

Assessing a Medium-Run Natural Rate of Interest

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The natural rate of interest is the inflation-adjusted interest rate consistent with the economy operating at full capacity. Although this rate helps gauge the economy's health, empirical estimates of it are imprecise and volatile. A medium-run measure that focuses on responsiveness to persistent economic factors while removing short-term volatility may provide more reliable guidance. Analysis suggests that monetary policy using this measure could stabilize inflation and achieve maximum employment more effectively than standard benchmarks. Current medium-run estimates suggest that monetary policy is accommodative, although uncertainty around this estimate remains high.

The natural rate of interest is the real, or inflation-adjusted, interest rate consistent with the economy operating at full capacity with maximum employment. The natural rate is thus an essential benchmark for understanding how monetary policy can best achieve the Federal Reserve's dual mandate of stable prices and maximum employment. When the real federal funds rate exceeds the natural rate, policy is tight, slowing spending and reducing pressure on the economy and inflation. Conversely, when the real rate falls below the natural rate, policy is accommodative, boosting spending and adding upward pressure on inflation.

While the natural rate changes with economic conditions, it is not directly observable and must be estimated. This poses a challenge for policymakers because estimates vary considerably depending on the length of time, or horizon, considered. Policymakers need a measure that is reliable enough to guide current policy without being so detached from present conditions that it becomes irrelevant.

This *Economic Letter* proposes a medium-run natural rate based on Cúrdia (2026) that offers three key advantages. First, it is more stable than short-run natural rate estimates, filtering out excessive volatility that can undermine policy guidance. Second, it achieves the dual mandate more effectively than long-run natural rate estimates by remaining responsive to current economic conditions rather than focusing solely on long-horizon trends. Third, it provides timely signals by responding to economic pressures before they fully materialize in inflation and unemployment data.

Although estimates of the natural rate are inherently imprecise, analyzing potential scenarios suggests that using the medium-run natural rate to set the federal funds rate could make inflation and employment more likely to remain close to their target levels compared with alternative approaches using short-run or long-run horizons. The current estimate of the medium-run real natural rate is approximately 1.5%. Adjusted for inflation, the real federal funds rate is below the natural rate, suggesting a somewhat accommodative monetary policy stance.

The natural rate of interest in theory and practice

Federal Open Market Committee actions are often characterized as setting the federal funds rate in response to how much inflation misses its target, called the inflation gap, and how far the economy is from its full capacity level for maximum employment, called the output gap. Taylor (1993) showed that U.S. monetary policy from 1987 to 1992 was well characterized by using a rule with these guidelines plus a constant term, known as a Taylor rule.

Woodford (2003) discussed the possibility that this type of rule can be a good characterization of where the policy rate ought to be, after replacing the constant term with the time-varying level of the natural rate of interest. To understand why responding to the natural rate is useful, consider the analogy of a boat and an iceberg. If the boat steers away in response to the visible part of the iceberg, then it may be too late and not nearly enough. However, if it can use sonar to estimate the size of the iceberg underneath, the boat can steer away in a more timely and effective way. The natural rate of interest is like the sonar equivalent of underlying demand pressures, in addition to observing current inflation and economic activity measures.

However, unlike the iceberg, the natural rate is hard to measure. If a natural rate estimate is not accurate then policymakers may steer the economy too much or not enough. One of the first empirical measures of the natural rate of interest was *r-star*, introduced by Laubach and Williams (2003). Conceptually, *r-star* is designed to capture medium- to long-run economic pressures; accordingly, the estimation approach ensures it responds only to very persistent changes. Since then, several other statistical models have been developed to measure the long-run level of the fed funds rate.

Finding the appropriate time horizon for estimating the natural rate is challenging. Short-run estimates of the natural rate track recent economic developments closely but are notoriously volatile and imprecise. In contrast, long-run estimates that reflect the expected natural rate after temporary economic pressures fade are more stable but provide limited guidance for current policy decisions.

In Cúrdia (2026), I propose a medium-run measure that averages short-run natural rate projections into the future, putting more weight on fluctuations up to five years ahead. Like *r-star*, this approach emphasizes persistent changes in the natural rate. However, unlike *r-star*, it also captures significant short-term movements driven by abrupt economic shifts, such as those during the COVID-19 pandemic period. For example, estimates of the medium-run measure during the pandemic period would have signaled the need to lower the federal funds rate ahead of movements in inflation and unemployment, avoiding delays in policy action from responding only to persistent shocks.

