.4	7.9	8.5	8.2	7.2	5.3
Previous Tealbook	8.2	7.0	6.3	6.7	7.8	5.4
Nonresidential structures	-3.0	-2.0	.9	-.6	3.4	1.3
Previous Tealbook	-1.9	-1.3	2.5	.6	3.3	1.4
Equipment and intangibles	4.5	3.0	5.2	4.1	2.7	2.6
Previous Tealbook	4.9	4.0	5.3	4.6	2.7	2.8
Federal purchases	.4	4.6	.3	2.4	-.5	-1.3
Previous Tealbook	.4	4.3	.5	2.4	-.5	-1.2
State and local purchases	1.4	1.7	1.4	1.6	1.8	1.8
Previous Tealbook	1.7	1.7	1.3	1.5	1.8	1.8
Exports	-.4	-.9	.9	.0	.9	3.2
Previous Tealbook	.0	-.6	1.7	.5	1.7	3.8
Imports	3.6	6.3	7.3	6.8	5.5	3.7
Previous Tealbook	3.9	7.3	7.1	7.2	4.6	3.6
	Contributions to change in real GDP (percentage points)					
Inventory change	-.2	.1	.3	.2	-.1	-.3
Previous Tealbook	.0	.0	.1	.1	-.2	-.3
Net exports	-.6	-1.0	-1.0	-1.0	-.7	-.2
Previous Tealbook	-.6	-1.2	-.9	-1.0	-.5	-.1

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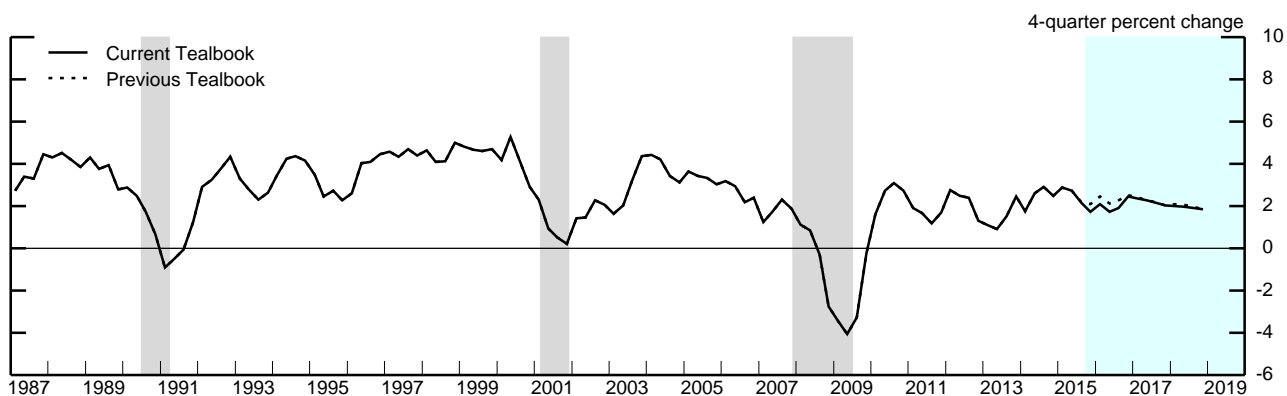
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

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

Domestic Econ Devel & Outlook

Components of Final Demand

Personal Consumption Expenditures

4-quarter percent change

- —— Current Tealbook
- ····· Previous Tealbook

Residential Investment

4-quarter percent change

Equipment and Intangibles

4-quarter percent change

Nonresidential Structures

4-quarter percent change
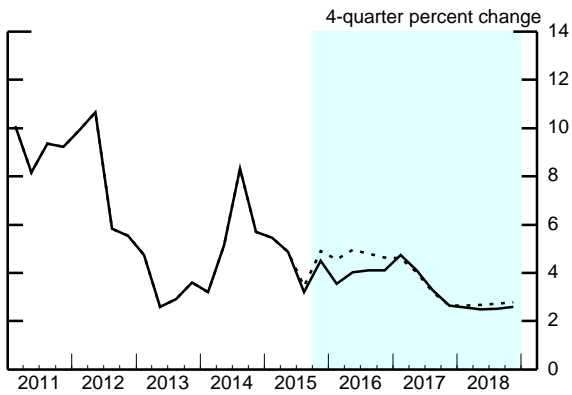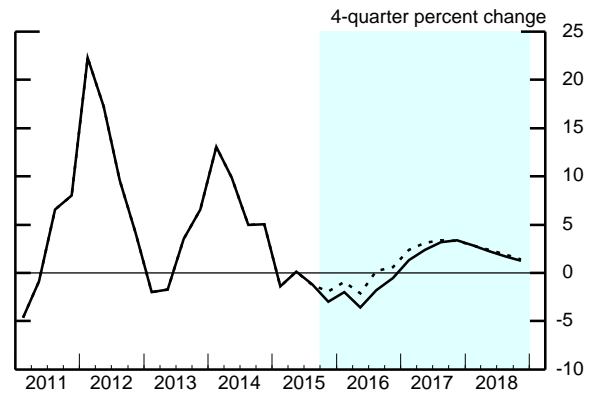
Government Consumption & Investment

4-quarter percent change

Exports and Imports

4-quarter percent change
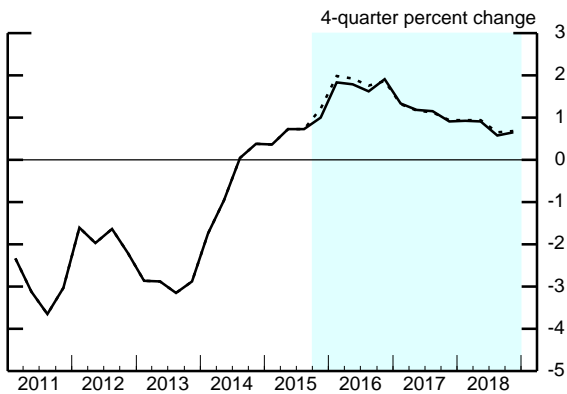
Exports

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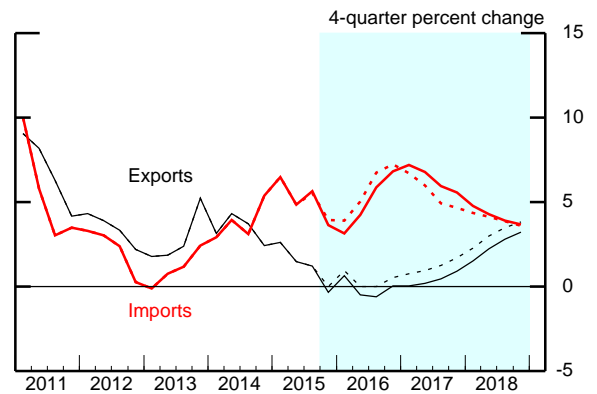
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Aspects of the Medium-Term Projection

Domestic Econ Devel & Outlook

Personal Saving Rate

Percent

— Current Tealbook
···· Previous Tealbook

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

Wealth-to-Income Ratio

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

Millions of units

Source: U.S. Census Bureau.
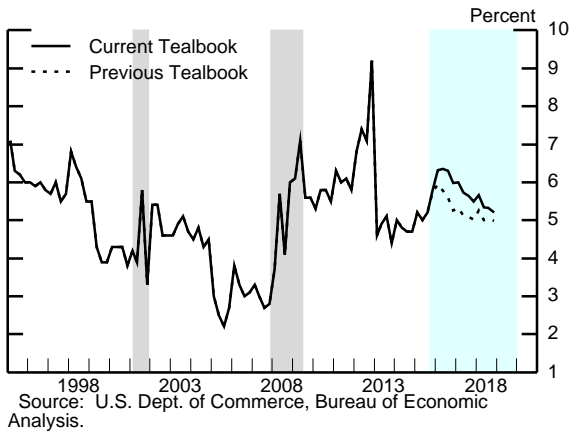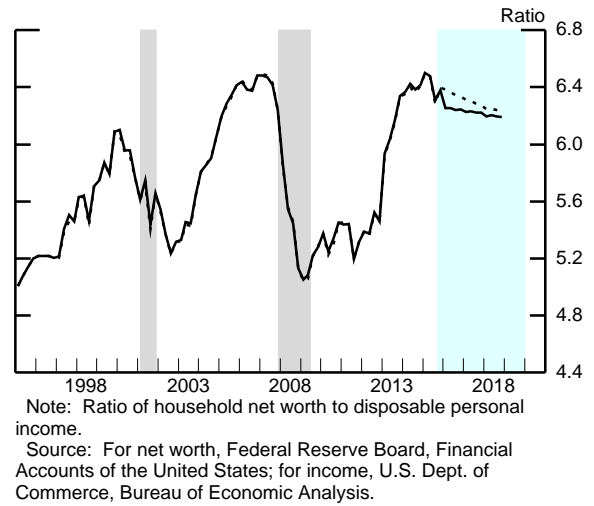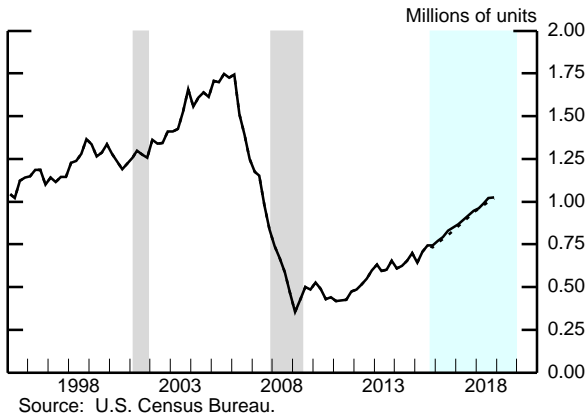
Equipment and Intangibles Spending

Share of nominal GDP

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.
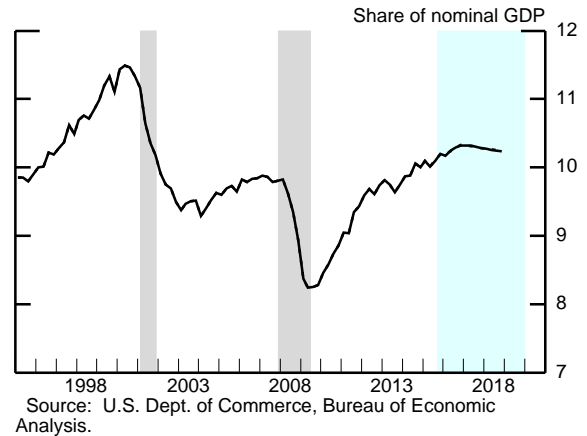
Federal Surplus/Deficit

Share of nominal GDP

4-quarter moving average

Source: *Monthly Treasury Statement.*
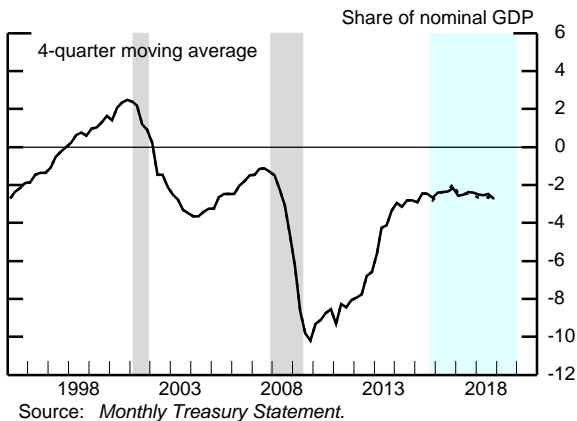
Current Account Surplus/Deficit
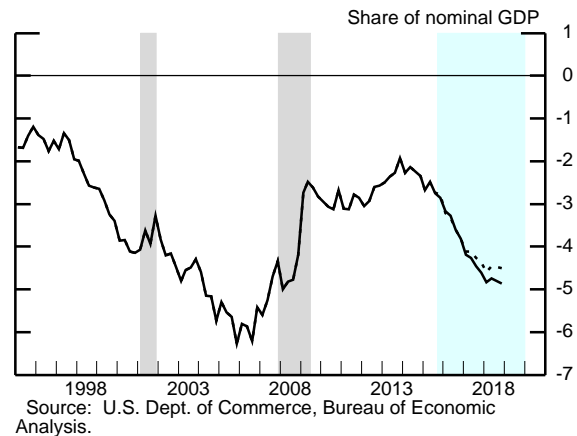
Share of nominal GDP

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.

January 20, 2016

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	1.7	1.1	1.1	1.5	1.6	1.7
Previous Tealbook	3.1	3.4	2.6	1.7	1.1	1.3	1.5	1.6	1.7
Selected contributions[1]									
Structural labor productivity[2]	1.6	2.9	2.8	1.5	.8	1.0	1.3	1.4	1.5
Previous Tealbook	1.6	2.9	2.8	1.5	.8	1.2	1.3	1.4	1.5
Capital deepening	.7	1.5	1.0	.3	.6	.8	.7	.7	.6
Multifactor productivity	.5	1.0	1.5	1.0	.1	.1	.4	.5	.7
Structural hours	1.6	1.2	.8	-.1	.6	.5	.4	.4	.3
Previous Tealbook	1.6	1.2	.8	-.1	.6	.5	.4	.4	.3
Labor force participation	.4	-.1	-.2	-.5	-.7	-.6	-.5	-.5	-.5
Previous Tealbook	.4	-.1	-.2	-.5	-.7	-.6	-.5	-.5	-.5
Memo:									
GDP gap[3]	-1.9	2.4	.8	-4.4	-.9	-.3	.7	1.1	1.3
Previous Tealbook	-1.9	2.4	.8	-4.4	-.9	-.1	.8	1.3	1.5

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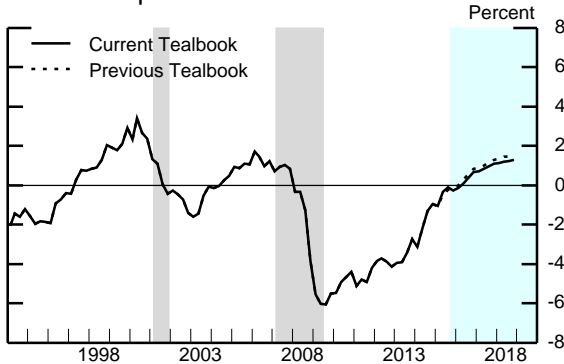
Note: The GDP gap is the percent difference between actual and potential GDP; a negative number indicates that the economy is operating below potential.
Source: U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.

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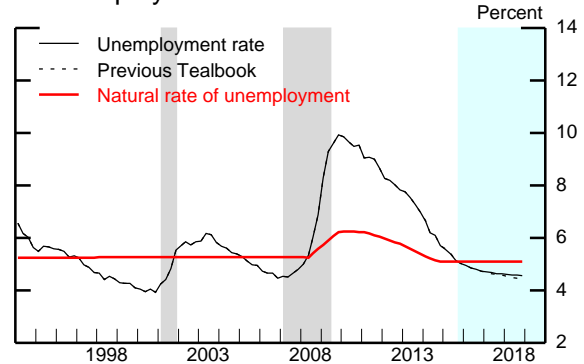
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

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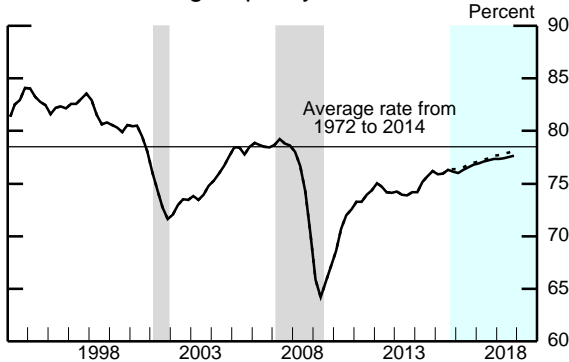
Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."

Structural and Actual Labor Productivity
(Business sector)
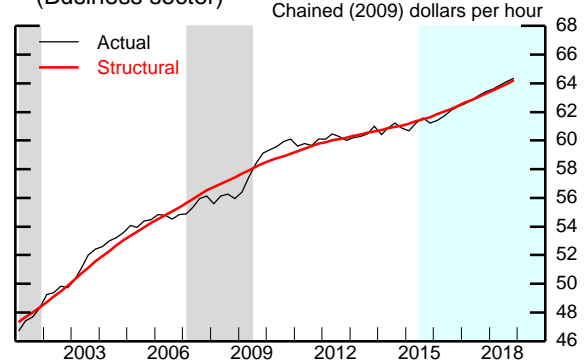
Source: U.S. Department of Labor, Bureau of Labor Statistics; U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.
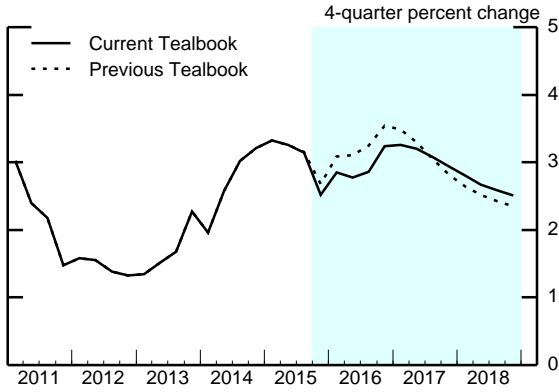
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

The Outlook for the Labor Market
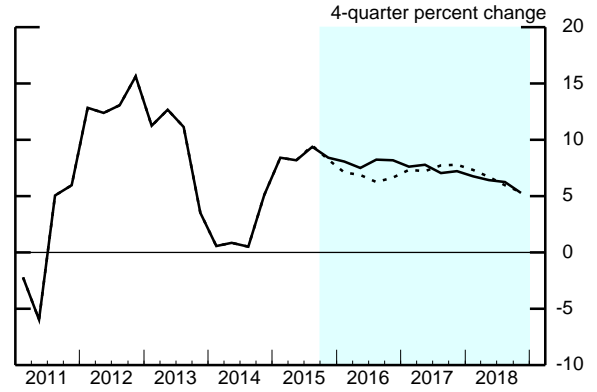
Measure	2015	2016		2016	2017	2018
		H1	H2			
Output per hour, business[1]	.6	1.6	2.1	1.9	1.7	1.4
Previous Tealbook	1.4	1.8	1.3	1.6	1.5	1.5
Nonfarm payroll employment[2]	221	221	181	201	137	108
Previous Tealbook	210	206	193	200	153	118
Private employment[2]	213	208	165	186	119	90
Previous Tealbook	202	192	178	185	135	100
Labor force participation rate[3]	62.5	62.5	62.4	62.4	62.3	62.0
Previous Tealbook	62.5	62.5	62.4	62.4	62.3	62.0
Civilian unemployment rate[3]	5.0	4.8	4.7	4.7	4.6	4.6
Previous Tealbook	5.0	4.8	4.7	4.7	4.6	4.5

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	.4	-.1	1.5	.7	1.7	2.0
Previous Tealbook	.4	.8	1.6	1.2	1.8	2.0
Food and beverages	.3	.6	1.8	1.2	2.0	2.0
Previous Tealbook	.7	1.6	1.8	1.7	2.0	2.0
Energy	-16.0	-28.4	6.7	-12.6	4.4	3.1
Previous Tealbook	-16.8	-13.8	6.5	-4.1	4.3	2.8
Excluding food and energy	1.3	1.3	1.3	1.3	1.6	1.9
Previous Tealbook	1.3	1.4	1.4	1.4	1.7	1.9
Prices of core goods imports[1]	-3.2	-2.9	.2	-1.4	1.1	1.2
Previous Tealbook	-3.2	-1.6	.7	-.4	1.2	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
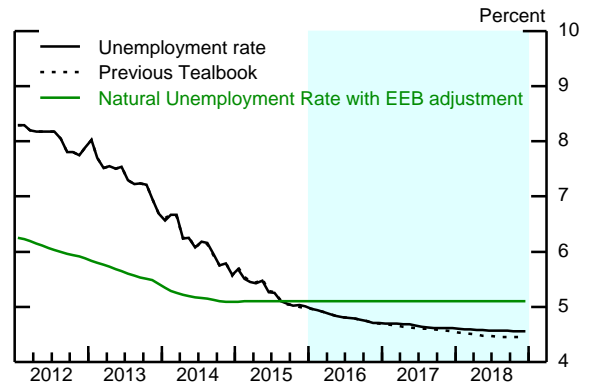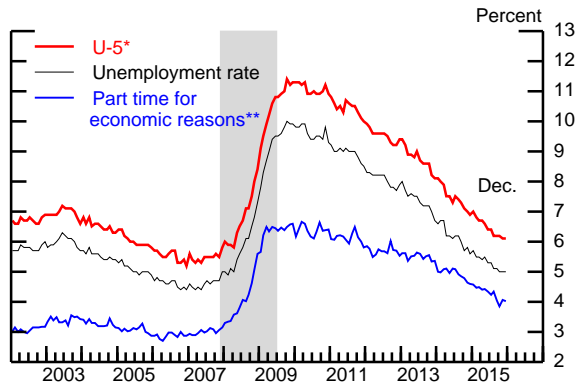
* U-5 measures total unemployed persons plus all marginally attached to the labor force, as a percent of the labor force plus persons marginally attached to the labor force.
** Percent of Current Population Survey employment.
EEB Extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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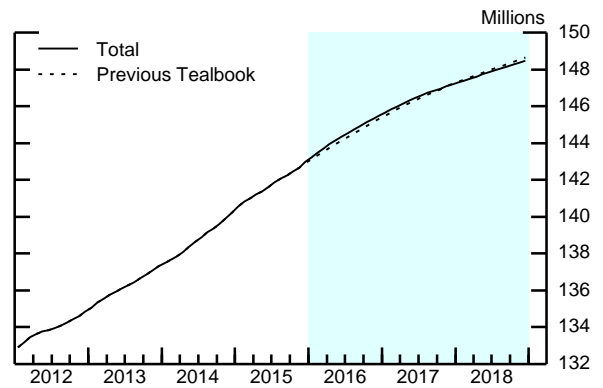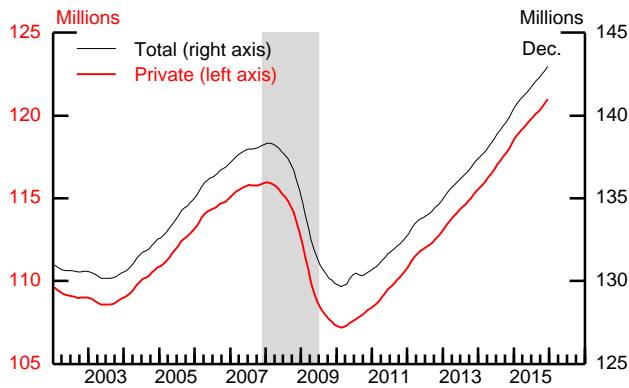
* 3-month moving averages.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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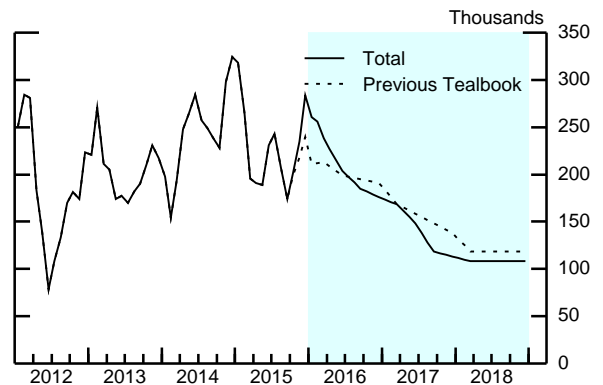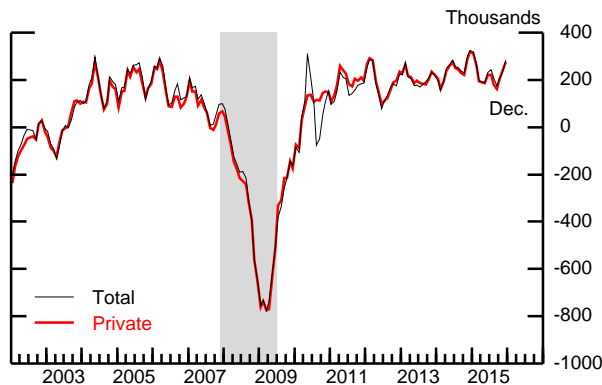
* 3-month moving averages.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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)
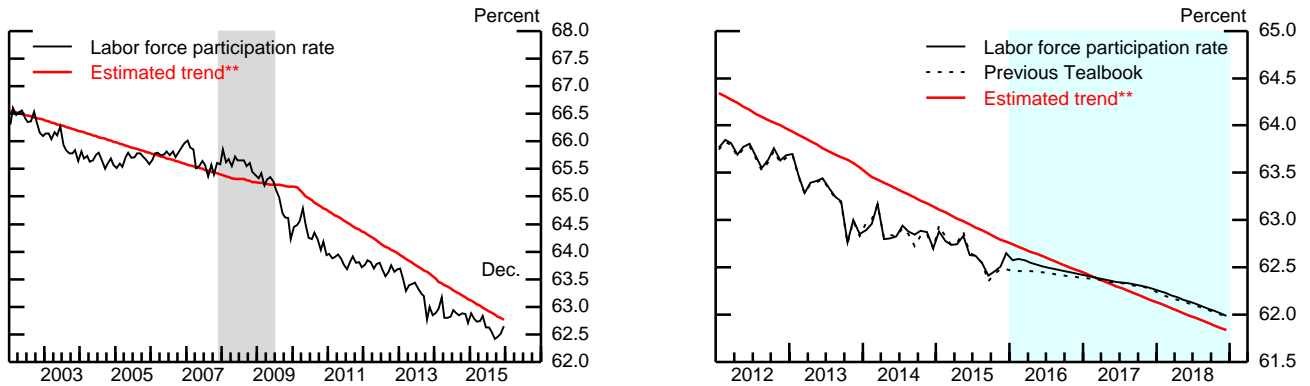
Domestic Econ Devel & Outlook

Labor Force Participation Rate*

Percent

- Labor force participation rate
- Estimated trend**

Dec.

Percent

- Labor force participation rate
- Previous Tealbook
- Estimated trend**

* 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*

Thousands

Jan. 9
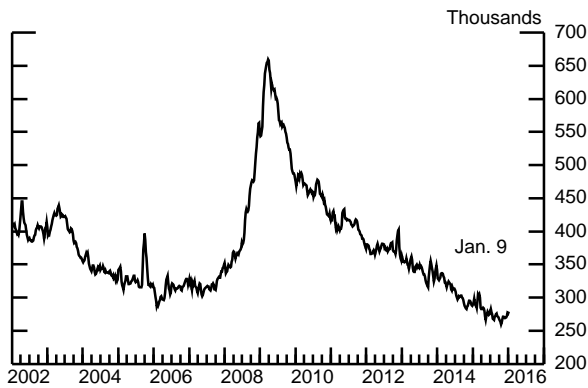
* 4-week moving average.
   Source: U.S. Department of Labor, Employment and Training Administration.

