SPECIAL REPORT

TD Economics

September 10, 2014

DIVERGENT VIEWS ON NEUTRAL INTEREST RATES

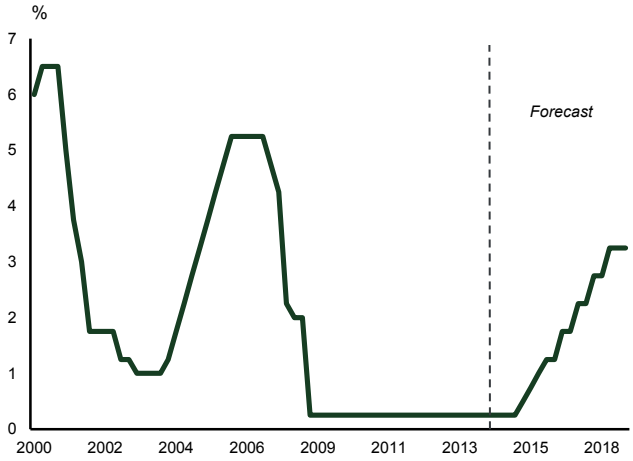
Highlights

- With the Fed signaling an end to QE in October, financial markets are now debating both the timing of future rate hikes and, more importantly, the level to which interest rates will ultimately rise. The latter requires an understanding of the neutral level of interest rates.
- Disagreement over how high rates will rise in the future seems to be embedded in different time-frames under discussion. The view of a 'new neutral' real fed funds rate of close to zero (2.00% in nominal terms) is usually grounded in a shorter timeframe that is not consistent with the long-run level of rates of an economy in equilibrium – growing at a trend pace with stable inflation.
- TD Economics believes that the long-run neutral level of the fed funds rate is around 3.25% (1.25% real) and the neutral level of 10-year Treasury yields is close to 4.00% (2.00% real). However, the Fed is expected to reach those points slowly, over the course of more than three years, assuming the economic recovery remains on track. The result is that our real fed funds rate averages -0.5% from 2015 to 2017.

The Federal Reserve has telegraphed that QE will likely end in October, shifting the focus of financial markets on the next steps towards a rebalancing of monetary policy. Specifically, when the fed funds rate will rise and, more importantly, what level it will come to rest at when the tightening cycle is complete. A number of institutions have put forward statements that a zero real fed funds rate is the "new neutral". This implies a nominal peak at around 2%. For perspective, this is half the average value over the 2005-2007 period, which was identified by the IMF and the CBO as a period of relative balance for unemployment and/or the output gap. It's also half the average value that persisted in the decade prior to the financial crisis. In contrast, forecasts by the Federal Open Market Committee (FOMC) members found in the Summary of Economic Projections (SEP) indicate quite a different view, with a median nominal rate of 3.75% according to the most recent "dots" forecast. The Fed has not deviated far from recent historical values.

For some time, TD Economics has viewed the future long-run neutral level of rates as lower than the pre-recession experience. We forecast a neutral level of interest rates in a range of 3.00% to 3.50% (equal to 1.00%-1.50% real), and we use the middle of that range (3.25%) to anchor our long term interest rate projection. However, we also believe it will be a lengthy process to return to neutral, with the first step in raising the fed funds rate occurring no earlier than June 2015, and the Fed moving in a gradual, stepwise fashion over a period of 3 years (Chart 1). Although the exact timing of the first step is highly dependent

CHART 1: FEDERAL FUNDS RATE FORECAST



Source: Forecast by TD Economics as of September 2014

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on labor market conditions, inflationary pressures, inflation expectations, and financial developments, investors and economists appear in agreement that 2015 will mark the start of the tightening cycle. At the time of writing, market expectations reflect 50-75 basis points in tightening by the end of that year. Thus, the divergence in views between investors, economists and FOMC members appears to be less on when the Fed will raise rates, and more on the peak level of the fed funds rate and the length of the tightening cycle. The varying perspectives on defining and estimating the neutral rate is the subject of this note.

