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Quantifying the Headwinds

Michiel de Pooter, Marcel Priebsch, and John Roberts

In the September Summary of Economic Projections, most FOMC participants projected that the federal funds rate in 2016 would be well below their estimate of its longer-run normal value despite the fact that they expected the unemployment rate in 2016 to be close to its longer-run normal value and inflation to be near the Committee's 2 percent objective. As noted in the minutes of the September FOMC meeting, a number of participants expected economic headwinds restraining the pace of the recovery to fade only slowly, and therefore that "the achievement of the Committee's employment and price stability objectives would likely require keeping the federal funds rate below its longer-run equilibrium value for some time even as economic conditions improved." This line of reasoning is broadly shared by recent Tealbook projections. In the October Tealbook, the federal funds rate at the end of 2016 was projected to be only 2 percent, 2 percentage points below its longer-run value, while the unemployment gap was projected to have narrowed to ¼ percentage point and inflation was projected to have increased to 1.6 percent. Moreover, the extended Tealbook projection did not show any noticeable drop of the unemployment rate below the natural rate during the remainder of the decade, nor any noticeable overshooting of inflation above 2 percent.[1] In this memo, we assess some of the factors that may help explain these features of the Tealbook projection, and provide some evidence on the extent to which financial market participants share the view that short-term interest rates are likely to remain low for a prolonged period, both in the United States and in some other advanced economies.

In the next section of this memo, we use the FRB/US model to identify several factors that continue to restrain aggregate demand in the staff's projection for 2016 relative to conditions projected to prevail in 2020 and thereafter. We present the effects of these factors both in terms of an alternative simulation and as reflected in rolling estimates of the "R-star" measure that is presented in Tealbook B. By way of comparison, we also present R-star for two of the alternative scenarios featured in the October Tealbook that highlight risks, both to the upside and the downside, to the staff's view that aggregate demand will recover only gradually over the next several years. The final section reviews evidence from financial market quotes and surveys to assess private sector views of the likely path of short-term interest rates.

[1] As also noted in the minutes of the September meeting, a projected low federal funds rate under the economic conditions projected in 2016 could alternatively reflect "a commitment to support the economy by maintaining a more accommodative policy for longer." Such a policy could lead to a more noticeable undershooting of the unemployment rate and the possibility of an overshooting of inflation in later years.

Identifying headwinds

To keep the analysis specific, we will focus on the question, why is the equilibrium funds rate consistent with the staff forecast higher in 2020 than in 2016? We can then use simulations of the FRB/US model to consider how macroeconomic outcomes would differ if the conditions that we identify in that first step were to prevail as of 2016.

We focus on three areas: fiscal policy, financial conditions, and private domestic spending. For fiscal policy, in the alternative scenario constructed here, the projected path of federal spending is altered so that, as of 2016, the federal budget deficit is the same as it is in the baseline in 2020. Thus, instead of the budget deficit being 3½ percent of GDP in 2016, as in the staff baseline forecast, the deficit in that year is 4¾ percent of GDP. While fiscal policy is thus more stimulative in the alternative scenario, it is worth noting that whereas the 2016 budget deficit in the staff baseline projection stabilizes the debt-to-GDP ratio, under the higher 2020 deficit, the debt-to-GDP ratio drifts up. One might therefore interpret the alternative simulation as one in which the needed eventual fiscal adjustment is delayed beyond the horizon considered here. We assume no adverse financial market consequences from this delayed adjustment.

In the cases of financial conditions and private domestic spending, the FRB/US model views the forces that have restrained aggregate demand since the financial crisis to be still operative in 2016, albeit to a diminishing extent. Specifically, the equity premium in 2016 is projected to be about 40 basis points above its 2020 value, consistent with the view that factors such as elevated uncertainty and risk aversion will still be depressing risky asset prices. In the alternative we consider here, the equity premium is set immediately to its 2020 value, reflecting an elimination of these forces. For private domestic spending, we focus on business investment spending because that is an area where, from the perspective of the FRB/US model, spending in 2016 is below a level implied by its longer-run fundamentals, consistent with the view that the restraint on firms' investment decisions from heightened uncertainty and business pessimism will diminish only gradually. We did not include residential construction spending in this list of factors because, in the staff's view, residential construction spending will have already returned to normal levels by the end of 2016, even after removing the effects of low interest rates at the end of 2016.