Private Hires, Quits, and Job Openings

Percent

- Hires*
- Openings**
- Quits*

Nov.
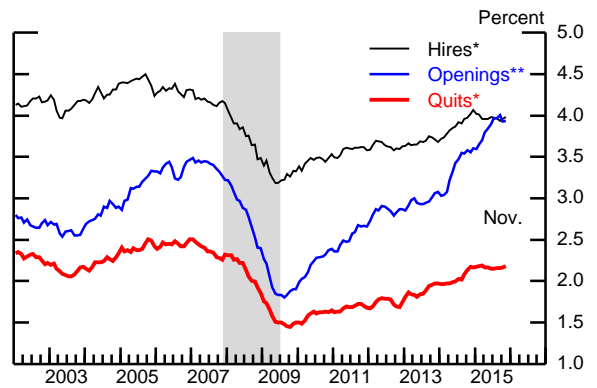
* Percent of private nonfarm payroll employment, 3-month moving average.
** Percent of private nonfarm payroll employment plus unfilled jobs, 3-month moving average.
   Source: Job Openings and Labor Turnover Survey.

Average Monthly Change in Labor Market Conditions Index

Index points

Q4
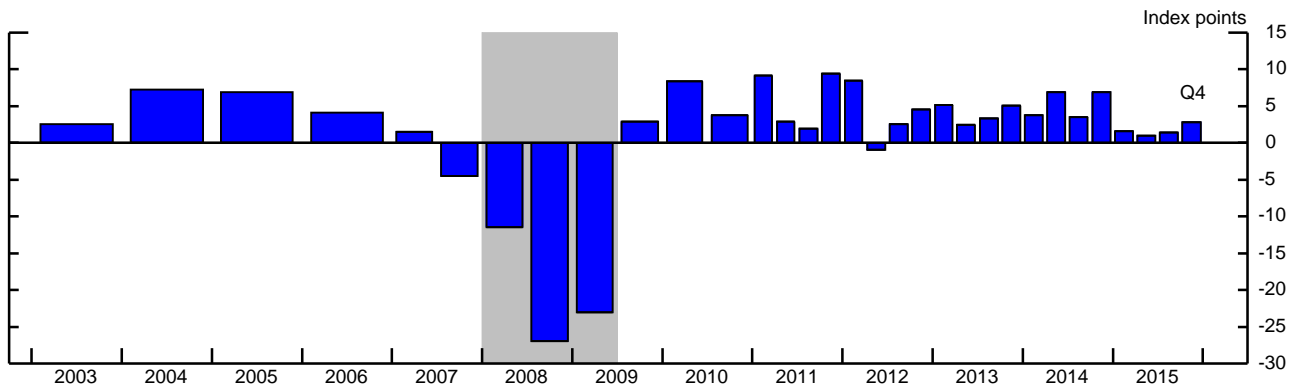
Source: Labor market conditions index estimated by staff.

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
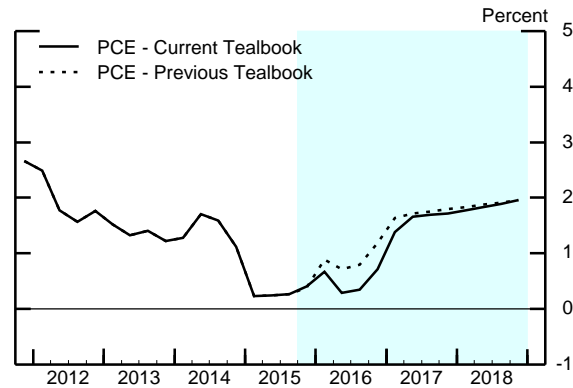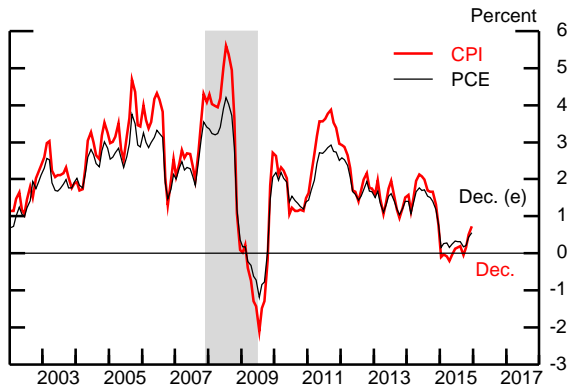
Note: PCE prices from October to December 2015 are staff estimates (e).
Source: For CPI, U.S. Department of Labor, Bureau of Labor Statistics; for PCE, U.S. Department of Commerce, Bureau of Economic Analysis.

Measures of Underlying PCE Price Inflation
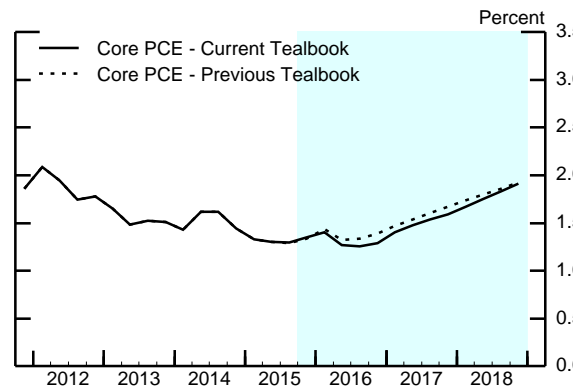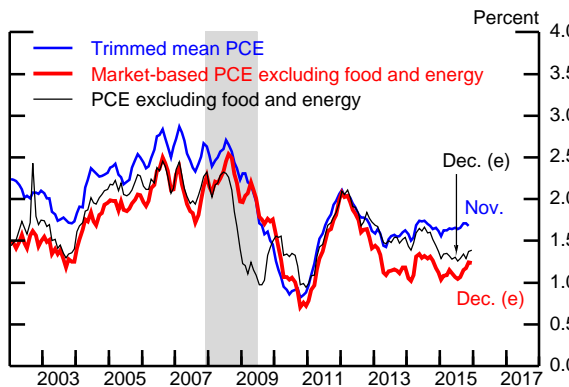
Note: Core PCE prices from October to December 2015 are staff estimates (e).
Source: For trimmed mean PCE, Federal Reserve Bank of Dallas; otherwise, U.S. Department of Commerce, Bureau of Economic Analysis.

Labor Cost Growth
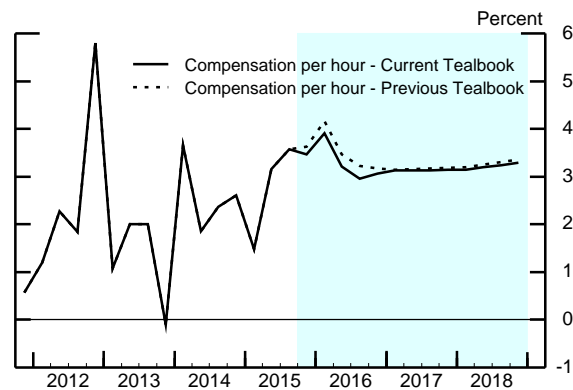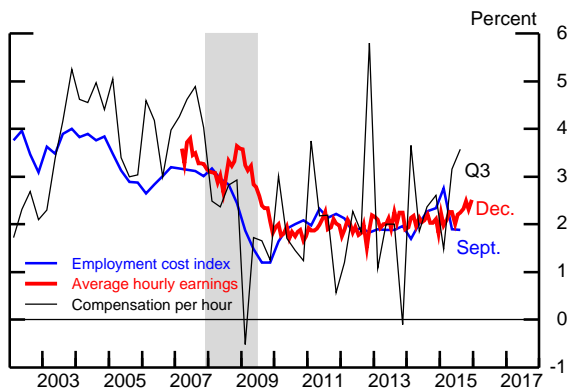
Note: Compensation per hour is for the business sector. Average hourly earnings are for the private nonfarm sector. The employment cost index is for the private sector.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

Inflation Developments and Outlook (2)
(Percent change from year-earlier period, except as noted)

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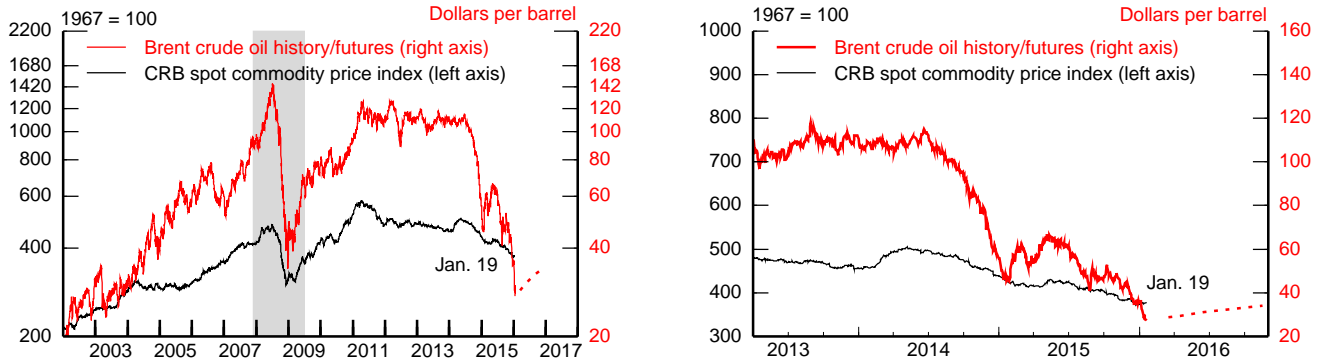
Note: Futures prices (dotted lines) are the latest observations on monthly futures contracts.
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

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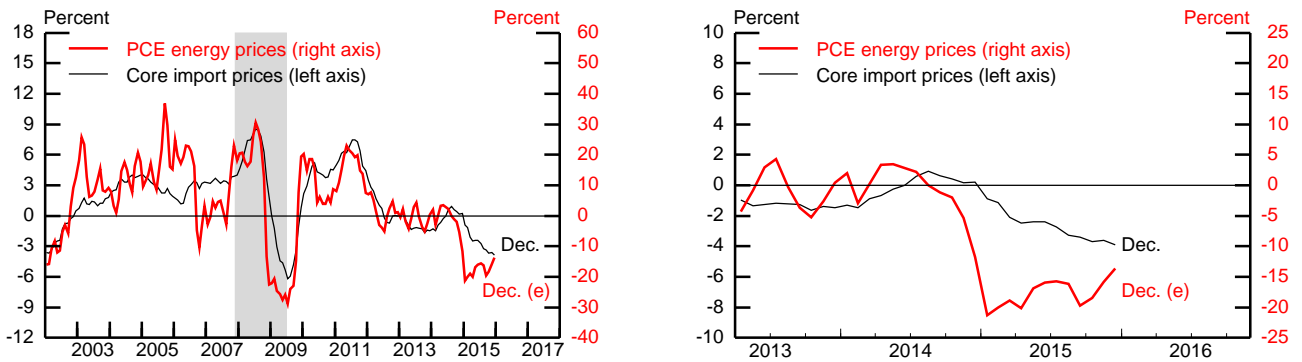
Source: For core import prices, U.S. Dept. of Labor, Bureau of Labor Statistics; for PCE, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Long-Term Inflation Expectations
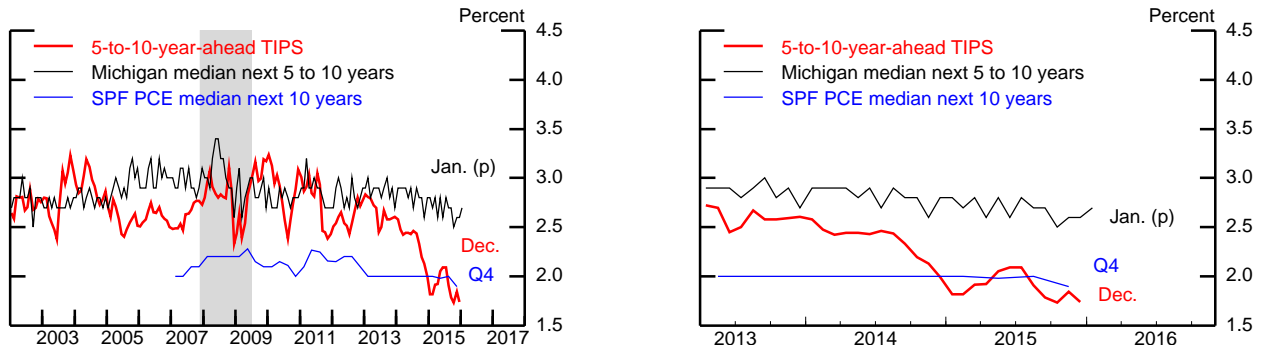
Note: Based on a comparison of an estimated TIPS (Treasury Inflation-Protected Securities) yield curve with an estimated nominal off-the-run Treasury yield curve, with an adjustment for the indexation-lag effect.
p Preliminary.
SPF Survey of Professional Forecasters.
Source: For Michigan, University of Michigan Surveys of Consumers; for SPF, 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.

Domestic Econ Devel & Outlook

Evolution of the Staff Forecast

Change in Real GDP

Percent, Q4/Q4

Tealbook publication date

Unemployment Rate

Percent, fourth quarter
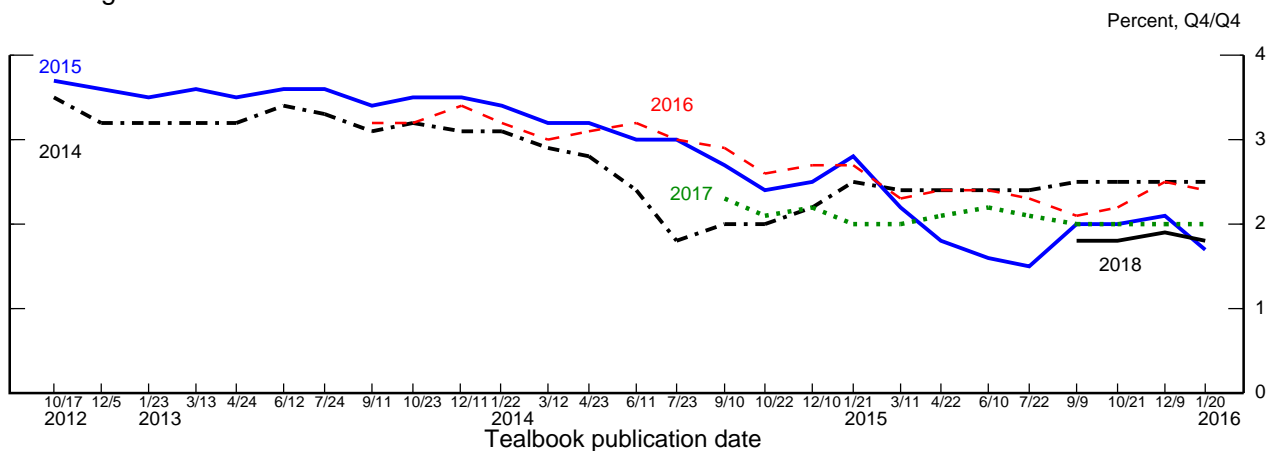
Tealbook publication date
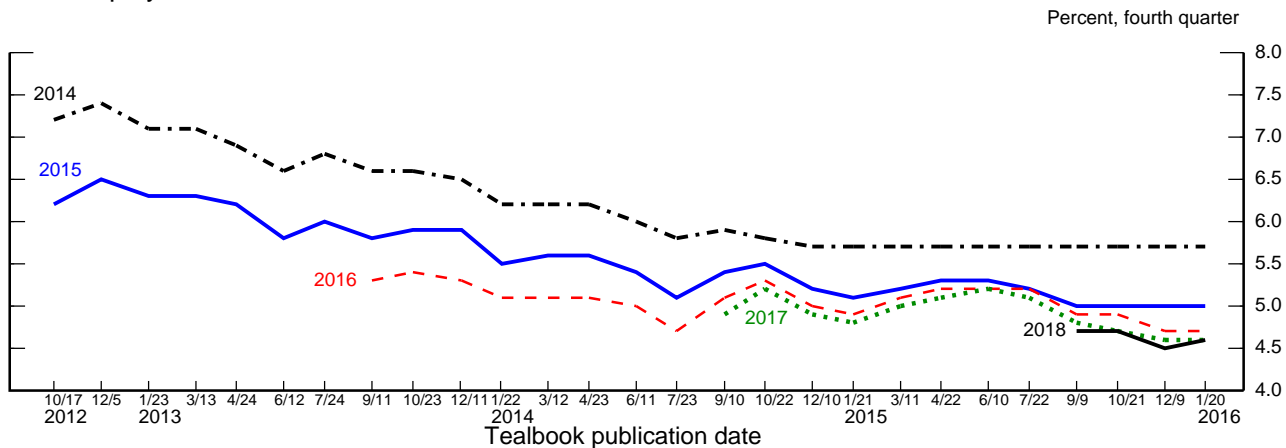
Change in PCE Prices excluding Food and Energy

Percent, Q4/Q4

Tealbook publication date
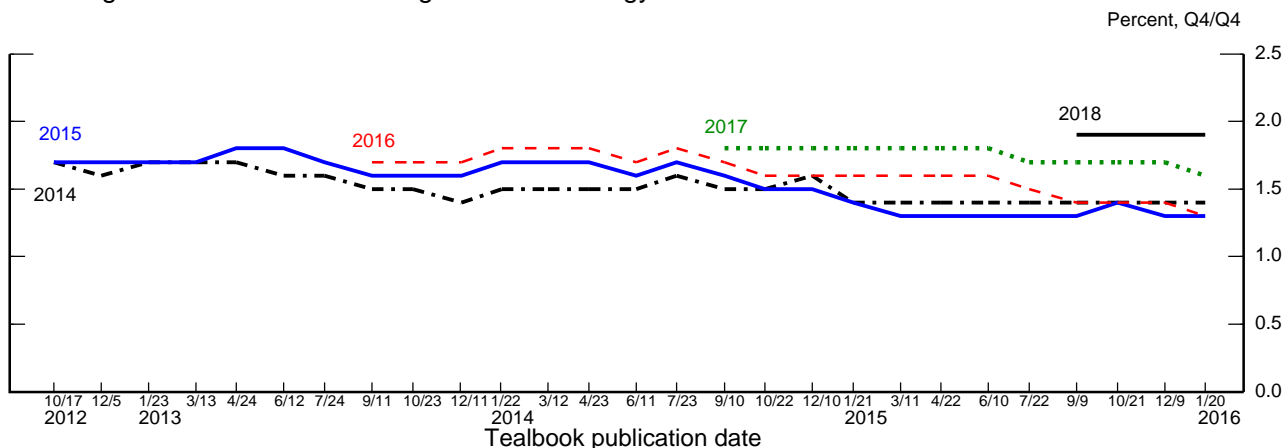
International Economic Developments and Outlook

The recent increase in financial market volatility, centered on developments in China and global commodity markets, underscores the headwinds and challenges weighing on the outlook for global economic growth. In addition to the risks and uncertainties facing China, these challenges include persistent sluggishness in global trade and manufacturing and the implications of the continuing decline in commodity prices for commodity-producing economies. Moreover, cross-border and domestic credit flows in the emerging market economies (EMEs) have slowed, in some cases quite sharply. And Japan and Europe are struggling to raise inflation from quite low levels, as policy rates are near zero. These factors contributed to lackluster foreign growth throughout 2015 and weigh on prospects going forward. Nevertheless, our baseline outlook for a return of foreign growth to more normal levels over the forecast period, while marked down a bit in the near term, remains essentially intact. We interpret the market volatility of recent weeks as primarily reflecting investor concerns about downside risks to the global economy.

We estimate fourth-quarter foreign real GDP grew at a subdued 2 percent annualized pace, down from 2½ percent in the third quarter and about ¼ percent below the forecast in the December Tealbook. The slower growth primarily reflected further drag from low oil prices in Canada and a deceleration in Mexico's economy as U.S. manufacturing growth stepped down. Foreign growth is expected to turn back up, albeit somewhat more slowly over the first half of 2016 than in our December projection, as the recent declines in oil and equity prices, along with tighter credit conditions in the EMEs, weigh on the near-term outlook. As in our previous forecasts, foreign growth reaches 3 percent—near its trend rate—by late 2016 and maintains that pace through 2018. Growth in the advanced foreign economies (AFEs) is supported by continuing policy accommodation, past currency depreciation, gradually improving credit market conditions, and, for Japan and Europe, low oil prices. In the EMEs, the South American economies gradually pull out of their slumps, and emerging Asia is supported by the combination of firmer exports to the advanced economies, accommodative policy, and lower oil prices.

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In contrast to the more dire concerns highlighted by the recent turmoil in financial markets, our baseline expectation is premised on China's economy decelerating only moderately and on the renminbi depreciating only somewhat further in the quarters ahead. Notwithstanding the Chinese authorities' recent clumsy communications and sometimes surprising policy actions, we think that the authorities will resist large currency moves, in part to damp capital outflows, and we do not see the currency as significantly overvalued. Moreover, the Chinese authorities continue to have at their disposal a broad array of policy tools to respond to market strains or shortfalls in growth. However, given the complex challenges facing China, a more adverse outturn cannot be ruled out. In particular, as explored in the "China-Driven Emerging Market Economy Crisis" scenario in the Risks and Uncertainty section, a financial crisis and sharp weakening of growth in China could produce severe adverse spillovers for other EMEs and the global economy. And further weakness in overall foreign growth could lead to the pressures laid out in the scenario "Stronger Dollar and Lower Oil Prices." Beyond the standard macroeconomic channels highlighted in this scenario, lower oil prices could also lead to financial stresses in the oil sector here and abroad and additional drag on growth.

We estimate that inflation fell to near zero in the AFEs in the fourth quarter, as retail energy prices declined further. The additional drop in oil prices since the December Tealbook is expected to hold AFE inflation near zero again in the first quarter. Thereafter, AFE inflation is projected to rise to close to 1 percent by the middle of the year, as energy prices stabilize, and then to increase gradually to 1¾ percent by the end of the forecast period as economic slack diminishes. In the EMEs, inflation fell to an estimated 1¾ percent in the fourth quarter, reflecting lower retail energy and food prices, but we see it rising to a 3 percent trend pace by the second half of 2016.

We have revised our monetary policy expectations in light of the weaker inflation and growth outlooks for the AFEs. We now expect the Bank of Canada (BOC) to lower its policy rate 25 basis points at its March meeting and the Bank of Japan (BOJ) to expand its asset purchase program by the middle of the year. We have also pushed back our forecast for the Bank of England (BOE) to begin raising rates by one quarter, to the

third quarter of 2016. We have not changed our baseline for the European Central Bank (ECB), but we see an increased probability of additional stimulus measures. In contrast, we have raised our forecasts for policy rate increases for several commodity-producing EMEs experiencing currency weakness and above-target inflation, including Brazil, Chile, Colombia, and Russia.

EMERGING MARKET ECONOMIES

- *China.* Chinese real GDP growth edged down from 7¼ percent in the third quarter to 7 percent in the fourth, slightly higher than our December Tealbook forecast, as a retrenchment in service sector growth offset a modest pickup in manufacturing activity. Consistent with the solid GDP print, industrial production, exports, and retail sales have all been relatively strong, although investment continues to slow. For 2015 as a whole, China's economy grew 6.9 percent, a hair under the authorities' target and only a modest deceleration from 7¼ percent growth in 2014. Notwithstanding a resurgence of volatility in China's financial markets during the intermeeting period, we do not see a precipitous slowing of the economy as the most likely scenario (see the box "Recent Developments in China and Implications for the Outlook"). Growth is expected to continue its gradual decline to 6 percent by the end of the forecast period, in line with our estimate of China's potential growth rate. This forecast is little changed from the December Tealbook.

  After turning slightly negative in the fourth quarter, inflation in China is projected to pick up going forward. Although recent declines in oil prices are expected to hold down inflation over the next few quarters, we see inflation settling at 2½ percent by the end of this year. We expect the authorities to support growth primarily through fiscal easing and credit policy, which are likely to be adjusted in response to the performance of the economy over the course of the year, and to make one additional cut to the benchmark lending rate. The authorities are also likely to reduce reserve requirements as

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Recent Developments in China and Implications for the Outlook

Since the start of the year, global financial markets have again been roiled by developments in China. An apparent change in the management of the Chinese exchange rate on the first trading day of the year led to concerns about the economy and a sharp decline in Chinese equity markets, triggering newly minted circuit breakers. Pressure on Chinese markets has continued, leaving the onshore value of the renminbi (RMB) 1¼ percent weaker against the dollar and equity prices down 16 percent so far this year. Tenuous stabilization of Chinese markets appears to have been achieved but only through significant government intervention in equity and foreign exchange markets, and questions remain about Chinese policy direction and risks to the global economy.

Market developments notwithstanding, recent official data do not point to a significant slowing in Chinese growth. Although the year started with a weaker-than-expected reading on the unofficial Caixin PMI for December, other Chinese data—such as industrial production and exports—have been relatively strong. The stability of these indicators was confirmed by the subsequent release of fourth-quarter GDP, which printed about in line with expectations. All told, we have left our forecast for GDP growth in China about unchanged, with growth slowing from about 7 percent in 2015 to 6½ percent this year and 6 percent by 2018. Outside analysts also do not appear to have significantly revised down their baseline outlook for China.

Instead, the global market volatility related to China appears to reflect increasing worries about downside risks to the Chinese economy and the coherence of Chinese policymaking. Authorities seem to be struggling to balance the goals of liberalizing markets and maintaining stability. Nowhere has that tension been more tangible, or the spillovers to global markets stronger, than in relation to China's exchange rate policy. In August, the People's Bank of China (PBOC) changed the way it sets its fixing rate (the red dots in figure 1) by tying it more closely to the previous day's close (the black line), which signaled that the exchange rate would more closely reflect market conditions. (The fixing rate serves as the midpoint and thus anchors the plus/minus 2 percent daily trading band.) In response to a consequent surge in capital outflows and market turmoil,

1. Chinese exchange rates

Source: China Foreign Exchange Trading System (CFETS).