Neutral means different things to different analysts

Although differences on an end-point for the neutral rate exist, there is broad agreement within the economics and investment communities that it will remain lower than the pre-recession period. This is due in large part to aging demographics that has cut labor force growth projections roughly in half relative to prior decades. However, differing projections of this variable is not the driver of the divergent views on neutral rates. After a review of the various perspectives, it has become clear that the neutral interest rate (NIR) concept means different things to different people, and this is causing confusion within media and market interpretations. The textbook definition of neutral refers to an economy that is allocating resources in a way that allows the pace of the economic expansion to correspond with full employment and stable inflation at the central bank's target. Thus, NIR typically captures a long run concept (say, five to ten years that includes a business cycle). Simply put, it's the Goldilocks level of interest rates that leaves the economy neither too hot nor too cold from a long-run inflation perspective.

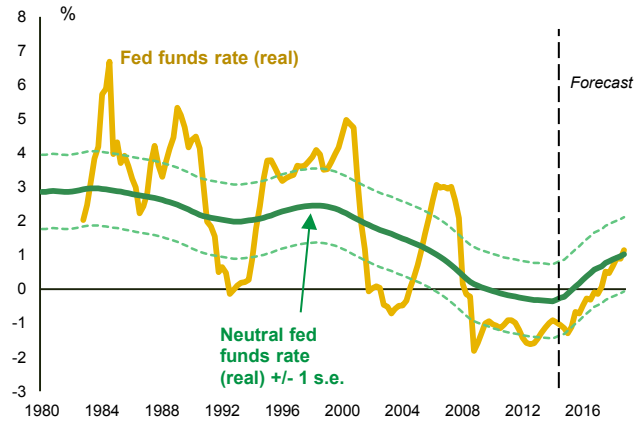
However, when referencing NIR estimates, the investment community more often than not is applying a short-to-medium timeframe of, say, two to five years. This causes the NIR to move around with greater frequency than would be the case under the long-term definition. In essence, NIR becomes a more time variant, cyclical measure. In this context, labor and capital resources are not yet fully utilized, but NIR is used as a gauge of the degree of accommodation or tightness being provided by a monetary authority. So in the long-run definition, NIR is the level required to *maintain* an economy running at its non-inflationary speed, and in the short-to-medium run definition, it provides a benchmark of the level of interest rates that would help output to *converge* back to its Goldilocks speed.

This shorter time-variant neutral concept appears to have gained prominence from a 2001 paper by two Fed researchers, Laubach and Williams (L&W). The findings[1] are commonly referenced by market pundits and are foundational to the new neutral concept. The authors apply an estimation technique (Kalman filter) that allows them to infer unobservable variables such as the real NIR from observed movements in real GDP, inflation, etc. In this model, real NIR is determined by their estimates of the rate of growth in trend GDP (trend productivity + trend labor input) and determinants of households' rate of time preference. This latter variable is a large catch-basin of influences on savings and investment behavior and could include assumptions around portfolio shifts stemming from a higher savings rate in emerging markets, preferences for safety, scars from the financial crisis that have led to a persistent weakness in investment, and other variables that are, again, not directly observable.

The L&W model estimates can be updated on a quarterly basis with a basic principle that if the actual estimate of real GDP is above the estimate of potential output (and/or inflation is above its target), then existing interest rates are too stimulative relative to the real NIR. By doing more timely updates of the NIR estimate, it is believed that large macroeconomic stabilization losses from short-run influences can be mitigated.[2] For instance, the L&W model estimates for the output gap and real NIR in 2003 were signaling that the Fed was already behind the curve in raising rates relative to where the actual fed funds rates was sitting at that time.

The L&W model is currently predicting a real neutral rate of -0.3% and this is often referenced to support the

CHART 2: NEUTRAL REAL FED FUNDS RATE



Source: Neutral fed funds rate and standard error range based on baseline Laubach and Williams (2003) two-sided estimate through 2014Q1. Forecast by TD Economics.

Table 1: Forecasts			
Rate Scenario	**Nom. Fed Funds**	**Real Fed Funds**	**Nom. 10-yr Treasury**
TD Economics	2% (2015-2018 average) 3.0%-3.5% (equilibrium)	0% (2015-2018 average) 1.0%-1.5% (equilibrium)	4.00% (end-2018) 4.00% (equilibrium)
FOMC	3.75% (equilibrium)	1.75% (equilibrium)	n/a
Pre-recession avg. 2005-2007	4.50%	2.50%	4.60%
Source: TD Economics			

"zero neutral" view by some analysts. Given the effective real fed funds rate is currently -1.5%, the stance of monetary policy is highly stimulative (particularly layering on the impact to longer term yields from the Fed's asset purchases). However, this neutral, as defined by the authors, is intended as a benchmark for the degree of monetary ease or tightness in the system. It's not reflecting a rate that will persist over the next 5-10 years to maintain an economy at its trend economic growth rate and inflation at the central bank target. By extension, it's not reflecting an optimal peak level in the fed funds rate. As the output gap shrinks (which is currently estimated to be in a -3.1% to -4.5% range by various sources), the -0.3% real NIR estimate will rise (Chart 2). It is this notion that is sometimes misconstrued by the popular media.

