June 2024

Fed Thoughts: The Natural or Neutral Rate of Interest, or R* in Brief

Vincent Reinhart | Chief Economist & Macro Strategist

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The natural or neutral rate of interest, also known as r*, was introduced in 1898 by Knut Wicksell, who held that "There is a certain rate of interest on loans which is neutral in respect to commodity prices, and tends neither to raise nor to lower them."[1] The concept generalizes the real interest rate at which output settles at its potential, the labor market is in balance and there is no pressure in either direction on the prevailing inflation rate.

Most well-structured macroeconomic models typically gravitate to a neutral rate in the fullness of time, which is why it is sometimes described as the rate ground out by the long-run forces of productivity and thrift.

If a model has lags (such as the Federal Reserve's (Fed's) FRB/US), the calculation may be complicated, depend on the time horizon and vary over time.[2] In fact, FRB/US does not have an estimate of r* but rather an implied value of r* given its assumptions about economic structure and estimates of all the coefficients of behavioral relationships.

In our view, central bankers latched onto the neutral rate in the early 2000s for three reasons:[3]

- **Simplify internal discussions.** Officials on policy-setting committees may have widely different opinions on specific forces shaping the outlook, including households' saving preferences, likely fiscal action, expectations for foreign economies and attitudes toward risk-taking in capital markets. Those differences can be summarized as the range of opinion on r*, creating a level playing field for assessing the stance of policy.

- **Clarify external communications.** The Fed implicitly publishes r* quarterly in the Summary of Economic Projections as the difference between the surveyed longer-run expectations of the nominal policy rate and inflation. As shorthand for the many forces impinging on the economy, this provides guidance on the near and longer run. As for the former, the gap between the current real policy rate and r* signals how the Fed assesses the current stance of policy. As for the latter, r* plus the inflation target gives market participants guidance on the longer-term direction of the policy rate.

- C**omplete a monetary policy rule.** Officials often consult policy rules to benchmark their policy-setting. Most monetary policy rules anchor the path of the rate prescription to r* in the long run. In the Taylor rule, for instance, r* is the intercept, which John Taylor assumed to be 2 percent as approximated by the average real funds rate over the sample for his paper in 1993.[4] A time-varying intercept, for example as produced regularly in the Fed's Monetary Policy Report using a survey-based measure of r*, incorporates shifts in behavior and other factors we believe are important in policy considerations.[5]

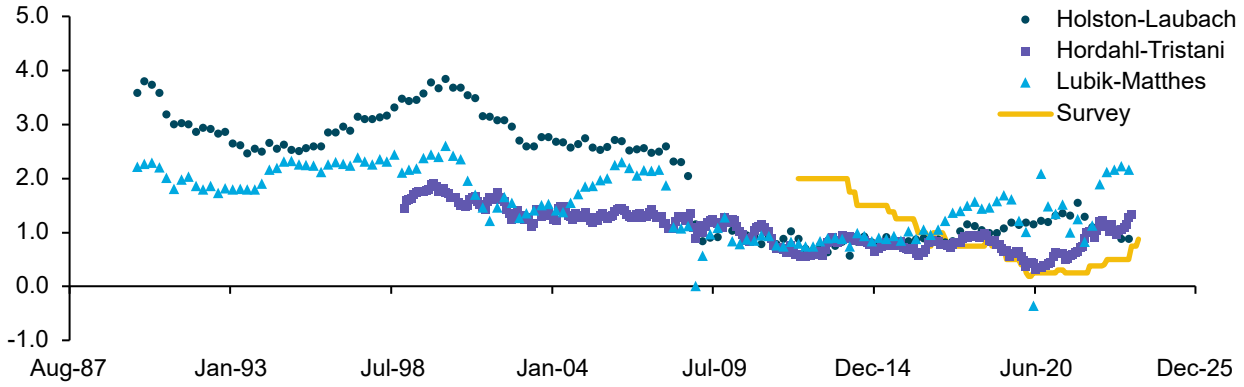
Estimates of r* can be obtained by relating a measure of slack to the real rate, either in a single- or multiple-equation specification, or from surveys. When the underlying model uses lags, the notion of r* is dynamic and depends on the time horizon. Any estimate is sensitive to the specification and sample period. The Quarterly Review of the Bank for International Settlements (BIS) recently published a useful compilation of such estimates based on various models and a survey, summarized in the following chart. As the chart shows, estimates of r* differ depending on technique at a point in time and vary significantly over time. The general message is that r* declined over the first part of this century and rebounded in recent years.