2. China exchange rate forecast

Source: CFETS, FRB, and staff calculations.
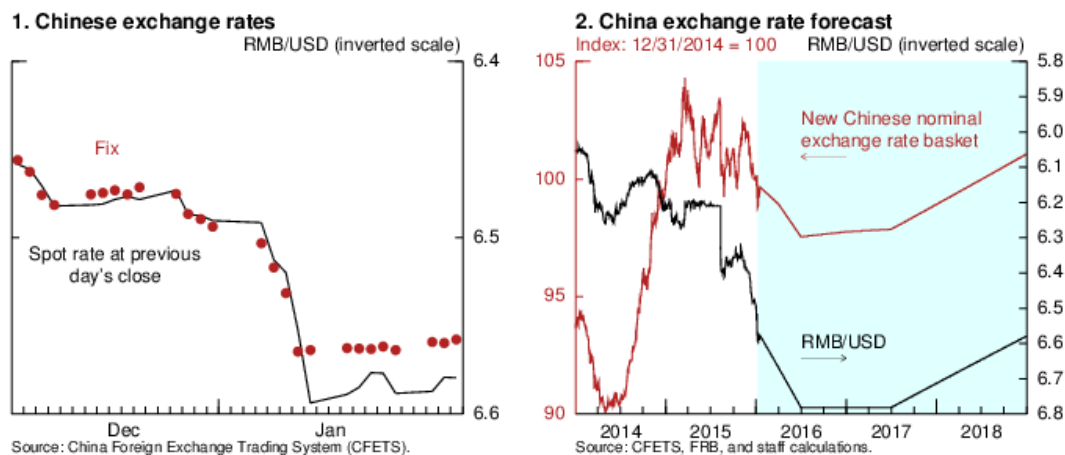
however, the PBOC intervened to stabilize the RMB, apparently contradicting its earlier intent. In December, the PBOC began publishing a new multilateral exchange rate index and indicated that it expected the RMB to be "basically stable" relative to the currency basket. But the PBOC never clarified whether, and to what degree, it had adopted a policy of pegging the RMB to that basket, nor did it reconcile that policy with the goal of giving more weight to market forces. Accordingly, in early January when authorities fixed the exchange rate both weaker against the dollar and weaker against the basket than the previous market's close , as shown in figure 2, investors took this as a signal that the RMB would be allowed to depreciate more sharply, setting off renewed turmoil in global markets. In consequence, the authorities once again acted to stabilize the RMB. We estimate that the PBOC has spent nearly $400 billion defending the currency during the past year—although, at $3.4 trillion, its reserves remain ample.

The authorities are clearly having trouble reconciling a large number of sometimes inconsistent objectives: (1) containing appreciation of the effective RMB that would accompany a further rise in the dollar, (2) preventing a large, disorderly depreciation of the currency, (3) maintaining reserves amid strengthening capital outflows, and (4) giving greater sway to market forces. Balancing these goals will be difficult, and attempts to accommodate downward pressure on the RMB by allowing some modest depreciation will further incentivize outflows and currency pressures. We project the RMB to depreciate further through the middle of this year, both against the dollar and the basket (black and red lines in figure 2), before flattening out for a period as investors come to realize a hard landing is not imminent. However, much more extreme outcomes are certainly possible.

Spillovers from the turmoil in China along with falling commodity prices—the latter due at least in part to concerns over global demand—have weighed on global financial markets, and advanced and emerging market equity indexes posted sharp declines in January. Although wealth effects from lower equity prices are small in most foreign economies, lower oil prices led us to mark down growth in key trading partners, including Canada and Mexico, leaving a negative imprint on our near-term outlook for trade-weighted foreign GDP.

The outlook for the U.S. economy has also been affected, primarily for the worse. The drag on some countries from falling commodity prices, the appreciation of the dollar since the previous Tealbook, and our assumption of further RMB depreciation (with knock-on effects to the projected path of other EME Asian currencies) have all lowered our forecast for net exports. In addition, declines in U.S. equities, which have been linked to concerns over the foreign outlook and increased risk aversion, have a negative wealth effect that lowers U.S. GDP. These negative effects are somewhat balanced by the positive effect of the decline in oil prices on domestic consumption, notwithstanding some additional downward pressure on oil-sector investment. All told, these effects sum up to a fairly small drag on U.S. growth over the next few years, with the higher dollar and lower oil prices also pushing down inflation in the first half of 2016. That said, the prospect of a further sharp depreciation of the RMB and a steep downturn in Chinese activity could potentially have very large effects on U.S. GDP growth and inflation, a scenario considered in the Risks and Uncertainty section.

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necessary to offset the monetary effects of continuing large-scale foreign exchange sales, but we do not see such actions as providing net stimulus.

- *Other Emerging Asia.* We estimate fourth-quarter growth edged down to 3½ percent, in line with our December forecast. This slowdown is due partly to weaker activity in **Korea** after the third-quarter rebound following the end of the MERS (Middle-East Respiratory Syndrome) outbreak and partly to deceleration in **India** following unusually strong growth in the third quarter. Elsewhere in the region, growth has generally held up; high-frequency indicators such as PMI and retail sales suggest that domestic demand is picking up, even as exports, especially to China, continue to disappoint. Overall, we expect growth to step up to 4¼ percent this year, supported initially by stronger domestic demand and later by more robust growth abroad.

  We expect inflation in the region to remain at 2½ percent in the current quarter as the continued fall in energy prices is offset by higher food prices. We see inflation moving up gradually to 3¼ percent by 2017.

- *Latin America.* Real GDP growth in **Mexico** stepped down ¾ percentage point to an estimated 2¼ percent in the fourth quarter, ¼ percentage point below our December projection. The deceleration reflects, in part, weaker external demand, as Mexican manufacturing exports declined. Also, investment in nonresidential structures plunged further in October, driven by oil price declines. In contrast, private consumption moved up, aided by rising employment, accommodative monetary policy, and higher disposable income as government reforms have pushed down energy and telecommunications prices. We see growth gradually moving up to 3 percent by 2018. The outlook for the Mexican economy is a little weaker than in the previous Tealbook, reflecting the downward revision to expected U.S. manufacturing production and lower oil prices.

  Headline inflation dropped to 2½ percent in the fourth quarter, driven by another plunge in telecommunications prices. We see inflation moving back

up to 3¼ percent by the second quarter and then sustaining that rate. The Bank of Mexico raised its policy rate to 3.25 percent following Fed liftoff, and we expect the central bank to broadly shadow changes in Federal Reserve policy rates going forward.

In **Brazil**, persistent political tensions and the associated uncertainty about the fiscal outlook, depressed commodity prices, continuing reverberations of the scandal at Petrobras, and ongoing monetary policy tightening led real GDP to contract at an estimated annual rate of 4½ percent in the fourth quarter. While exports and the PMI improved somewhat late in the fourth quarter, industrial production and consumer and business confidence fell further. We expect growth to remain in negative territory this year and to resume expanding at an anemic pace in 2017, aided by a weaker currency and firming global growth.

Despite the weak economy, the substantial depreciation of the *real* and hikes in administered prices kept inflation at a 10¼ percent annual rate in the fourth quarter. We see inflation declining to 5½ percent by mid-2017, reflecting continued tight monetary policy and lower pressure from administered prices. We expect that the continued elevated pace of inflation will prompt the central bank to resume policy tightening at this week's meeting. We do not expect policy to begin easing until late 2016.

In **Argentina,** the administration of newly elected President Mauricio Macri moved to begin tackling the country's serious economic problems and restore its access to global capital markets. The government laid out a four-year economic plan to reduce the fiscal deficit and bring inflation down to 5 percent by the end of 2019. The exchange rate system was unified, and the official exchange rate was allowed to depreciate by 40 percent; export taxes were repealed; and talks with holders of defaulted debt began in January.

In **Venezuela**, whose economy has been ravaged by economic mismanagement and the collapse in oil prices, President Nicolás Maduro has decreed a 90-day economic emergency, a measure that would grant him broad

powers to enact new economic measures. The opposition-controlled congress is poised to reject the decree, however, and political tensions will likely intensify in coming weeks. Meanwhile, the government released a year's worth of macroeconomic data showing that economic activity is extremely depressed, with GDP declining 7 percent on a four-quarter basis through the third quarter. And inflation has soared further into three-digit territory, exceeding 140 percent on a 12-month basis in September.

- *Other EMEs.* In **South Africa**, financial markets have come under pressure, as two finance ministers were dismissed within a week, and concerns mounted over South Africa's dependence on commodity exports and its reliance on portfolio inflows to finance large external deficits. The country also continues to suffer from low growth and elevated inflation. Since the December Tealbook, the rand has fallen by about 15 percent and the CDS premium is up around 85 basis points.

ADVANCED FOREIGN ECONOMIES

- *Canada.* We have slashed our estimate of fourth-quarter growth in Canada to only ½ percent, from 2 percent in the December Tealbook. Incoming indicators point to weaker momentum and a larger drag from low oil prices than we had previously thought: Business investment, manufacturing output, and construction activity contracted in the fourth quarter, and growth in the service sector slowed. The weak incoming data and further declines in oil prices have led us to also lower our projection ¾ percentage point for the first half of 2016. We do not expect the weakness to be sustained, and we have growth picking up to just over 2 percent later in 2016 and in 2017, as investment recovers, exports are supported by past currency depreciation, monetary policy remains accommodative, and the recently elected government implements fiscal stimulus.

We estimate that inflation declined from 2¼ percent in the third quarter to ¾ percent in the fourth. As the drag from lower oil prices fades, inflation is

projected to step up to 1¾ percent in the second half of 2016, reaching the BOC's target of 2 percent by mid-2017. In response to the weaker economic outlook, we now expect the BOC to cut its policy rate by 25 basis points at its March meeting.

- ***Euro Area.*** Recent indicators suggest real GDP grew 1¼ percent in the fourth quarter. Going forward, the boost from the recent fall in oil prices should more than offset the drag from the recent declines in equity prices. We expect GDP to rise at about a 2 percent rate over the next three years, a touch higher than in the December Tealbook, supported by ongoing monetary stimulus, past currency depreciation, low oil prices, and easing credit conditions.

  Headline inflation stayed slightly negative in the fourth quarter due to another plunge in retail energy prices and a moderate decrease in core inflation. As the drag from energy prices moderates and the output gap narrows, we expect inflation to step up to 1½ percent by late 2016 and to edge up a bit further thereafter. Compared with the December Tealbook, this projection is about 1 percentage point lower in the first half of 2016, largely due to declines in energy prices. We continue to expect the ECB to purchase assets through mid-2017 and to keep its policy rates at current low levels until late 2018. However, the recent lowering of the near-term inflation outlook, along with recent declines in longer-term inflation compensation, raise the possibility that the ECB will undertake further stimulus.

- ***Japan.*** Growth in the fourth quarter is estimated to have remained around 1 percent. The recent appreciation of the yen should damp export growth, but the decline in oil prices should provide an offsetting boost to consumption. All told, we still expect that GDP growth will stay around 1 percent in 2016, supported by ongoing monetary easing and low oil prices, before a second hike in the consumption tax temporarily stalls the expansion in 2017.

  We estimate that consumer prices fell ¼ percent last quarter, largely reflecting falling retail energy prices, but that core inflation held steady at just under

1 percent. We project that inflation (excluding the direct effect of the 2017 consumption tax hike) will rise to 1 percent by the end of 2016 and to 1¼ percent in 2017 and 2018. With inflation well below the BOJ's 2 percent target, and given the recent substantial oil price declines and appreciation of the yen, we now expect that the BOJ will expand its asset purchase program by midyear.

- *United Kingdom.* Recent indicators, such as PMIs for services and construction, retail sales, and economic sentiment, point to solid growth in domestic demand, which has offset some of the weakness in external demand. We expect GDP growth to pick up from 1¾ percent in the third quarter to 2¼ percent in the fourth and to average just above that pace over the next three years. We also expect that uncertainty about the referendum on U.K. membership in the European Union (EU), which could take place as soon as the middle of this year, will weigh on activity. But, because our baseline assumption is of continued EU membership, this effect should be temporary and largely offset by the boost from recent declines in oil prices and the foreign exchange value of the pound.

  Because of declining energy prices, consumer prices fell 0.3 percent in the fourth quarter, and we expect them to rise by ½ percent this quarter, ½ percentage point below the December forecast. As energy prices stabilize and the economy continues to expand, we project that inflation will step up to a 2 percent pace by late 2016. In response to BOE communications focusing on recent slower wage growth and uncertainties about the global economy, we now expect the BOE to wait until the third quarter of 2016 to begin raising its policy rate, one quarter later than assumed in the December Tealbook.

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**	**2.0**	**2.3**	**2.6**	**2.8**	**2.8**	**2.9**
	Previous Tealbook	*1.5*	*2.4*	*2.3*	*2.6*	*2.8*	*2.8*	*2.8*	*2.9*
2.	**Advanced Foreign Economies**	**0.8**	**1.8**	**1.0**	**1.4**	**1.8**	**2.2**	**2.0**	**1.9**
	Previous Tealbook	*0.8*	*1.8*	*1.7*	*1.9*	*2.0*	*2.1*	*1.8*	*1.9*
3.	Canada	-0.5	2.3	0.6	1.2	1.8	2.3	2.1	1.8
4.	Euro Area	1.9	1.2	1.3	1.7	2.0	2.2	2.2	2.1
5.	Japan	1.9	1.0	0.9	1.0	1.1	1.2	-0.3	1.0
6.	United Kingdom	1.8	1.8	2.2	2.4	2.4	2.4	2.4	2.3
7.	**Emerging Market Economies**	**2.2**	**3.1**	**2.9**	**3.1**	**3.4**	**3.5**	**3.6**	**3.8**
	Previous Tealbook	*2.3*	*3.0*	*2.8*	*3.3*	*3.5*	*3.6*	*3.8*	*3.9*
8.	China	6.5	7.2	7.0	6.2	6.3	6.2	6.1	6.0
9.	Emerging Asia ex. China	2.7	3.8	3.6	4.1	4.3	4.2	4.1	4.1
10.	Mexico	2.3	3.0	2.2	2.5	2.8	2.8	2.8	2.9
11.	Brazil	-5.7	-6.7	-4.5	-2.5	-1.0	0.1	1.6	2.1

* GDP aggregates weighted by shares of U.S. merchandise exports.
... Not applicable.

Int'l Econ Devel & Outlook

Total Foreign GDP

Percent change, annual rate

Foreign GDP
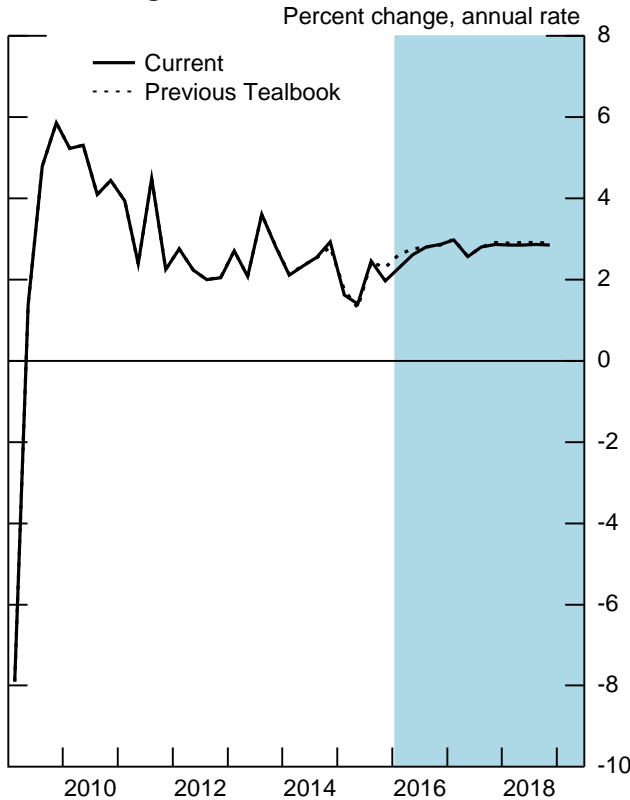
Percent change, annual rate
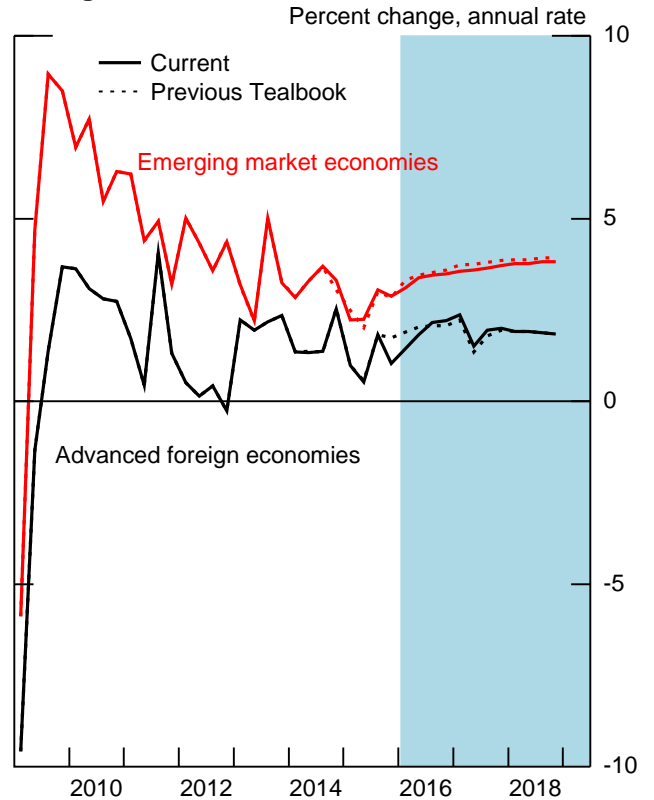
The Foreign Inflation Outlook

Consumer Prices*   Percent change, annual rate

| | 2015 | | | 2016 | | | 2017 | 2018 |
	H1	Q3	Q4	Q1	Q2	H2		
1. Total Foreign	**1.4**	**2.0**	**1.0**	**1.4**	**2.0**	**2.3**	**2.5**	**2.5**
Previous Tealbook	*1.4*	*2.0*	*1.0*	*1.8*	*2.2*	*2.4*	*2.5*	*2.5*
2. Advanced Foreign Economies	**0.6**	**0.7**	**0.1**	**-0.1**	**0.9**	**1.4**	**1.9**	**1.7**
Previous Tealbook	*0.6*	*0.7*	*0.2*	*0.8*	*1.3*	*1.5*	*1.9*	*1.7*
3. Canada	1.1	2.3	0.8	1.1	1.4	1.7	2.0	2.0
4. Euro Area	0.5	-0.1	-0.1	-1.0	0.8	1.4	1.6	1.6
5. Japan	0.7	0.0	-0.3	-0.4	0.1	0.7	2.5	1.3
6. United Kingdom	-0.2	1.0	-0.3	0.5	1.7	2.0	2.1	2.0
7. Emerging Market Economies	**2.0**	**3.0**	**1.7**	**2.5**	**2.8**	**3.0**	**3.0**	**3.0**
Previous Tealbook	*2.0*	*2.9*	*1.6*	*2.5*	*2.8*	*3.0*	*3.0*	*3.0*
8. China	1.4	3.1	-0.2	1.5	2.1	2.4	2.5	2.5
9. Emerging Asia ex. China	1.4	1.5	2.6	2.5	2.7	3.1	3.2	3.3
10. Mexico	1.9	2.8	2.4	3.0	3.2	3.2	3.2	3.2
11. Brazil	10.6	10.1	10.3	7.6	6.2	6.2	5.5	5.4

* CPI aggregates weighted by shares of U.S. non-oil imports.
... Not applicable.

Foreign Monetary Policy

AFE Policy Rates
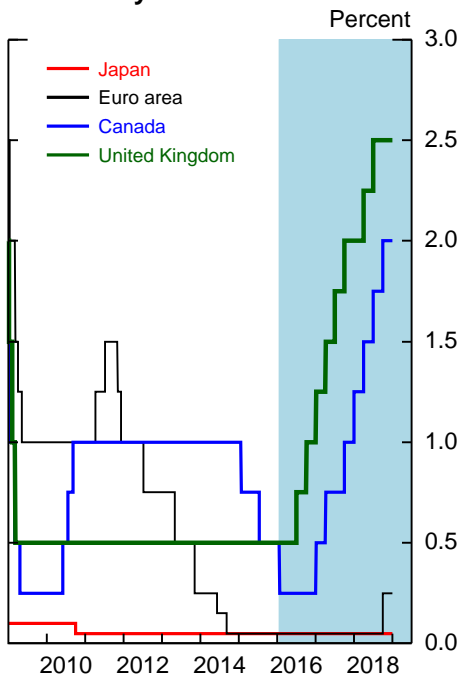
AFE Central Bank Balance Sheets
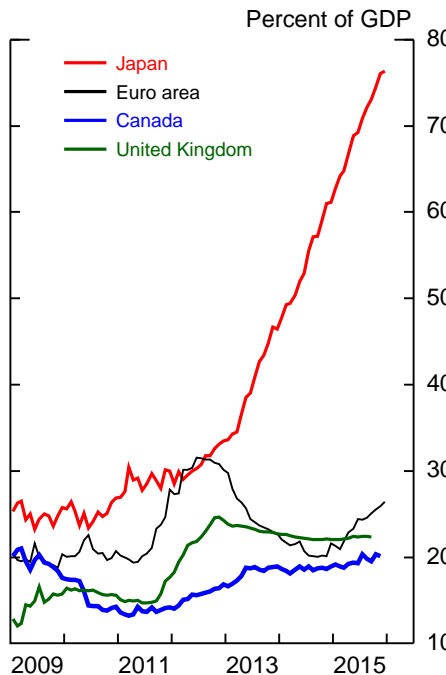
EME Policy Rates
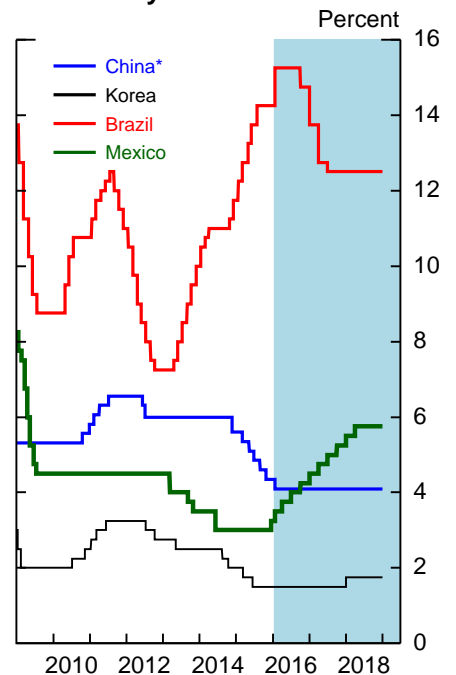
* 1-year benchmark lending rate.

Int'l Econ Devel & Outlook

Recent Foreign Indicators

Nominal Exports

Jan. 2010 = 100

- Foreign
- AFE
- EME*

* Excludes Venezuela.

Industrial Production

Jan. 2010 = 100

- Foreign
- AFE*
- EME**

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

Retail Sales

12-month percent change

- Foreign
- AFE*
- EME**

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

Employment

4-quarter percent change

- Foreign
- AFE
- EME*

* Excludes Argentina, China, and Venezuela.
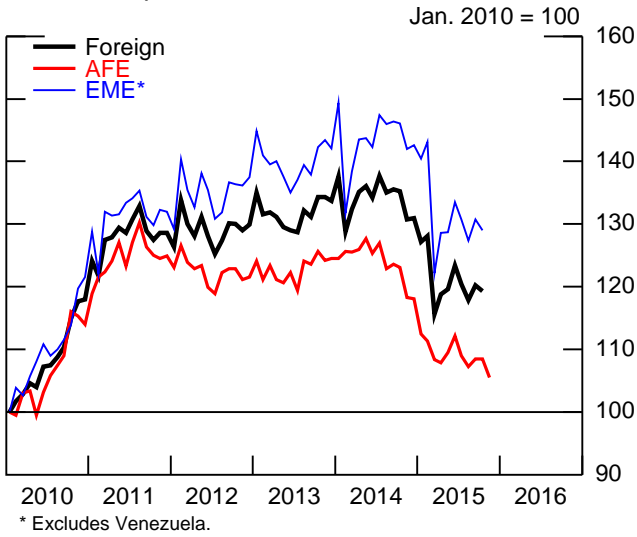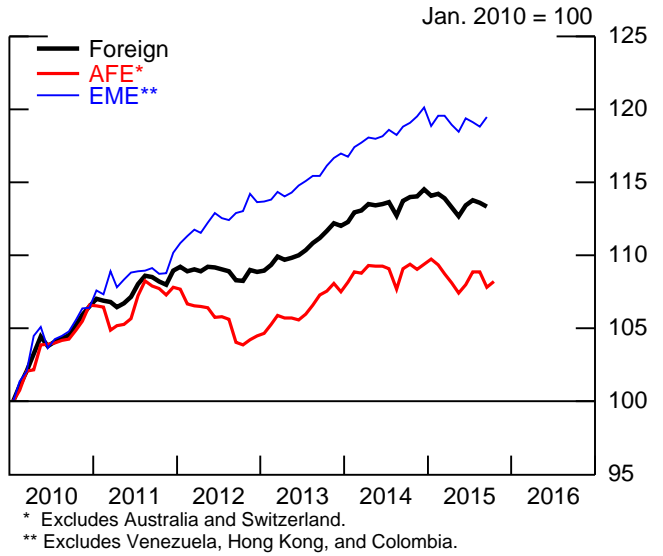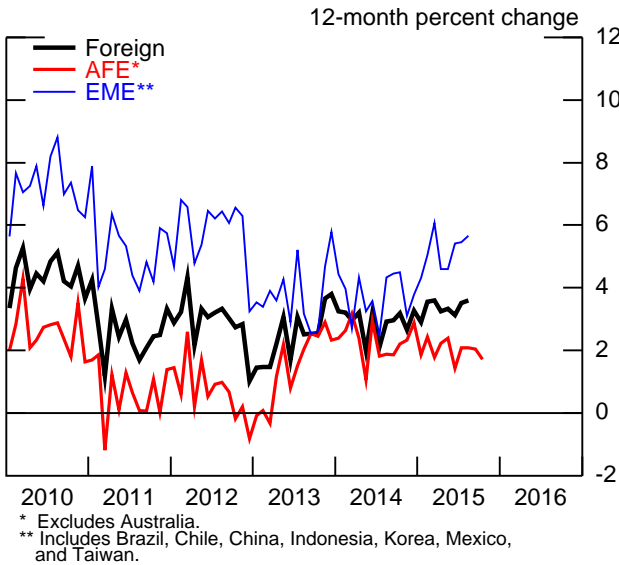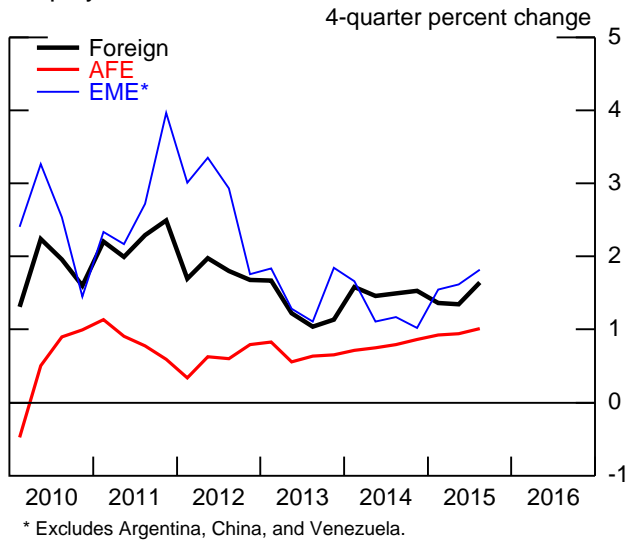
Consumer Prices: Advanced Foreign Economies

12-month percent change

- Headline
- Core*

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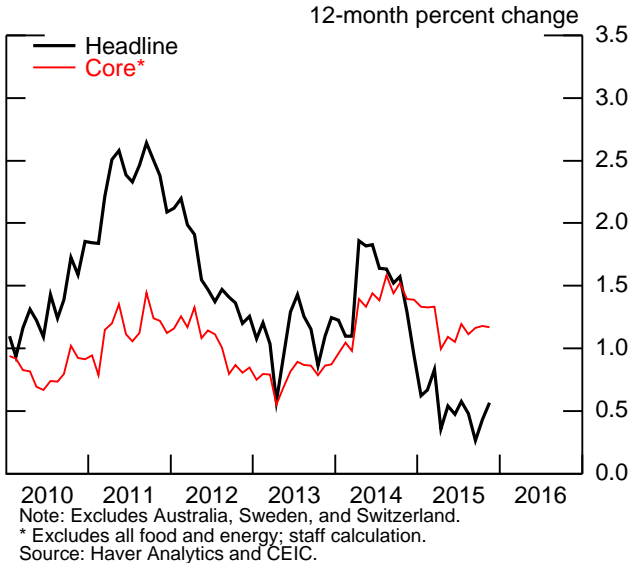
Consumer Prices: Emerging Market Economies

12-month percent change

- Headline
- Ex. food--Emerging Asia*
- Ex. food--Latin America*

* Excludes all food; staff calculation.