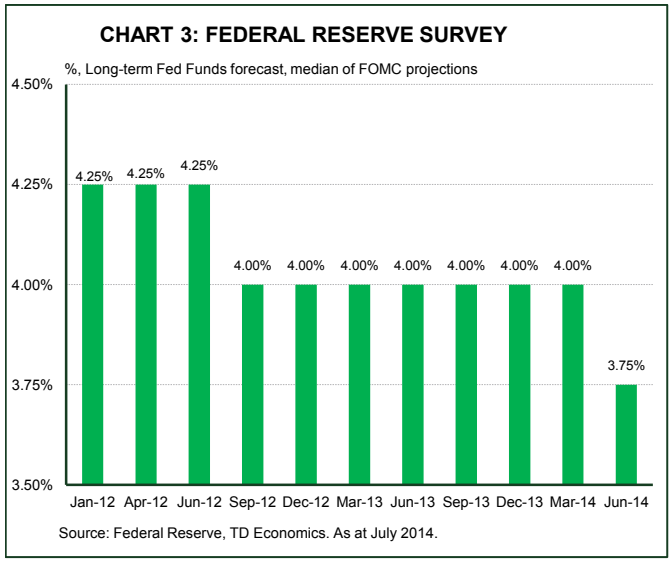
Assessing differing views of neutral

This backdrop of a time-variant neutral now provides greater insight into zero-bound real NIR views that are often cited by analysts and media. It also helps explain why the Federal Reserve SEP forecast seems to reflect a more "hawkish" view on the level of rates. The Fed's estimates depart from analyst views because they look at the neutral level of rates as a long-term or equilibrium concept. The median of the dots reflects a nominal fed funds rate of 3.75%. Applying the Fed's inflation target of 2%, implies a 1.75% real NIR. Although some investors may believe the Fed has a static view on NIR, Chart 3 demonstrates a gradual downward migration in median nominal NIR since 2012 among Fed members. Two influences are at work here. Individual FOMC members make adjustments for projections of trend growth as data are subject to revisions and as more data on productivity trends and time preferences become available. In addition, the downward migration likely reflects changes that occur among Federal Reserve Board members and the twelve Federal Reserve Bank Presidents, who have differing views. For instance, the June 2014 survey captured the view of three new members. Nevertheless, the median real NIR among the dots is hovering at or above the top end of the ranges among most market analysts, including ourselves.

What is particularly interesting is that market analysts will reference the research of L&W. However, one of the authors of that report, John C. Williams, is currently the San Francisco Fed president and, thus, his opinion is captured as one of the "dots" in the SEP. Even though his model is currently predicting a real NIR of -0.3%, the lowest dot on the Fed survey sits at a nominal value of 3.25% (equivalent to 1.25% real). In other words, the author himself does not subscribe to the view that a shorter time-variant neutral is equivalent to a longer term neutral concept, which seems to be used interchangeably by analysts.

The TD Economics view

This brings us to the perspective of TD Economics. Our view of the real fed funds rate over the next three years is in line with that of many investment institutions, but we simply do not refer to it as "neutral" under the shorter time-variant notion. Although we expect the Fed will begin raising rates in mid-2015 in a stepwise fashion, our real fed funds rate averages a mere -0.5% from 2015 to 2017 due to its low



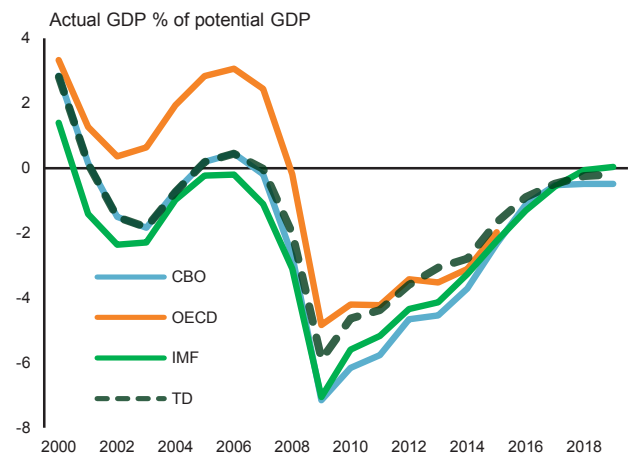
starting point and gradual progression.

