Are Interest Rates Too High?
Taylor's Rule versus SARB's Rules

A Research Note on Economic Policy

cannon asset managers

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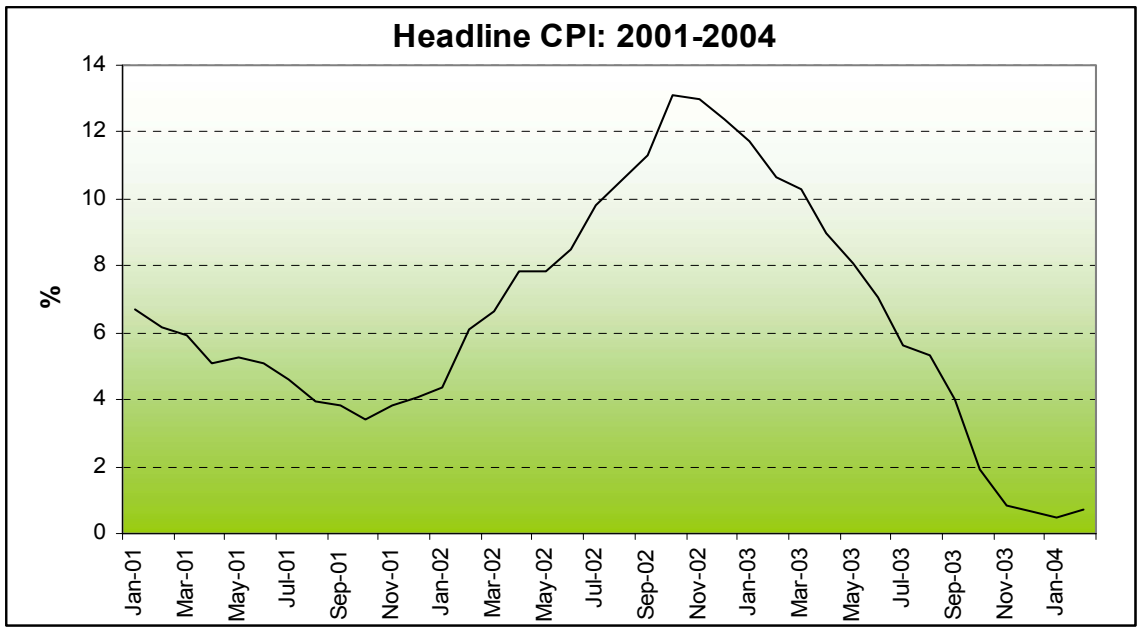
Executive Summary

This report is offered as a service to the clients of Cannon Asset Managers (Pty) Ltd, the company's subsidiaries and its associates. The report provides insights into our views on interest rates and monetary policy in the South African setting. The study employs a monetary policy rule, known as the Taylor Rule, to investigate these topics. The findings suggest that the stance of the South African Reserve Bank (SARB) is appropriate in terms of current interest rate policy. In other words, contrary to popular perception, the key lending rate set by the SARB apparently is not 'too high' given South Africa's current economic conditions.

However, the study also argues that the SARB's approach to setting rates through time may be costly to the economy. Specifically, on the basis of the Taylor Rule, the findings reveal that SARB's interest rate policy tends to be overly restrictive and excessively cautious. The argument also suggests that SARB's approach to adjustment of the key lending rate tends to be reactive. In terms of monetary policy formulation, these attributes of SARB policy may be costly to an economy that is struggling to achieve acceptable rates of economic growth and battling to create jobs.

