Regional Economic Outlook ANALYTICAL NOTES
FALL 2012
Western Hemisphere Department

On Neutral Interest Rates in Latin America

By Nicolas E. Magud and Evridiki Tsounta†

Introduction

An increasing number of Latin American countries have been strengthening their monetary policy frameworks to contain inflation and anchor inflation expectations since the late 1990s. Some of them moved to inflation targeting, using a policy interest rate as the main instrument. When calibrating the monetary policy stance, policymakers need to know how the current interest rate compares to a benchmark or *neutral* rate.

The concept of the neutral interest rate was originally suggested by Wicksell (1898), who defined the *natural* real interest as the long-run equilibrium rate that equates saving and investment (thus, being non-inflationary, or neutral); and which in the absence of frictions would equal the marginal product of capital.

Against this background, in this paper we focus on the short-run neutral real *policy* interest rate, which is the rate consistent with a closed output gap and stable inflation. The short-run neutral rate might differ from the long-run natural interest rate due to market frictions or other temporary conditions. Moreover, the short-run neutral rate can change over time given changes in macroeconomic fundamentals and global interest rates.[1]

This note estimates monthly neutral real (policy) interest rates (NRIRs) for ten Latin American countries starting in the early 2000s. The sample includes countries that either have a full-fledged inflation targeting (IT) regime in place (namely Brazil, Chile, Colombia, Mexico, Peru, and Uruguay) or have recently transitioned to it (Costa Rica, Dominican Republic, Guatemala, and Paraguay).

As there is no single best estimation method, and recognizing differences in country characteristics and data availability, a battery of different methodologies is used to compute a NRIR *range* for each country rather than a specific point estimate (see Annex). We also use these estimates to assess the appropriateness of the stance of monetary policy and its implications for the output and inflation gaps over the past few years, and to explore the role of macro-prudential policies (MaPPs) in affecting this stance.

Neutral Interest Rate Estimates

Cross-Country Comparisons

Despite differences in methodologies, and notwithstanding data limitations, we find alternative NRIR estimates for each country to be clustered typically within 200 basis points and generally consistent with those reported in country-specific studies (Figure 1).

Neutral policy rates tend to be lower in countries with stronger monetary frameworks and economic fundamentals that are more financially open and developed. Notable exceptions are Brazil and Uruguay, where neutral rates are among the highest in the region and across emerging economies.[2]

Better fundamentals usually imply lower NRIRs as they translate into lower and better anchored

† Regional Studies Division, Western Hemisphere Department, IMF. Based on Magud and Tsounta (2012).

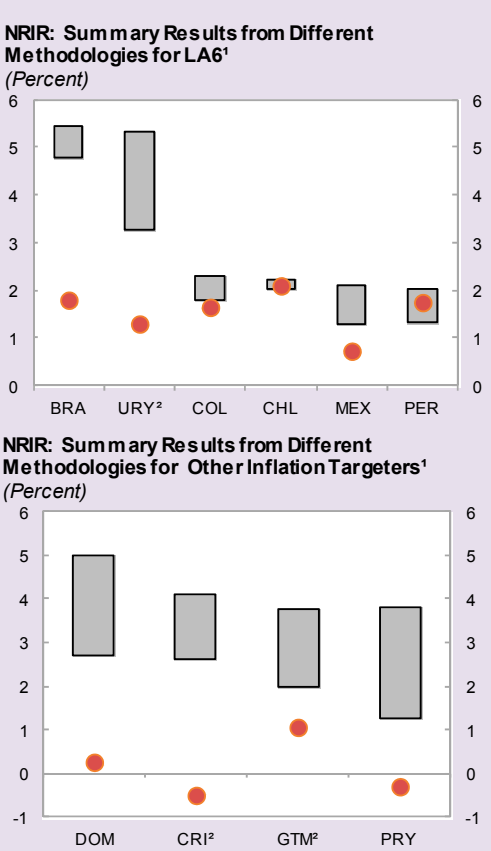
1 The NRIR is an unobservable variable, like the natural rate of unemployment and the output gap.

2 Possible reasons for Brazil's interest rate puzzle include Brazil's historically high public debt and low domestic saving, widespread financial indexation, and strong presence of public banks.

inflation expectations and country risk premiums.[3] Meanwhile, more financially developed and open countries tend to face a lower cost of raising capital and are generally less liquidity constrained. Funding frictions, resulting from capital controls, dollarization, or less developed domestic financial markets, can increase a country's risk premium, often exacerbating weak economic fundamentals.