Our view of the real NIR, based on the traditional, long-term equilibrium concept, is placed in a range of 1%-1.5%, which we don't expect will be realized until 2018, at the earliest. This timeframe corresponds to an output gap that is expected to have largely closed and stabilized (Chart 4). In addition, our forecast is consistent with what is generated in the L&W model for 2018 under our trend growth and output gap assumptions through the period, although that model does not form the basis of our forecast.

In the determination of the yield curve, TD Economics uses the mid-point of the neutral range (3.25%) as the anchor to the term structure. Chart 5 shows the evolution of our yield forecast over the medium term, with an equilibrium nominal 10-year Treasury yield of roughly 4.00%, equal to 2.00% real. This equilibrium is lower than what existed prior to the financial crisis, but is higher than some analyst views that 10-year yields will remain little changed from where they are today (2.00%-2.50% nominal). Embedded in the TD Economics yield forecast is our expectations for the real fed funds rate (1.25%), inflation (2%) and the term premium (80 basis points) – the three building blocks of the long-term Treasury yield.

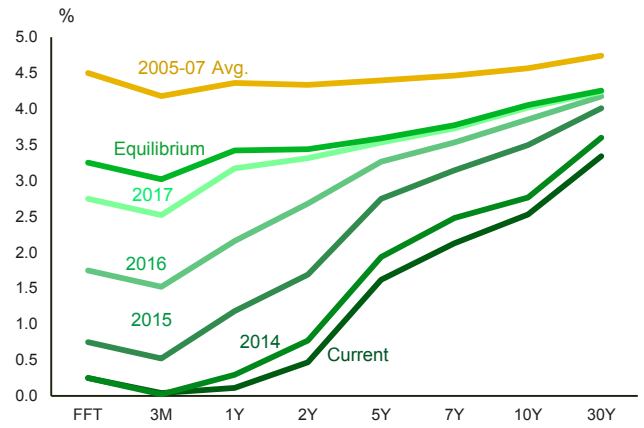
Among these elements, the term premium has a good deal of subjectivity given that it is an unobserved variable, and analysts with lower yield forecasts sometimes ascribe near-zero term premium estimates. Applying a term structure model estimated by Federal Reserve Board staff (Kim & Wright) produces a term premium estimate that has been largely bouncing around in the 0-35 basis point

CHART 4: OUTPUT GAP



Source: TD, CBO, OECD, IMF.

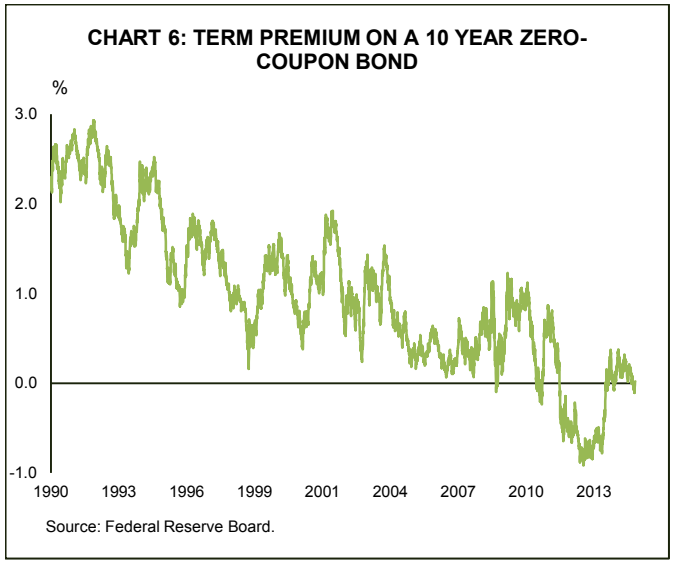
CHART 5: U.S. YIELD CURVE PROJECTIONS



Source: Federal Reserve Board, TD Economics.