Int'l Econ Devel & Outlook
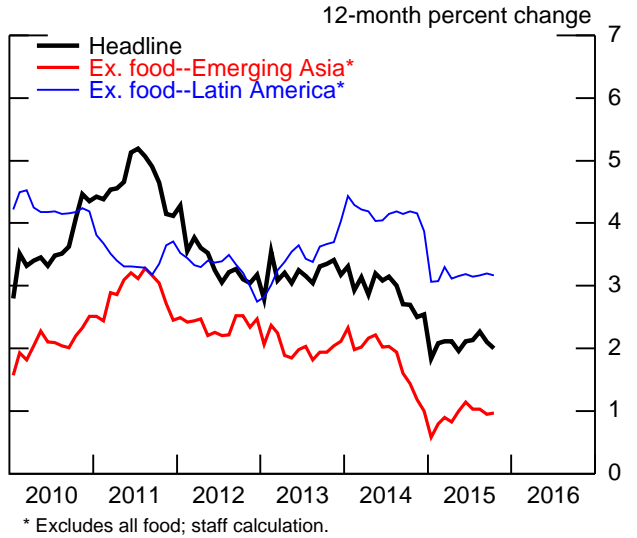
Evolution of Staff's International Forecast

Int'l Econ Devel & Outlook

Total Foreign GDP

Percent change, Q4/Q4

2015

2016

2017

2018

Tealbook publication date

1/23 3/13 4/24 6/12 7/24 9/11 10/23 12/11 1/22 3/12 4/23 6/11 7/23 9/10 10/22 12/10 1/21 3/11 4/22 6/10 7/22 9/9 10/21 12/9 1/20
2013   2014   2015   2016

Total Foreign CPI

Percent change, Q4/Q4

2015

2016

2017

2018

Tealbook publication date

1/23 3/13 4/24 6/12 7/24 9/11 10/23 12/11 1/22 3/12 4/23 6/11 7/23 9/10 10/22 12/10 1/21 3/11 4/22 6/10 7/22 9/9 10/21 12/9 1/20
2013   2014   2015   2016

U.S. Current Account Balance

Percent of GDP

2015

2016

2017

2018

Tealbook publication date

1/23 3/13 4/24 6/12 7/24 9/11 10/23 12/11 1/22 3/12 4/23 6/11 7/23 9/10 10/22 12/10 1/21 3/11 4/22 6/10 7/22 9/9 10/21 12/9 1/20
2013   2014   2015   2016

Financial Developments

Stock prices tumbled worldwide over the intermeeting period, as the post-year-end turmoil in Chinese financial markets and the continued slide in oil prices stoked global growth concerns and increased risk aversion. The decline in the prices of risky assets after year-end weighed on policy rate expectations both domestically and abroad, and market-based measures of forward inflation compensation fell to record lows. Corporate credit quality showed some further signs of deterioration, and speculative-grade issuance slowed to a near halt. Financing conditions for high-credit-quality businesses and households, though, apparently remained accommodative.

Following the Committee's decision at the December meeting to raise the target range for the federal funds rate, the effective federal funds rate rose to the middle of the new target range and other overnight market rates moved up largely in line. Otherwise, the FOMC statement elicited little market reaction.

- The Shanghai composite index dropped 14 percent over the intermeeting period, and the renminbi depreciated 1⅔ percent against the dollar, despite reports of repeated intervention in both markets by Chinese authorities.

- Brent crude oil prices fell to less than $30 per barrel, a level not seen in over a decade. The broad index of the dollar increased 2¾ percent.

- The S&P 500 index dropped about 8 percent, and stock indexes in the euro area and Japan fell 8 percent and 10 percent, respectively. The VIX rose to about 26 percent, near the top of its range over the past few years.

- Yields on 2-, 5-, and 10-year nominal Treasury securities decreased 12, 23, and 22 basis points, respectively. Interest rates on 30-year mortgages moved roughly in line with Treasury yields.

- The expected target federal funds rate of participants in the primary dealer survey by the end of 2016 is now 0.80 percent, implying one less rate hike compared with the December survey.

Financial Developments

Foreign Developments

Stock Price Indexes

Jan. 2, 2015 = 100

Daily
- MSCI Emerging Markets*
- DJ Euro Stoxx
- Shanghai
- S&P 500

Dec. FOMC

Jan. 19

* Local currency returns.
Source: Bloomberg.
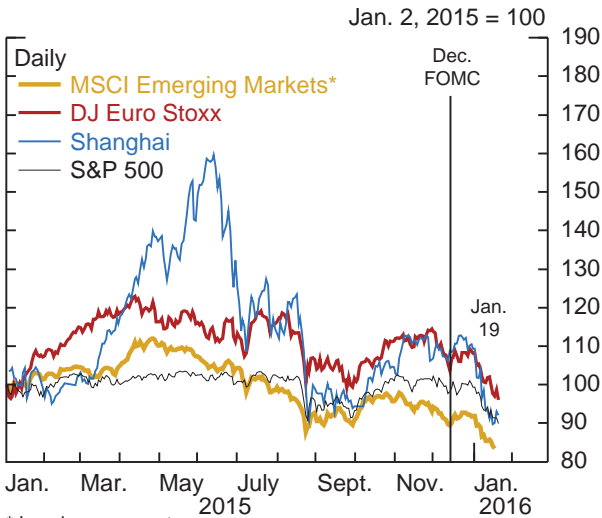
Dollar Exchange Rate Indexes

Jan. 2, 2015 = 100

Daily
- Euro
- AFE
- EME

Dec. FOMC

Jan. 19

Source: Federal Reserve Board; Bloomberg.
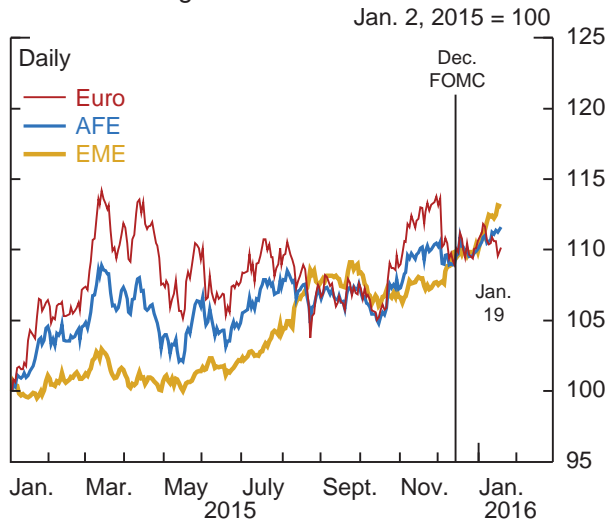
AFE and U.S. 10-Year Nominal Benchmark Yields

Percent

Daily

Dec. FOMC

United States

United Kingdom

Jan. 19

Germany

Japan

Source: Bloomberg.
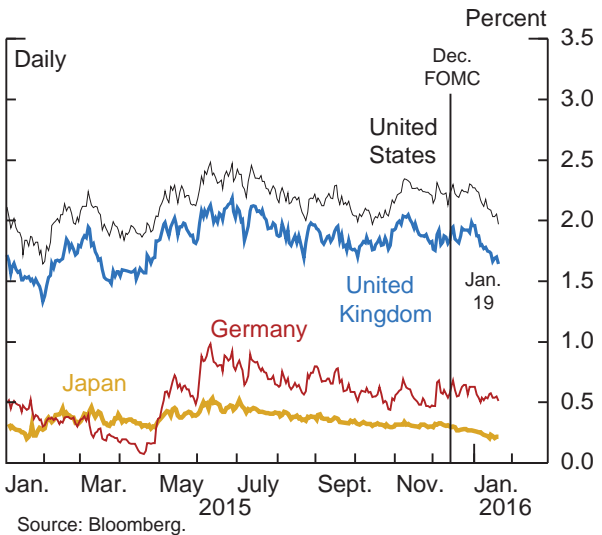
24-Month-Ahead Policy Expectations

Percent

Daily

Dec. FOMC

United States

United Kingdom

Japan

Jan. 19

Euro area

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

Chinese Exchange Rates

Percent

Renminbi (RMB) per U.S. dollar

Daily

Dec. FOMC

- RMB spread (left scale)
- RMB offshore (right scale)
- RMB onshore (right scale)

Jan. 19

Source: Bloomberg.
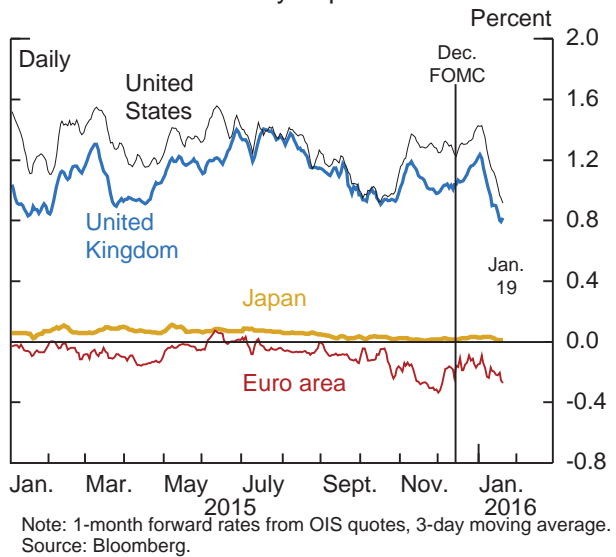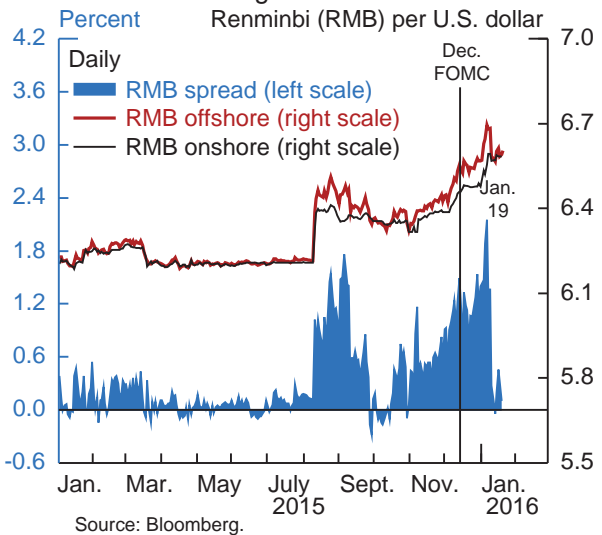
Emerging Market Flows and Spreads

Billions of dollars

Basis points

Weekly

Dec. FOMC

EMBI+

Jan. 19

- Equity funds (left scale)
- Bond funds (left scale)
- EMBI+ (right scale)

Note: Emerging market bond spreads over zero-coupon Treasury securities. Excludes intra-China flows.
Source: Emerging Portfolio Fund Research.

Financial Developments
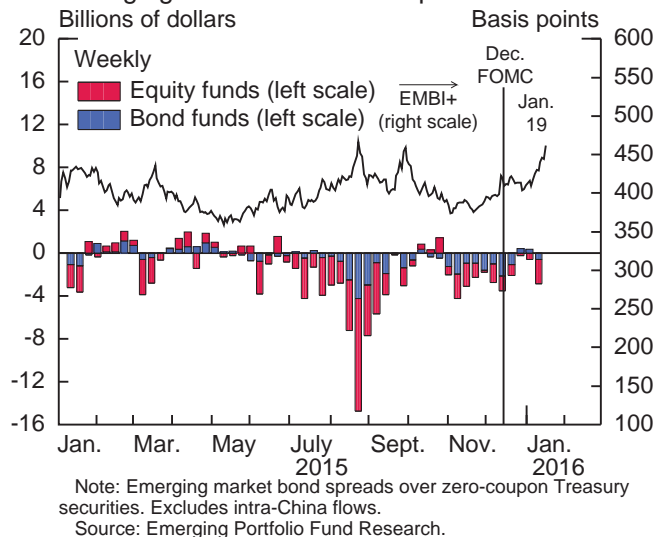
- TIPS-based measures of inflation compensation declined, with the 5-to-10-year measure of TIPS-based inflation compensation hitting a new low.

- Yield spreads on both investment- and speculative-grade corporate bonds widened, in part owing to another jump in energy-sector spreads. CMBS spreads widened further.

- Banks' lending standards reportedly tightened for business loans, on net, but eased for several categories of loans to households during the fourth quarter. Loan demand reportedly increased across most major loan categories.[1]

FOREIGN DEVELOPMENTS

After little discernible reaction following the liftoff of U.S. policy interest rates, global financial market conditions deteriorated sharply in January, as developments in Chinese financial markets and another step-down in oil prices appeared to ignite fears about global growth. This shift in sentiment led to a pronounced decline in the prices of equities and other risky assets and a notable strengthening of the dollar.

On January 4 and again on January 7, Chinese authorities set a weaker-than-expected central parity for the exchange rate of the renminbi versus the U.S. dollar. Fears that this action foreshadowed further renminbi depreciation spooked investors, and stock prices in China fell sharply. Since the December FOMC meeting, the Shanghai composite index has dropped 14 percent despite reports of repeated stock purchases by government-directed institutions. Chinese authorities also appear to have intervened heavily in both onshore and offshore foreign exchange markets, selling foreign reserves to manage the pace of depreciation of the renminbi amid intensifying capital outflows. Concerns about China's intentions regarding its exchange rate were compounded by the release of data indicating much larger foreign exchange reserve sales in December than had been expected. (See the box "Recent Developments in China and Implications for the Outlook" in the International Economic Developments and Outlook section.)

Both the turmoil in Chinese markets and the sizable decline in oil prices weighed on global financial markets. Equity prices in advanced foreign economies (AFEs) and emerging market economies (EMEs) fell sharply, with stock indexes down about

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[1] See Robert Kurtzman (2016), "The January 2016 Senior Loan Officer Opinion Survey on Bank Lending Practices," memorandum to the FOMC, January 21.

Policy Expectations and Treasury Yields

Selected Interest Rates

Percent

Percent

Dec. FOMC statement

Dec. 2016 Eurodollar (left scale)

ISM manufacturing report

Dec. FOMC minutes

First Chinese decline

Second Chinese decline

Dec. employment report

Dec. retail sales report

10-year Treasury yield (right scale)

Dec. 16 Dec. 18 Dec. 22 Dec. 24 Dec. 28 Dec. 30 Jan. 1 Jan. 5 Jan. 7 Jan. 11 Jan. 13 Jan. 15 Jan. 19

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

Percent

Most recent: January 19, 2016
Last FOMC: December 15, 2015

Jan. 27   Mar. 16   Apr. 27 2016   June 15   >=July 27
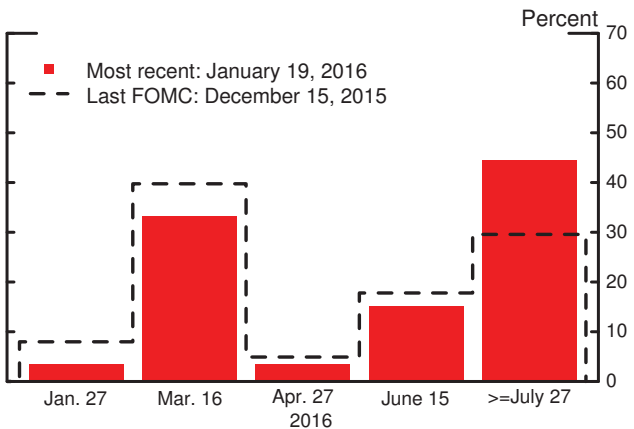
Note: Implied by federal funds futures. Assumes that investors expect the federal funds rate to trade at the expected rate implied by futures contracts until the next FOMC meeting. The probabilities on December 15 are probabilities conditional on liftoff in December.
Source: CME Group; Federal Reserve Board staff estimates.

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

Percent

Most recent: 22 respondents
Last FOMC: 22 respondents

0.00-0.25%   0.26-0.50%   0.51-1.00%   1.01-1.50%   1.51-2.00%   2.01-2.50%   >=2.51%
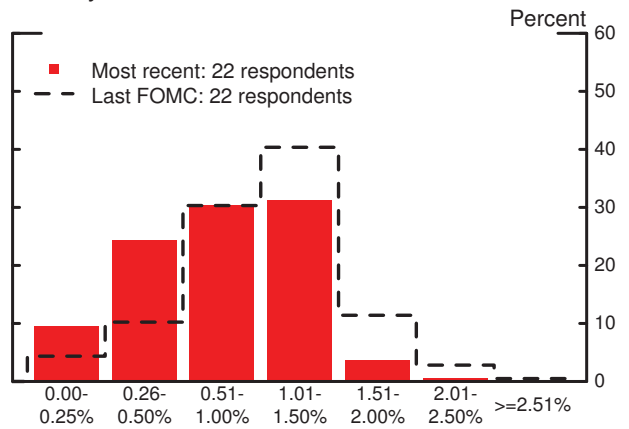
Note: Unconditional distribution of the federal funds rate.
Source: Desk's primary dealer survey from January 19, 2016.

Treasury Yield Curve

Percent

Most recent: January 19, 2016
Last FOMC: December 15, 2015

2   5   10   20   30
Maturity in years
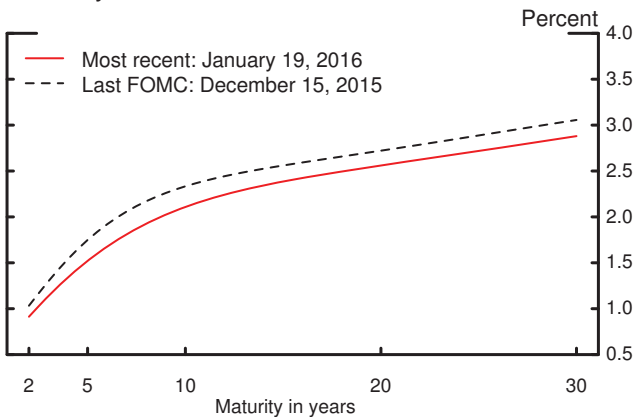
Note: Smoothed yield curve estimated from off-the-run Treasury coupon securities. Yields shown are those on notional par Treasury securities with semiannual coupons.
Source: Federal Reserve Bank of New York; Federal Reserve Board staff estimates.

Inflation Compensation

Percent

Daily

5 to 10 years ahead

Dec. FOMC

Next 5 years*

Jan. 19

2014   2015   2016
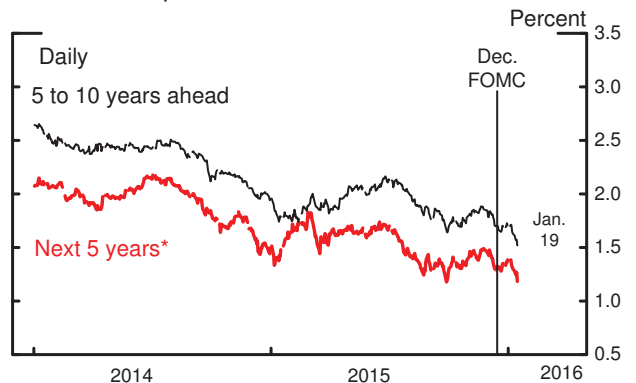
Note: Estimates based on smoothed nominal and inflation-indexed Treasury yield curves.
* Adjusted for lagged indexation of Treasury Inflation-Protected Securities (carry effect).
Source: Federal Reserve Bank of New York; Federal Reserve Board staff estimates.

Financial Developments

8 percent and 10 percent in the euro area and Japan, respectively. AFE 10-year sovereign yields decreased substantially, with almost all of the decline due to a drop in inflation compensation. Policy expectations for major foreign central banks, which had risen some after the December FOMC meeting, ended the period down. EME credit spreads widened, but outflows from EME-dedicated mutual funds remained moderate.

The U.S. dollar appreciated further against most currencies, leaving the broad index of the dollar up 2¾ percent. The dollar was little changed, on net, against the euro but appreciated about 6 percent versus sterling and the Canadian dollar. The dollar appreciated up to 3 percent against most Asian EME currencies, which generally moved in sympathy with the renminbi, and a bit more versus several Latin American currencies. In contrast, the dollar depreciated against the Japanese yen, which was likely supported by flight-to-safety flows, including some unwinding of yen-funded carry trades.

POLICY EXPECTATIONS AND TREASURY YIELDS

The Committee's decision to raise the target range for the federal funds rate to ¼ to ½ percent at the December meeting elicited little reaction in Treasury and interest rate futures markets, as market participants had appeared reasonably sure that liftoff would occur in December. The changes to the forward-guidance language in the FOMC statement were similarly reported as consistent with market expectations that future adjustments to the target range would be data dependent but likely gradual. The December FOMC minutes also prompted limited market reaction. Market participants place essentially no odds on the next rate increase occurring at the January meeting. Based on a straight read of federal funds futures rates, the perceived odds of a rate hike by the March meeting declined in the intermeeting period from around 50 percent to about 30 percent. Positive news regarding December payrolls was overshadowed by global growth concerns and negative domestic spending indicators.

The market-based expected path of the federal funds rate 12 to 24 months out flattened over the intermeeting period and continues to lie noticeably below survey-based expectations. (See the box "Negative Risk Premiums and the Federal Funds Path Puzzle.") Similarly, the expected path of the federal funds rate according to the Desk's January Surveys of Primary Dealers has declined. The expected year-end 2016 target federal funds rate moved down to 0.8 percent, suggesting dealers anticipate one less rate hike by the end of the year compared with the December survey. Survey participants

Financial Developments

Negative Risk Premiums and the Federal Funds Path Puzzle

The market price implied path of the federal funds rate over the medium term stands well below most survey-based measures of the trajectory of the federal funds rate (figure 1). In part, the gap could indicate that the path of the federal funds rate expected by market participants differs materially from that expected by survey respondents.[1] We explore the possibility that survey measures of policy expectations may, in fact, be reasonably well aligned with market expectations and that the gap between the federal funds futures curve and the surveys largely reflects a substantial negative risk premium.

A number of standard models suggest that negative risk premiums can arise in some environments. The general intuition of such models is that investors are willing to accept low returns on assets that have high payoffs during "bad times" when positive payoffs are particularly valuable. This intuition suggests that investors may value federal funds futures contracts partly because they help insure against the risk of recession on the assumption that the FOMC will lower the federal funds rate in recessions or periods of unexpectedly low growth.

We use three models from the macro-finance literature to illustrate the potential magnitude of this negative premium.[2] The first model, a variant of the "habit persistence" model developed by Campbell and Cochrane (1999), assumes that a representative investor's marginal utility and risk aversion increase sharply during recessions as consumption weakens.[3] We modify the model to include monetary policy that follows an inertial Taylor (1999) rule, with the implication that the federal funds rate falls during recessions, generating insurance value for federal funds futures contracts. Under this

Figure 1. Federal funds rate projections

- Jan. PD survey median
- Jan. PD survey mean
- Federal funds futures rates on Jan.19, 2016

Percent
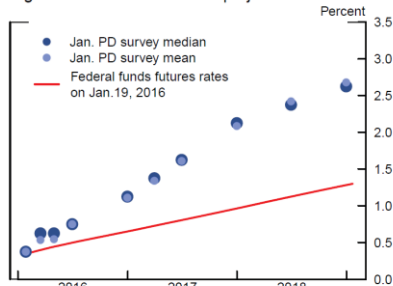
Note: The implied federal funds rate path is estimated using overnight index swaps (OIS) quotes with a spline approach and a term premium of zero basis points.
Source: Bloomberg; Federal Reserve Board of New York primary dealer (PD) survey sell-side results; and staff calculations.

Figure 2. Risk premium adjustments to future rates

- Jan. PD survey mean
- Habit model
- LRR model
- DSGE model
- Federal funds futures rates

Percent
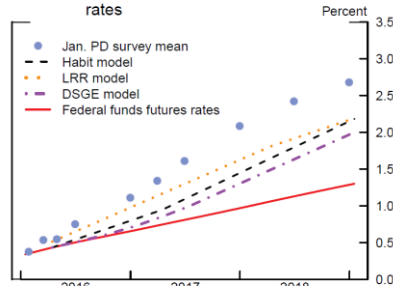
Note: LRR is a long-run risk asset-pricing model, while DSGE is a dynamic stochastic general equilibrium model.
Source: Federal Reserve Board New York primary dealer (PD) Survey sell-side results and staff calculations.

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[1] Alternative explanations include Illiquidity or other imperfections in financial market prices. The December 2015 Tealbook discussed several possibilities (see the box "The Federal Funds Rate Path: Market Expectations and Risk Scenarios" in Book B).

[2] Our goal in this exercise is not to calibrate the models to match the observed gap between survey expectations and futures rates. Rather, we use standard calibrations to the extent possible to determine what the models imply for the risk premium on federal funds futures rates under fairly typical parameterizations.

[3] John Campbell and John Cochrane (1999), "By Force of Habit: A Consumption-Based Explanation of Aggregate Stock Market Behavior," *Journal of Political Economy*, vol. 107 (April), pp. 205–51.

Financial Developments

model, to infer market expectations for the path of the federal funds rate from market prices, one must "correct" federal funds futures rates by adding back the model-implied negative risk premium. The habit model line in figure 2 plots the market-expected path of the federal funds rate generated by this procedure. The risk premium correction is substantial under the habit model in the present circumstance. Indeed, the magnitude of the implied risk premium is about one-half of the observed gap between the actual futures path (solid red line) and survey-based expectations (blue dots). Under this model, the premium is presently larger than average in magnitude because aggregate consumption remains low relative to its pre-crisis trend, and investor risk aversion thus remains high.[4]

The second model is based on the "long-run risk" (LRR) model of Bansal and Yaron (2004), which we also modify to include the Taylor rule.[5] In this model, macroeconomic uncertainty increases during recessions, increasing the magnitude of risk premiums. As shown by the LRR model line, this model also prescribes a large correction to federal funds futures rates due to the presence of a relatively large negative risk premium. The key ingredient for this result is that the level of uncertainty regarding the growth rate of consumption is somewhat higher than average.