We also find that economies with weaker monetary frameworks, and thus higher inflation risk premiums (like those with less developed IT regimes), exhibit wider ranges in their NRIR estimates although data limitations may be a factor behind this larger dispersion.

Figure 1. Neutral interest rates: cross-country variations.

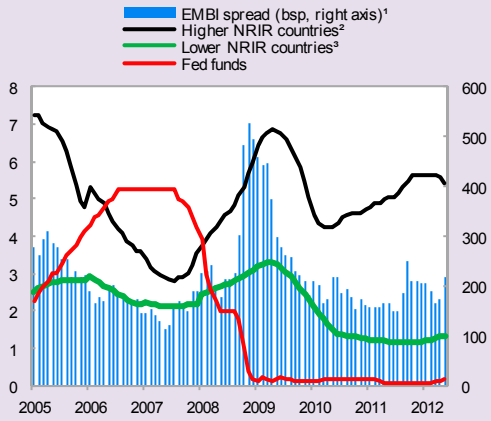


Source: Authors' calculations.
¹ Red dots denote end-August 2012 real policy rate (deflated by expected inflation). Rectangles represent values (end-May 2012) for NRIR ranges (excluding outliers).
²For Costa Rica, Guatemala, and Uruguay, a sub-sample of methodologies is used due to data limitations.

Declining Trend

There has been a downward trend in the NRIR in the last decade, with the exception of Brazil and Uruguay more recently (Figure 2). This downward trend possibly reflects the region's stronger economic fundamentals (such as lower exchange rate risks and inflation risk premiums, and fiscal consolidations that has taken place during the last decade), as well as easing global financial conditions that have increased available savings in the region. Hence, as global conditions normalize over the medium term, it is likely that we will see some reversal of the recent trajectory of NRIRs.

Figure 2. Neutral interest rates: declining trends.



Sources: Bloomberg; St. Louis Federal Reserve; and IMF staff calculations.
¹Average of Brazil, Chile, Colombia, Mexico, Peru, and Uruguay.
²Average of Brazil and Uruguay (dynamic Taylor rule for both).
³Average of Chile, Colombia, Mexico, and Peru. For Chile and Peru the NRIR is estimated using the savings-investment approach, for Colombia the dynamic Taylor rule is used, while for Mexico the implicit common stochastic trend.

Effectiveness of Monetary Policy

Using the estimated NRIR,[4] we construct the interest rate gap—the difference between the actual and neutral real policy interest rates, which is an indicator of the stance of monetary policy—as a proxy for domestic financial conditions. Visual inspection in financially integrated economies reveals that (Figures 1 and 3):

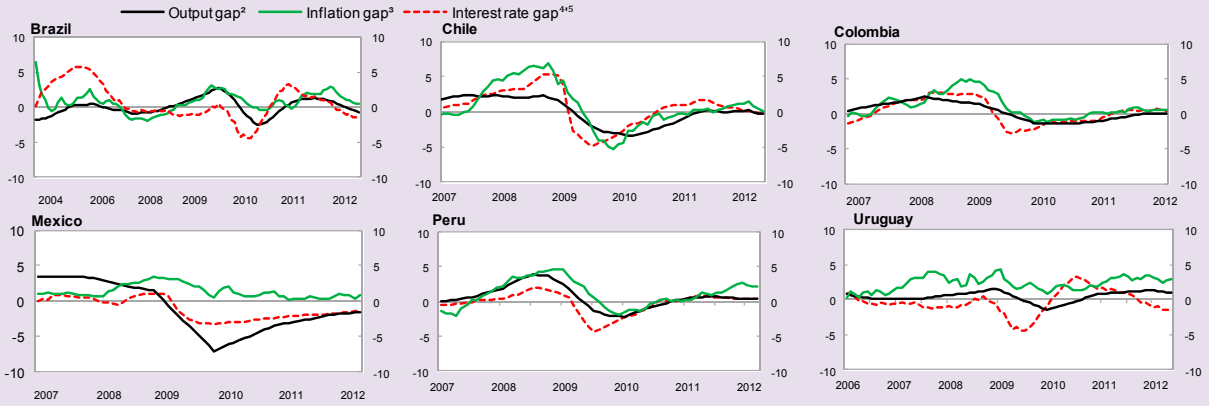
[3] Stronger fundamentals have also been associated with relatively more developed countries, which tend to have a lower marginal product of capital.