1. Is the Interest Rate in South Africa Too High?[1]

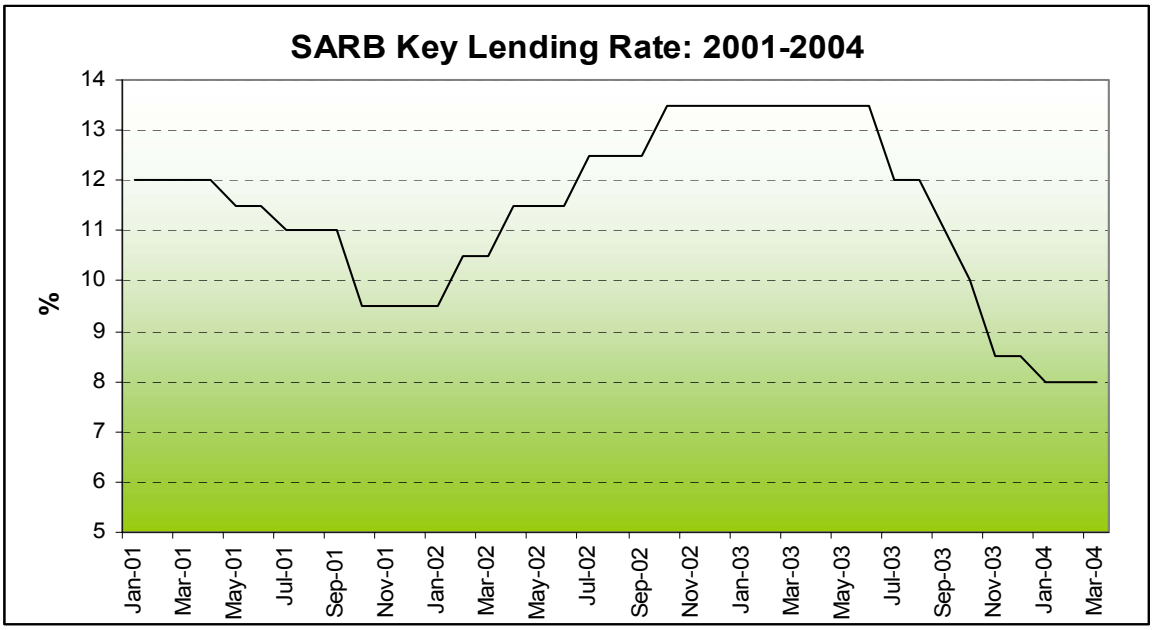
Over the past two years, the rate of consumer price inflation in the South African economy has plunged. As illustrated by Figure 1 below, since peaking in October 2002 at just over 13 percent, year-on-year headline inflation, as measured by the consumer price index (CPI), has fallen to a current level of below one percent. Rand strength has been a primary driver of this decline in the rate of price inflation.



Source: Statistics South Africa

Over the same period, the South African Reserve Bank (SARB) has reduced its key lending rate, the 'repo' rate, in sympathy with lower domestic CPI inflation. Softer global interest rates and a dampened rate of expansion in the domestic economy have furthered the case for lower domestic interest rates. However, whilst domestic lending rates have declined over the past 18 months, the decrease has been far smaller than the decline in CPI inflation. For instance, in October 2002 the year-on-year rate of CPI inflation peaked at 13.1 percent, whilst the 'repo' rate simultaneously peaked at 13.5 percent. Since then, CPI inflation has declined by 12.4 percentage points, reaching an annual rate of 0.7 percent in February 2004. Over the same period, the 'repo' rate has declined by a much smaller 5.5 percentage points to 8.0 percent. These recent movements in the 'repo' rate are shown in Figure 2 below.

[1] The author would like to thank two anonymous referees for helpful comments. The usual caveats apply.