Figure 1 compares the resulting outlook with the staff baseline through the lens of the "R-star" measure that is reported in Tealbook B. (Recall that this measure of R-star is defined as the level of the *real* federal funds rate that, if maintained, would return the output gap to zero after twelve quarters.)[2] In the staff baseline projection, R-star rises gradually from under -1 percent in 2014 to 2 percent in 2020, a value in line with the

[2] We find R-star to be a convenient way of summarizing the level of aggregate demand over the twelve-quarter period. However, this measure has limitations for current purposes. In particular, it reflects aggregate demand conditions over the coming twelve quarters and not just for the quarter indicated. Also, although the R-star measure implicitly specifies a path for the federal funds rate, it is not intended to be a policy prescription as it does not take into account the effects of the prescribed policy path on inflation or on outcomes beyond a twelve-quarter horizon.

staff's longer-run view. At the end of 2016, it is still only ½ percent, suggesting that over the three years starting in 2016:Q4, aggregate demand remains, on average, below its long-run value. By contrast, in the alternative projection, R-star is already close to 2 percent by the end of 2016. Thus, the factors we have identified here can account for the shortfall in the equilibrium real funds rate as of 2016. The alternative stance of fiscal policy accounts for almost 1 percentage point of the increase in R-star, while the equity premium and business investment spending each account for about half of the remainder.

The view that aggregate demand has not recovered fully by late 2016 is not unique to the staff projection. To provide an additional perspective, figure 1 also includes an estimate of R-star for an extended version of the FRB/US projection that is summarized in the Risks and Uncertanty section of the Tealbook. The extended FRB/US forecast also implies a depressed level of R-star as of the end of 2016.

Figure 2 presents the outcomes for unemployment, inflation, and the federal funds rate in the staff baseline and in this alternative setting for aggregate demand. Under the staff's usual assumption about the setting for monetary policy, the unemployment rate in the alternative scenario drops to 4¼ percent by the end of 2016.[3] At that time, the nominal federal funds rate has increased to 3½ percent. The federal funds rate continues to rise thereafter, reaching 4½ percent late in the decade. By 2020, the unemployment rate has returned to about its natural rate. Inflation peaks at 2¼ percent; beyond the horizon shown here, it eventually returns to the Committee's longer-run target.

The outcomes shown by the red dotted lines assume that even in a scenario in which the factors restraining aggregate demand dissipate rapidly, policymakers would still set the funds rate path as indicated by a highly inertial interest rate rule, which leads to pronounced undershooting of the unemployment rate. By contrast, the green dashed lines in figure 2 depict outcomes under the alternative scenario using an alternative setting for monetary policy—namely, the time-consistent version of optimal control that was reported in the September Tealbook. This setting of monetary policy may be of interest because it strives to be "optimal"—subject to the assumed preferences and the validity of the FRB/US model—while not relying on any commitment of policymakers in the future. In this case, the federal funds rate rises more abruptly than under the baseline policy framework (threshold plus inertial rule), reaching 5½ percent by 2017. As a consequence of this more aggressive monetary policy, the unemployment rate does not fall as far below the natural rate and inflation is closer to its target level.

Implications of the October alternative scenarios

One reason the staff's projection assumes weak aggregate demand conditions will lift only slowly is that, during this expansion, improvements in real GDP have fallen short of our earlier expectations. We have interpreted these forecast errors as indicating that the headwinds facing the economy have been more persistent than we had anticipated, and thus our current projection reflects an assumption that weak aggregate demand conditions

[3] Specifically, the federal funds rate remains at its effective lower bound until one of the Committee's thresholds is crossed and is set according to an inertial version of the Taylor (1999) rule thereafter.

will continue to lift only slowly. But it is possible that we are wrong about the persistence of the factors holding back aggregate demand. In the Faster Recovery scenario presented in the October Tealbook, the forces restraining aggregate demand lift more rapidly than we have assumed in the baseline Tealbook projection and thus the equilibrium federal funds rate returns more rapidly to its longer-run value. Alternatively, the forces restraining aggregate demand could lift more slowly than in the baseline projection, as was the case in the Consumer Restraint alternative scenario. In this scenario, the equilibrium real funds rate can be interpreted as remaining at a low level for an extended period, requiring a period of low federal funds rates that is even longer than in the staff baseline projection.

