

## Does Slower Growth Imply Lower Interest Rates?

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Over the past two years, both monetary and fiscal policy projections have been based on the view that declines in the long-run potential growth rate of the economy will in turn push down interest rates. In contrast, examination of private-sector professional forecasts and historical data provides little evidence of such a linkage. This suggests a greater risk that future interest rates may be higher than expected.

The aging of the labor force, weak productivity growth, and possible long-run supply-side damage from the Great Recession have all suggested recently that the potential growth rate of the U.S. economy may be lower in the years ahead. According to standard economic theory, such slower growth would push down the level of the natural rate of interest. This natural rate, also called the neutral or equilibrium real interest rate, is the risk-free short-term interest rate adjusted for inflation that would prevail in normal times with full employment (Williams 2003).

Moreover, a decline in the natural rate of interest would tend to lower every other real and nominal interest rate in the economy. Therefore, understanding the linkage between economic growth and the natural rate is crucial for forecasting *all* types of interest rates. Indeed, this linkage has been at the center of recent fiscal and monetary policy forecasts. The Congressional Budget Office (CBO 2014) noted that its lower projections of U.S. Treasury yields and the federal government's future debt servicing costs partly reflected reductions in its forecast for potential output. In addition, earlier this year, some Federal Open Market Committee (FOMC) participants appeared to reduce their estimates of the natural rate of interest because of an expectation of slower growth ahead for potential output.

This *Economic Letter* examines the linkage between growth and interest rates as embodied in recent projections by FOMC participants, the CBO, and private-sector forecasters. Although forecasts of potential growth or the natural rate are rarely reported, we can construct reasonable proxies from long-run forecasts of GDP growth, the short-term interest rate, and inflation. In essence, the long-run nature of these forecasts strips out cyclical variation and reveals the fundamental secular trends that underlie the concepts of potential growth and the natural rate of interest.

Although in the CBO and FOMC policy projections long-run forecasts of growth and the real interest rate have fallen together, private-sector forecasters do not anticipate a similar dual drop. In particular, the recent downward revisions in private-sector expectations for long-run growth have been associated with no change in their long-run projections of the real short-term interest rate. If the private-sector forecasters are correct, this would raise a concern that the CBO and FOMC may have overestimated the effects of slower potential growth toward reducing interest rates, which may introduce some upside risk to CBO and FOMC interest rate projections.

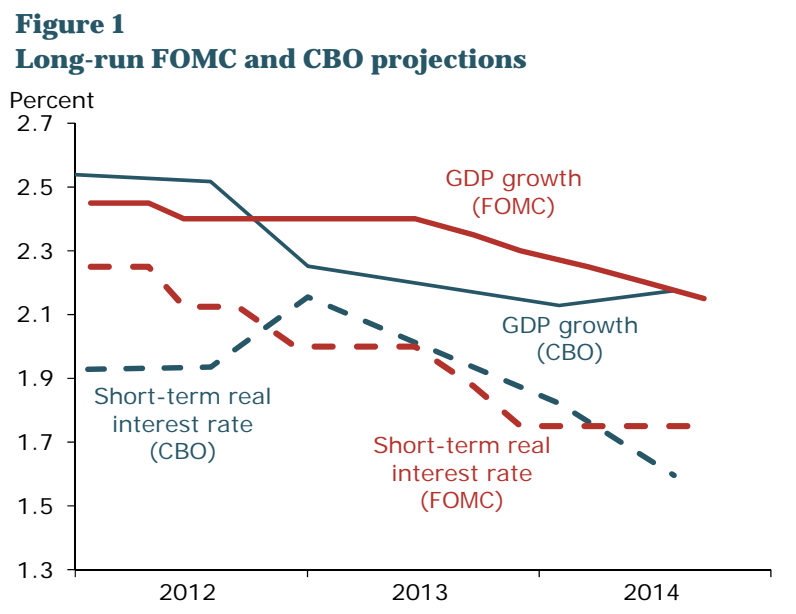
## FOMC and CBO projections of growth and interest rates

In standard economic theory, the natural interest rate—that is, the short-term real interest rate at which the economy would stay at full employment—is related positively to the growth rate of potential output. Higher potential growth can affect the real interest rate via two key channels. First, it increases the returns on investment and thus leads to higher investment demand. Second, because higher growth boosts future earnings, it leads forward-looking households to consume more and save less. The combination of higher investment and lower savings raises the real interest rate. As a result, higher potential growth would be associated with a higher natural rate (Laubach and Williams 2003). Of course, this simple theory is not definitive, and in the real world, other factors may obscure or overwhelm this relationship, including those highlighted in the recent debate about secular stagnation (Summers 2014). Most importantly perhaps, in an open economy with international financial flows, the real interest rate is determined by the interaction of growth, saving, and investment at a *global* level—rather than by developments in any single country.

