The Sensitivity of South African Inflation Expectations to Surprises

Monique Reid
University of Stellenbosch

Abstract

The maintenance of price stability is widely recognised as the primary goal of modern monetary policy and the management of private sector expectations has become an essential channel through which this goal is achieved. This evaluation aims to improve our understanding of the degree to which the South African Reserve Bank has succeeded at anchoring private sector expectations. In this paper, the methodology of Gurkaynack, Sack and Swanson (2005a) is adopted in order to measure the sensitivity of the South African inflation expectations to 'surprises'. A comparison of the South African results with those of the countries in the original studies supports the contention that the South African Reserve Bank has anchored inflation expectations relatively well and that inflation targeting offers a useful framework for the management of private-sector expectations.

1. INTRODUCTION

The maintenance of price stability is widely recognised as the primary goal of modern monetary policy and the management of private sector expectations has become an essential channel through which this goal is achieved. The inflation targeting framework for monetary policy adopted by the South African Reserve Bank is a forward looking regime. At its core, it claims to anchor private sector inflation expectations, facilitating the achievement of price stability while limiting the output sacrifice. This central claim is evaluated in this paper and it is found that the South African Reserve Bank's success at anchoring inflation expectations compares well with other leading inflations targeters.

Despite this success, the lack of coordination in South Africa between policy-makers and the market on several occasions, suggests that there may be room for improvement in the communication by the SARB. Despite warnings of a possible rate hike by the Governor of the South African Reserve Bank, Tito Mboweni, the markets were generally surprised by the April

2005 and June 2006 rise in the interest rate. The data available to the market and the communication from the Reserve Bank had not convinced the market that the threat was credible (Joffe, 2006) and analysts questioned the reasons given by the central bank for the rate increase.

Section 2 provides a theoretical exploration of modern monetary policy and section 3 reviews the available evidence regarding the transparency and credibility of South African monetary policy. Then methodology of Gurkaynack, Sack and Swanson (2005a) is adopted in section 4 in order to measure the sensitivity of the South African inflation expectations to 'surprises'. A comparison of the South African results with those of the countries in the original studies supports the contention that the South African Reserve Bank has anchored inflation expectations relatively well and that inflation targeting offers a useful framework for the management of private-sector expectations.

2. MODERN MONETARY POLICY

It seems appropriate to base any critical evaluation of the operation of monetary policy in South Africa, or proposal for its improvement, on a sound understanding of the objectives and challenges facing contemporary monetary policy. Price stability has become widely accepted as the primary goal of monetary policy[1]. Monetarists emphasised the long-term effects of monetary policy in the pursuit of price stability, with Friedman (1968) calling attention to the lags between the implementation of monetary policy and its effects in the real world. This focus on the long-term naturally drew attention to the role of expectations and required that purposeful monetary policy be forward-looking.

If we recognise that economic policy is not a once-off, static decision, we must be conscious about the implications of applying policy in a dynamic setting. Optimal control theory has been widely used for dynamic problems, including policy decisions. If the private sector is a passive participant, the benevolent policy maker could maximise the social outcome by making the optimal decision, based on the state of the economy at the time and the historical development of policy up to that point.

[1] This approach acknowledges that monetary policy is not an appropriate way to pursue economic growth, but that price stability is a *prerequisite* for achieving sustainable growth and job creation.

In practice policy decisions are complicated by the fact that the setting within which they are typically made is dynamic in terms of the interaction between thinking agents over time. Not only do policy makers assess the environment and make decisions that they deem best, but the public also act in their own best interests. Monetary policy models have largely been based on this assumption that decision makers form expectations in a 'rational' way. This calls attention to the strategic nature of the interaction - through their economic decisions, the private sector and the monetary authority's impact on one another's decisions. These ideas have had substantial implications for policy, guided by compelling developments in the theory[2].

In an evaluation of four monetary regimes, Mishkin (1999) identifies the use of a nominal anchor as a fundamental commonality. He describes a nominal anchor narrowly as 'a constraint on the value of domestic money' and more broadly as 'a constraint on discretionary policy' (1999: 1). He concludes that transparency and accountability are essential to this end, regardless of the specific strategy adopted by the country. By maintaining transparency, central banks are allowing themselves to be held accountable and limiting their own discretion.