Figure 3 shows rolling estimates of R-star for these two October alternative scenarios. In the Faster Recovery scenario, R-star rises more steeply than in the baseline, reaching 2 percent by the end of 2016 and 2¾ percent in 2019. By contrast, under the Consumer Restraint scenario, R-star remains below -2 percent through the end of 2017. It recovers more rapidly thereafter, but is still only about 50 basis points at the end of 2020.

Private-sector views of the interest-rate path

Evidence derived both from financial market data and from surveys suggests that financial market participants share the expectations of most FOMC participants, as expressed in the September SEP, that short-term interest rates in the United States are likely to remain substantially below their long-run values for several years to come. In particular, measures of private sector views of the likely path of short-term interest rates show that the federal funds rate is projected to rise only gradually as monetary accommodation is withdrawn and that the federal funds rate is expected to remain at or below 2 percent through at least mid-2016. Combined with information from surveys of inflation expectations, it also appears that financial-market participants and survey respondents anticipate that real interest rates will remain low.

The mean policy path derived from overnight index swap (OIS) quotes is shown by the solid red line in panel 1 of figure 4. The expected policy rate based on this measure is only around ¾ percent at the end of 2015, and remains below 1½ percent at the end of 2016. Moreover, the modal (most likely) path of the policy rate derived from interest rate caps—depicted by the solid black line—is even lower.

The policy rate paths reported in panel 1 are derived from market quotes under the assumption that term premiums are zero over the maturity range considered. Policy rate paths implied by surveys—including the Blue Chip survey and the desk's Survey of Primary Dealers shown in panel 2—indicate a somewhat higher level of the expected policy rate in 2015-2016 than those shown in panel 1. The median respondent in the Survey of Primary Dealers projected a policy rate of 2 percent at the end of 2016, while the consensus forecast in the Blue Chip survey indicates a policy rate of 2½ percent.[4]

[4] The Survey of Primary Dealers explicitly asks about the modal (i.e., most likely) federal funds rate forecast, whereas the Blue Chip survey does not spell out whether it is asking about the mean or modal forecast.

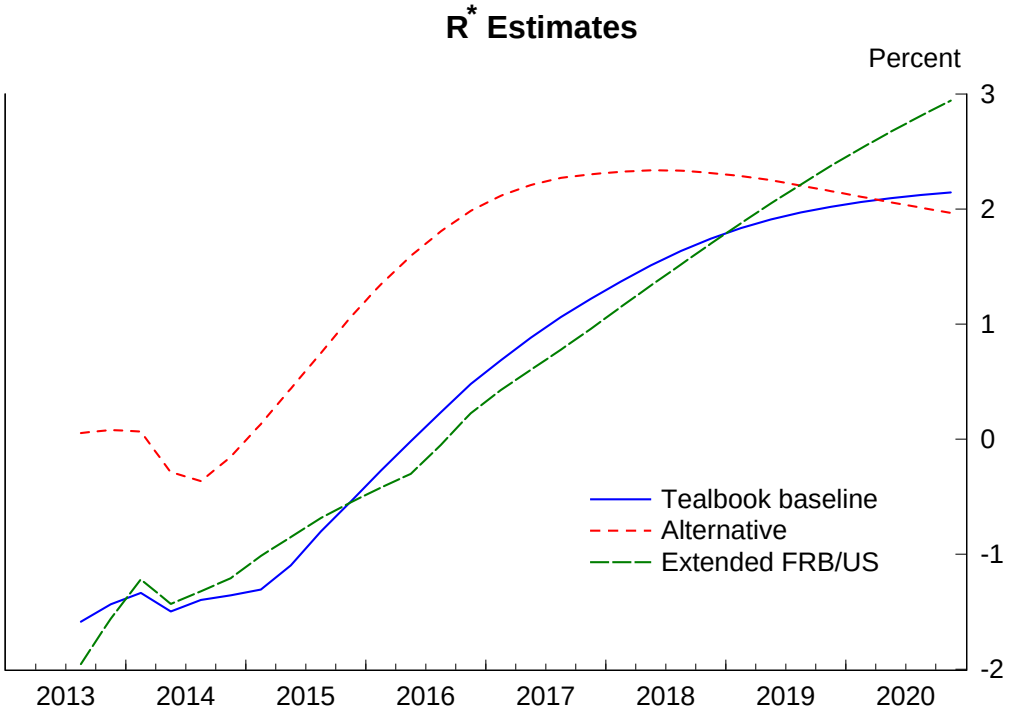
Combined with the financial-market-based expecations shown in panel 1, these forecasts would imply a negative term premium at maturities of two to three years. Similarly, the expected path of policy rates implied by a staff term structure model—shown in panel 3—is also higher than the unadjusted rate paths in panel 1. Nevertheless, the expected federal funds rate in late 2016 is in the range of 2-2½ percent under all of these alternative survey- or model-based projections. Inflation forecasts—shown in panel 4—remain close to the FOMC's 2 percent target, implying that real interest rates are expected to be negative until at least mid-2016.