Estimates of the medium-run natural rate

I measure the medium-run natural rate path by estimating the macroeconomic model of Cúrdia (2026) with data from 1987 through the fourth quarter of 2025 for inflation, economic growth, and interest rates.

The blue line in Figure 1 shows the median estimate, and the shaded area surrounding the line represents 90% uncertainty bands measuring the range of accuracy. For comparison, the red line is the Holston, Laubach, and Williams (2023) estimate of *r-star*, HLW for short.

The medium-run natural rate estimate captures the lowest points of economic activity, known as business cycle troughs, in the early 2000s, the 2008 financial crisis, and the 2020 pandemic. By comparison, the HLW measure captures the overall trend movement in the natural rate but smooths over large transitory fluctuations in the economic cycles, especially troughs.

During the 2008 financial crisis, both measures declined. The medium-run natural rate fell nearly 5 percentage points in the first year, driven primarily by persistent disruptions from the financial crisis. The measure also captured part of the transitory weakness in household demand that contributed to the initial trough in the early 2000s. As these demand-side disruptions eased, the natural rate gradually recovered over the following decade. In contrast, the HLW r-star measure responded only to the persistent component, resulting in a more stable and modest decline.

The pandemic episode offered more contrast between the two measures. During this period, economic pressures were substantial but transitory, resolving within three years. The medium-run natural rate accounts only partially for such very large pressures if they are transitory; all in all, the medium-run natural rate of interest dropped nearly 4 percentage points. By contrast, r-star did not respond noticeably to the disruption.

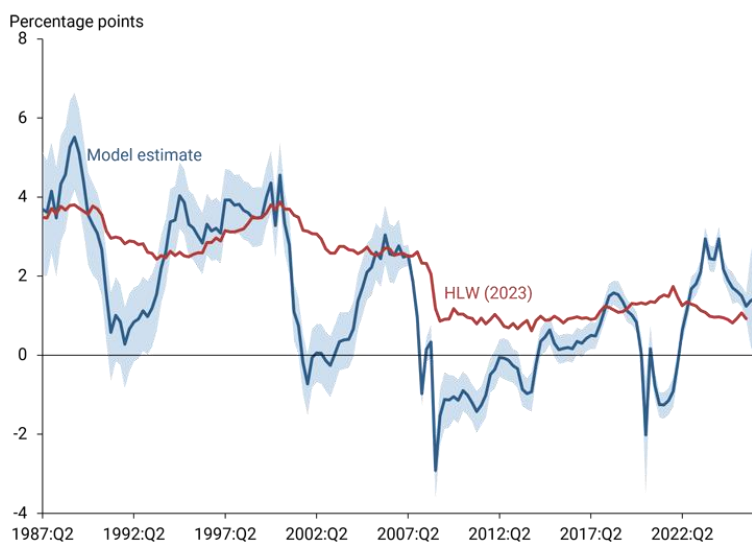
From a policy perspective, this implies that the medium-run natural rate can give a more immediate forward-looking signal of economic weakness to motivate immediate policy rate adjustment, while longer-run measures such as r-star generally let observed data on inflation and economic activity motivate policy rate changes more slowly over subsequent quarters, unless there are persistent changes to economic pressures.

The current estimate of the medium-run real natural rate is approximately 1.5%. With the federal funds rate target at 3.5 to 3.75% and inflation hovering at 3%, the implied real rate of 0.5 to 0.75% is below the natural rate, which suggests a somewhat accommodative monetary policy stance.

How much does the choice of the natural rate affect economic outcomes?

To assess which measure of the natural rate is best to guide policy, I compare three approaches: a policy rule that responds to the short-run natural rate; a rule that responds to the medium-run measure; and a rule that assumes that the natural rate is constant, effectively a long-run measure. In each case, I use the estimated model dynamics to simulate hypothetical forecasts at a two-year-ahead horizon—a horizon that is commonly used to judge policy rules, since it takes time for interest rate changes to fully work through the

Figure 1
Medium-run natural rate of interest (annualized)



Source: Cúrdia (2026), Holston, Laubach, and Williams (HLW 2023), and author's calculations.

economy. I then compare the average gap for each outcome from its target level across different simulations. The model does not explicitly estimate unemployment, but I extrapolate the outcome based on the historical rule that unemployment moves by half as much as the output gap.

Figure 2 shows that when policy responds to the short-run natural rate, the average gaps for output and unemployment are smaller than when it responds to the medium-run natural rate. Namely, unemployment is on average 0.2 percentage point closer to target when using the short-run natural rate, compared to the result using the medium-run measure. The average inflation gap is similar for those two approaches. This is at the cost of the federal funds rate having to move on average 0.2 percentage point further away from its long-run level. If policy assumes a constant natural rate, then the federal funds rate is more stable, but the dual mandate misses are much larger.