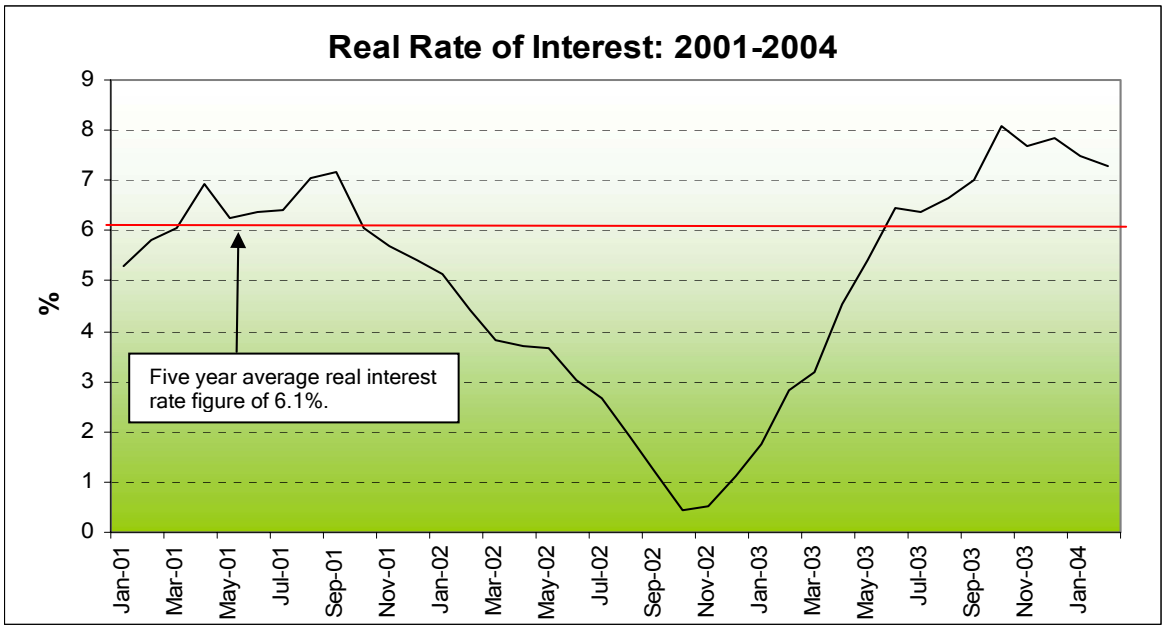


Source: SARB

As a consequence of the above forces and trends, the real rate of interest in the South African setting has increased sharply over the past 18 months.[2] More specifically, since falling to 0.4 percent in October 2002, the real rate of interest has climbed steeply to a recent peak of 8.1 percent in October 2003. Furthermore, whilst subsequent shifts in interest rates and price inflation have helped to reduce the real interest rate over the past five months, the current differential of 7.3 percent (as at February 2004) is high by recent standards (see Figure 3).

That said, when viewed from a longer-term stance, the current real interest rate differential is only modestly higher than the average of 6.1 percent recorded over the past five years (February 1998 to February 2004).

[2] The real rate of interest is equal to the difference between the nominal interest rate and the rate of consumer price inflation.