Moreover, financial market data show that policy rates are also expected to remain very low in most advanced foreign economies. As seen in figure 5, the mean policy rate implied by OIS quotes remains below 1 percent until mid-2016 in the euro area, Japan, and the United Kingdom, and below 2 percent in Canada. Even when adjusting the OIS-implied rates to account for time-varying term premiums using a term-structure model maintained by staff—the red lines—implied policy rates are below 1 percent at the end of 2016 in the euro area and Japan, and only around 2 percent in the United Kingdom and Canada. Taking into account available survey measures of inflation over the 2014-2016 period, real interest rates are expected to remain below zero in all of these economies through 2016.[5]

Of course, it is impossible to know the thinking behind market-based expectations. That said, expectations of participants in U.S. financial markets are no doubt influenced by the SEP and other statements by U.S. policymakers. Expectations of foreign policy rates are likely similarly influenced by statements and explicit projections of policymakers. While it is difficult to determine whether market expectations reflect an assessment of underlying factors similar to those discussed in this memo, it is easier to assess the views of survey respondents. A special question in the October Survey of Primary Dealers asked about the degree to which economic headwinds were affecting dealers' forecasts. While a few respondents expected that headwinds would no longer be an issue by the end of 2016, the majority did cite some form of continuing economic adjustment related to fiscal policy, financial markets, or the labor market as a factor underlying their late-2016 federal funds rate forecasts. As a result, the median dealer responded that the most likely value of the federal funds rate at the end of 2016 would be 2 percent, a value that is below the median dealer's estimate of its 3¼ percent neutral value projected for late 2016, and also that this late-2016 neutral federal funds rate projection would be below the median dealer's longer-term value of 4 percent.

[5] Based on the October Consensus forecast projections, inflation is expected to average around 1½ percent per year in the euro area and Japan, around 2 percent per year in Canada, and slightly over 2½ percent per year in the United Kingdom.

Figure 1

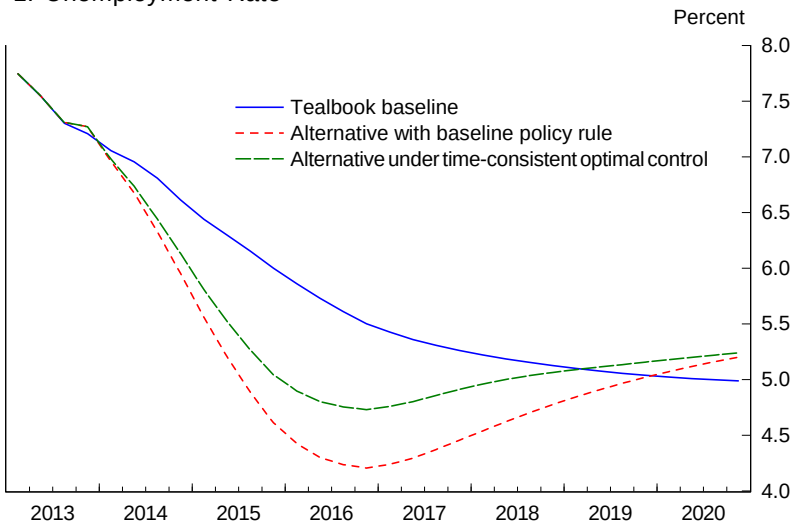


Note: R^* is defined to be the value of the real federal funds rate that, if maintained, would eliminate the output gap after 12 quarters.