Because we do not directly observe the natural rate of interest or potential trend growth, we construct proxies from long-run forecasts of real GDP growth and short-term real interest rates. Since the impact of cyclical shocks diminishes over time, long-run projections should capture forecasters' views of secular influences in the economy, which are the factors that affect potential growth and the natural rate.

We first examine long-run policy projections of real GDP growth and the short-term real interest rate from the FOMC and the CBO. FOMC forecasts are reported four times per year in the FOMC's Summary of Economic Projections (SEP). Long-run real GDP growth forecasts are available since 2009. Long-run forecasts of the equilibrium real interest rate can be constructed since 2012 using long-run forecasts of the nominal federal funds rate and of inflation in the price index for personal consumption expenditures. We use the midpoint of the forecasts' central tendency, which excludes the three highest and three lowest projections. The CBO's long-run forecasts are available since 1996. We use the average of five- to ten-year-ahead forecasts. We calculate the real interest rate forecast using projections of the three-month Treasury bill rate and of inflation in the consumer price index (CPI). Based on historical differences among the data series, we subtract 0.3 percentage point from the CPI inflation forecasts and add 0.2 percentage point to the Treasury bill rate forecasts to make them broadly comparable to the FOMC projections.

Figure 1 depicts the evolution of the FOMC and the CBO long-run forecasts for real GDP growth and the short-term real interest rate. Since the beginning of 2012, FOMC participants have lowered their projections of the short-term rate from 2.3% to 1.7%, and one likely important factor behind this decline was the FOMC participants' more pessimistic outlook for long-run GDP growth, reflected in Figure 1. The June 2014 FOMC minutes described the connection: "Compared with March, some



participants revised down their estimates of the longer-run federal funds rate, with a lower assessment of the longer-run level of potential output growth cited as a contributing factor for the majority of those revisions” (Board of Governors 2014).

Figure 1 also shows that the CBO lowered its estimate of the short-term real interest rate by roughly 0.4 percentage point since the beginning of 2012. Echoing the views of FOMC participants, the latest report on the long-term budget outlook from the CBO (2014) emphasized that a key factor behind the declining real rate was the decline in potential growth. This link between potential growth and the natural real interest rate is also evident in the CBO’s projections since the mid-1990s, shown in Figure 2. The two series have a fairly close correlation of 0.5.



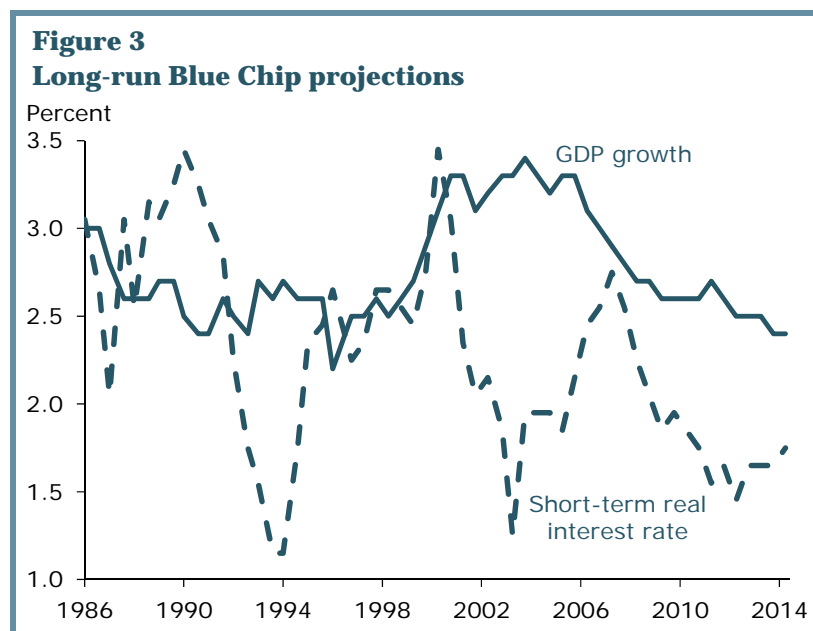
### Evidence from private-sector forecasts and historical data

Are the views of FOMC participants and the CBO about the linkage between long-run growth and interest rates shared by private-sector forecasters? Since 1986, the Blue Chip Economic Indicators has reported long-run forecasts from business economists for growth and interest rates. We use the average five- to ten-year-ahead consensus forecasts for real GDP growth and for the short-term real interest rate. We base the latter on projections of the federal funds rate and CPI inflation adjusted by 0.3 percentage point.