Monetary policy was exogenously specified in the first two models; in contrast, the third model, based on Diercks (2015), combines the long-run risk specification with the New Keynesian dynamic stochastic general equilibrium (DSGE) literature and assumes fully endogenous monetary policy, consumption, and asset prices.[6] As shown by the DSGE model line, this model also predicts a sizable negative risk premium at the end of 2018.

As discussed earlier, the risk premium in these models stems from a positive correlation between the federal funds rate and consumption. That correlation may hold up well during periods when economic fluctuations are driven largely by "demand shocks." However, the risk premium could be quite different during periods when high interest rates are associated with weak economic activity. While the results from these models are suggestive, there are some caveats that should be noted. First, more work is necessary to develop estimates of term premiums that can capture realistic behavior over time using these models. Second, these models suggest that, at present, we should observe relatively high risk premiums for other assets that could suffer losses during recessions, such as corporate equities and bonds. Measuring such risk premiums is very difficult; by some estimates, risk premiums for these assets are currently somewhat elevated. However, other estimates of risk premiums for such assets are not especially high. Developing models that can account for the linkages in risk premiums across asset classes is an important area for future research.

<div style="text-align: right">Financial Developments</div>

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[4] In general, this model requires extremely high levels of investor risk aversion to match the average levels of other risk premiums observed in the economy, such as the equity risk premium.

[5] Ravi Bansal and Amir Yaron (2004), "Risks for the Long Run: A Potential Resolution of Asset Pricing Puzzles," *Journal of Finance*, vol. 59 (August), pp. 1481–1509.

[6] Anthony M. Diercks (2015), "The Equity Premium, Long-Run Risk, and Optimal Monetary Policy," Finance and Economics Discussion Series 2015-087 (Washington: Board of Governors of the Federal Reserve System, September), http://dx.doi.org/10.17016/FEDS.2015.087.

Corporate Asset Prices and Earnings

Intraday Crude Oil and S&P 500 Futures

Dollars   Dec. 15, 2015, 4:00 p.m. = 100

5-minute increments

— WTI crude* (left scale)
— S&P 500 (right scale)

Dec. 15   Dec. 22   Dec. 30   Jan. 7   Jan. 14
2015   2016

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

Equity Performance, by International Sales Exposure

Dec. 15, 2015 = 100

Daily

Dec. FOMC

Low exposure

High exposure

Jan. 19

June July Aug. Sept. Oct. Nov. Dec. Jan.
2015   2016

Note: Sample includes all Compustat firms except those in the energy, financial, and utility sectors. International sales exposure is defined as the ratio of foreign sales to total sales.
Source: Compustat; Yahoo Finance.

Implied Volatility on S&P 500 (VIX)

Log scale, percent

Daily

Dec. FOMC

Jan. 19

2011 2012 2013 2014 2015 2016

Source: Chicago Board Options Exchange.

Bond Ratings Changes of Nonfinancial Firms

Percent of outstandings*

Annual rate

Upgrades

H1 Q3 Q4

Downgrades

2001 2003 2005 2007 2009 2011 2013 2015

* Computed as a percent of nonfinancial bonds outstanding.
Source: Calculated using Moody's ratings from Mergent Fixed Income Securities Database.

Corporate Bond Spreads

Percentage points   Percentage points

Daily

Dec. FOMC

10-year high-yield (right scale)

10-year triple-B (left scale)

Jan. 19

1998 2001 2004 2007 2010 2013 2016

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

High-Yield Spreads, by Sector

Percentage points

Daily

Dec. FOMC

Telecommunications

Energy and utilities

Jan. 19

Other

2011 2012 2013 2014 2015 2016

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

Financial Developments

view 1.3 percent to be the most likely level of the federal funds rate at which the timing of the Committee's reinvestment policy will change.

Consistent with the decline in fed funds futures rates, nominal Treasury yields decreased over the intermeeting period. Part of the decline likely reflected lower term premiums related to global growth concerns following Chinese developments and the continued slide in oil prices. Yields on 2-, 5-, and 10-year nominal Treasury securities decreased 12, 23, and 22 basis points, respectively. Meanwhile, near-term uncertainty about longer-term interest rates, as measured by swaption-implied volatilities on the 10-year swap rate, was little changed on net.

The 5- and 5-to-10-year measures of TIPS-based inflation compensation moved down 11 basis points and 17 basis points, respectively, largely in line with declining oil prices, pushing the far-term measure to a new low. Inflation compensation measures based on inflation swaps posted similar declines.

CORPORATE ASSET PRICES AND EARNINGS

Broad U.S. stock price indexes fell 8½ percent since the December FOMC meeting, largely in sync with oil prices and equity markets around the world. In addition to energy and basic materials, banks and technology were among the hardest-hit sectors. U.S. firms with high international sales exposure decreased more than those with low exposure. The one-month-ahead option-implied volatility on the S&P 500 index—the VIX— climbed to about 26, near the 90th percentile of its range over the past few years but short of last August's spike.

Yield spreads of investment- and speculative-grade corporate bonds widened 19 basis points and 46 basis points, respectively, in part as spreads for firms in the energy sector ratcheted up sharply to levels signaling considerable financial stress. Bid-asked spreads for high-yield corporate bonds were little changed, on net, around the December FOMC liftoff announcement and the liquidation of a high-yield corporate debt fund, Third Avenue Focused Credit Fund. High-yield bid-asked spreads spiked near year-end, mostly reflecting their seasonal pattern, but have since normalized.

Reflecting primarily the slump in the energy and materials sectors, corporate earnings continued to show signs of weakness. Based on our most recent read of Wall Street analysts' earnings forecasts, fourth-quarter earnings are estimated to have declined

Financial Developments

Business and Municipal Finance

Selected Components of Net Debt Financing, Nonfinancial Firms

Billions of dollars

Monthly rate

- Commercial paper*
- C&I loans*
- Corporate bonds
- Total

2011 2012 2013 2014 2015

H1 Q3 Q4
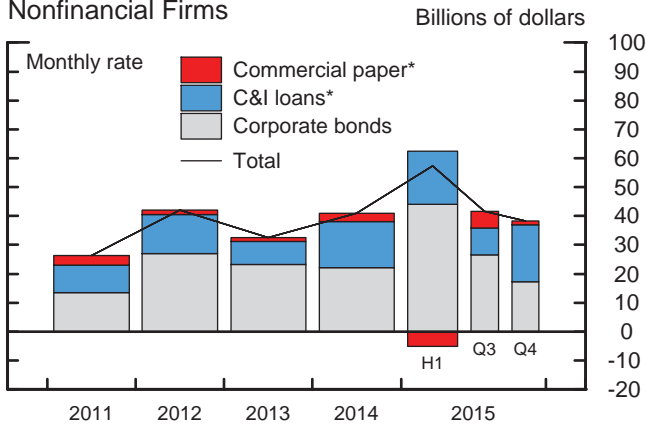
* Period-end basis, seasonally adjusted.
Source: Depository Trust & Clearing Corporation; Mergent Fixed Investment Securities Database; Federal Reserve Board.

Standards and Demand for C&I Loans

Net percent

Quarterly

Tightening/stronger

Easing/weaker

- Standards
- Demand

Q4

1991 1995 1999 2003 2007 2011 2015
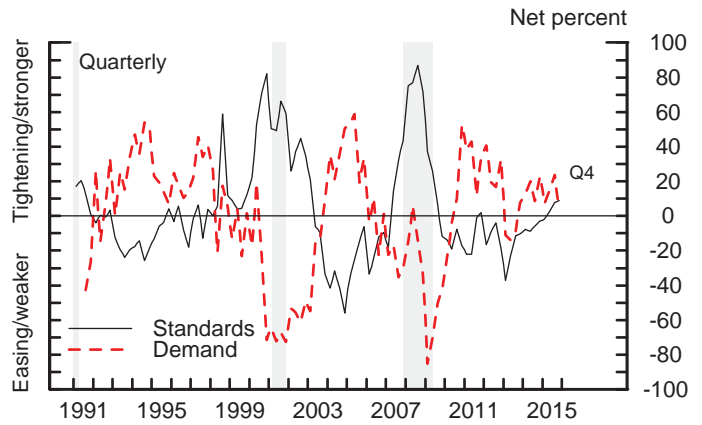
Note: Individual bank responses have been weighted by the outstanding amount of the relevant loan category on its balance sheet at the end of the prior quarter. Shaded bars indicate periods of business recessions as defined by the National Bureau of Economic Research.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Nonfinancial Equity Issuance: IPO and SEO

Billions of dollars

Monthly rate

- SEO
- IPO
- Total

2011 2012 2013 2014 2015

H1 Q3 Q4
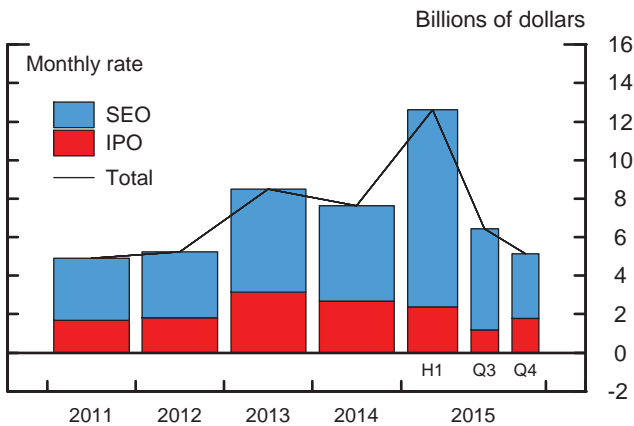
Note: IPO is initial public offering; SEO is seasoned equity offering.
Source: Securities Data Company.

Institutional Leveraged Loan Issuance, by Purpose

Billions of dollars

Monthly rate

- New money
- Refinancings

Q2

Q1 Q3 Q4

2002 2004 2006 2008 2010 2012 2014 2015
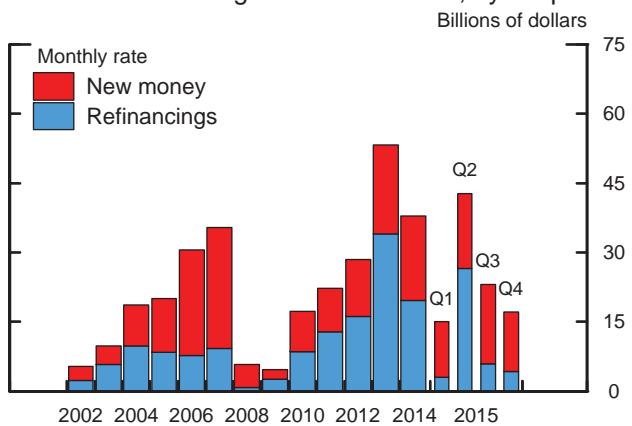
Source: Thomson Reuters LPC LoanConnector.

10-Year Triple-A CMBS Spreads over Swaps

Basis points   Basis points

Weekly

Dec. FOMC

Triple-B spread (left scale)

Jan. 15

Triple-A spread (right scale)

2011 2012 2013 2014 2015 2016
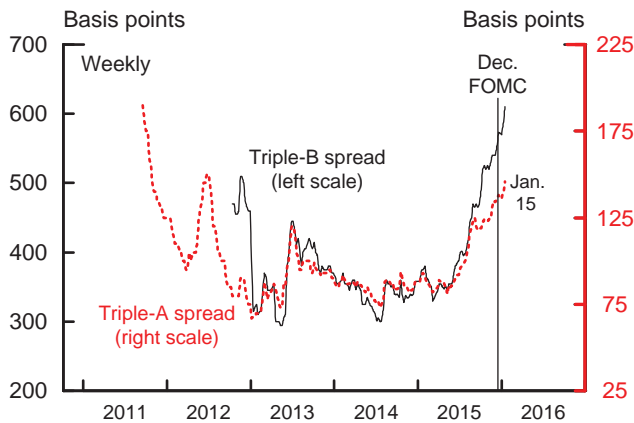
Source: J.P. Morgan.

Municipal Bond Spread

Ratio

Weekly

Dec. FOMC

Jan. 14

2011 2012 2013 2014 2015 2016
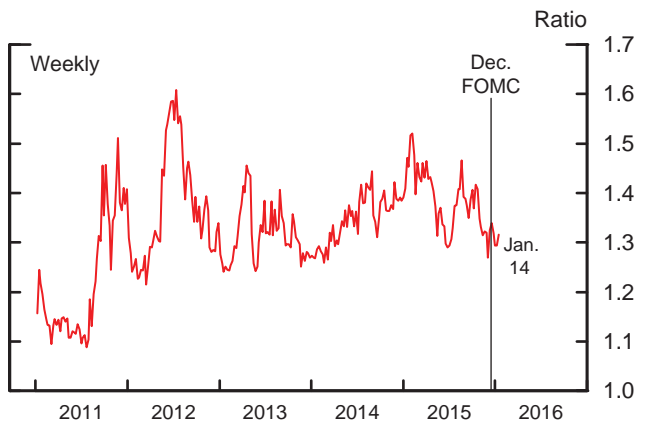
Note: Bond Buyer general obligation 20-year index over 20-year Treasury yields.
Source: Bond Buyer; Merrill Lynch.

Financial Developments

slightly from year-ago levels. Excluding oil and gas firms, earnings appear to have increased modestly.

Credit quality of nonfinancial businesses continued to show signs of deterioration. Through the third quarter, the aggregate ratio of debt to assets climbed further to its highest level since the early 1990s. The volume of nonfinancial bonds downgraded by Moody's Investors Service outpaced the volume of upgrades again in December. Downgrades continued to plague speculative-grade issuers in the energy sector, but, even outside the energy sector, downgrades outpaced upgrades. The Moody's KMV expected year-ahead default rate continued to increase and is near the upper range of its distribution outside of recessions. In the most recent SLOOS, on net, a significant number of banks expected a worsening of the performance of loans to larger firms over 2016, especially syndicated leveraged loans.

BUSINESS AND MUNICIPAL FINANCE

Financing conditions for riskier firms tightened somewhat but remained accommodative for highly rated firms. In December and early January, investment-grade bond issuance remained robust, while speculative-grade bond issuance was weak.   In the most recent SLOOS, on net, a moderate number of banks reported tightening C&I loans to large and middle-market firms, and a significant number of banks reported tightening spreads on the riskiest loans in their portfolios. Banks that reported tightening standards and terms pointed to industry-specific problems, particularly in the oil and gas industry, as one of the reasons. Both initial and seasoned equity offerings also continued to be subdued, while M&A activity remained strong. Issuance volumes in the syndicated leveraged loan market decreased in the fourth quarter, as new-issue spreads increased. The decline in issuance was particularly pronounced for relatively risky leveraged loans such as those earmarked for leveraged buyouts.

While overall financing conditions for CRE remained fairly accommodative and credit continued to flow smoothly into the sector, financing conditions tightened somewhat over the intermeeting period. In CMBS markets, spreads continued to widen but CMBS issuance for December continued apace. In the most recent SLOOS, on net, a moderate number of banks reported tightening standards on CRE loans in the fourth quarter. Nevertheless, the growth of CRE loans on banks' balance sheets remained robust through the fourth quarter.

Household Finance

Consumer Interest Rates

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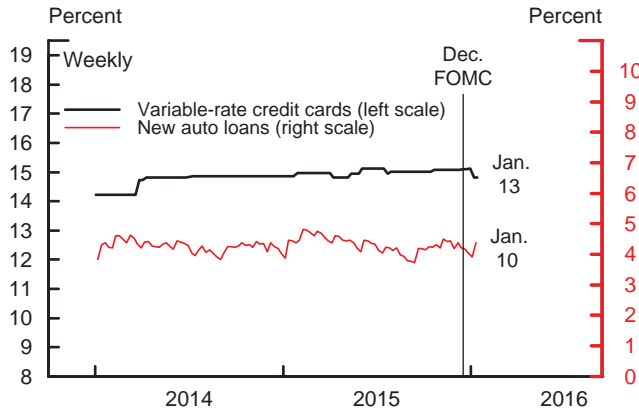
Source: For variable-rate credit cards, Bankrate Monitor; for new auto loans, J.D. Power and Associates.

Selected ABS Spreads (3-Year Triple-A)

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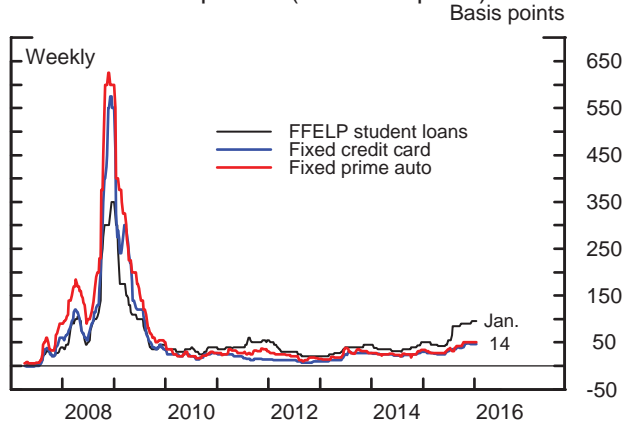
Note: Spreads are to swap rate for credit card and auto ABS and to 3-month LIBOR for student loans. FFELP is Federal Family Education Loan Program.
Source: J.P. Morgan.

Consumer Credit

Percent change from a year earlier
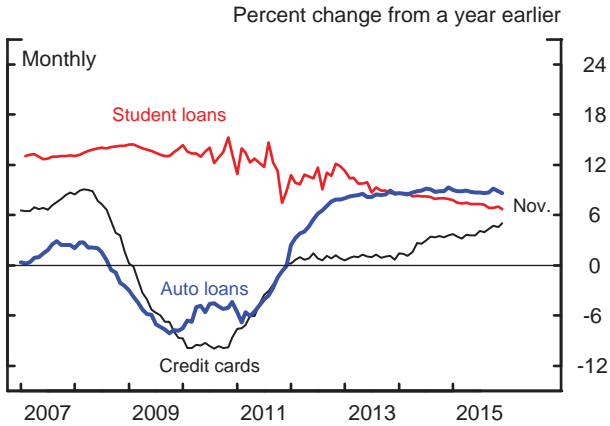
Note: The data are not seasonally adjusted.
Source: Federal Reserve Board.

Net Percentage of Banks Tightening Standards for Consumer Loans
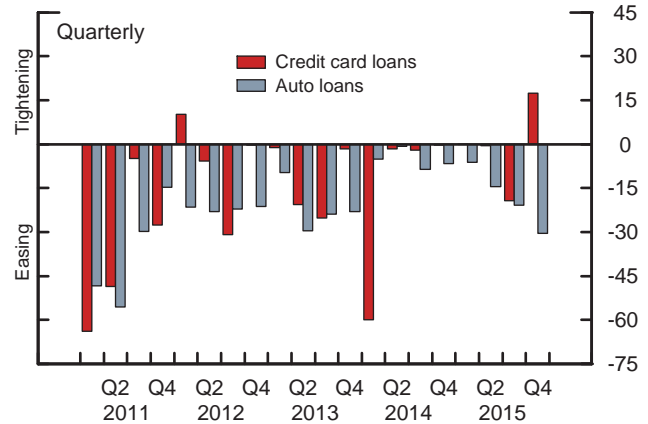
Net percent

Note: Responses are weighted by survey respondents' holdings of relevant loan types as reported on Call Reports.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Net Percentage of Respondents Tightening Standards for Residential Mortgage Loans

Net percent
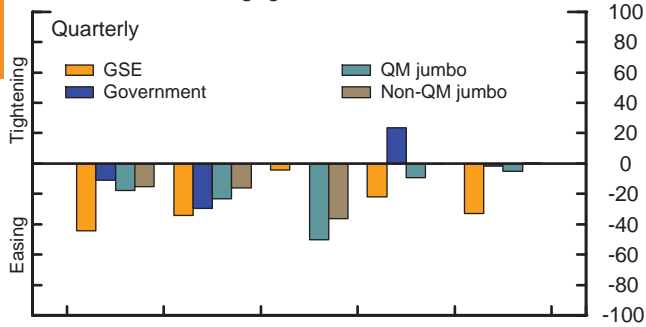
Note: Individual bank responses are weighted by residential real estate loans outstanding as of the end of the prior quarter. Loans eligible for purchase by government-sponsored enterprises (GSEs) meet Fannie Mae and Freddie Mac underwriting guidelines. Qualified mortgages (QMs) satisfy the Consumer Financial Protection Bureau mortgage rules. Jumbo loans have origination amounts exceeding GSE loan limits.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Mortgage Rate and MBS Yield

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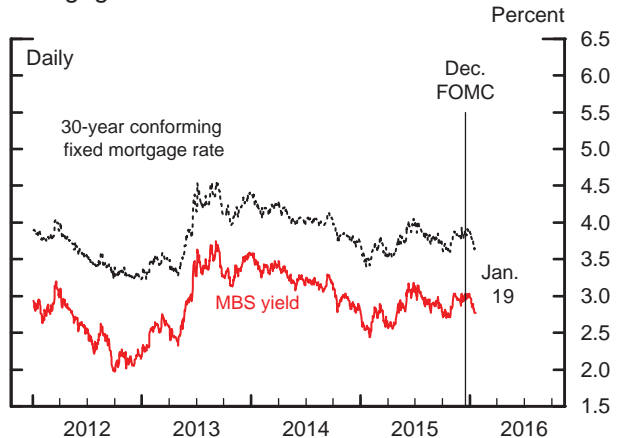
Note: The MBS yield is the Fannie Mae 30-year current-coupon rate.
Source: For MBS yield, Barclays; for mortgage rate, Loansifter.

Financial Developments

Financing conditions for municipalities stayed generally stable. Over the intermeeting period, the general obligation (GO) municipal bond yield spread was little changed, even as Puerto Rico continued to experience financial stress. As expected, the commonwealth made principal and interest payments on its GO debt due January 1 but defaulted on a small amount of bonds issued by its infrastructure and development institutions.

HOUSEHOLD FINANCE

Financing conditions in consumer credit markets were little changed and remained accommodative on balance. Since liftoff, interest rates on variable-rate credit cards have ticked lower, while those on new auto loans are little changed. Spreads on consumer loan ABS, which fund a moderate portion of these consumer loans, have stabilized at somewhat elevated levels after widening earlier last year.

Consumer loan balances continued to rise at a robust pace through November, reflecting a further expansion in credit card balances and robust increases in auto and student loan balances. Student and auto loans remained broadly available, even to borrowers with subprime credit histories. In contrast, lending standards on credit card loans continued to be relatively tight for riskier borrowers. In response to the SLOOS, banks indicated, on net, that over the past three months they had eased standards and terms on auto loans and tightened standards and terms on credit card loans. A significant fraction of respondents expect the performance of subprime auto loans to deteriorate this year.

Credit conditions for residential mortgages were little changed over the intermeeting period. Despite the gradual net easing that has occurred for several years, credit remained tight for borrowers with low credit scores, hard-to-document income, or high debt-to-income ratios. A number of banks reported in the SLOOS that they had eased standards on several types of home mortgages over the past three months, and that they expected to ease standards further this year.

BANKING DEVELOPMENTS AND MONEY

Growth of core loans at commercial banks remained strong in the fourth quarter. CRE, RRE, and C&I loans grew at rates similar to those of the previous quarter, while

Banking Developments and Money

Core Loans and Securities

Percent

Monthly, year over year
Core loans
Securities

Dec.
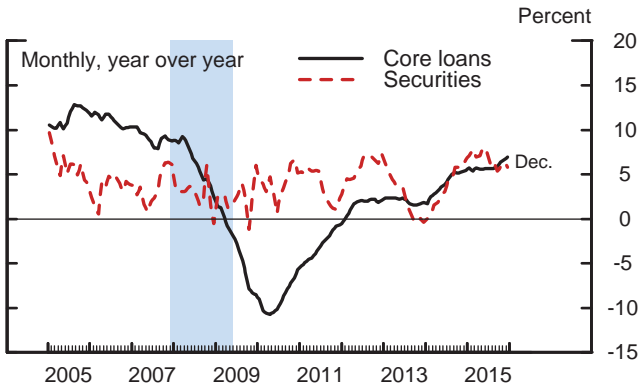
Note: Growth rates based on average (not seasonally adjusted) monthly levels.
Source: Federal Reserve Board, FR 2644, Weekly Report of Selected Assets and Liabilities of Domestically Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks.

Selected Components of Liquid Assets at Large Banks

Percent

Monthly, year over year
Government securities
Government securities + cash

QE3 begins
QE3 ends

Dec.
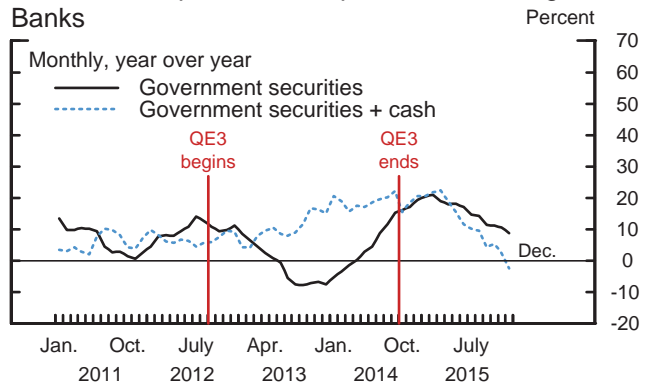
Note: Year-over-year growth rates are shown. Government securities include Treasury and agency debt plus agency mortgage-backed securities.
Source: Federal Reserve Board, FR 2644, Weekly Report of Selected Assets and Liabilities of Domestically Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks.