In conclusion, transparency, accountability, credibility and commitment to rules-based policies have become central to the implementation of modern monetary policy. When policy makers commit themselves to greater transparency and accountability, in a way that is believable, they give their policy credibility. If their commitment to low inflation is regarded as trustworthy, the markets should believe that inflationary spikes are transitory. Their inflation expectations of the longer term future would remain low, so they would not adjust their market decisions in such a way as to add further upward inflationary pressure. This would allow the monetary authority to use less aggressive adjustments to their instrument to maintain price stability and the cost of tighter monetary policy on output (the sacrifice ratio) would be lower.

[2] Theoretical developments of particular relevance are: the Lucas critique (Lucas, 1976), the understanding that policy can be time inconsistent (Kydland and Prescott, 1977), and the definition of monetary policy as a *path* of policy stances over time (Sargent and Wallace, 1981).

3. REVIEW OF THE EVIDENCE: TRANSPARENCY AND CREDIBILITY OF SOUTH AFRICAN MONETARY POLICY

Current discussion surrounding inflation expectations and the degree to which the South African Reserve Bank is effectively managing expectations in South Africa is dominated by analyses of macroeconomic trends, inflation expectations surveys and 'break-even' rates (the difference between nominal and inflation-indexed bonds of similar maturity) (see Reid (2008) for a more comprehensive discussion of these). However, none of the above measures directly examines the relationship between the changes in the monetary policy instrument and other market interest rates.

Ballim and Moolman (2005) contribute to the literature by investigating the impact of changes in the repo rate on a range of financial market instruments, in order to capture the response of interest rates at different horizons. These include forward rate agreements (FRAs) with maturities of less than a year and government bonds with longer maturities. Using a variety of empirical tests, they find strong correlation (diminishing with longer horizons) between movements in the repo rate and short-term interest rates, and they find that the majority of the market adjustment occurs *before* the decision is announced, suggesting that markets are anticipating changes in the repo rate.

Aron and Muellbauer (2006) extend the former study by using FRAs with different dimensions to identify the expectations of the markets regarding the following policy decision more clearly. However, their results are similar to those of Ballim and Moolman (2005).

These two studies begin to empirically scrutinise the causal relationship between monetary policy and the market interest rates. Aron and Muellbauer (2006) still question the strong policy conclusions by Ballim and Moolman and propose that a comparison of the magnitudes of the responses with those of another country would provide more indication of the room for improvement.

To avoid measurement error, it is also preferable to use the 'surprise' (the difference between the forecasted value and the actual value realised) of the market after the announcement of a monetary policy decision, rather than simply the change in the repo rate, as the independent variable. The markets may be surprised by the failure of the SARB to adjust the repo rate, or conversely a change in the policy rate may be entirely anticipated, so we get a more precise measure of the new information presented to the market for them to consider when pricing their instruments by measuring their surprise. These issues will be addressed by the empirical study in the following section.

4. THE SENSITIVITY OF INFLATION EXPECTATIONS TO 'SURPRISES' IN SOUTH AFRICA

Recent work in a series of papers beginning with Gurkaynack, Sack and Swanson (2005a), have offered exciting new insights. They investigated the impact of new information (macroeconomic data and monetary policy 'surprises') on the short-term and long-term interest rates (the term structure of the interest rate).

Using advances in the literature regarding how to measure the market's expectations of interest rates and inflation in a period far in the future, Gurkaynack, Sack and Swanson (2005a) find that long term expectations (as captured by the long-term interest rates) in the US are not as well anchored[3] as one might have expected. Subsequent research found that the long-term inflation expectations in the US and the pre- 1997 UK (before the BoE gained independence[4]) were far more sensitive to surprise information than those of Sweden and the post- 1997 UK (Gurkaynack, Levin and Swanson, 2006). They interpreted this as evidence that the anchoring of long-term inflation expectations was enhanced through inflation targeting.

These findings were reinforced through a study by Mauricio Larrain (2005) from the Central Bank of Chile, who examined the effect of monetary policy surprises on the term structure of interest rates in Chile. He found that inflation expectations in Chile (an emerging market) compared favourably with that of the US. The study by Gürkaynak, Sack and Swanson has

[3] A nominal anchor should convince the public that the authorities will control inflation in the long run, so the longer-term inflation expectations of the public should not react strongly to new information.
[4] The hypothesis is that an independent BoE should have more credibility because it reduces the extent to which the government can use monetary policy to pursue other goals and sacrifice the attainment of the BoE's objective.

also been extended to test its applicability for Canada and Chile (Gürkaynak, Levin, Marder and Swanson, 2005). The results bolstered those of the original study, with the forward inflation compensation (difference between the forward rates of nominal and real bonds) of Canada and Chile not showing significant response to domestic macroeconomic data and monetary policy surprises. An interesting peculiarity of this article is that the Canadian far-ahead interest rates did show a degree of sensitivity to news from the U.S., although it was still less than the response of the U.S.