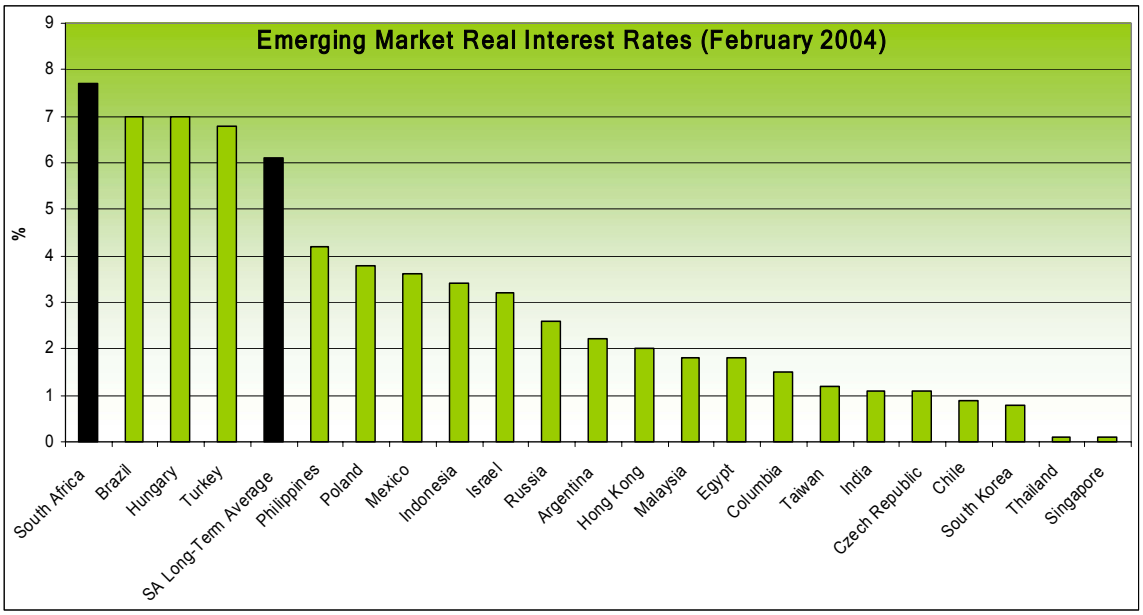


Source: SARB and Cannon Asset Managers

2. Implications of Interest Rates for Economic Performance

The high real rate of interest has various implications for the South African economy. For instance, high real interest rates are widely perceived to be an important explanatory factor behind the Rand's strength over the past two years. In turn, recent evidence suggests that the strength of the Rand has undermined the competitiveness – and so growth – of important components of the local economy (especially the mining and manufacturing sectors, which account for about one-third of economic activity).

As an aside, it is instructive to compare South Africa's current real interest rate with rates in other emerging markets. Using CPI inflation, the figure below provides a comparison between South Africa' real interest rate and rates in other emerging markets. It is evident that South Africa's current rate and long-term average rate are high by emerging market standards.



Source: Adapted from Econometrix

Comparisons aside, it is commonly accepted that high real interest rates retard economic expansion. In the South African context, three obvious transmission mechanisms exist:

- High real interest rates attract short-term capital inflows. This flow of funds into the country causes the domestic currency to appreciate. A stronger domestic currency erodes the competitiveness and profitability of South African exports and, simultaneously, increases levels of (cheaper) imported goods and services.[3]
- High real interest rates discourage consumer spending.
- All else equal, higher real interest rates raise the cost of capital which reduces levels of fixed investment spending.

Given that the current real interest rate is seen to be high by South Africa's historical record, as well as relative to other emerging markets, it is unsurprising, at first blush, that widespread calls have come for the SARB to lower its key lending rate in order to aid economic growth. However, the SARB appears committed to its 'tight money' stance to squeeze price inflation out of the South African economy.

These juxtaposed positions give rise to the important question: 'What real interest rate is sufficient to squeeze inflation out of the domestic economy without compromising economic growth?'. Or, more simply, what is the right level for real interest rates in the South Africa setting?

[3] The mechanism described may also have monetary implications. For example the process described can be expected to affect the level of the domestic money supply. However, the argument presented here is concerned chiefly with real economic effects.

3. Taylor's Rule versus SARB's Rule

Whilst the question can be approached from various angles, helpful guidance on the issue is provided by what is known as the Taylor Rule.[4] The roots of the Taylor Rule can be traced back to the use of rules in monetary policy. Essentially, this school of thought argues that monetary policy should be fundamentally automatic. In particular, the central bank should be required to follow a series of simple, pre-specified and publicly announced rules in setting interest rates or controlling money supply. In the case of interest rates, one such rule is provided by the so-called Taylor Rule, introduced by John Taylor of Stanford University in the United States.[5]

The Taylor Rule is given by:

$$R^*_t = \pi_t + \pi^* + \alpha(\pi_t - \pi^*) + \beta(Y_t - Y^*),$$

where:

R^*_t is the equilibrium real short-term interest rate in period t;
π_t is the rate of price inflation at period t, measured over the previous four quarters;
π^* is the targeted rate of inflation; and
$Y_t - Y^*$ is the output gap at period t, measured as a percentage deviation of actual gross domestic product from potential gross domestic product.

The parameters α and β are assumed to be equal to 0.5.

Thus, the Taylor Rule requires that the real interest rate ($R^*_t - \pi_t$) responds to (a) the difference between current output (Y_t) and full-employment output (Y^*); and (b) the difference between current inflation (π_t) and targeted inflation (π^*). On this basis, if the economy is overheating with output growing faster than full-employment output and inflation rising, then the Taylor Rule requires the central bank to hike the interest rate. Conversely, if the economy is sluggish, with output and inflation declining, then the Taylor Rule requires the central bank to reduce the interest rate. Thus, a consistent monetary policy rule is established.

Returning to the argument, using the Taylor Rule, it is thus possible to assess whether the key lending rate set by the SARB is currently at an appropriate level.