Commercial Real Estate Loans
Changes in Standards and Demand
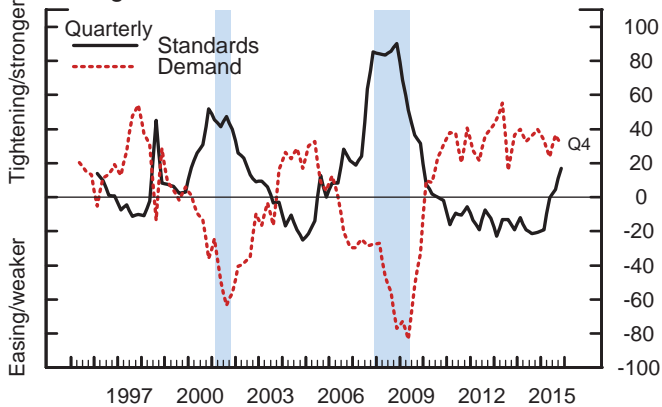
Net percent

Quarterly
Standards
Demand

Tightening/stronger
Easing/weaker

Q4

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

C&I Loan Terms: Changes in Premiums Charged on Riskier Loans
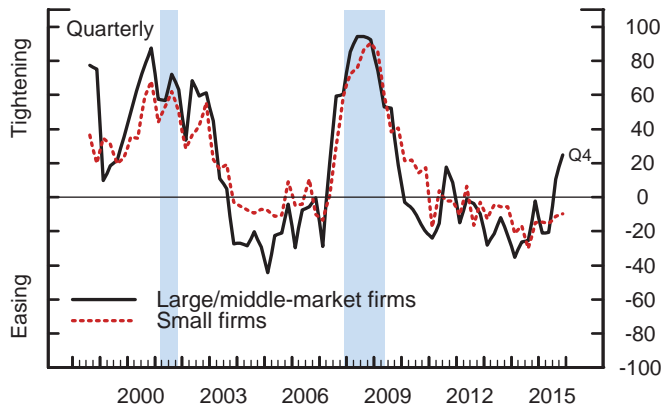
Net percent

Quarterly

Tightening
Easing

Large/middle-market firms
Small firms

Q4

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

S&P 500 Stock Price Indexes

Ratio scale; Dec. 15, 2015 = 100

Daily
Oct. FOMC
S&P 500
S&P 500 Bank Index
Jan. 19
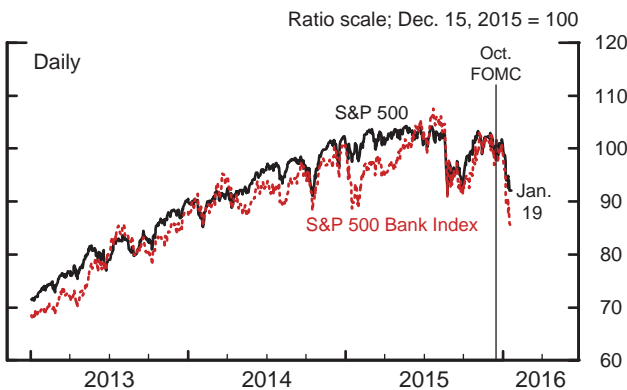
Source: Bloomberg.

Growth of M2 and Its Components

Percent, s.a.a.r.	M2	Liquid deposits	Small time deposits	Retail MMFs	Curr.
2015	6.0	7.6	-17.5	-.3	7.3
2015:H1	6.2	8.0	-15.0	-4.6	7.5
2015:Q2	4.7	6.7	-20.6	-5.3	5.1
2015:Q3	6.1	7.9	-27.1	3.5	6.4
2015:Q4	5.1	5.9	-17.3	4.9	7.3

Note: Retail MMFs are retail money market funds.
Source: Federal Reserve Board.

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

Financial Developments

auto and other consumer loans grew at a faster pace. Large banks continued to build up holdings of agency MBS and reduce holdings of Treasury securities.

Over the intermeeting period, stock prices of large domestic BHCs substantially underperformed the broader market, but CDS spreads increased only modestly. Of those large banks that have reported earnings, the majority have met or exceeded analysts' earnings forecasts for the fourth quarter; large bank profitability improved a bit despite increases in loss provisions for oil-related loans and persistent pressures on net interest margins from low interest rates. However, market participants primarily focused on the exposure of banks to declines in oil prices and global growth concerns.

M2 expanded at an average annual rate of around 6 percent over November and December, continuing the moderate growth seen over the second half of 2015. The pass-through of the increase in the general level of short-term rates to retail deposit rates has been limited to date.

FEDERAL RESERVE OPERATIONS AND SHORT-TERM FUNDING MARKETS

Following the increase in the target range for the policy rate, the effective federal funds and Eurodollar rates traded within a range of 35 to 37 basis points, in the middle of the target range.[2] The overnight repo rate for Treasury collateral, as surveyed by the Desk, increased to about 30 basis points in the days following the FOMC meeting.

Subsequently, in response to typical year-end pressures, the fed funds and Eurodollar rates dipped below the target range, to 20 basis points on year-end. The decline in unsecured rates was somewhat larger than the drops observed on recent quarter-ends, likely reflecting reduced support from the zero lower bound. The average financing rate for primary dealers increased a few basis points, while the increase in the GCF repo rate was more pronounced. Following year-end, pressures in money markets quickly abated.

Financial Developments

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[2] The effective federal funds rate averaged 34 basis points over the intermeeting period, with the intraday standard deviation averaging 5.3 basis points. On March 2, 2016, the Federal Reserve Bank of New York will change the data source for the calculation of the effective federal funds rate from aggregated data provided by federal funds brokers to individual federal funds transactions reported by depository institutions in the Report of Selected Money Market Rates (FR 2420). The effective federal funds rate will be calculated as a volume-weighted median rate, as opposed to the current volume-weighted average rate.

Federal Reserve Operations and Short-Term Funding Markets

Basis points
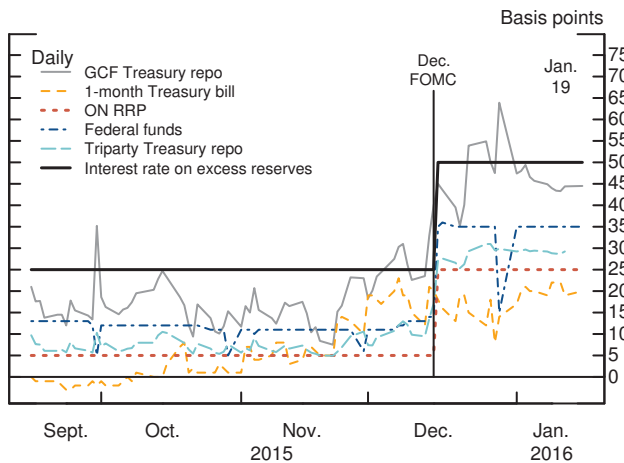
Note: GCF is General Collateral Finance; ON RRP is overnight reverse repurchase agreement; repo is repurchase agreement.
Source: Depository Trust & Clearing Corporation; Federal Reserve Bank of New York; Federal Reserve Board.

ON RRP and Term RRP Take-Up

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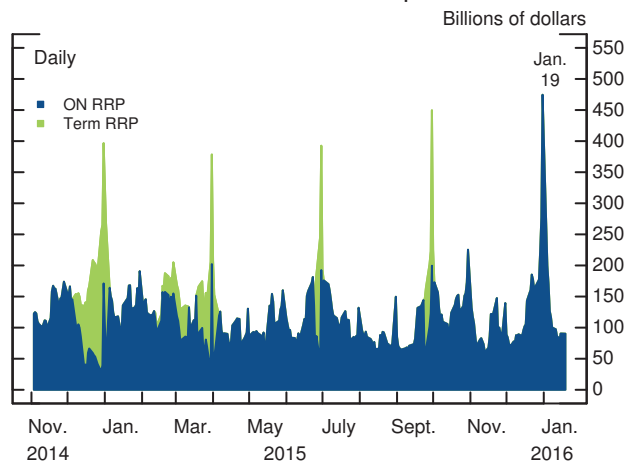
Note: ON RRP is overnight reverse repurchase agreement; term RRP is term reverse repurchase agreement.
Source: Federal Reserve Bank of New York.

Money Market Rates around Year-End

Basis points
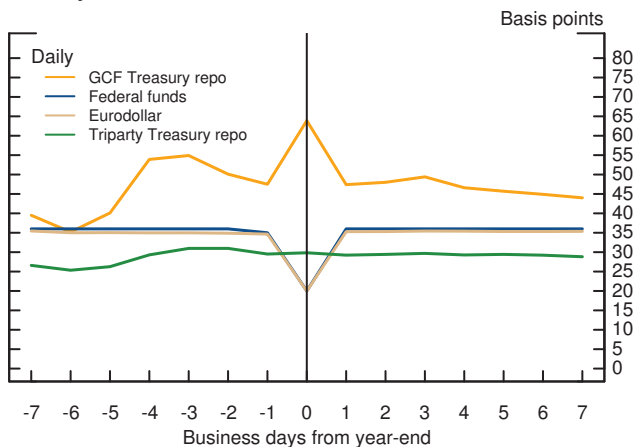
Note: GCF is General Collateral Finance; repo is repurchase agreement.
Source: Depository Trust & Clearing Corporation; Federal Reserve Bank of New York; Federal Reserve Board.

Financial Developments

Take-up of RRPs was almost unchanged immediately following the increase in the policy rate and continued to be explained by the spread of the ON RRP offering rate to comparable money market rates. Demand rose steadily in the days leading up to year-end, with ON RRPs outstanding reaching $475 billion on December 31, consistent with recent quarter-ends. Demand for term RRPs was nearly nil, as there was ample capacity in the overnight RRP facility and term RRPs were not offered at any premium over overnight RRPs. More recently, overnight take-up fell to under $100 billion.

The Desk purchased about $21 billion of 15- and 30-year MBS under the reinvestment program and rolled $0.9 billion in expected settlements over the period. The ratio of monthly settlements for these reinvestment operations relative to gross issuance of MBS was roughly unchanged in December at about 30 percent.[3]

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[3] Reserve Banks provided payments of approximately $98 billion of their estimated 2015 net income to the U.S. Treasury. In addition, the Federal Reserve transferred to the Treasury $19.3 billion from Reserve Bank capital surplus on December 28, 2015, which was the amount necessary to reduce aggregate surplus to the $10 billion surplus limitation in the Fixing America's Surface Transportation Act.

Financial Developments

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Financial Developments

Risks and Uncertainty

ASSESSMENT OF RISKS

We view the uncertainty around our projections for real GDP growth, the unemployment rate, and inflation as broadly in line with the average over the past 20 years, a period that includes considerable volatility in real activity but relatively stable inflation. We have maintained our assumption that the risks to our GDP projection are tilted to the downside and that the risks to our unemployment projection are tilted to the upside, both because we view neither monetary nor fiscal policy as well positioned to offset large adverse shocks to the economy, and—a consideration that has recently become even more salient—because of downside risks emanating from abroad. Our concerns with respect to inflation remain mostly to the downside given the low levels of market-based measures of inflation compensation, hints from some surveys of lower longer-term inflation expectations, and the possibility that the realization of the downside risks to economies abroad may put upward pressure on the foreign exchange value of the dollar.

Our view of the risks to the economic outlook is informed by the staff's quarterly quantitative surveillance assessment, which judges the financial vulnerabilities of the U.S. financial system as moderate. This assessment reflects strong capital and liquidity positions at banks, moderate leverage in the nonbank financial sector, and subdued borrowing by households. While valuation pressures in corporate debt markets have eased to a significant degree over the past year amid a pullback in appetite for credit risk, leverage has continued to increase not just for oil-related firms and riskier segments of the nonfinancial business sector, but also more broadly. High leverage of nonfinancial corporations and liquidity mismatch at high-yield bond mutual funds suggest elevated risks for bond investors and lower-rated borrowers.

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. In the first scenario, financial turmoil in China triggers a full-blown crisis that severely depresses activity in emerging market economies (EMEs). In the second scenario, weaker growth abroad causes the dollar to appreciate substantially and oil prices to decline. In contrast,

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	2.3	2.6	2.0	1.8	1.6
China-driven crisis in the EMEs	1.5	.8	.8	2.4	2.1
Stronger dollar and lower oil prices	2.1	1.9	1.6	2.0	1.8
Faster growth with higher inflation	4.5	3.1	1.7	1.5	1.5
Misperceived NRU	2.3	2.7	2.2	2.0	1.7
Financial turbulence	-1.0	2.6	2.6	2.2	1.8
Unemployment rate[1]					
Extended Tealbook baseline	4.8	4.7	4.6	4.6	4.7
China-driven crisis in the EMEs	4.9	5.1	5.7	5.6	5.3
Stronger dollar and lower oil prices	4.9	4.9	5.0	5.0	5.0
Faster growth with higher inflation	4.4	4.2	4.3	4.4	4.6
Misperceived NRU	4.8	4.7	4.4	4.2	4.3
Financial turbulence	5.5	5.4	5.0	4.8	4.8
Total PCE prices					
Extended Tealbook baseline	-.1	1.5	1.7	2.0	2.0
China-driven crisis in the EMEs	-1.1	-.4	.7	1.9	2.0
Stronger dollar and lower oil prices	-1.1	.9	1.3	1.8	1.9
Faster growth with higher inflation	.4	2.1	2.2	2.4	2.4
Misperceived NRU	-.1	1.4	1.5	1.7	1.9
Financial turbulence	-.2	1.5	1.7	1.9	2.0
Core PCE prices					
Extended Tealbook baseline	1.3	1.3	1.6	1.9	2.0
China-driven crisis in the EMEs	.8	.1	.6	1.6	1.9
Stronger dollar and lower oil prices	.8	.7	1.2	1.7	1.8
Faster growth with higher inflation	1.8	1.9	2.1	2.3	2.4
Misperceived NRU	1.2	1.2	1.4	1.7	1.9
Financial turbulence	1.2	1.2	1.5	1.9	2.0
Federal funds rate[1]					
Extended Tealbook baseline	.8	1.4	2.4	3.2	4.0
China-driven crisis in the EMEs	.7	1.0	.6	1.2	2.9
Stronger dollar and lower oil prices	.8	1.2	1.8	2.5	3.4
Faster growth with higher inflation	1.1	2.1	3.6	4.3	4.8
Misperceived NRU	.8	1.3	2.3	3.1	3.8
Financial turbulence	.4	.6	1.4	2.3	3.4

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

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in the third scenario, recent strong job gains and upbeat consumer confidence signal that economic activity is stronger than in the baseline; in addition, inflation is more sensitive to tighter resource utilization. The fourth scenario considers a significantly lower trajectory for the natural rate of unemployment and illustrates the consequences when monetary policymakers learn about the lower natural rate only slowly. In the final scenario, recent financial strains increase and economic activity falls sharply.

The first two scenarios are run in the multicountry SIGMA model, and the third uses the Board staff's EDO model. The fourth scenario uses a DSGE model developed by Board staff economists that features search and matching frictions in the labor market. The final scenario is implemented using a DSGE model developed by the staff from the Federal Reserve Bank of New York that explicitly incorporates financial frictions. 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.[1] In addition, all scenarios assume that the size and composition of the SOMA portfolio follow their baseline paths.

China-Driven Crisis in the Emerging Market Economies

In our baseline forecast, we expect reasonably solid Chinese real GDP growth of 6 percent or a little more, which helps allay concerns about a hard landing and contributes to an eventual stabilization of the renminbi (see the box "Recent Developments in China and Implications for the Outlook" in the International Economic Developments and Outlook section). However, given China's many underlying vulnerabilities—including high corporate debt, excess capacity in manufacturing, continued property market problems, and a large and opaque shadow banking system—adverse shocks could trigger a severe crisis that causes both China's GDP growth and its currency to plummet, which have large spillovers to other EMEs.

In this scenario, we assume that such a crisis materializes. GDP growth in China plunges to around 1 percent this year before recovering, with the level of output falling 7 percent below the baseline by the middle of next year. GDP in other EMEs is depressed to the same extent. The stresses in EMEs also trigger a noticeable rise in corporate and household borrowing spreads in the United States and AFEs, while flight-

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[1] Although the form of the policy rule is the same across all models, the concept of the output gap differs. EDO uses a production-function-based output gap, whereas the other models use 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.

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Forecast Confidence Intervals and Alternative Scenarios

Confidence Intervals Based on FRB/US Stochastic Simulations

- ■ Extended Tealbook baseline
- ■ China–driven crisis in the EMEs
- ■ Stronger dollar and lower oil prices
- ■ Faster growth with higher inflation
- ■ Misperceived NRU
- ■ Financial turbulence

Real GDP
4-quarter percent change
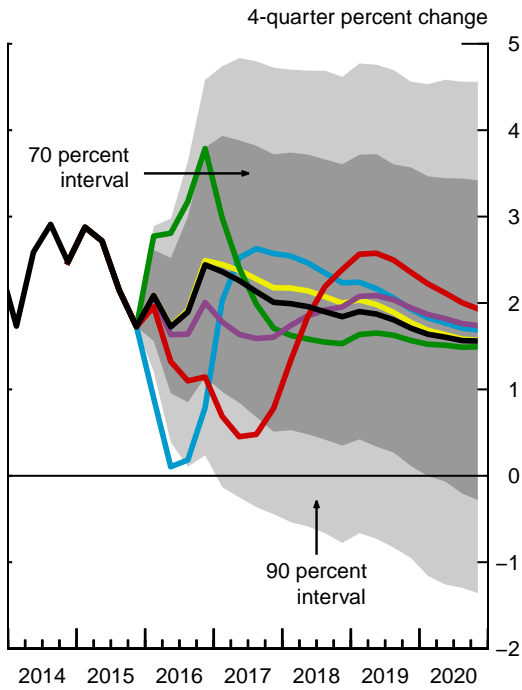
70 percent interval

90 percent interval

Unemployment Rate
Percent

PCE Prices excluding Food and Energy
4-quarter percent change
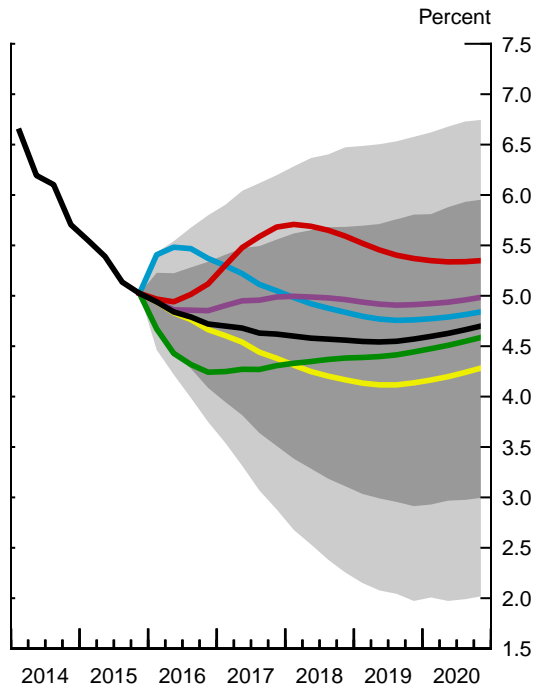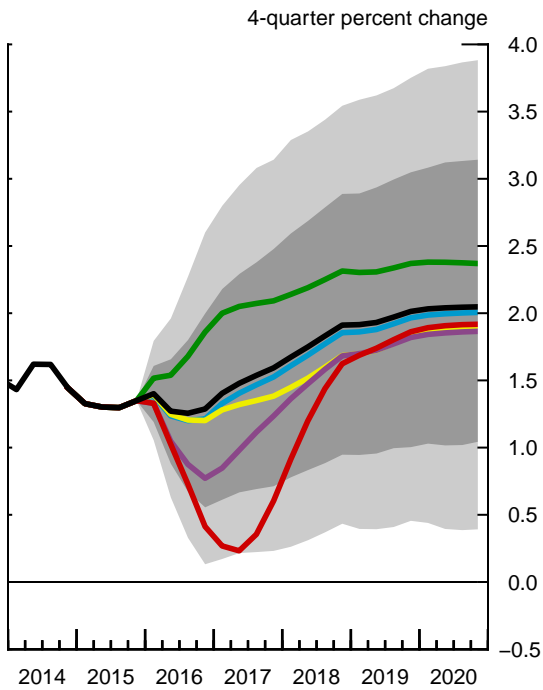
Federal Funds Rate
Percent
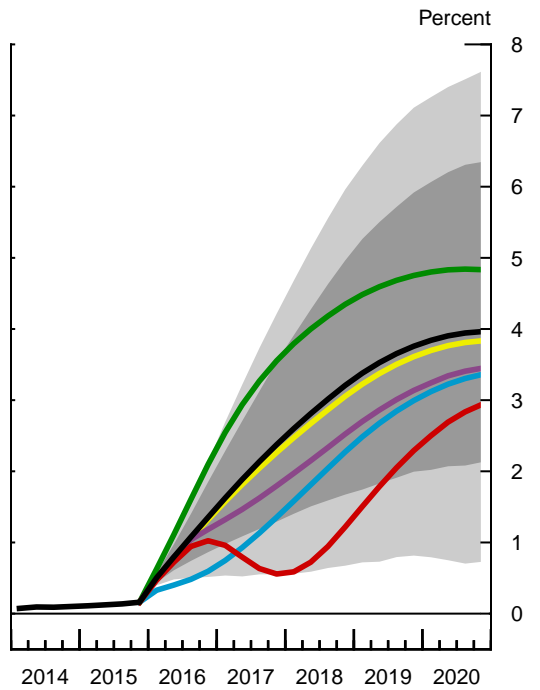
Risks & Uncertainty

to-safety flows cause the dollar to appreciate 15 percent and depress term premiums on government bonds. The EME GDP contraction in our scenario roughly parallels the EME experience during the Asian and Russian crises of the late 1990s, while the rise in the dollar is slightly larger than what occurred during the crises of the late 1990s. To reflect the deeper linkages in global financial markets at present, we have built somewhat larger disruptions to U.S. financial markets in this scenario than were observed in the late 1990s, at least prior to the Long-Term Capital Management crisis of September 1998.

In this environment, U.S. real net exports decline relative to the baseline in response to the sharp decline in foreign activity and the substantial appreciation of the dollar. Real GDP grows at an annual rate of about 1¼ percent in 2016, and the unemployment rate rises to nearly 5¾ percent in 2017. The appreciation of the dollar and lower resource utilization push down U.S. core PCE inflation to ½ percent in 2016. The federal funds rate follows a much shallower path relative to the baseline.

Stronger Dollar and Lower Oil Prices

In our baseline projection, a modest pickup in foreign growth helps support demand for crude oil and damps further upward pressure on the dollar so that oil prices rise gradually and the dollar appreciates only slightly over the forecast period. These developments are expected to help U.S. inflation move toward the Committee's 2 percent target by 2018. Nevertheless, even moderately weaker growth abroad may keep global financial markets focused on downside risks to the foreign economies and monetary policy divergence with the United States, causing the dollar to rise substantially and oil prices to continue their descent. In this scenario, we assume that a shortfall in foreign GDP growth of ½ percentage point per year relative to the baseline causes the dollar to appreciate 10 percent—mainly by raising the risk premium on foreign currency–denominated assets—and oil prices to decline 25 percent, about $7 per barrel, relative to the baseline.

The stronger dollar and weaker activity abroad depress U.S. real net exports. As this drag on net exports more than offsets the stimulus to consumption from lower oil prices, U.S. real GDP expands only 2 percent in 2016, nearly ½ percentage point below the baseline.[2] Greater resource slack, the appreciation of the dollar, and lower oil prices

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[2] This estimate does not take into account any financial effects of falling oil prices on the oil industry or nonlinear effects on energy investment as oil prices decline to very low levels. In principle, the

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

Measure	2015	2016	2017	2018	2019	2020
Real GDP						
(percent change, Q4 to Q4)						
Projection	1.7	2.4	2.0	1.8	1.7	1.6
Confidence interval						
Tealbook forecast errors	1.1–2.6	.9–4.1	-.4–3.6	-.9–3.3	. . .	. . .
FRB/US stochastic simulations	1.6–1.9	1.1–3.8	.5–3.7	.4–3.6	.1–3.6	-.3–3.4
Civilian unemployment rate						
(percent, Q4)						
Projection	5.0	4.7	4.6	4.6	4.6	4.7
Confidence interval						
Tealbook forecast errors	4.9–5.1	4.1–5.0	3.5–6.0	3.2–6.4	. . .	. . .
FRB/US stochastic simulations	5.0–5.0	4.1–5.3	3.5–5.6	3.1–5.7	2.9–5.8	3.0–6.0
PCE prices, total						
(percent change, Q4 to Q4)						
Projection	.4	.7	1.7	2.0	2.0	2.1
Confidence interval						
Tealbook forecast errors	.3–.7	.1–2.2	1.1–3.3	1.3–3.3	. . .	. . .
FRB/US stochastic simulations	.3–.5	-.1–1.5	.8–2.7	.9–3.0	.9–3.1	1.0–3.3
PCE prices excluding						
food and energy						
(percent change, Q4 to Q4)						
Projection	1.3	1.3	1.6	1.9	2.0	2.0
Confidence interval						
Tealbook forecast errors	1.2–1.8	.9–2.0	1.1–2.4	. . .	. . .	. . .
FRB/US stochastic simulations	1.3–1.4	.6–2.0	.7–2.5	.9–2.9	1.0–3.0	1.0–3.1
Federal funds rate						
(percent, Q4)						
Projection	.2	1.4	2.4	3.2	3.8	4.0
Confidence interval						
FRB/US stochastic simulations	.2–.2	.9–1.9	1.3–3.5	1.7–5.0	2.0–5.9	2.1–6.3

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.
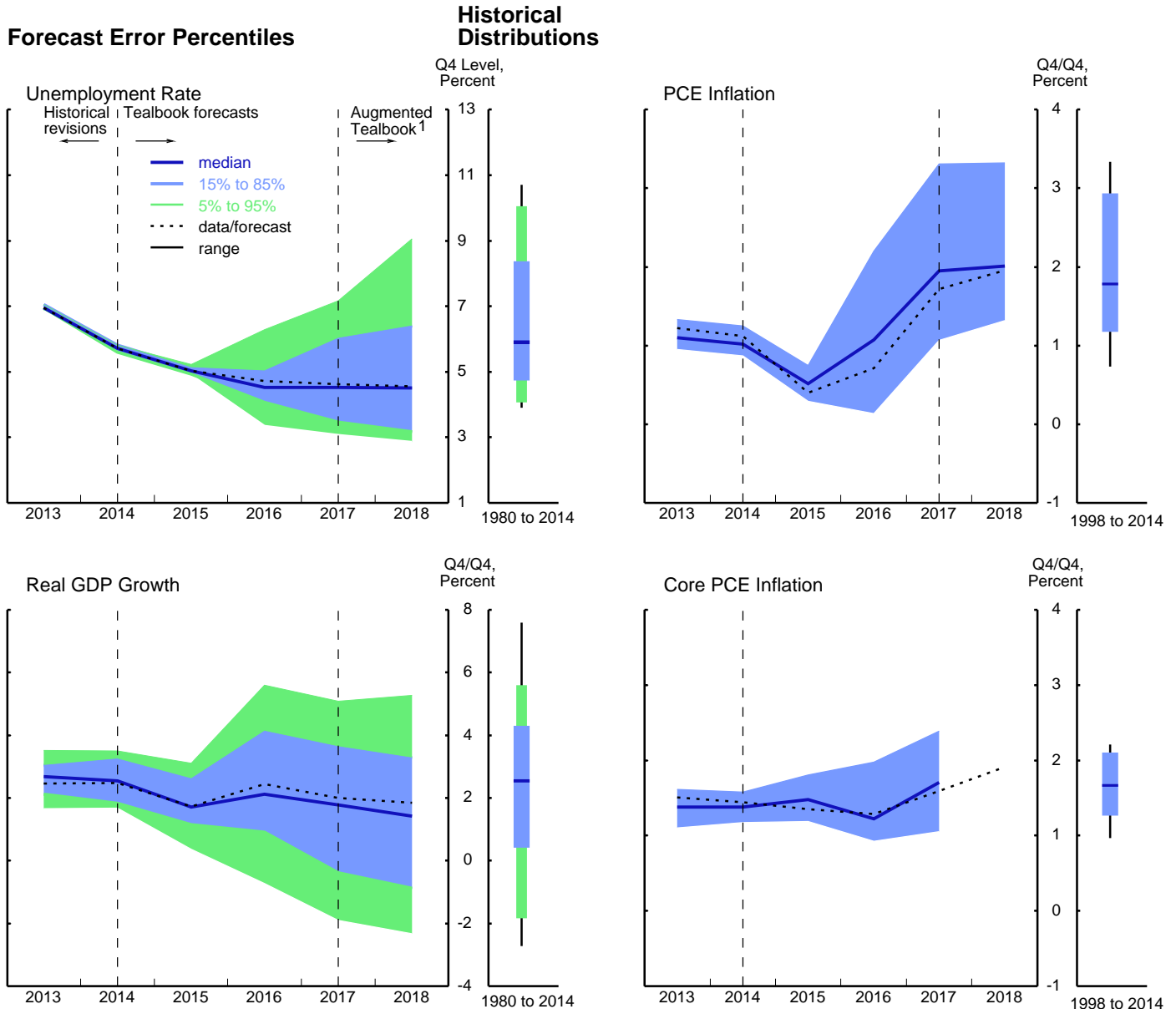
Prediction Intervals Derived from Historical Tealbook Forecast Errors
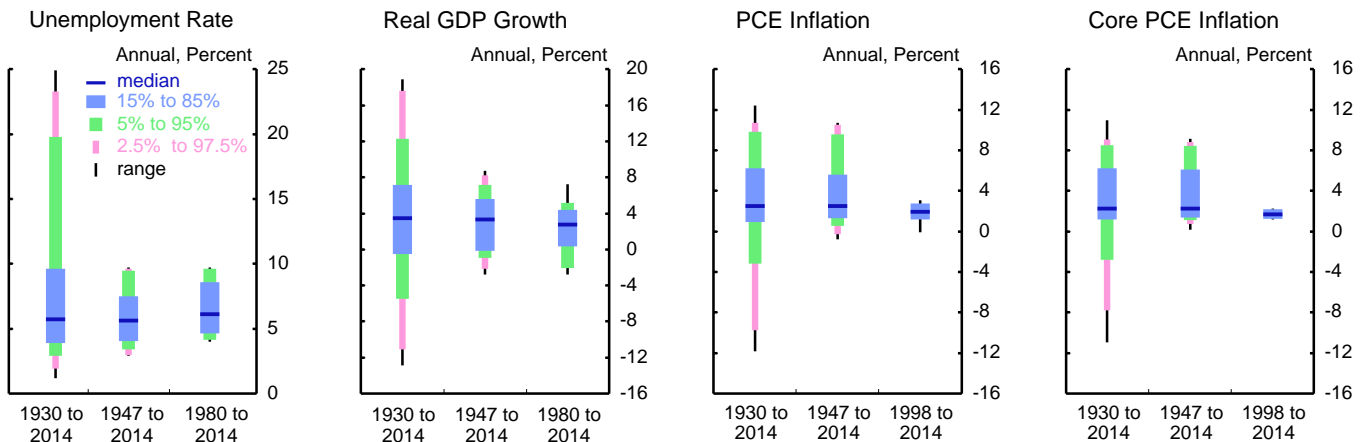
Note:. See the technical note in the appendix for more information on this exhibit.