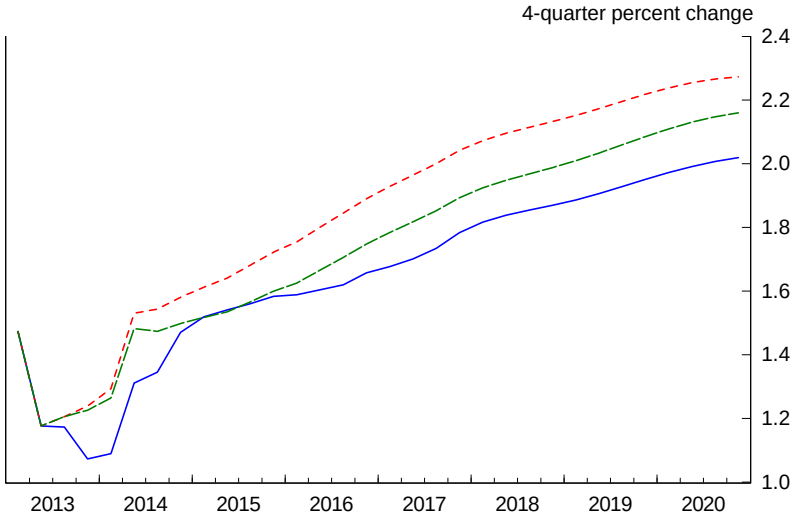
Figure 2

Macroeconomic Outcomes under the Alternative

1. Unemployment Rate



2. PCE Prices excluding Food and Energy



3. Federal Funds Rate

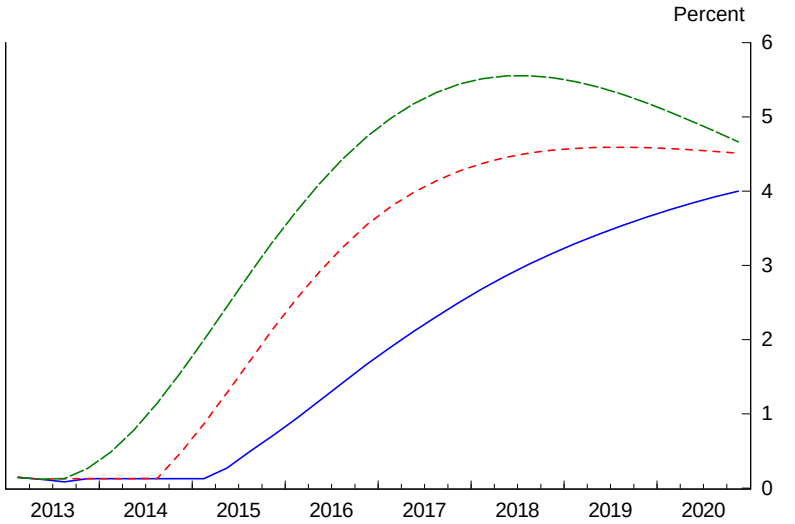


Figure 3

R* Estimates for October Alternative Scenarios

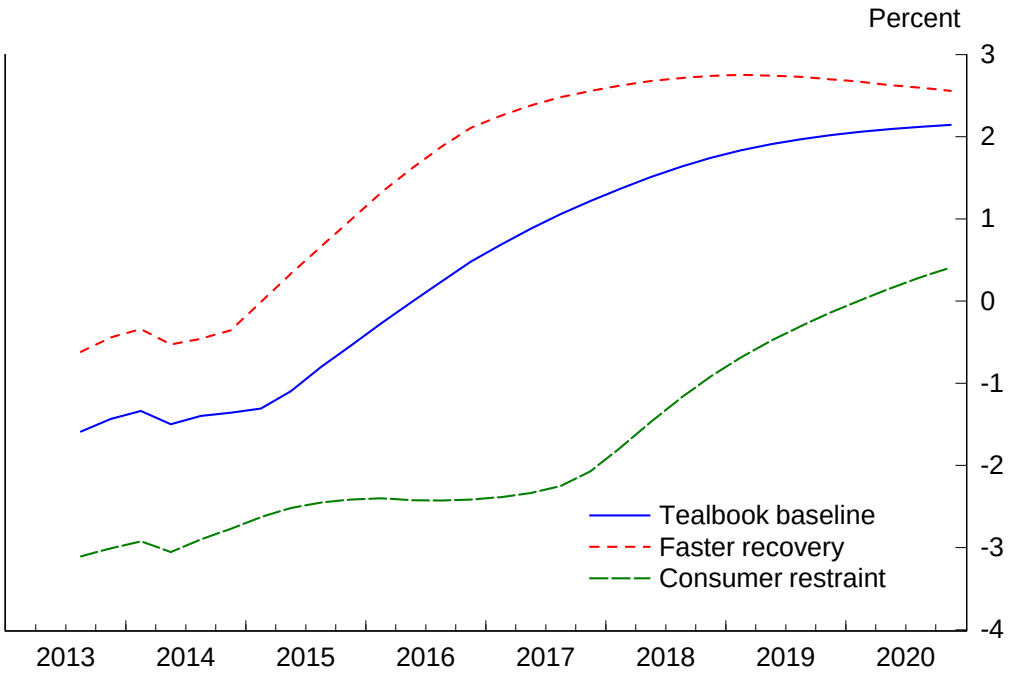
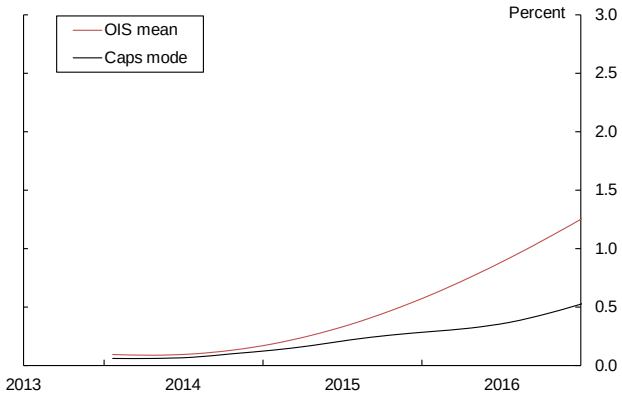