[4] Mostly based on the models' data availability and strength of results for each country.

Figure 3. Effectiveness of monetary policy.

Latin America: Output, Interest, and Inflation Gaps[1]

(Percent)



Source: Authors' calculations.
[1] Data as of end–May 2012
[2] Difference between actual and potential real GDP as a percent of potential GDP.
[3] Difference between actual and target inflation.
[4] Difference between actual and neutral real interest rate. An increasing gap implies monetary policy tightening and vice-versa.
[5] The NRIR is estimated using the savings-investment approach for Brazil and Mexico, the implicit common stochastic trend method for Colombia, the Dynamic Taylor rule for Peru and Uruguay, and the expected inflation-augmented Taylor rule for Mexico. The choice of model for each country is mostly based on data availability and strength of results, despite little variation across models.

- Interest rate gaps and output gaps are positively correlated.[5] This observed correlation would suggest that central banks have been responding counter-cyclically to business cycle fluctuations. In addition, monetary policy appears to have been effective in fine-tuning the business cycle, as periods of accommodative monetary policy (negative interest rate gaps) are often followed by shrinking (negative) output gaps—and vice versa.

- For most countries studied, the interest rate gap is negatively correlated with future GDP growth. Periods of expansionary monetary policy are followed (typically within 9 months) by above-trend growth. However, the impact on GDP dissipates as the interest rate approaches its neutral level. These findings are in line with the work of Neiss and Nelson (2003).

- As of end-August 2012, the stance of monetary policy seems to be appropriate in most countries with full-fledged IT regimes, with countries moving towards a neutral stance in line with narrowing output gaps. Monetary policy remains stimulative (with actual interest rates below neutral) in Brazil, where there is evidence that growth is starting to pick up supported by the monetary stimulus in place. In Mexico, a policy rate below its neutral level is consistent with the ongoing fiscal consolidation and a broadly closed output gap.

- When comparing interest rate gaps with the inflation gap—deviations of inflation from target–as in Woodford (2003), we observe that central banks typically undertake restrictive monetary policies if the rate of inflation exceeds the target (and vice-versa).

Countries that have recently transitioned toward a full-fledged IT regime (Costa Rica, Dominican Republic, Guatemala, and Paraguay), seem to have an accommodative monetary stance despite generally closed output gaps. These results need to be interpreted with caution, however, since changes in policy rates are not always reflected in market financing conditions in these countries given a relatively weak monetary transmission channel. This might be related to a high degree of financial dollarization, limited exchange rate flexibility, excess liquidity holdings by banks, and segmented short-term funding markets. For these countries, it might be useful to complement our estimated NRIRs with different measures of financial condition pressures

[5] Although some models jointly estimate the NRIR and the output gap, others don't. Yet, the correlation remains.

to improve the assessment of the stance monetary policy.

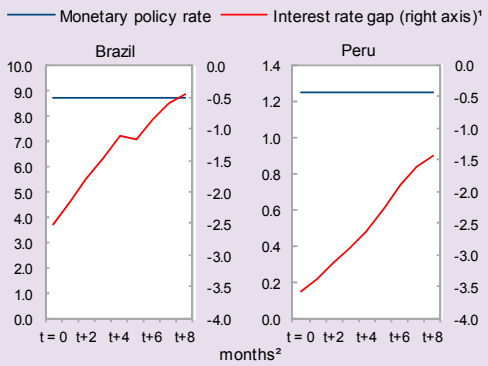
Macroprudential Policies and the Stance of Monetary Policy

In recent years, some countries in the region have also used less conventional measures to affect financial conditions, known as macro-prudential policies (MaPPs). These include, among others, changing reserve requirements, imposing limits on currency mismatches or loan-to-value ratios, or imposing specific asset risk weights. In this section, we explore how MaPPs might have affected our estimated neutral real (policy) interest rate, based on an event analysis for Brazil and Peru post-Lehman (Figure 4).

Following significant monetary easing amid the global financial crisis, both Brazil and Peru started implementing restrictive MaPPs in the second half of 2009 to contain domestic credit, without altering their policy rate (see Magud and Tsounta (2012) for details). These measures reduced the estimated neutral policy rate (NRIR), possibly through tightening credit conditions, and resulted in a less accommodative monetary stance (i.e., increase the interest rate gap).[6]

The above event analysis suggests that MaPPs could supplement standard macroeconomic policies by directly affecting the credit channel. MaPPs could thereby safeguard financial stability without the unintended consequences of higher capital inflows that a rise in the policy rate might entail. That said, more research is needed to better understand and quantify the impact of specific macroprudential policies on credit growth, the output gap, and thus the neutral real interest rate, as well as to determine whether this impact is of a temporary or permanent nature.