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.

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cause U.S. core inflation to fall to ¾ percent in 2016. The federal funds rate follows a shallower path than in the baseline, reaching 2.5 percent by the end of 2018.

Faster Growth with Higher Inflation

Although many indicators of spending and production have recently been weak, the labor market has been quite strong. Moreover, consumer confidence has remained upbeat in recent months. In this scenario, we assume that these latter indicators are providing a more accurate reading on the underlying state of the economy. In particular, strong job gains and solid consumer confidence lead to 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, such as Smets and Wouters (2007).[3] 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.[4]

Real GDP rises 3¾ percent in 2016, compared with 2½ percent in the baseline projection. The unemployment rate falls rapidly, bottoming out at 4¼ percent by the end of 2016; it then edges up over the remainder of the forecast period but stays 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 rises more than in the baseline, approaching 2½ percent, on average, in 2019 and 2020. The federal funds rate rises more steeply, passing 4 percent in 2018 and reaching 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 to bring inflation back down—simply returning to the natural rate is enough—because inflation expectations remain anchored throughout the scenario.

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financial effects might imply a somewhat greater fall in U.S. GDP, although the implications of nonlinearities in the relationship between oil investment and oil prices are less clear.

[3] Frank Smets and Rafael Wouters (2007), "Shocks and Frictions in US Business Cycles: A Bayesian DSGE Approach," *American Economic Review,* vol. 97 (June), pp. 586−606.

[4] 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, Dallas Fed Economic Letter, vol. 9 (13), www.dallasfed.org/assets/documents/research/eclett/2014/el1413.pdf.

Misperceived Natural Rate of Unemployment

The baseline forecast anticipates that the unemployment rate falls to 4.6 percent by the end of 2018, with the natural rate of unemployment unchanged at a 5.1 percent level. This scenario considers the possibility that the natural rate of unemployment falls 1 percentage point over the next few years. The natural rate could be driven lower by a variety of influences, such as demographic factors, improvements in matching efficiency, or a deterioration in workers' bargaining power.

The natural rate of unemployment is estimated with considerable uncertainty, and it may be difficult for staff or policymakers to gauge such a change in the natural rate accurately in real time. In this scenario, we assume that the FOMC learns about the natural rate only gradually from noisy signals of the underlying economic drivers and, thus, that a considerable gap between the actual and perceived natural rates persists through the end of 2020. The unemployment rate falls to 4¼ percent by the end of 2018, still slightly above the actual natural rate but considerably below the perceived natural rate.

Economic activity is somewhat stronger than in the baseline throughout the simulation as firms create more jobs and expand production. However, because the unemployment rate does not fall as much as the true natural rate, there is disinflationary pressure, and core inflation remains persistently below the baseline through the end of 2020. Despite the lower path for inflation in this scenario, the federal funds rate is only slightly lower than in the baseline because of policymakers' misperception of how much resource slack is present in the economy.

Financial Turbulence

Measures of financial market volatility, such as the VIX, spiked up again recently amid the unease in the stock market. Meanwhile, corporate bond spreads have continued to climb since mid-2014 and have now reached levels similar to those at the onset of the 2001 recession. Market commentary has cited, among other contributing factors, uncertainty about both the economic strength of the EMEs and U.S. corporate leverage. In this alternative scenario, we explore the consequences of a further deterioration in financial conditions. We assume that household and investor risk aversion rises, pushing the corporate bond spread 200 basis points above the baseline in the first quarter of 2016,

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roughly one-half the increase observed between 2007 and 2008.[5] Spreads then gradually return to a more normal level. The rise in spreads raises financing costs for firms' capital expenditures. In addition, the underlying increase in risk aversion depresses household spending, further reducing aggregate demand.

Under these circumstances, the economy experiences an outright contraction in the first quarter of 2016 and grows much more slowly than in the baseline for the rest of the year. The unemployment rate rises to 5½ percent by the middle of the year before a gradual recovery begins. Core PCE inflation is only slightly below the baseline because the model has a fairly high degree of price rigidity. The path of the federal funds rate remains roughly 1 percentage point below the baseline in 2017 and 2018.

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[5] In the estimated model of the Federal Reserve Bank of New York, which explicitly incorporates financial market frictions, structural shocks of this magnitude or larger have occurred roughly once every 20 years. However, estimates of the frequency of such rare adverse shocks are highly uncertain.

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	.01	.02	.04	.05
Previous Tealbook	.02	.04	.03	.05
Less than 1 percent				
Current Tealbook	.66	.48	.07	.21
Previous Tealbook	.40	.29	.10	.20

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	.02	.02	.17	.02
Previous Tealbook	.02	.03	.15	.01
Decrease by 1 percentage point				
Current Tealbook	.12	.09	.12	.14
Previous Tealbook	.11	.07	.13	.24

Probability of Near-Term Recession

Probability that real GDP declines in the next two quarters	Staff	FRB/US	EDO	BVAR	Factor Model
Current Tealbook	.02	.01	.05	.06	.23
Previous Tealbook	.02	.01	.04	.03	.18

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.

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Assessment of Key Macroeconomic Risks (2)

Probability that Total PCE Inflation Is above 3 Percent
(4 quarters ahead)

Probability

FRB/US

BVAR

1998 2000 2002 2004 2006 2008 2010 2012 2014
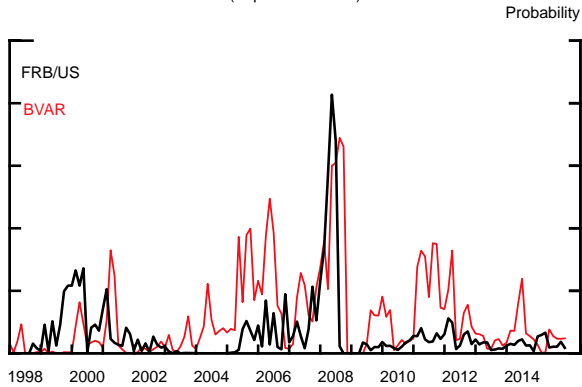
Probability that Total PCE Inflation Is below 1 Percent
(4 quarters ahead)

Probability

1998 2000 2002 2004 2006 2008 2010 2012 2014
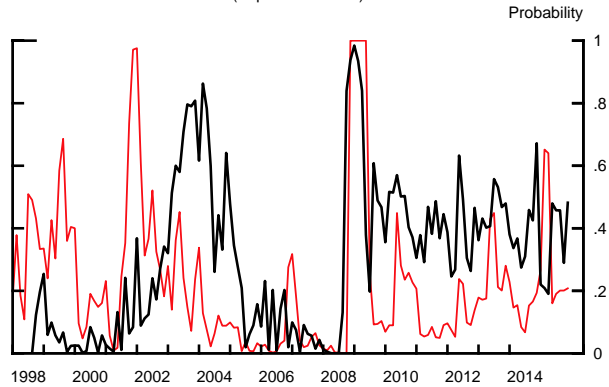
Probability that the Unemployment Rate Increases 1 ppt
(4 quarters ahead)

Probability

1998 2000 2002 2004 2006 2008 2010 2012 2014
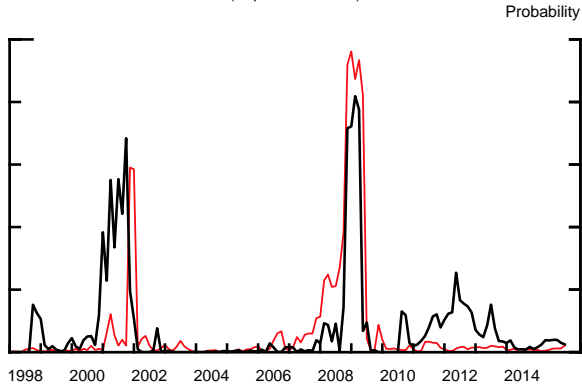
Probability that the Unemployment Rate Decreases 1 ppt
(4 quarters ahead)

Probability

1998 2000 2002 2004 2006 2008 2010 2012 2014
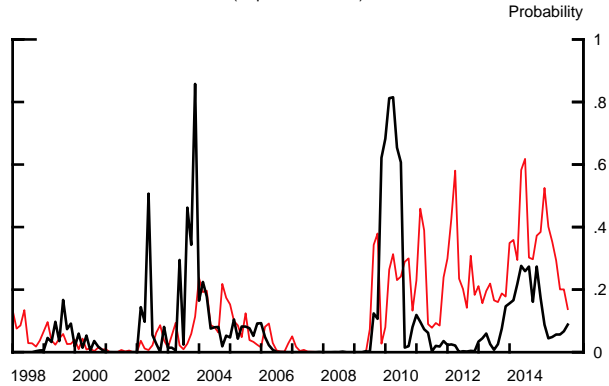
Probability that Real GDP Declines in Each of the Next Two Quarters

Probability

1998   2000   2002   2004   2006   2008   2010   2012   2014
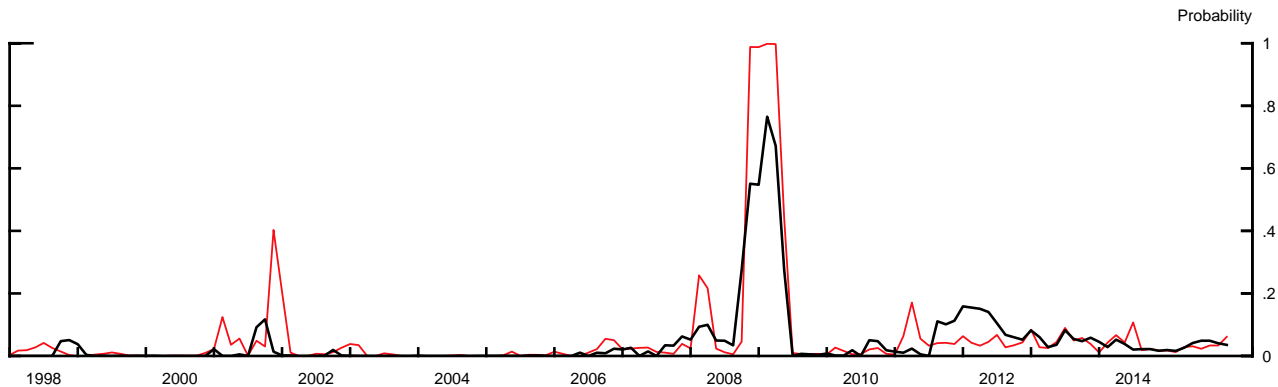
Risks & Uncertainty

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.

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.

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[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.

Risks & Uncertainty

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]	
	12/09/15	01/20/16	12/09/15	01/20/16	12/09/15	01/20/16	12/09/15	01/20/16	12/09/15	01/20/16
Quarterly										
2015:Q1	.8	.8	.6	.6	-1.9	-1.9	1.0	1.0	5.6	5.5
Q2	6.1	6.1	3.9	3.9	2.2	2.2	1.9	1.9	5.4	5.4
Q3	3.4	3.3	2.1	2.0	1.3	1.3	1.3	1.4	5.1	5.1
Q4	2.5	1.1	1.7	.4	.0	.1	1.2	1.2	5.0	5.0
2016:Q1	2.5	2.0	2.1	2.1	.0	-.9	1.4	1.2	4.9	4.9
Q2	4.2	3.1	2.6	2.4	1.5	.7	1.4	1.4	4.8	4.8
Q3	4.4	4.3	2.7	2.7	1.6	1.5	1.4	1.3	4.8	4.8
Q4	4.4	4.2	2.7	2.6	1.6	1.5	1.4	1.3	4.7	4.7
2017:Q1	3.8	3.8	1.7	1.8	1.8	1.8	1.7	1.6	4.7	4.7
Q2	4.0	3.9	2.1	2.0	1.8	1.8	1.7	1.6	4.6	4.7
Q3	4.1	3.9	2.2	2.2	1.8	1.7	1.7	1.5	4.6	4.6
Q4	4.0	3.9	2.1	2.1	1.8	1.7	1.7	1.5	4.6	4.6
Two-quarter[2]										
2015:Q2	3.4	3.4	2.3	2.3	.1	.1	1.4	1.4	-.3	-.3
Q4	2.9	2.2	1.9	1.2	.7	.7	1.3	1.3	-.4	-.4
2016:Q2	3.3	2.5	2.4	2.3	.8	-.1	1.4	1.3	-.2	-.2
Q4	4.4	4.2	2.7	2.6	1.6	1.5	1.4	1.3	-.1	-.1
2017:Q2	3.9	3.8	1.9	1.9	1.8	1.8	1.7	1.6	-.1	.0
Q4	4.0	3.9	2.2	2.1	1.8	1.7	1.7	1.5	.0	-.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	3.2	2.8	2.1	1.7	.4	.4	1.3	1.3	-.7	-.7
2016:Q4	3.8	3.4	2.5	2.4	1.2	.7	1.4	1.3	-.3	-.3
2017:Q4	4.0	3.9	2.0	2.0	1.8	1.7	1.7	1.6	-.1	-.1
2018:Q4	3.9	3.9	1.9	1.8	2.0	2.0	1.9	1.9	-.1	.0
Annual										
2014	4.1	4.1	2.4	2.4	1.4	1.4	1.5	1.5	6.2	6.2
2015	3.5	3.4	2.5	2.4	.3	.3	1.3	1.3	5.3	5.3
2016	3.5	2.9	2.3	2.0	.9	.5	1.4	1.3	4.8	4.8
2017	4.1	3.9	2.2	2.2	1.7	1.6	1.6	1.5	4.6	4.7
2018	4.0	3.9	2.0	1.9	1.9	1.9	1.8	1.8	4.5	4.6

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

Greensheets

Class II FOMC - Internal (FR)   January 20, 2016

Greensheets

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

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]
Real GDP	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
Previous Tealbook	3.9	2.1	1.7	2.1	2.6	2.7	2.7	1.7	2.1	2.2	2.1	2.1	2.5	2.0	1.9
Final sales	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
Previous Tealbook	3.9	2.9	1.9	1.9	2.8	2.3	2.9	2.1	2.5	2.2	2.2	2.1	2.5	2.2	2.2
Priv. dom. final purch.	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
Previous Tealbook	3.9	3.3	2.8	3.2	3.9	3.9	3.8	3.4	3.1	2.9	2.8	3.0	3.7	3.0	2.5
Personal cons. expend.	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
Previous Tealbook	3.6	3.0	2.4	3.4	3.6	3.6	3.5	3.2	2.9	2.7	2.6	2.7	3.5	2.8	2.3
Durables	8.0	6.6	2.4	3.6	6.8	6.4	6.0	4.5	4.5	4.2	3.9	4.7	5.7	4.3	3.9
Nondurables	4.3	4.2	1.9	2.9	2.7	2.8	2.9	3.0	2.8	2.5	2.8	2.7	2.8	2.7	2.7
Services	2.7	2.1	1.6	3.1	2.9	3.1	2.9	3.0	2.9	2.8	2.5	2.1	3.0	2.8	2.2
Residential investment	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
Previous Tealbook	9.3	8.5	5.0	5.7	8.4	5.8	6.8	8.3	8.1	7.8	7.0	8.2	6.7	7.8	5.4
Nonres. priv. fixed invest.	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
Previous Tealbook	4.1	3.3	4.6	1.6	4.2	5.0	4.4	3.0	2.9	2.6	2.5	3.4	3.8	2.8	2.5
Equipment & intangibles	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
Previous Tealbook	3.5	6.4	5.4	3.0	5.0	5.8	4.8	2.9	2.7	2.6	2.5	4.9	4.6	2.7	2.8
Nonres. structures	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
Previous Tealbook	6.2	-7.3	1.5	-3.6	1.1	1.8	3.1	3.6	3.9	2.9	2.7	-1.9	.6	3.3	1.4
Net exports[2]	-535	-546	-565	-610	-657	-715	-747	-805	-841	-874	-886	-547	-682	-852	-923
Previous Tealbook[2]	-535	-543	-566	-624	-669	-723	-749	-791	-815	-837	-846	-546	-691	-822	-873
Exports	5.1	.7	-.9	-2.2	.5	.1	1.8	-2.3	1.1	1.2	3.7	-.4	.0	.9	3.2
Imports	3.0	2.3	2.1	5.2	7.5	8.8	5.9	6.6	5.9	5.5	4.3	3.6	6.8	5.5	3.7
Gov't. cons. & invest.	2.6	1.8	-.3	3.2	2.5	1.1	.8	.9	1.9	1.0	-.2	1.0	1.9	.9	.6
Previous Tealbook	2.6	1.8	.5	3.0	2.4	1.1	.9	.8	1.8	.9	.2	1.2	1.9	.9	.7
Federal	.0	.2	.4	7.3	2.0	.6	.0	.6	.1	-.1	-2.7	.4	2.4	-.5	-1.3
Defense	.3	-1.4	.3	4.2	1.0	-1.4	-1.3	1.9	-.9	-1.1	-3.9	.0	.6	-1.0	-1.3
Nondefense	-.5	2.8	.6	12.2	3.5	3.8	1.8	-1.2	1.5	1.4	-1.0	1.0	5.2	.2	-1.2
State & local	4.3	2.8	-.8	.7	2.8	1.4	1.3	1.1	3.0	1.7	1.4	1.4	1.6	1.8	1.8
Change in priv. inventories[2]	114	85	49	57	57	77	81	84	71	73	70	90	68	75	35
Previous Tealbook[2]	114	81	71	79	73	87	79	64	49	51	46	95	79	52	20

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	1.7	2.4	2.0	1.8
Previous Tealbook	-.2	2.7	1.7	1.3	2.5	2.5	2.1	2.5	2.0	1.9
Final sales	-.4	2.0	1.5	1.7	1.9	2.6	1.9	2.3	2.1	2.2
Previous Tealbook	-.4	2.0	1.5	1.7	1.9	2.6	2.1	2.5	2.2	2.2
Priv. dom. final purch.	-2.4	3.5	2.6	2.3	2.6	3.6	2.8	3.4	3.1	2.6
Previous Tealbook	-2.4	3.5	2.6	2.3	2.6	3.6	3.0	3.7	3.0	2.5
Personal cons. expend.	-.2	3.1	1.5	1.3	2.3	3.2	2.5	3.2	2.9	2.5
Previous Tealbook	-.2	3.1	1.5	1.3	2.3	3.2	2.7	3.5	2.8	2.3
Durables	2.5	9.3	4.8	7.2	4.6	7.5	4.7	5.7	4.3	3.9
Nondurables	.2	3.3	.4	.8	2.6	2.3	2.7	2.8	2.7	2.7
Services	-.8	2.0	1.4	.6	1.8	2.8	2.1	3.0	2.8	2.2
Residential investment	-10.8	-5.2	6.0	15.7	3.5	5.1	8.4	8.2	7.2	5.3
Previous Tealbook	-10.8	-5.2	6.0	15.7	3.5	5.1	8.2	6.7	7.8	5.4
Nonres. priv. fixed invest.	-12.2	8.1	9.0	5.2	4.2	5.5	2.8	3.1	2.8	2.3
Previous Tealbook	-12.2	8.1	9.0	5.2	4.2	5.5	3.4	3.8	2.8	2.5
Equipment & intangibles	-6.0	12.0	9.2	5.5	3.6	5.7	4.5	4.1	2.7	2.6
Previous Tealbook	-6.0	12.0	9.2	5.5	3.6	5.7	4.9	4.6	2.7	2.8
Nonres. structures	-27.1	-4.0	8.0	4.1	6.5	5.0	-3.0	-.6	3.4	1.3
Previous Tealbook	-27.1	-4.0	8.0	4.1	6.5	5.0	-1.9	.6	3.3	1.4
Net exports[1]	-395	-459	-459	-447	-417	-443	-547	-682	-852	-923
Previous Tealbook[1]	-395	-459	-459	-447	-417	-443	-546	-691	-822	-873
Exports	.8	10.1	4.2	2.2	5.2	2.4	-.4	.0	.9	3.2
Imports	-6.2	12.0	3.5	.3	2.4	5.4	3.6	6.8	5.5	3.7
Gov't. cons. & invest.	2.3	-1.1	-3.0	-2.2	-2.9	.4	1.0	1.9	.9	.6
Previous Tealbook	2.3	-1.1	-3.0	-2.2	-2.9	.4	1.2	1.9	.9	.7
Federal	3.9	3.2	-4.0	-2.1	-6.8	-.8	.4	2.4	-.5	-1.3
Defense	3.6	2.0	-4.1	-3.9	-7.4	-2.9	.0	.6	-1.0	-1.3
Nondefense	4.6	5.5	-3.9	1.0	-5.9	2.7	1.0	5.2	.2	-1.2
State & local	1.3	-4.0	-2.3	-2.3	-.2	1.1	1.4	1.6	1.8	1.8
Change in priv. inventories[1]	-148	58	38	55	61	68	90	68	75	35
Previous Tealbook[1]	-148	58	38	55	61	68	95	79	52	20

1. Billions of chained (2009) dollars.

Greensheets

Class II FOMC - Internal (FR)   January 20, 2016

Greensheets

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

Item	2015 Q2	2015 Q3	2015 Q4	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2015¹	2016¹	2017¹	2018¹
Real GDP	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
Previous Tealbook	3.9	2.1	1.7	2.1	2.6	2.7	2.7	1.7	2.1	2.2	2.1	2.1	2.5	2.0	1.9
Final sales	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
Previous Tealbook	3.9	2.9	1.9	1.9	2.7	2.3	2.8	2.1	2.5	2.2	2.2	2.1	2.5	2.2	2.2
Priv. dom. final purch.	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
Previous Tealbook	3.3	2.8	2.4	2.7	3.3	3.3	3.2	2.8	2.6	2.5	2.4	2.5	3.1	2.6	2.2
Personal cons. expend.	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
Previous Tealbook	2.4	2.1	1.6	2.3	2.5	2.5	2.4	2.2	2.0	1.8	1.8	1.8	2.4	1.9	1.6
Durables	.6	.5	.2	.3	.5	.5	.4	.3	.3	.3	.3	.3	.4	.3	.3
Nondurables	.6	.6	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
Services	1.2	1.0	.7	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.0	1.4	1.3	1.1
Residential investment	.3	.3	.2	.3	.2	.4	.2	.2	.3	.3	.3	.3	.3	.3	.2
Previous Tealbook	.3	.3	.2	.2	.3	.2	.2	.3	.3	.3	.3	.3	.2	.3	.2
Nonres. priv. fixed invest.	.5	.3	.4	.0	.5	.6	.5	.4	.4	.3	.3	.4	.4	.4	.3
Previous Tealbook	.5	.4	.6	.2	.5	.6	.6	.4	.4	.3	.3	.4	.5	.4	.3
Equipment & intangibles	.4	.5	.5	.1	.5	.6	.5	.3	.3	.3	.2	.4	.4	.3	.3
Previous Tealbook	.4	.6	.5	.3	.5	.6	.5	.3	.3	.3	.3	.5	.5	.3	.3
Nonres. structures	.2	-.2	-.1	-.1	.0	.0	.1	.1	.1	.1	.1	-.1	.0	.1	.0
Previous Tealbook	.2	-.2	.0	-.1	.0	.0	.1	.1	.1	.1	.1	-.1	.0	.1	.0
Net exports	.2	-.3	-.4	-1.0	-1.0	-1.3	-.7	-1.2	-.8	-.7	-.2	-.6	-1.0	-.7	-.2
Previous Tealbook	.2	-.2	-.5	-1.3	-1.0	-1.2	-.5	-.9	-.5	-.5	-.2	-.6	-1.0	-.5	-.1
Exports	.6	.1	-.1	-.3	.1	.0	.2	-.3	.1	.1	.4	.0	.0	.1	.4
Imports	-.5	-.4	-.3	-.8	-1.1	-1.3	-.9	-1.0	-.9	-.8	-.7	-.6	-1.0	-.8	-.6
Gov't. cons. & invest.	.5	.3	-.1	.6	.4	.2	.1	.2	.3	.2	.0	.2	.3	.2	.1
Previous Tealbook	.5	.3	.1	.5	.4	.2	.2	.1	.3	.2	.0	.2	.3	.2	.1
Federal	.0	.0	.0	.5	.1	.0	.0	.0	.0	.0	-.2	.0	.2	.0	-.1
Defense	.0	-.1	.0	.2	.0	-.1	-.1	.1	.0	.0	-.2	.0	.0	.0	-.1
Nondefense	.0	.1	.0	.3	.1	.1	.0	.0	.0	.0	.0	.0	.1	.0	.0
State & local	.5	.3	-.1	.1	.3	.2	.1	.1	.3	.2	.2	.1	.2	.2	.2
Change in priv. inventories	.0	-.7	-.9	.2	.0	.5	.1	.1	-.3	.1	-.1	-.2	.2	-.1	-.3
Previous Tealbook	.0	-.8	-.3	.2	-.1	.3	-.2	-.4	-.4	.0	-.1	.0	.1	-.2	-.3

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

January 20, 2016

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

Item	2015			2016				2017				2015[1]	2016[1]	2017[1]	2018[1]
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
GDP chain-wt. price index	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
Previous Tealbook	2.1	1.3	.8	.4	1.5	1.7	1.7	2.0	1.9	1.8	1.8	1.1	1.3	1.9	2.0
PCE chain-wt. price index	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
Previous Tealbook	2.2	1.3	.0	.0	1.5	1.6	1.6	1.8	1.8	1.8	1.8	.4	1.2	1.8	2.0
Energy	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
Previous Tealbook	15.1	-1.8	-23.5	-28.2	3.6	7.0	6.0	5.4	4.4	3.8	3.6	-16.8	-4.1	4.3	2.8
Food	-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
Previous Tealbook	-1.1	2.2	2.0	1.7	1.6	1.7	1.9	1.9	1.9	2.0	2.0	.7	1.7	2.0	2.0
Ex. food & energy	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
Previous Tealbook	1.9	1.3	1.2	1.4	1.4	1.4	1.4	1.7	1.7	1.7	1.7	1.3	1.4	1.7	1.9
Ex. food & energy, market based	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
Previous Tealbook	1.8	1.2	1.3	1.3	1.4	1.4	1.4	1.7	1.7	1.6	1.6	1.2	1.4	1.7	1.9
CPI	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
Previous Tealbook	3.0	1.6	.2	-.1	2.1	2.3	2.3	2.4	2.3	2.3	2.3	.4	1.6	2.3	2.4
Ex. food & energy	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
Previous Tealbook	2.5	1.7	2.1	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.0	2.0	2.2	2.3
ECI, hourly compensation[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
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	3.7	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
Previous Tealbook	3.7	2.7	.5	1.5	2.1	1.3	1.3	1.1	1.8	1.6	1.5	1.4	1.6	1.5	1.5
Compensation per hour	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
Previous Tealbook	5.9	4.1	3.3	3.4	3.1	3.1	3.1	3.3	3.1	3.1	3.1	3.6	3.2	3.2	3.4
Unit labor costs	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
Previous Tealbook	2.1	1.3	2.8	1.9	.9	1.8	1.8	2.2	1.3	1.5	1.6	2.2	1.6	1.7	1.8
Core goods imports chain-wt. price index[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
Previous Tealbook[3]	-3.1	-2.0	-3.0	-2.3	-.9	.5	1.0	1.2	1.2	1.2	1.2	-3.2	-.4	1.2	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.