We interpret the time variation of r* as an intrinsic feature of the behavior of the real policy rate. As in the "The Real Fed Funds Rate and Measures of Pressures on Resources" charts, the Fed kept policy very accommodative during the 2007-2008 global financial crisis and continued to suppress the rate during the subsequent "lower for long" period (the solid blue line in both charts). Measures of slack (both dashed lines), the gap between the actual unemployment rate and an estimate of the natural rate, at the right, and the annual change in inflation, at the left,

bounced around zero and were more often than not negative. If there was slack on average, then r* must have been systematically below the actual real rate, declining as the real rate fell. In the past few years, the actual real rate has moved higher and so, too, have estimates of r*.

Estimates of the Neutral Real Fed Funds Rate for the US

Percent



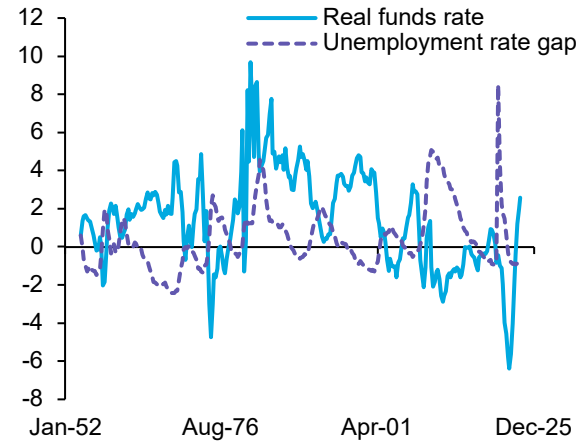
Source: Benigno, G., Hofmann, B., Barrau, G. N., & Sandri, D. (2024). Quo vadis, r*? The natural rate of interest after the pandemic. BIS Quarterly Review, 17. Data includes a semi-structural model-based estimate from Holston et al. (2023); a time series model-based measure from Lubik and Matthes (2023); a term structure model-based measure from Hördahl and Tristani (2014); and a survey-based measure from central bank surveys of market participants.

In our view, these estimates of r* vary in too wide a range and got too low to capture the underlying structure of the economy. The neutral rate depends on slow-moving forces, including saving preferences and investment incentives, the government budget position and the growth of population and productivity. We think it is best to think of these estimates as volatile approximations of those underlying slow-moving forces.

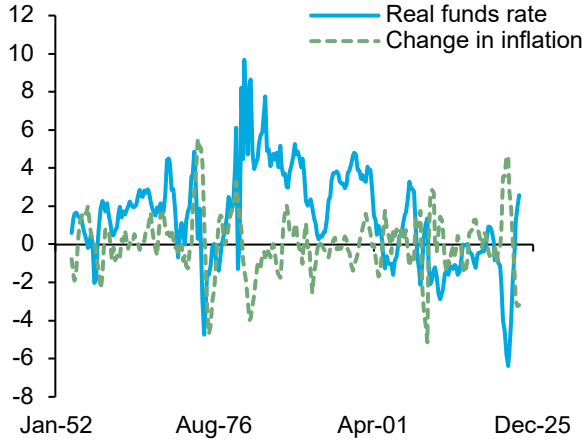
The Real Fed Funds Rate and Measures of Pressures on Resources

Percent and Percentage Points

Unemployment Rate Gap



Change in Inflation Rate



Source: The nominal funds rate comes from the Federal Reserve. The unemployment rate is produced by the Bureau of Labor Statistics and inflation is calculated as the twelve-month change in the personal consumer price index from the Bureau of Economic Analysis. The Congressional Budget Office estimates the natural rate of unemployment. Firm analysis using data accessed from FRED on 4/16/24.

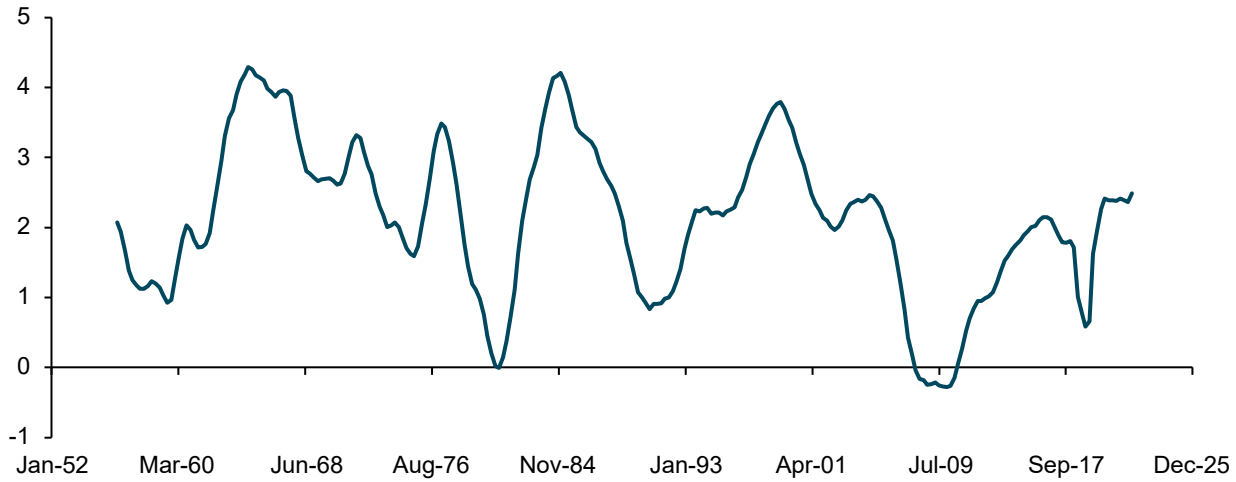
We don't understand why the neutral rate would get very low, especially negative, in a market economy. If real returns were persistently so low, firms would have an incentive to shrink the capital stock, which didn't happen.