Figure 4

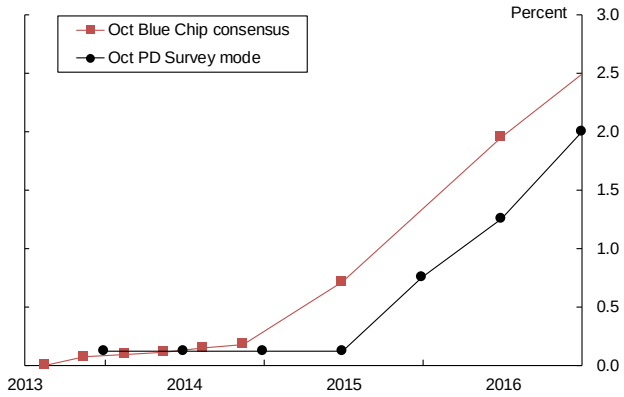
Private-Sector Federal Funds Rate Expectations

1. Policy Paths Implied by Raw Financial Market Quotes



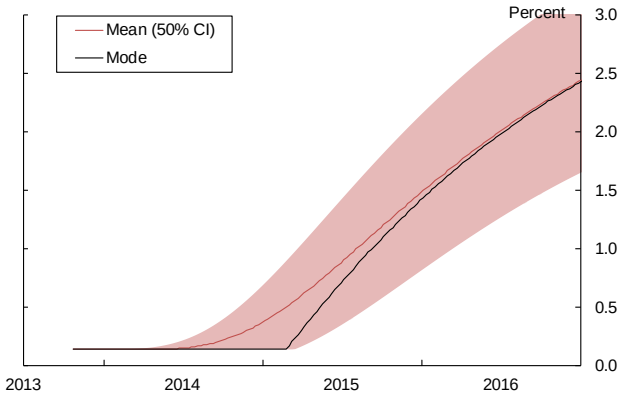
Note: Paths are derived under the assumption of zero term premiums from market quotes on Oct 22, 2013.

2. Policy Paths Implied by Surveys



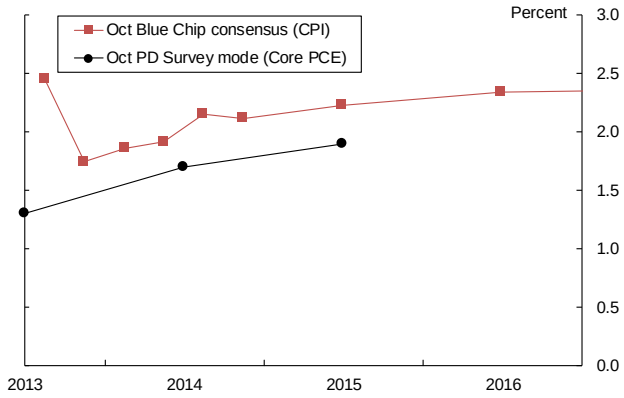
Note: Blue Chip consensus refers to the expected future 3-month T-Bill yield from the Blue Chip Economic Indicators survey, conducted on Oct 2-3, 2013. PD Survey Mode refers to the median dealer's most likely (modal) federal funds rate forecast. Dealers responded on or before Oct 22, 2013. Potential differences between the two surveys arise from the different dates on which the surveys were taken, the different panels of forecasters, and the different types of forecast (mean vs. mode).