Figure 3 shows the movements in the Blue Chip forecasts for real GDP growth and the short-term real interest rate. Like the FOMC and CBO, private forecasters have also lowered their projections of long-run

growth since 2012. However, despite this weaker growth outlook, the Blue Chip long-run estimates of the short-term real interest rate have actually edged up during this period. Furthermore, this recent episode is not unusual. Over the past three decades, it appears that private forecasters have incorporated essentially no link between potential growth and the natural rate of interest: The two data series have a zero correlation.

This evidence is surprising given the predictions of standard economic



theory, but it is in line with some other research findings. For instance, Goldman Sachs (2014) recently examined the effect of real per-capita GDP growth on short-term real interest rates in 20 countries since the early 1800s. The report found no statistically significant relationship between these two variables. Similarly, Carroll and Summers (1991) and Bosworth (2014) found at best a weak positive relationship between growth and short-term real interest rates using data for a number of countries.

A strong positive link between higher growth and higher real interest rates depends in part on a decline in the saving rate, arising from household assumptions about longer-term income. However, much research has instead found that higher growth is associated with a higher saving rate (for example, International Monetary Fund 2014). In this case, although higher growth would raise investment demand and put upward pressure on real interest rates, this effect would be mitigated by a rise in the saving rate.

The Blue Chip results could be interpreted in three ways. First, it's possible that the private forecasters are naively ignoring an important growth and interest rate connection that is obvious in policy projections. Alternatively, it is possible that the Blue Chip forecasters have a more subtle understanding of the many factors other than growth that influence investment and saving in a way that masks a positive connection between potential growth and the equilibrium real interest rate. Finally, the Blue Chip forecasters may correctly recognize that there is no significant relationship between potential growth and the equilibrium real funds rate. If either the second or third of these interpretations were true, it would imply that many FOMC participants and the CBO may have overemphasized the effect that weaker potential growth has on damping future interest rates.

### Conclusions and policy implications

In this *Letter*, we document a range of views about the link between potential growth and the natural interest rate. In particular, while the CBO and many FOMC participants expect weaker long-run growth to translate into lower interest rates, private-sector forecasts do not seem to share this view. Thus, future downward pressure on interest rates may be more muted than indicated by current monetary and fiscal policy projections, which would translate into an upside risk to these longer-term interest rate forecasts.

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### References

- Board of Governors of the Federal Reserve System. 2014. "Minutes of the Federal Open Market Committee," June 17–18. <http://www.federalreserve.gov/monetarypolicy/files/fomcminutes20140618.pdf>
- Bosworth, Barry P. 2014. "Interest Rates and Economic Growth: Are They Related?" Brookings Institution Working paper.
- Carroll, Christopher D., and Lawrence H. Summers. 1991. "Consumption Growth Parallels Income Growth: Some New Evidence." Chapter in *National Saving and Economic Performance*, eds. B. Douglas Bernheim, and John B. Shoven. Chicago: Chicago University Press, pp. 305–348.
- Congressional Budget Office. 2014. "An Update to the Budget and Economic Outlook: 2014 to 2024." August. [http://www.cbo.gov/sites/default/files/45653-OutlookUpdate\\_2014\\_Aug.pdf](http://www.cbo.gov/sites/default/files/45653-OutlookUpdate_2014_Aug.pdf)
- Goldman Sachs Global Macro Research. 2014. "Some Long-Term Evidence on Short-Term Rates." *U.S. Economics Analyst* 14(25, June 20).

International Monetary Fund. 2014. "Perspectives on Global Real Interest Rates." *World Economic Outlook*, Chapter 3.

Laubach, Thomas, and John C. Williams. 2003. "Measuring the Natural Rate of Interest." *Review of Economics and Statistics* 85(4, November), pp. 1,063–1,070.

Summers, Lawrence H. 2014. "U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound." *Business Economics* 49(2), pp. 65–73.

Williams, John C. 2003. "The Natural Rate of Interest." *FRBSF Economic Letter* 2003-32 (October 31).  
<http://www.frbsf.org/economic-research/publications/economic-letter/2003/october/the-natural-rate-of-interest/>

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