The neutral rate probably fell as the growth rates of productivity and population slowed in the early 2000s and has risen since as they have rebounded on technical progress and increased immigration. In addition, r* was probably pushed up as the shift toward a more aggressive use of fiscal policy tilted the path of the federal budget balance deeper into the red.

Our intuition on r* is supported by the medium-term movements in the growth of consumption per capita, plotted below, which economic theory predicts should track the unobserved real return if households are rational in planning their spending over time. (This is a prediction from Wicksell 120 years ago in the citation above.) When the growth rate of potential output slowed, so too did that of consumption. The rebound in the former has been matched by the latter. Those medium-term variations in consumption growth provide a reasonable sense of changes in r*. It fell for 20 years but has recently risen.

Real Consumption per Capita

Fifteen-quarter Centered Moving Average, Percent



Source: Consumption per capita is published by the Bureau of Economic Analysis. The fifteen-quarter centered moving average of annual consumption growth is from Firm analysis. Data was accessed from FRED on 4/16/24.

We think that r* has moved up, and probably to a level higher than the Fed currently acknowledges. Abstracting from the effects of the business cycle, our working hypothesis is that r* is around 1½ percent. If so, monetary policy is currently restrictive, but not as much as the Fed thinks, and suggests that "high for long" is a feature of the outlook. As a result, we think that the nominal policy rate should settle in a range higher than currently expected in financial markets, at around 3½ percent, which implies longer-term yields are likely to rise going forward.

Vincent Reinhart
Chief Economist & Macro Strategist

Vincent is the firm's Chief Economist and Macro Strategist. In this role, he is responsible for developing views on the global economy and making relative value recommendations across global bond markets, currencies and sectors.

Previously, Vincent served as the Chief US Economist and a managing director at Morgan Stanley. For the prior four years, he was a resident scholar at the American Enterprise Institute (AEI). Vincent also spent 24 years at the Federal Reserve, holding several roles including Director of the Division of Monetary Affairs and Secretary and Economist of the Federal Open Market Committee (FOMC). His responsibilities at the Federal Reserve included directing research and analysis of monetary policy strategies and the conduct of policy through open market operations, discount window lending and reserve requirements. Prior to these roles, he was the principal liaison with the domestic desk at the Federal Reserve Bank of New York and was responsible for preparing a document outlining policy alternatives for each FOMC meeting. He was Deputy Director in the Division of International Finance and Associate Economist of the FOMC and spent five years at the Federal Reserve Bank of New York in both the domestic and international research departments.

His academic publications primarily concern the conduct of policy and issues related to the monetary transmission mechanism as well as an analysis of alternative auction techniques and Treasury debt management. After an undergraduate training at Fordham University, he received graduate degrees in economics at Columbia University.

Endnotes

[1.] Knut Wicksell, Interest and Prices, translated by R.F. Kahn, Royal Economic Society, 1936.

[2.] The FRB/US model is a large-scale model of the US economy featuring optimizing behavior by households and firms as well as detailed descriptions of monetary policy and the fiscal sector.

[3.] Estimates of r* began to appear regularly in briefing documents to the FOMC when the author, Vincent Reinhart, was responsible for drafting them as Secretary and Economist of the Federal Open Market Committee (FOMC). Numerous examples can be found in the transcripts, at https://www.federalreserve.gov/monetarypolicy/fomc_historical.htm.

[4.] Taylor, J. B. (1993, December). Discretion versus policy rules in practice. In Carnegie-Rochester conference series on public policy (Vol. 39, pp. 195-214). North-Holland.

[5.] They appear at the back of each semi-annual report, the latest at https://www.federalreserve.gov/publications/files/20240301_mprfullreport.pdf.

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