That the inflation targeting central banks are more credible than the Federal Reserve Bank would be an unpersuasive argument. It is more likely that the systematic implementation and communication of monetary policy in the inflation targeting countries reduces the uncertainty experienced by the financial markets in these countries. If a central bank is more transparent about its plans for future policy, it would potentially be able to shape these market expectations more directly and improve coordination.

In this section, the methodology of Gürkaynack, Sack and Swanson (2005a), will be applied in order to evaluate the link between monetary policy and the financial markets in South Africa more directly. It will shed light on the degree to which the international findings of Gürkaynack, Sack and Swanson (2005a) are applicable to South Africa, and investigate how well inflation expectations have been anchored in South Africa over the past five years.

4.1. DATA AND METHODOLOGY

As with many studies performed in less developed countries, the availability of data, especially in the form required, was a challenge[5]. Following the model of Gürkaynack, Sack and Swanson (2005a), variables were created to capture the 'surprise' experienced by the markets following a number of macroeconomic data releases and monetary policy decisions; and the variable 'forward inflation compensation' was created, as a measure of the inflation expectations of the markets.

[5] In a footnote Gurkaynack, Levin and Swanson (2006) identify some of the ways in which data limitations (which tend to be worse in developing countries) have frustrated efforts to apply their methods to other inflation targeting countries.

This enables an estimate of the impact of the surprises on the inflation expectations of the market during this period, using the following regression:

$$\Delta FIC_t = \alpha + \beta_1 CPIX_t + \beta_2 GDP_t + \beta_3 CA_t + \beta_4 PPI_t + \beta_5 REPO_t + \varepsilon_t \quad (1)$$

The change in the forward inflation compensation on day t (ΔFIC_t) was regressed on the surprise components of the macroeconomic announcements on the corresponding day t. CPIX, GDP, CA and PPI are the surprise components of the consumer price index, gross domestic production, current account and producer price index data releases respectively; and REPO is the surprise component of the monetary policy decision regarding the setting of the repo rate. ε_t represents the factors that influence forward inflation compensation other than regressors used.

4.1.1. Macroeconomic surprises

The 'surprise' component of the macroeconomic data announcements was isolated to reflect the fact that the markets are forward looking and would have already incorporated any information that was available to them prior to the announcement. Abrupt movement of the interest rate shortly after the announcement would reflect the extent to which they misjudged the actual outcome. This is the extent to which the markets have received *new information*, which has not yet been priced in. To capture the surprise of the markets at the release of macroeconomic data, Gürkaynack, Sack and Swanson (2005) calculated the difference between the actual data released and the median forecast of a panel of professional forecasters, polled shortly before that data release.

$$surprise = actualrelease - medianforecast \quad (2)$$

For the purposes of this study of the South African situation, the macroeconomic variables considered were the consumer price index, producer price index, gross domestic product and the Current Account. These were selected due to the availability of survey data and their high degree of relevance for inflation expectations.

With regard to the actual data releases, Van Walbeeck (2006) recently expressed concern regarding the size of the official revisions to South African national accounts data and the impact of these on econometric studies that use this data. He found that the official figures were often adjusted substantially as more accurate information became available to the statistical authorities. The implication for the dataset used in this study is that the 'surprise' experienced by the market following a data release may be dispersed over time as the official figures are revised. On consideration, first release data was used, because, as Van Walbeeck (2006) pointed out, the first release does receive the most attention.

Series of consensus forecasts were required to capture the expectations of the markets regarding the relevant macroeconomic variables. The median of the forecasts from the panel of economists was used rather than the mean in order to limit the influence of changes in the composition of the panel of professional forecasters surveyed and to minimise the effect of outliers.