range since the start of the year (Chart 6). The bottom end of that range was temporary breached by recent coinciding international events, such as the escalation of geopolitical risks and an asset purchase announcement by the European Central Bank that anchored US yields lower. However, the term premium has since edged back into slight positive territory, demonstrating an upward tendency even within this environment. An 80 basis point premium is the average that presided over the 2000-2007 period. An argument for a term premium lower than 80 basis points can certainly be made, but one that persists near zero for a long-term period, like 5 to 10 years, would neglect risk features, like the potential for investors to attribute fiscal penalties related to elevated and rising government debt, and a government that has yet to have a funded social security system or constrain health care costs in the long term.

In addition, there are other factors that should pressure the term premium (and thus yields) higher relative to recent experience. A global savings glut is often cited as a key factor that will constrain the term premium towards zero. A good example of this influence was seen in the 2004 to 2006 period in which the fed funds rate rose 425 basis points, and yet the 10-year Treasury yield held remarkably steady, rising just 55 basis points, on average. Over this period, estimates of the 10-year Treasury term premium went from roughly 130 basis points to just 50 basis points, thus offering a source of downward pressure on yields in a rising rate environment. At the time, Fed Chair Bernanke and others postulated that a contributing factor was the rise in savings stemming from emerging markets, which were being channeled into US Treasuries. The IMF estimates that



the savings rate among emerging markets rose 10 percentage points between 2000 and 2007, largely due to the effect of acceleration in China's economic growth.[3] Simply put, they found a strong relationship between the savings rate and economic growth in the short to medium term.

Likewise, a lower projected growth path would result in a negative shift in the savings rate among emerging markets, and this is precisely what is currently happening and expected to persist going forward. China will likely produce real GDP growth in the 7-7.5% range over the next few years, as oppose to the 10.5% average that existed over the 2000-2007 period. In addition, they are attempting to restructure their economy towards consumption and away from investment. This too is negative for the savings rate. The IMF estimates that the combination is expected to shift emerging market savings rates down by 3.5 percentage points, which equates to a rise in global real rates of 25 to 125 basis points.[4] Clearly if US Treasuries benefited from the flow-through of escalating global savings, the opposite would likewise impact Treasury demand and offer a source of upward pressure on yields.

Conclusion

The divergence in economist and market views on neutral rates largely relate to differing interpretations of the concept of neutral, compounded by differing assumptions on trend growth and time preferences for savings and investment. There is broad consensus that trend real GDP growth, and thus real NIR, will be lower going forward than it was over the pre-recession decade. But, there is more division on other factors, like the persistence of a near-zero term premium in the determination of long-term yields.

In addition, NIR estimates should be considered in the context of a range, rather than a point estimate. And, as a word of caution, this range can be quite wide with the time-variant application. The L&W study demonstrates this by quantifying one standard error in the point estimate to be +/- 1.1 percentage points. Meaning, the current -0.3% estimate falls within a range of -1.4% to +0.7%. At two standard errors, the band widens out to two percentage points on either side. Real-time estimates of neutral rates are also at the mercy of subsequent data revisions and are naturally constrained by the data that is available at the time of estimation. For instance, the real-time estimate of real NIR was 1.8% in Q1 2008. Incorporating all the data that has since become available and re-estimating the variable today produces a forecast of 0.4% for Q1 2008. This serves as a reminder that real-time estimates are subject to high variability as more information becomes known.

Thus, we feel the overarching message is that as the economy improves and the output gap narrows, the NIR is likely to increase. The Fed will increase its policy rate accordingly, as failing to do so in a timely manner could result in increased inflationary pressures or a "miss" in the timing of rebalancing. Just like the rest of us, the Fed is unlikely to know precisely where they're going until they get there. The broadest implication is that they will begin rebalancing monetary policy in 2015, it is likely to be done slowly, with bond yields remaining lower than pre-recession levels.

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Endnotes:

1 Published in a refereed journal in 2003. http://www.federalreserve.gov/pubs/feds/2001/200156/200156pap.pdf

2 Ibid.

3 IMF, "Perspectives on Global Real Interest Rates", Chapter 3, April 2014

4 Ibid.