What is the Equilibrium Real Interest Rate for the Philippines?

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There are alternative methods of estimating the equilibrium real interest rate of an economy. The simplest method is via historical averages of benchmark or market interest rates, say over 10 to 20 years, or period averages during years characterized as "normal" conditions which correspond to the time periods during which inflation was low and stable and external conditions were relatively stable. The drawback in these approaches, however, is that the long-run real interest rate is assumed to be constant over time. The averaging method does not take into account movements in the long-run real interest rate through time, which are affected by periods of transition and structural changes in the economy. A constant benchmark may be applicable only for developed countries which are more or less approaching their long-run equilibrium output.

Another approach uses a time-varying equilibrium interest rate or the Neutral Real Interest Rate (NRR) via a simple and intuitive non-model approach. Under this method, market data contained in the yield curve are derived, based on the approach of Basdevant, Bjorksten, and Karagedikli (2004) of the Reserve Bank of New Zealand.

This paper aims to measure the long-term real interest rate for the Philippines using various alternative methods of estimating a benchmark or long-run real interest rate for an economy using market interest rate data between 1998 and 2008.

THE DIFFERENT MEASURES

1. Historical Average of Real Market Interest Rates (1998 – 2008)

a. Average of the real 91-day Treasury bill (T-bill) rate - 1.2943 percent

The 91-day T-bill rate has been considered the benchmark market interest rate, with other market interest rates following suit.[2] It has also been observed to respond to BSP's policy rates particularly during the inflation targeting period beginning in 2001.[3] By around Q3 2008, however, there appears to be some divergence between the two rates, as the global financial crisis has weakened to a certain extent the traditional transmission mechanism of the interest rate channel to the real economy. In the first half of 2008, for example, the 91-day T-bill rate has generally continued to trend down (or remain low) despite the increases in the policy interest rates. The Bureau of the Treasury (BTr) continued to reject bids in the T-bill auctions at that time, citing that the bid rates were too high. Primary T-bill rates only began to increase around the fourth quarter of 2008 as fiscal requirements increased and the fiscal stimulus plan was conceptualized.

b. Average of the real 364-day T-bill rate – 3.0592 percent

Alternatively, the volume of subscription is historically higher in the auction for 1-year

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[2] Granger causality tests showed that the RRP rate Granger causes both 91-day and 364-day Tbill rates in the primary market at the 1% confidence level.

[3] Dakila and Claveria (2006) in their study of an impulse response analysis of the reverse repurchase (RRP) rate and the 91-day T-bill rate from a vector autoregression (VAR), showed that a one-time shock in the RRP rate by one percentage point leads to a maximum increase in the 91-day T-bill rate of 0.70 percentage point in the second month and dissipates thereafter.

T-bills so that the 364-day T-bill rate could be considered as a better benchmark instead of the 91-day T-bill rate. However, even the 364-day T-bill rate shows some divergence from the movements in the policy rates of the BSP as movements in the rates were observed to depend on the auction results and the BTr's acceptance of bids. During the period when the BTr suspended the offering of 364-day T-bills, the disassociation of primary market rates from the BSP policy rates became more evident.

c. Average of the real 364-day T-bill secondary market rate – 3.4767 percent

Secondary market yields, on the other hand, showed an increased responsiveness to movements in the policy rates.[4] Although trading in the secondary market is also driven by factors other than monetary policy developments, it has been generally influenced directly by market expectations on the monetary policy stance and, in the case of longer tenors, on inflation expectations going forward.

2. Average of Real Market Interest Rates During Periods of Stable Inflation

Under this framework, we can select the average of the real market interest rates in 2002-2003 or in 2007, which correspond to the time periods during which inflation has been low and stable in the country.

2002-03:	Real 364-day secondary market yields	4.6665 %
	Real 364-day T-bill rates	4.0287 %
2007:	Real 364-day secondary market yields	2.6596 %
	Real 364-day T-bill rates	2.2154 %

The drawback in the use of historical or period averages is that it assumes that the long-run real interest rate is constant over time. The averaging method does not take into account movements in the long-run real interest rate

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[4] Granger causality tests reveal that the RRP rate Granger causes the 91-day Tbill rate in the secondary market at the 10% confidence level; while the 91-day Tbill Granger causes the 364-day Tbill rate in the secondary market at the 5% confidence level.

through time, as it is affected by periods of transition and structural changes in the economy. A constant benchmark may be applicable only for developed countries which are more or less approaching their long run equilibrium output.