[4] Evidence gathered from the Japanese, North American and British economies suggests that the Taylor Rule can offer useful guidance on interest rate policy. However, as is the case with most topics in macroeconomics, the issue is not without its critics; more work needs to be done.
[5] See Abel, A.B. and Bernanke, B.S. (2001) *Macroeconomics*, 4th edition. Boston: Addison Wesley.

The following values are assumed for the inputs required to calculate the appropriate current (March 2004) key lending rate:

r^*_t = 8.0 percent, the current 'repo' rate set by the SARB;
π_t = 4.8 percent, the annual rate of price inflation for February 2004;[6]
π^* = 4.5 percent, the mid-point of the SARB's targeted inflation rate of 3.0 percent to 6.0 percent; and
$Y_t - Y^*$ = -2.0 percent, which is the output gap prevailing at end February 2004. The figure is derived from various data sources, including the SARB's Quarterly Bulletin and Statistics South Africa.

Thus, the appropriate rate of interest is calculated as:

$$R^*_t = \pi_t + \pi^* + \alpha(\pi_t - \pi^*) + \beta(Y_t - Y^*)$$
$$= 4.8 + 4.5 + 0.5(4.8\text{-}4.5) + 0.5(98.0\text{-}100.0)$$
$$= 8.45$$

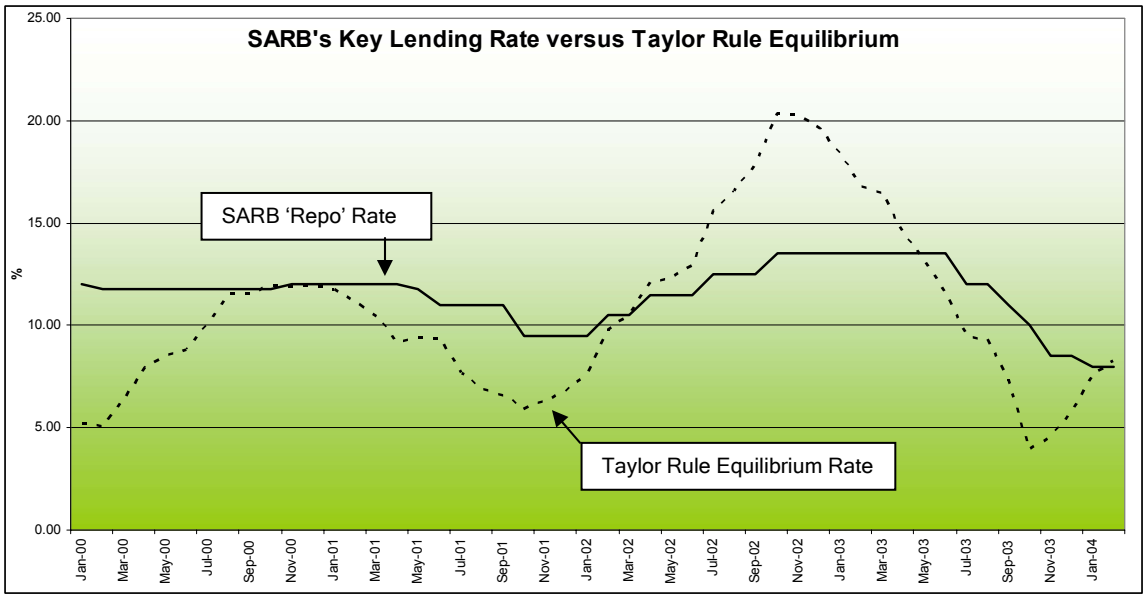
On the basis of the Taylor Rule, then, the equilibrium rate of interest is calculated to be 8.45 percent. This is marginally higher than the current 'repo' rate of 8.0 percent. So, if anything, the current 'repo' rate is found to be 'too low'. However, the calculations carried out above must allow for errors in measurement, as well as expectations of future inflation rate movements. We consider a margin of 50 basis points – or 0.5 pecent – sufficient to cater for measurement errors and expectation variances. On this basis, then, it appears that, contrary to popular perception, the 'repo' rate of 8.0 percent appropriately accommodates South Africa's extant inflation and production conditions.