3. Policy Paths Implied by ZLB Term Structure Model



Note: Paths represent the expected (mean) and most likely (modal) future short rate paths as of Oct 22, 2013, based on a staff term structure model that respects the zero lower bound (ZLB) and is estimated on a sample of Treasury securities and survey forecasts. The shaded area is a 50 percent confidence interval around the mean.

4. Inflation Forecasts Implied by Surveys

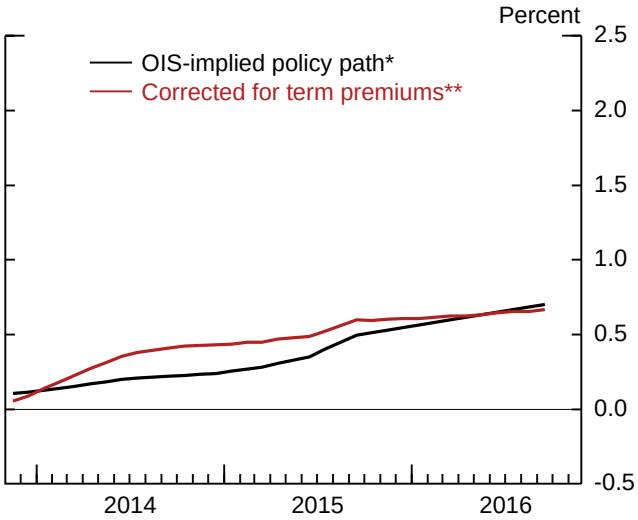


Note: Forecasts are for the annualized percentage change in CPI and Core PCE Deflator, respectively, over the reference period. Refer to the note for panel 2 for a description of the surveys and the construction of forecasts in each survey.

Figure 5

Expected Policy Rate Paths in AFEs

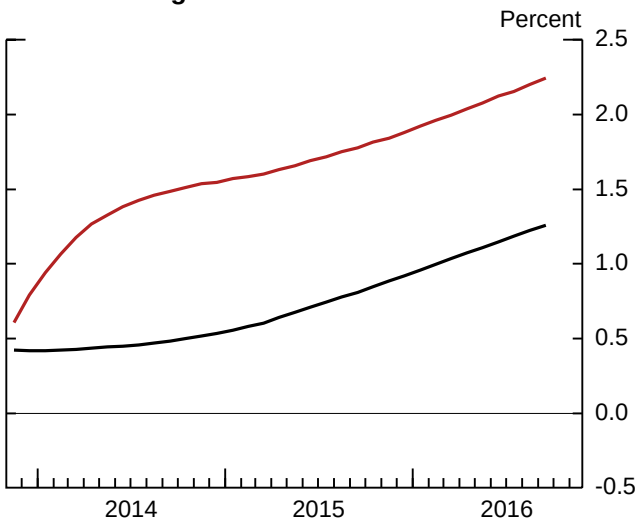
1. Euro Area



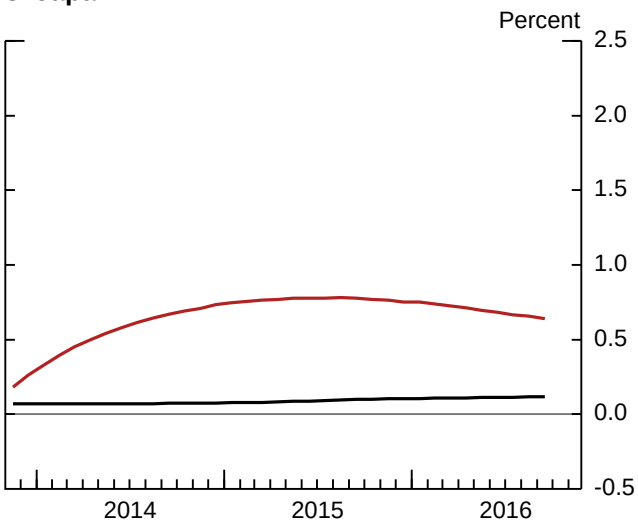
* One-month forward rates from OIS quotes on Oct. 22, 2013, assuming a term premium of zero basis points per month.

** Corrected using a staff model that allows for time-varying term premiums.

2. United Kingdom



3. Japan



4. Canada