At face value, this could be a reason to adopt the short-run measure and accept a little more movement in the interest rate. However, these simulations assume that the Federal Reserve knows exactly what the true natural rate is at all times, which is not plausible. Policymakers only have imperfect measures of the natural rate, which could lead them to make changes to the policy rate that are different from what the true underlying conditions would warrant.

To account for this, I repeat the simulations considering that such measurement errors are more substantial for the short-run than for the medium-run measures based on their different estimation uncertainty. I then recalculate the average gaps from target for each outcome.

Figure 3 shows that, after accounting for measurement error, the average gaps for inflation are still comparable for the short- and medium-run measures, while output and unemployment are now slightly smaller when using the medium-run natural rate compared with using the short-run natural rate, by a little less than 0.1 percentage point. The average deviation of the federal funds rate from its long-run

Figure 2
Comparing outcome gaps for alternative policy rules

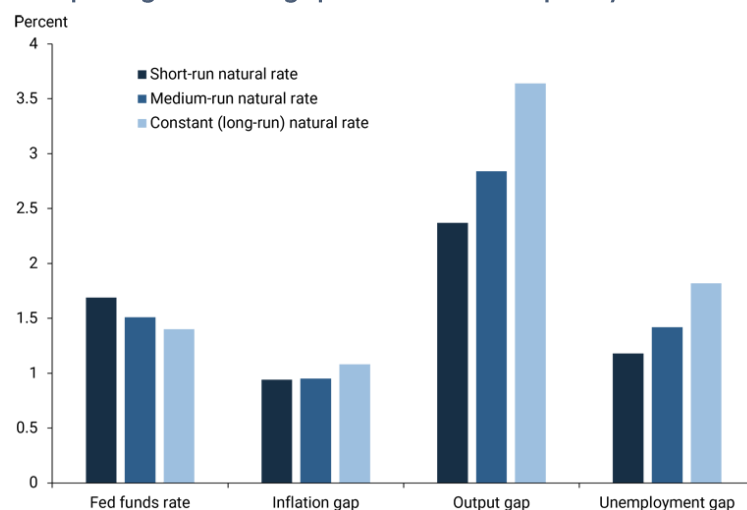
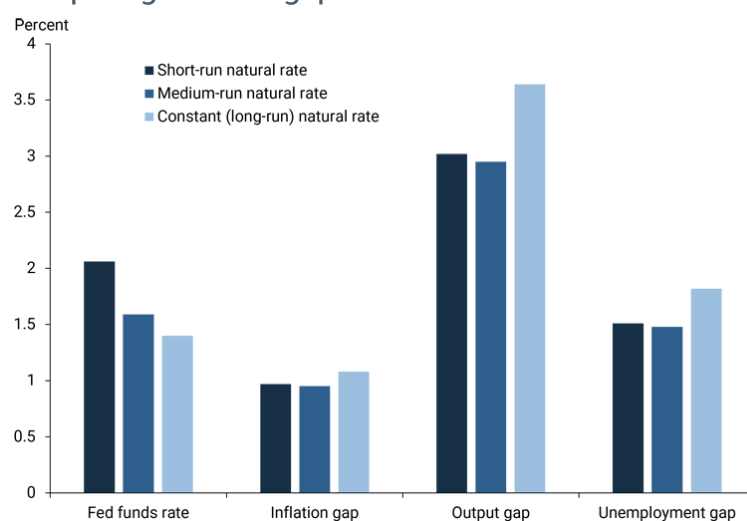


Figure 3
Comparing outcome gaps with measurement error



estimated level drops from 2.1 to 1.6 percentage points. Thus, responding to the medium-run natural rate yields better economic stabilization with less interest rate volatility, a clear improvement.

Conclusion

The natural rate of interest is an elusive but important metric for the conduct of monetary policy. This *Letter* shows that a medium-run natural rate can be a useful benchmark for monetary policy, offering a clearer signal than a long-run natural rate that ignores transitory changes to the economy but also avoiding excessive reliance on a volatile and potentially mismeasured short-run natural rate. As a result, accounting for the medium-run natural rate when setting the federal funds rate could lead to smaller expected misses of the dual mandate goals relative to those two alternative approaches. As of August 2026, estimates of the medium-run real natural rate suggest that monetary policy is accommodative, although it's important to keep in mind that the uncertainty around this estimate remains high.

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Data

[Download data for figures](#) (Excel, 259 kb)

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