4. The Taylor Rule in a Dynamic Setting

However, whilst the current 'repo' rate appears appropriate, a different picture emerges if one compares movements in the 'repo' rate to the equilibrium rate indicated by the Taylor Rule across time. For the sake of consistency, this exercise is conducted for the period 2000 to present (the period during which inflation targeting has been formally adopted by the SARB).

The results of the exercise, which are shown in the figure below, offer at least three useful insights into domestic monetary policy.

[6] The rate of price inflation is measured by way of CPIX (CPI less mortgage prices), as opposed to CPI. This is consistent with other studies. More notably, the use of CPIX, as opposed to CPI, is consistent with the inflation target adopted by the SARB.

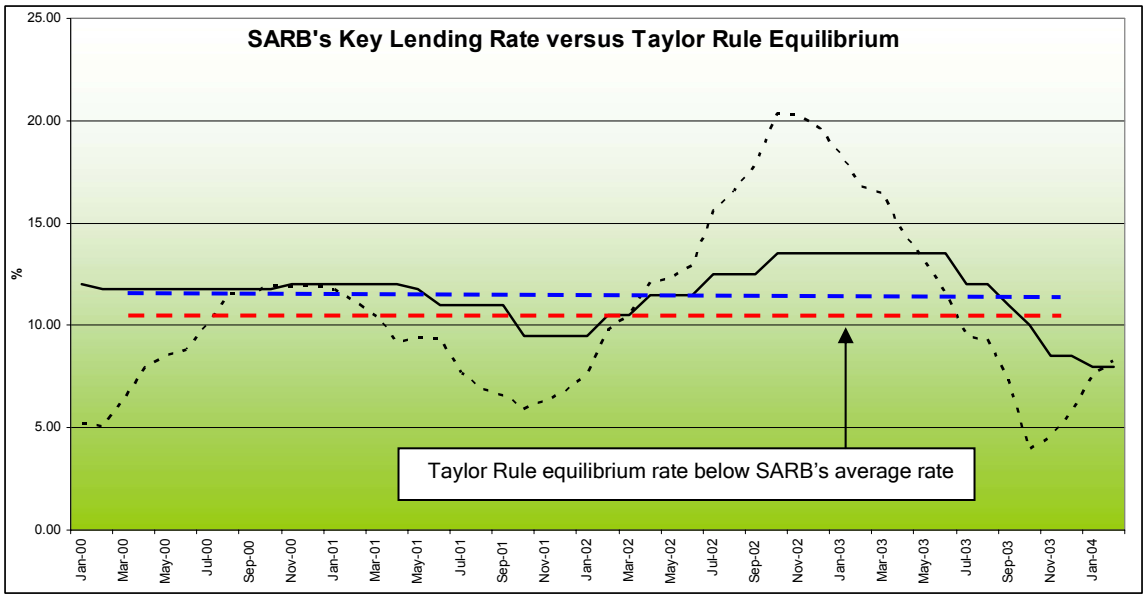


Source: Cannon Asset Managers and SARB

First, if assessed on the basis of the Taylor Rule, then it would appear that the SARB is generally less active in adjusting rates than the rule suggests. This point is illustrated by the fact that the 'repo' rate moves in a far tighter band than the equilibrium Taylor Rule rate. Over the sample period, the 'repo' rate moved between a low of 8.0 percent and a high of 13.5 percent. In contrast, the equilibrium Taylor Rule rate ranged between 3.9 percent and 20.3 percent. Thus, on the basis of the Taylor Rule, the SARB is under-reactive.[7]