Figure 4. Restrictive macroprudential policies and their impact on the interest rate gap.



Source: IMF staff calculations.
¹ The interest rate gap, computed as the monetary policy rate minus the NRIR, is based on the saving-investment approach (Brazil) and the dynamic Taulor rule (Peru) estimated neutral rates.
² t=0 represents July 2009 for Brazil and September 2009 for Peru.

Conclusion

This note presents various estimates of the NRIR for a group of 10 Latin American countries based on several methodologies commonly used in the literature. Key findings include:

- Countries with deeper financial markets, well-established IT frameworks, and stronger fundamentals tend to enjoy a lower NRIR.
- NRIRs have been on a downward trend for most countries, possibly reflecting easy external financial conditions along with stronger fundamentals.
- The stance of monetary policy, measured by the interest rate gap, is generally a good predictor of future economic growth and inflation. The current monetary stance is about neutral in several of the financially-integrated economies in the region, consistent with closing output gaps. Monetary policy remains stimulative in Brazil, where there is evidence that growth is starting to pick up, while in Mexico the policy rate is below its neutral level in line with the ongoing fiscal consolidation and a broadly closed output gap.

[6] Results appear to be symmetric for macroprudential loosening measures.

- We also find that the current monetary stance in countries that recently adopted inflation targeting appears somewhat accommodative despite generally closed output gaps. However data limitations and weak monetary transmission mechanisms might hinder these NRIR estimates from accurately capturing domestic financing conditions.

- Preliminary evidence from Brazil and Peru suggests that macroprudential policies could affect the interest rate gap through the estimated neutral real (policy) interest rate, even when the policy rate remains unchanged. However, more work is needed to appropriately quantify the impact of MaPPs on the economy.

Our findings should be interpreted with some caution, particularly in countries with data limitations and thinner capital markets, where the monetary transmission mechanism is generally weak. Notwithstanding these limitations, having a range for the neutral interest rate based on commonly used methodologies can allow central bankers to better calibrate their monetary policy decisions.

References

Magud, N.E., and E. Tsounta, "To Cut or not to Cut? That's the (Central Bank's) Question. In Search of the Neutral Interest Rate in Latin America," IMF Working Paper 12/243 (Washington: International Monetary Fund).

Neiss, K., and E. Nelson, 2003, "The Real Interest Rate Gap as an Inflation Indicator," *Macroeconomic Dynamics,* Vol. 7, No. 2, pp. 239–62.

Wicksell, K., 1898, *Geldzins und Guterpreise*, translated by R.F. Kahn, 1936, as "Interest and Prices."

Woodford, M., 2003, *Interest and Prices: Foundations of a Theory of Monetary Policy* (Princeton : Princeton University Press).

Annex: Data and Methodology

NRIRs are estimated using different static and dynamic models commonly used in the literature (for details see Magud and Tsounta, 2012).

Static approaches estimate the NRIR as the rate that equalizes saving and investment in the stationary (long-run) state. Two different methods are considered, where the NRIR is the rate that makes investors indifferent between (1) holding domestic and foreign financial assets (no arbitrage opportunities; *interest rate parity condition*), and (2) holding domestic assets today or in the future (*consumption smoothing model*). These analyses use data on inflation, short-run interest rates (e.g., 90-day central bank paper), sovereign risk premiums, potential GDP growth, and assumptions about risk aversion and time preferences. These static models, which provide an estimate of the NRIR at a point in time, are less data-demanding than dynamic ones, and thus can be easily applied to economies with thinner capital markets.

Dynamic approaches tend to be based on more complex modeling strategies and provide time-varying estimates for the NRIR. Various methodologies are employed, including (i) utilizing information captured in the yield curve—where a steepening yield curve could imply that the current rate is below the neutral level, as a rise in inflation is expected (referred to as the implicit common stochastic trend model); (ii) using the (dynamic) Taylor rule, which relates the interest rate to deviations of inflation from the target and deviations of output from its potential level; and (iii) estimating a savings and investment equilibrium model to obtain time-varying neutral rates.

These dynamic methodologies have the advantage of being able to capture (at least partially) changes in macroeconomic fundamentals, although they are far more data-intensive and tend to work better in countries with more sophisticated domestic capital markets.