3. Long-Run Trend of the Real Market Interest Rate

A third alternative in estimating the long-run real interest rate is measuring the long-term trend in real market interest rates. This may be done using the Hodrick-Prescott filter. However, because the objective of monetary policy is to ensure positive real interest rates for the proper functioning of the financial markets, we will exclude the recent periods of negative real interest rates, treating these as extraordinary episodes brought about by the global financial crises affecting the transmission mechanism in the economy adversely. Using this methodology, we see that by 2008, the HP trend for the real 364-day T-bill rate (excluding the negative real interest rate episodes) is about 1.99 percent.

4. The Estimation of the Neutral Real Interest Rate (NRR)

The fourth approach involves estimating the NRR as the long-run real interest rate of the economy. The NRR concept dates back to Wicksell (1898) though a more modern version is expressed in Svensson (2001):

"In the longer term, the central bank must set its instrument rate so that on average the short real rate is equal to the neutral real rate. The neutral real rate is the real rate that is consistent with output equal to potential output. It is largely determined by factors other than monetary policy."

This approach makes use of market data that are contained in the yield curve and involves measuring the long-term real interest rates during periods of neutral monetary policy. This is estimated by considering the extent to which the actual interest rate differential between short and long-term market rates deviates from the average differential. The real interest rate gap between short and long-

term rates hence indicates whether monetary policy is tight or loose.

The idea is that over the business cycle, monetary policy settings must on average be neutral if inflation is stable, such that the yield spread will revert to its mean (Karagedikli, et. al., 2004). However, we revise the formula from Karagedikli, et. al. slightly as illustrated below by making use of the historical average real 364-day secondary market rate over the period1998-2008 in place of the actual real 364-day secondary market rates, to provide some stability in the estimates.

NRR = [average (1-year secondary rates - actual inflation rate)] - ((real 1- year secondary - real 5-year secondary rates) - (real 1-year secondary average - real 5-year secondary average))

Under this framework, we arrive at fairly similar results as in the long-term HP trend of real market interest rates (excluding the negative real interest rates) approach. For 2008, the NRR is at 2.455 percent while the HP trend of the NRR is at 1.897 percent.

CONCLUSION

It is important to have some measure of the long-term real interest rate of the economy that would guide monetary policy decision-making. Given the respective strengths and limitations of the alternative methods, and the fact that the equilibrium interest rate is an unobservable variable, this study allows us to have an indicative range for the long-term positive real interest rate for the Philippines. Based on the estimation above (please see table), the equilibrium real interest rate for the Philippines would be somewhere between 1.9 percent (based on the NRR framework) to a maximum of 2.7 percent (based on the 2007 period of price stability approach).

As the global economy begins its normalization process during the aftermath of the financial crisis, there are several issues that a central bank needs to consider when taking the decision to unwind the extraordinary monetary policy measures implemented during the crisis. One of the more important considerations is that if the decision to exit is taken too late, financial sector instability may ensue. However, if the decision is taken too early, the recovery process may be undermined.

	Historical Average of Real Market Interest Rates	Average Real Market Interest Rates During Periods of Stable Inflation		HP* Trend of the Real Market Interest Rate	Neutral Real Rate (NRR)	HP Trend of NRR
	(1998-2008)	2002-2003	2007	2008	2008	2008
91-day T-bill [1]	1.2943					
364-day T-bill [1]	3.0592	4.0287	2.2154	1.9900	2.455	1.8970
364-day T-bill [2]	3.4767	4.6650	2.6596			

[1]/ T-bill rates in the primary market

[2]/ T-bill rates in the secondary market

*HP= Hodrick-Prescott

Under the forward-looking inflation targeting framework, the policy interest rate cycle should anticipate the economic cycle, by about 12 to 24 months depending on the lag of monetary policy. This means that interest rates should peak well ahead of the peak of the cycle and start rising well ahead of the trough. The uncertainties surrounding this decision include one important unknown: the uncertainty about the end point of the tightening phase, i.e., the so-called natural long-term level of the interest rate.

For this purpose, this study has helped in giving us a range of values for the equilibrium real interest rate for the Philippines, the midpoint of which is at about 2.3 percent. As an initial estimate, this value allows us to compare current real market interest rates with the long-term rate for the economy, thus enabling the BSP to estimate a Taylor-rule type of policy rule as an additional guidepost for monetary policy.

There is a need to develop a model-based approach to estimate the NRR for the Philippines that will improve the estimates and the BSP's forecasting capability for an unobservable variable such as the NRR. For example, a State Space Model using the Kalman Filter to estimate a time-varying, model-based NRR can be used in place of the initial non-model approach in this paper, to serve as a more dynamic estimation of the benchmark long-term equilibrium real interest rate level and an input to a forward-looking Taylor policy rule estimation. This will be a topic for future study in the BSP.

References

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