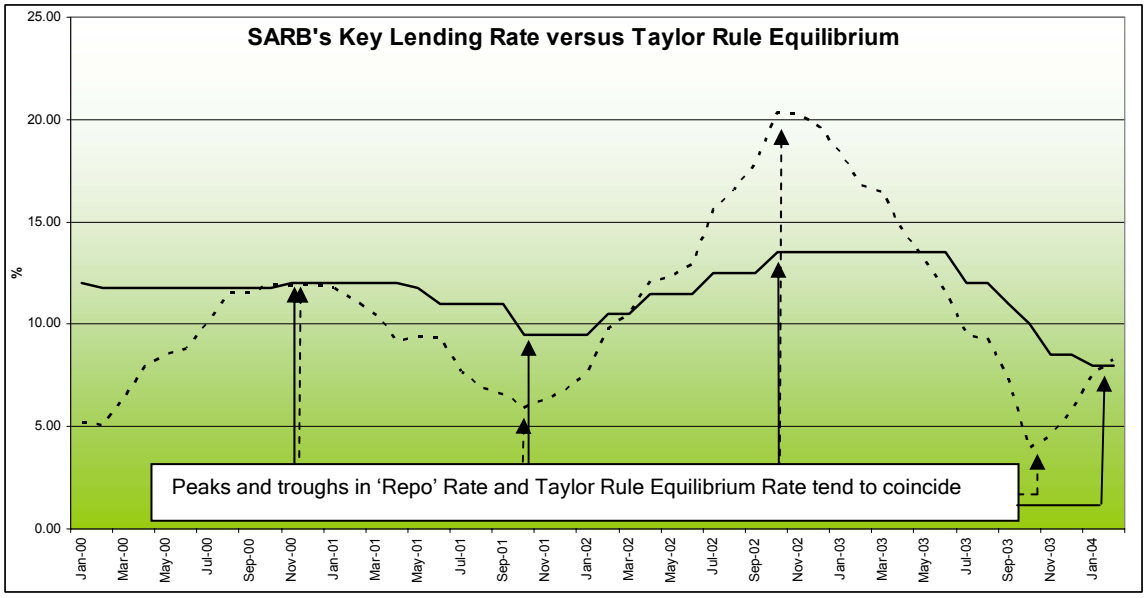
Second, the time series analysis reveals that, on average, the SARB's monetary policy stance is more restrictive than the Taylor Rule suggests. Over the survey period, the average for the 'repo' rate is 11.5 percent, as compared to the 10.7 percent equilibrium rate calculated from the Taylor Rule. This overly restrictive stance may help explain the SARB's recent effectiveness in combating consumer price inflation whilst, at the same time, offering insights into why the domestic economy has struggled to achieved higher rates of economic growth.

[7] Of course adjusting the interest rate on a 'dynamic basis' implies a highly volatile headline interest rates Thus, the benefits of fine tuning rates need to be weighed up against the costs of volatile interest rates. Still, the point that the SARB appears ot be under-reactive holds.