Greensheets

Greensheets
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	.9	1.8	2.0
Previous Tealbook	.4	1.8	1.9	1.9	1.6	1.3	1.1	1.3	1.9	2.0
PCE chain-wt. price index	1.2	1.3	2.7	1.8	1.2	1.1	.4	.7	1.7	2.0
Previous Tealbook	1.2	1.3	2.7	1.8	1.2	1.1	.4	1.2	1.8	2.0
Energy	2.3	6.4	12.0	2.3	-2.5	-6.4	-16.0	-12.6	4.4	3.1
Previous Tealbook	2.3	6.4	12.0	2.3	-2.5	-6.4	-16.8	-4.1	4.3	2.8
Food	-1.8	1.3	5.1	1.2	.8	2.8	.3	1.2	2.0	2.0
Previous Tealbook	-1.8	1.3	5.1	1.2	.8	2.8	.7	1.7	2.0	2.0
Ex. food & energy	1.4	1.0	1.9	1.8	1.5	1.4	1.3	1.3	1.6	1.9
Previous Tealbook	1.4	1.0	1.9	1.8	1.5	1.4	1.3	1.4	1.7	1.9
Ex. food & energy, market based	1.8	.7	1.9	1.5	1.2	1.2	1.2	1.2	1.6	1.9
Previous Tealbook	1.8	.7	1.9	1.5	1.2	1.2	1.2	1.4	1.7	1.9
CPI	1.5	1.2	3.3	1.9	1.2	1.2	.4	1.0	2.3	2.4
Previous Tealbook	1.5	1.2	3.3	1.9	1.2	1.2	.4	1.6	2.3	2.4
Ex. food & energy	1.8	.6	2.2	1.9	1.7	1.7	2.0	2.0	2.2	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	2.0	2.4	2.6	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	-.2	.6	1.9	1.7	1.4
Previous Tealbook	5.6	1.7	.0	-.2	1.6	-.2	1.4	1.6	1.5	1.5
Compensation per hour	1.3	1.2	.6	5.8	-.1	2.6	3.5	3.1	3.1	3.3
Previous Tealbook	1.3	1.2	.6	5.8	-.1	2.6	3.6	3.2	3.2	3.4
Unit labor costs	-4.2	-.4	.6	6.0	-1.7	2.8	2.8	1.2	1.4	1.8
Previous Tealbook	-4.2	-.4	.6	6.0	-1.7	2.8	2.2	1.6	1.7	1.8
Core goods imports chain-wt. price index[2]	-1.9	2.3	4.3	.1	-1.1	.5	-3.2	-1.4	1.1	1.2
Previous Tealbook[2]	-1.9	2.3	4.3	.1	-1.1	.5	-3.2	-.4	1.2	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]	.6	.6	.7	.8	.6	.6	.5	.5	.5	.4	.3	2.7	2.5	1.7	1.3
Unemployment rate[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
Previous Tealbook[3]	5.4	5.1	5.0	4.9	4.8	4.8	4.7	4.7	4.6	4.6	4.6	5.0	4.7	4.6	4.5
Natural rate of unemployment[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
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	59.5	59.5	59.5	59.5	59.5	59.4	59.4	59.4	59.4	59.5	59.4	59.2
Employment-to-Population Trend[3]	59.8	59.7	59.6	59.5	59.4	59.4	59.3	59.2	59.2	59.1	59.0	59.6	59.3	59.0	58.7
GDP gap[4]	-.3	-.1	-.3	-.1	.1	.4	.7	.7	.8	1.0	1.1	-.3	.7	1.1	1.3
Previous Tealbook[4]	-.5	-.2	-.1	.0	.3	.6	.8	.9	1.0	1.2	1.3	-.1	.8	1.3	1.5
Industrial production[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
Previous Tealbook[5]	-2.3	2.7	-2.0	1.8	2.1	1.8	2.4	2.5	2.2	1.9	2.2	-.5	2.0	2.2	1.9
Manufacturing industr. prod.[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
Previous Tealbook[5]	1.5	3.4	1.5	1.2	2.4	2.3	2.3	1.9	2.2	1.9	2.2	1.4	2.0	2.1	1.8
Capacity utilization rate - mfg.[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
Previous Tealbook[3]	75.9	76.3	76.4	76.4	76.6	76.8	77.0	77.1	77.3	77.4	77.6	76.4	77.0	77.6	78.1
Housing starts[6]	1.2	1.2	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.5	1.1	1.3	1.5	1.6
Light motor vehicle sales[6]	17.1	17.8	17.8	17.4	17.4	17.2	17.2	17.0	17.0	16.9	16.8	17.4	17.3	16.9	16.6
Income and saving															
Nominal GDP[5]	6.1	3.3	1.1	2.0	3.1	4.3	4.2	3.8	3.9	3.9	3.9	2.8	3.4	3.9	3.9
Real disposable pers. income[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
Previous Tealbook[5]	2.6	4.0	4.7	4.3	2.9	2.8	2.0	3.5	2.0	2.5	2.3	3.8	3.0	2.6	2.3
Personal saving rate[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
Previous Tealbook[3]	5.0	5.2	5.7	5.9	5.8	5.6	5.3	5.3	5.1	5.1	5.0	5.7	5.3	5.0	5.0
Corporate profits[7]	14.7	-6.2	-14.0	-22.6	-8.7	4.9	6.8	-4.6	-3.3	2.5	.5	-7.6	-5.7	-1.3	2.2
Profit share of GNP[3]	11.5	11.2	10.8	10.1	9.8	9.8	9.9	9.7	9.5	9.5	9.4	10.8	9.9	9.4	9.3
Gross national saving rate[3]	18.7	18.5	19.0	18.7	18.7	18.6	18.5	18.2	18.1	18.0	17.9	19.0	18.5	17.9	17.5
Net national saving rate[3]	3.8	3.5	4.0	3.6	3.5	3.4	3.2	2.8	2.6	2.5	2.3	4.0	3.2	2.3	1.7

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.

Greensheets

Greensheets
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	2.0	2.2	2.5	2.9	2.7	2.5	1.7	1.3
Unemployment rate[2]	9.9	9.5	8.7	7.8	7.0	5.7	5.0	4.7	4.6	4.6
Previous Tealbook[2]	9.9	9.5	8.7	7.8	7.0	5.7	5.0	4.7	4.6	4.5
Natural rate of unemployment[2]	6.2	6.2	6.0	5.8	5.4	5.1	5.1	5.1	5.1	5.1
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	59.5	59.4	59.2
Employment-to-Population Trend[2]	61.3	60.9	60.6	60.2	60.1	59.9	59.6	59.3	59.0	58.7
GDP gap[3]	-5.5	-4.4	-4.2	-4.2	-2.8	-.9	-.3	.7	1.1	1.3
Previous Tealbook[3]	-5.5	-4.4	-4.2	-4.2	-2.8	-.9	-.1	.8	1.3	1.5
Industrial production[4]	-5.4	5.9	2.8	2.1	2.3	4.5	-.9	1.4	1.7	1.7
Previous Tealbook[4]	-5.4	5.9	2.8	2.1	2.3	4.5	-.5	2.0	2.2	1.9
Manufacturing industr. prod.[4]	-6.1	6.0	2.7	1.5	1.3	3.4	1.1	2.0	1.8	1.5
Previous Tealbook[4]	-6.1	6.0	2.7	1.5	1.3	3.4	1.4	2.0	2.1	1.8
Capacity utilization rate - mfg.[2]	67.1	72.5	74.4	74.1	74.2	76.2	76.1	76.8	77.3	77.7
Previous Tealbook[2]	67.1	72.5	74.4	74.1	74.2	76.2	76.4	77.0	77.6	78.1
Housing starts[5]	.6	.6	.6	.8	.9	1.0	1.1	1.3	1.5	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	16.6
Income and saving										
Nominal GDP[4]	.1	4.6	3.6	3.2	4.1	3.9	2.8	3.4	3.9	3.9
Real disposable pers. income[4]	-.7	2.6	1.7	5.1	-2.9	3.6	3.7	3.5	2.4	2.2
Previous Tealbook[4]	-.7	2.6	1.7	5.1	-2.9	3.6	3.8	3.0	2.6	2.3
Personal saving rate[2]	5.6	5.5	5.8	9.2	4.4	4.7	5.8	6.0	5.5	5.2
Previous Tealbook[2]	5.6	5.5	5.8	9.2	4.4	4.7	5.7	5.3	5.0	5.0
Corporate profits[6]	53.7	18.0	6.8	.6	4.1	3.4	-7.6	-5.7	-1.3	2.2
Profit share of GNP[2]	10.6	12.0	12.3	12.0	12.0	11.9	10.8	9.9	9.4	9.3
Gross national saving rate[2]	14.6	15.2	16.1	18.0	18.1	18.8	19.0	18.5	17.9	17.5
Net national saving rate[2]	-1.7	-.3	.8	2.9	3.1	3.9	4.0	3.2	2.3	1.7

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	2018	2015 Q1a	Q2a	Q3a	Q4	2016 Q1	Q2	Q3	Q4	2017 Q1	Q2	Q3	Q4
					\<-- Not seasonally adjusted --\>											
Unified budget																
Receipts	3,249	3,430	3,567	3,701	680	1,027	802	766	724	1,076	865	794	759	1,131	883	829
Outlays	3,688	3,857	4,019	4,186	943	904	924	981	942	952	982	982	1,057	996	983	1,024
Surplus/deficit	-439	-427	-452	-485	-263	123	-123	-216	-218	124	-117	-189	-298	134	-100	-195
Previous Tealbook	*-439*	*-422*	*-469*	*-524*	*-263*	*123*	*-123*	*-244*	*-203*	*136*	*-112*	*-183*	*-307*	*123*	*-104*	*-202*
Means of financing:																
Borrowing	337	771	576	605	67	-16	46	552	148	-77	147	233	313	-100	130	226
Cash decrease	-40	-58	-4	0	123	-154	56	-135	94	-17	-1	-15	15	-4	-1	-1
Other[1]	142	-285	-120	-120	73	47	21	-202	-23	-30	-30	-30	-30	-30	-30	-30
Cash operating balance, end of period	199	257	261	261	100	254	199	333	240	257	257	272	256	260	261	263
					\<-- Seasonally adjusted annual rates --\>											
NIPA federal sector																
Receipts	3,392	3,513	3,650	3,790	3,356	3,440	3,473	3,483	3,489	3,515	3,564	3,610	3,629	3,661	3,699	3,735
Expenditures	3,988	4,127	4,342	4,556	3,936	4,015	4,080	4,048	4,115	4,130	4,215	4,264	4,345	4,347	4,411	4,455
Consumption expenditures	956	988	1,015	1,027	957	957	961	964	990	996	1,001	1,004	1,015	1,019	1,022	1,020
Defense	594	603	610	614	595	595	595	596	604	606	605	605	612	612	612	609
Nondefense	362	385	405	413	362	362	366	368	386	391	396	399	403	407	410	412
Other spending	3,032	3,139	3,326	3,529	2,979	3,057	3,118	3,085	3,125	3,133	3,214	3,260	3,330	3,328	3,389	3,435
Current account surplus	-597	-614	-692	-766	-579	-574	-606	-565	-626	-615	-651	-654	-716	-686	-712	-720
Gross investment	263	268	273	274	262	264	263	263	268	270	271	271	273	274	275	272
Gross saving less gross investment[2]	-588	-609	-689	-762	-569	-567	-598	-556	-620	-611	-647	-649	-714	-684	-710	-715
Fiscal indicators																
High-employment (HEB) surplus/deficit[3]	-548.4	-622.9	-751.5	-850.6	-508.3	-542.6	-595.0	-554.4	-627.1	-629.7	-680.3	-702.0	-769.2	-749.2	-785.7	-798.9
Change in HEB, percent of potential GDP	.5	.3	.6	.4	-.2	.2	.3	-.2	.4	.0	.2	.1	.3	-.1	.2	.0
Fiscal impetus (FI), percent of GDP[4]	.4	.6	.3	.1	.0	.7	.5	.2	.8	.7	.4	.4	.3	.4	.3	.1
Previous Tealbook	*.4*	*.4*	*.2*	*.2*	*.0*	*.7*	*.6*	*.3*	*.6*	*.5*	*.3*	*.3*	*.2*	*.4*	*.2*	*.1*
Federal purchases	.0	.2	.0	-.1	.1	.0	.0	.0	.5	.1	.0	.0	.0	.0	.0	-.2
State and local purchases	.1	.2	.2	.2	-.1	.5	.3	-.1	.1	.3	.2	.1	.1	.3	.2	.1
Taxes and transfers	.2	.2	.1	.0	.0	.2	.3	.3	.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.

Greensheets

Greensheets

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

	2015				2016				2017			
					---------	---------	Projected	---------	---------	---------	---------	---------
Measure and country	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP[1]												
Total foreign	1.6	1.4	2.5	2.0	2.3	2.6	2.8	2.9	3.0	2.6	2.8	2.9
Previous Tealbook	*1.8*	*1.3*	*2.4*	*2.3*	*2.6*	*2.8*	*2.8*	*2.8*	*3.0*	*2.6*	*2.8*	*2.9*
Advanced foreign economies	1.0	.5	1.8	1.0	1.4	1.8	2.2	2.2	2.4	1.5	1.9	2.0
Canada	-.7	-.3	2.3	.6	1.2	1.8	2.3	2.3	2.3	2.2	2.1	2.0
Japan	4.4	-.5	1.0	.9	1.0	1.1	1.1	1.2	3.2	-4.9	-.3	1.1
United Kingdom	1.5	2.2	1.8	2.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3
Euro area	2.2	1.6	1.2	1.3	1.7	2.0	2.2	2.3	2.2	2.2	2.2	2.2
Germany	1.4	1.8	1.3	1.5	1.7	1.9	2.2	2.2	2.1	2.1	2.1	2.0
Emerging market economies	2.2	2.2	3.1	2.9	3.1	3.4	3.4	3.5	3.6	3.6	3.7	3.7
Asia	4.3	4.0	5.1	5.0	4.9	5.1	5.0	5.0	4.9	4.9	4.9	4.9
Korea	3.3	1.3	5.3	4.0	4.1	4.1	4.1	4.0	3.8	3.8	3.8	3.8
China	5.7	7.2	7.2	7.0	6.2	6.3	6.3	6.2	6.1	6.1	6.1	6.1
Latin America	.9	.6	1.5	1.0	1.6	2.1	2.2	2.3	2.5	2.5	2.6	2.7
Mexico	2.1	2.5	3.0	2.2	2.5	2.8	2.8	2.8	2.7	2.7	2.8	2.9
Brazil	-3.3	-8.0	-6.7	-4.5	-2.5	-1.0	-.2	.5	1.1	1.5	1.8	2.0
Consumer prices[2]												
Total foreign	.3	2.5	2.0	1.0	1.4	2.0	2.3	2.4	2.4	2.8	2.5	2.5
Previous Tealbook	*.2*	*2.5*	*2.0*	*1.0*	*1.8*	*2.2*	*2.3*	*2.4*	*2.4*	*2.8*	*2.4*	*2.5*
Advanced foreign economies	-.7	1.9	.7	.1	-.1	.9	1.3	1.5	1.6	2.6	1.7	1.7
Canada	-.2	2.5	2.3	.8	1.1	1.4	1.7	1.8	1.9	2.0	2.0	2.0
Japan	-.3	1.7	.0	-.3	-.4	.1	.5	1.0	1.2	6.5	1.2	1.2
United Kingdom	-1.2	.9	1.0	-.3	.5	1.7	2.0	2.0	2.0	2.1	2.1	2.0
Euro area	-1.2	2.2	-.1	-.1	-1.0	.8	1.4	1.5	1.6	1.6	1.6	1.6
Germany	-1.4	2.1	-.2	.3	-1.0	1.0	1.4	1.7	1.7	1.7	1.7	1.7
Emerging market economies	1.0	3.0	3.0	1.7	2.5	2.8	2.9	3.0	3.0	3.0	3.0	3.0
Asia	.2	2.7	2.5	.8	1.9	2.3	2.6	2.7	2.7	2.8	2.8	2.8
Korea	.1	1.5	.9	1.9	2.1	2.4	3.0	3.0	3.0	3.0	3.1	3.2
China	.3	2.6	3.1	-.2	1.5	2.1	2.3	2.5	2.5	2.5	2.5	2.5
Latin America	2.3	3.7	4.2	3.7	3.8	3.8	3.7	3.7	3.6	3.6	3.6	3.6
Mexico	1.1	2.7	2.8	2.4	3.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Brazil	10.9	10.2	10.1	10.3	7.6	6.2	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	Projected		
							2016	2017	2018
Real GDP[1]									
Total foreign	4.8	3.3	2.3	2.8	2.5	1.9	2.6	2.8	2.9
Previous Tealbook	*4.8*	*3.3*	*2.3*	*2.8*	*2.5*	*1.9*	*2.8*	*2.8*	*2.9*
Advanced foreign economies	3.1	1.9	.2	2.2	1.6	1.1	1.9	2.0	1.9
Canada	3.6	3.1	.7	3.1	2.4	.5	1.9	2.1	1.8
Japan	3.6	.3	.0	2.1	-.9	1.4	1.1	-.3	1.0
United Kingdom	1.8	2.1	1.0	2.8	2.8	1.9	2.4	2.4	2.3
Euro area	2.4	.5	-1.1	.6	.9	1.6	2.0	2.2	2.1
Germany	4.5	2.4	.1	1.3	1.5	1.5	2.0	2.1	1.9
Emerging market economies	6.6	4.7	4.3	3.4	3.3	2.6	3.4	3.6	3.8
Asia	8.2	5.1	5.6	5.3	4.9	4.6	5.0	4.9	4.8
Korea	6.1	2.9	2.1	3.4	2.7	3.5	4.1	3.8	3.8
China	10.0	8.6	7.9	7.6	7.2	6.8	6.2	6.1	6.0
Latin America	4.7	4.2	3.4	1.6	2.0	1.0	2.1	2.6	2.9
Mexico	4.4	4.2	3.4	1.1	2.6	2.5	2.7	2.8	2.9
Brazil	5.7	2.5	2.6	2.4	-.7	-5.6	-.8	1.6	2.1
Consumer prices[2]									
Total foreign	3.2	3.4	2.3	2.3	2.0	1.5	2.0	2.5	2.5
Previous Tealbook	*3.2*	*3.4*	*2.3*	*2.3*	*2.0*	*1.4*	*2.2*	*2.5*	*2.5*
Advanced foreign economies	1.7	2.2	1.3	1.0	1.1	.5	.9	1.9	1.7
Canada	2.2	2.7	1.0	1.0	1.9	1.3	1.5	2.0	2.0
Japan	-.3	-.3	-.2	1.4	2.5	.3	.3	2.5	1.3
United Kingdom	3.4	4.6	2.6	2.1	.9	.1	1.5	2.1	2.0
Euro area	2.0	2.9	2.3	.8	.2	.2	.7	1.6	1.6
Germany	1.6	2.6	2.0	1.3	.4	.2	.8	1.7	1.8
Emerging market economies	4.3	4.3	3.1	3.3	2.6	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	2.6	3.1	3.2
China	4.6	4.6	2.0	2.9	1.5	1.5	2.1	2.5	2.5
Latin America	4.4	4.0	4.3	4.0	4.7	3.5	3.8	3.6	3.6
Mexico	4.3	3.5	4.1	3.6	4.2	2.3	3.1	3.2	3.2
Brazil	5.6	6.7	5.6	5.9	6.6	10.4	6.5	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.

Greensheets

Greensheets

U.S. Current Account

Quarterly Data

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

	2015				2016				2017 (Projected)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
U.S. current account balance	**-473.2**	**-444.4**	**-496.5**	**-517.9**	**-577.6**	**-600.6**	**-667.2**	**-713.6**	**-792.4**	**-813.8**	**-858.4**	**-896.5**
Previous Tealbook	*-473.2*	*-451.0*	*-493.9*	*-506.1*	*-587.2*	*-611.9*	*-672.8*	*-720.5*	*-783.3*	*-790.3*	*-827.7*	*-856.7*
Current account as percent of GDP	-2.7	-2.5	-2.7	-2.9	-3.2	-3.3	-3.6	-3.8	-4.2	-4.3	-4.5	-4.6
Previous Tealbook	*-2.7*	*-2.5*	*-2.7*	*-2.8*	*-3.2*	*-3.3*	*-3.6*	*-3.8*	*-4.1*	*-4.1*	*-4.3*	*-4.4*
Net goods & services	-537.2	-532.3	-534.8	-537.3	-569.7	-612.6	-668.8	-703.5	-764.3	-793.3	-827.7	-846.5
Investment income, net	208.8	221.2	194.6	172.7	158.3	160.1	149.6	143.1	138.2	127.6	117.2	103.3
Direct, net	278.8	288.4	258.6	237.7	242.9	258.7	264.7	276.3	290.6	301.2	314.0	323.7
Portfolio, net	-70.0	-67.2	-64.1	-65.0	-84.6	-98.7	-115.1	-133.2	-152.4	-173.6	-196.8	-220.4
Other income and transfers, net	-144.8	-133.3	-156.3	-153.2	-166.2	-148.0	-147.9	-153.2	-166.2	-148.0	-147.9	-153.2

Annual Data

Billions of dollars

	2010	2011	2012	2013	2014	2015	2016 (Projected)	2017	2018
U.S. current account balance	**-442.0**	**-460.4**	**-449.7**	**-376.8**	**-389.5**	**-483.0**	**-639.7**	**-840.3**	**-958.6**
Previous Tealbook	*-442.0*	*-460.4*	*-449.7*	*-376.8*	*-389.5*	*-481.1*	*-648.1*	*-814.5*	*-906.3*
Current account as percent of GDP	-3.0	-3.0	-2.8	-2.3	-2.2	-2.7	-3.5	-4.4	-4.8
Previous Tealbook	*-3.0*	*-3.0*	*-2.8*	*-2.3*	*-2.2*	*-2.7*	*-3.5*	*-4.2*	*-4.5*
Net goods & services	-494.7	-548.6	-536.8	-478.4	-508.3	-535.4	-638.6	-808.0	-882.3
Investment income, net	185.7	229.0	220.8	233.6	247.4	199.3	152.8	121.6	77.6
Direct, net	288.0	298.6	290.2	301.7	300.5	265.9	260.6	307.4	356.5
Portfolio, net	-102.3	-69.5	-69.4	-68.1	-53.1	-66.6	-107.9	-185.8	-278.8
Other income and transfers, net	-133.0	-140.8	-133.7	-132.0	-128.6	-146.9	-153.9	-153.9	-153.9

Abbreviations

ABS	asset-backed securities
AFE	advanced foreign economy
BHC	bank holding company
BOC	Bank of Canada
BOE	Bank of England
BOJ	Bank of Japan
CDS	credit default swaps
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
EME	emerging market economy
EU	European Union
FOMC	Federal Open Market Committee; also, the Committee
GCF	General Collateral Finance
GDP	gross domestic product
GO	general obligation
IP	industrial production
LMCI	labor market conditions index
M&A	mergers and acquisitions
MBS	mortgage-backed securities
MERS	Middle East Respiratory Syndrome
ON RRP	overnight reverse repurchase agreement
PCE	personal consumption expenditures
PMI	purchasing managers index

PPI	producer price index
repo	repurchase agreement
RRE	residential real estate
RRP	reverse repurchase agreement
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SOMA	System Open Market Account
S&P	Standard & Poor's
TIPS	Treasury Inflation-Protected Securities