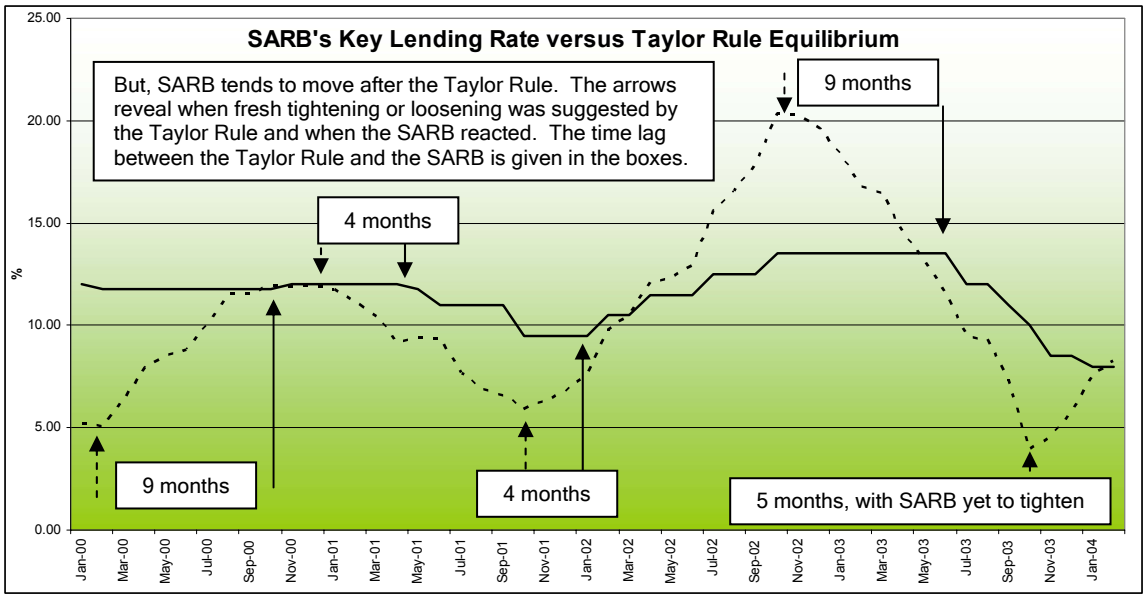


Source: Cannon Asset Managers and SARB

Third, the analysis suggests that the SARB tends to be 'behind the curve' in its policy decisions. Specifically, peaks and troughs in the 'repo' rate and the Taylor Rule rate tend to coincide closely. However, over the survey period, the 'repo' rate has tended to be adjusted upwards or downwards after the Taylor Rule rate has begun to move. The figures below summarise this third set of arguments.



Source: Cannon Asset Managers and SARB



Source: Cannon Asset Managers and SARB

As can be gleaned from the above figure, over the sample period the SARB has completed two cycles of loosening and tightening. However, over the survey period, the SARB's reaction time has lagged the Taylor Rule by an average of 6.5 months. Thus, the SARB is apparently slow to react in adjusting rates. On this score, the current lag between the Taylor Rule and the SARB in rate tightening stands at five months. Further, the likelihood of the SARB hiking rates when the Monetary Policy Committee meets in April appears to be low. On the back of this argument, it seems that the SARB will increase this average lag time in the current cycle.

In summary, the SARB's current interest rate stance appears appropriate for the extant economic environment. However, the analysis conducted suggests that when assessed across time, the SARB's monetary policy stance, as reflected by the key lending rate, appears to be overly restrictive, relatively rigid and sluggish. As noted in Section 2, the SARB's stance may have implications for the South African economy by undermining competitiveness, profitability and growth of South African companies – especially export-oriented firms; hampering consumer spending activity; and discouraging investment spending – a critical ingredient to securing long-term economic growth.

5. Summary

In summary, the analysis conducted in this paper reveals that from the perspective of the so-called Taylor Rule, interest rates in South Africa are not 'too high'. Indeed, allowing for small errors that are caused by measurement problems and expectations, it is found that the current 'repo' rate of 8.0 percent appropriately accommodates South Africa's extant price inflation and production

conditions. However, this conclusion applies to a point in time and, if one takes a longer-term perspective, then three factors emerge from the above analysis that may have material implications for the South African economy.

First, the analysis suggests that, all else equal, the SARB is overly restrictive in its monetary policy stance. Across time, the 'repo' rate has averaged higher than the Taylor Rule equilibrium rate. Second, the SARB appears to be slow to react in adjusting rates. Over the sample period, for two completed cycles of loosening and tightening, the SARB's reaction time has lagged the Taylor Rule by an average of 6.5 months. The current lag between the Taylor Rule and the SARB stands at five months. Given that the SARB is unlikely to hike rates when the Monetary Policy Committee meets in April, it appears that the SARB is set to protect this average lag time in the current cycle. Third, the SARB appears to be overly cautious in the extent of rate adjustments, moving the key lending rate in a band that is tighter than the range suggested by the Taylor Rule. In a phrase, the SARB under-reacts.

Thus, whilst the current 'repo' rate appears to be appropriate, the 'groping' process of interest rate adjustment followed by the SARB may be costly for the South African economy. All else equal, it would seem that the central bank's method of setting the interest rate results in an interest rate that is higher than necessary. Interest rate policy also appears to be more rigid than desirable, with the situation exacerbated by the SARB's apparent slow reaction time. These factors will have ramifications for the economy. For instance, higher interest rates will produce a stronger Rand, lower levels of exports, lower rates of investment and, consequently, a slower pace of economic growth. Whilst positive spin-offs may emerge in the form of lower consumer price inflation, this would appear to be a high price to pay in an economy that is struggling to generate sufficient rates of economic growth to attract investment or create jobs. If this is the case, then it may be opportune for the SARB to move away from extant SARB-based rules and towards Taylor-based rules in setting the interest rate in South Africa.