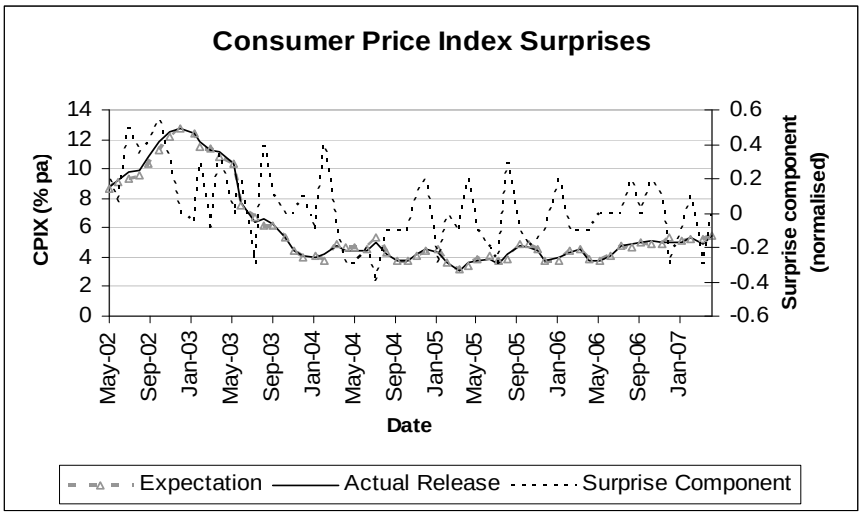
The precise publication dates of the data were necessary to match the forecast and actual data releases accurately, and then to match these surprise components with the movement in the forward inflation compensation on the day of each 'surprise'.

CPIX:

The first releases of CPIX were collected from consecutive issues of the SARB Quarterly Bulletin (2002 - 2007) by collecting only the last figures, which had not yet been revised, from each issue. Publication dates were provided by Stats SA and these were compared with media reports where available (Business Day, Various issues 2002 – 2007) to confirm that there were not discrepancies due to delayed release of data.

To capture the market's expectations of the CPIX, the Reuters 'Econometer'[6] was considered first as it is a comprehensive and reputable survey that has been conducted since October 1999. Unfortunately, although the economists are polled monthly, they forecast for the end of the quarter, so matching the CPIX data releases (released monthly) with the forecast becomes a bit contrived[7]. The Beeld newspaper, economist of the year competition posed the same problem. This increases the potential for measurement error and simultaneity. Alternatively, a series of surveys conducted by Bloomberg (2002 – 2007) within the week leading up to the data release were used for the forecast of CPIX. This allowed the surprise resulting from each, individual release to be captured more accurately.

Figure 1:



Source: Bloomberg, SARB Quarterly Bulletins (2002 - 2007), Stats SA (as above).
Surprise Component - own calculation

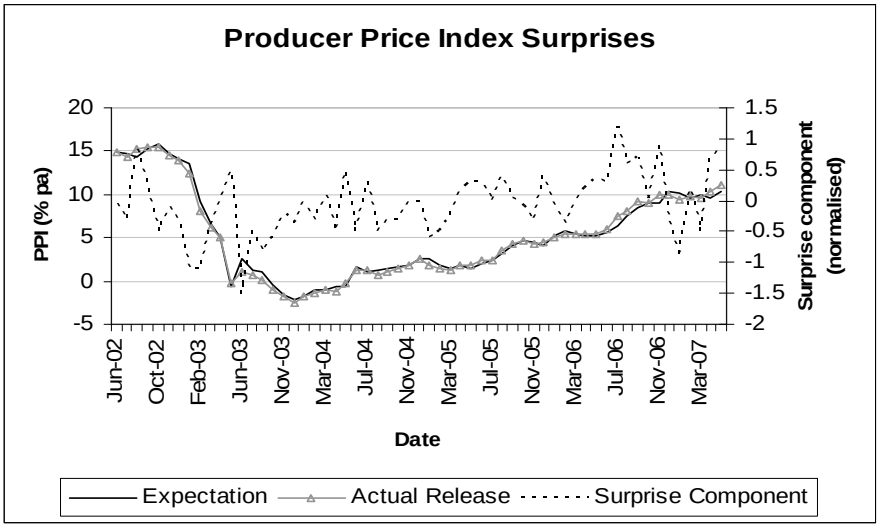
Figure 1 shows the actual CPIX series, the forecast CPIX series and the surprise component. The actual and forecast series run relatively closely together, which is confirmed by the dotted line representing the surprise component, which fluctuates gently around zero.

[6] Forecasts of a panel of professional economists.
[7] Although Reuters do survey the market's expectations of some data releases for a shorter horizon, these were not available further back than the past two years.

PPI:

The PPI is also released monthly. The first releases of the actual data and the forecasts (conducted in the week leading up to the data release) were received from Bloomberg. The dates on which the data was published were collected from consecutive, electronic statistical publications (Stats SA, 2002 - 2007).

Figure 2:

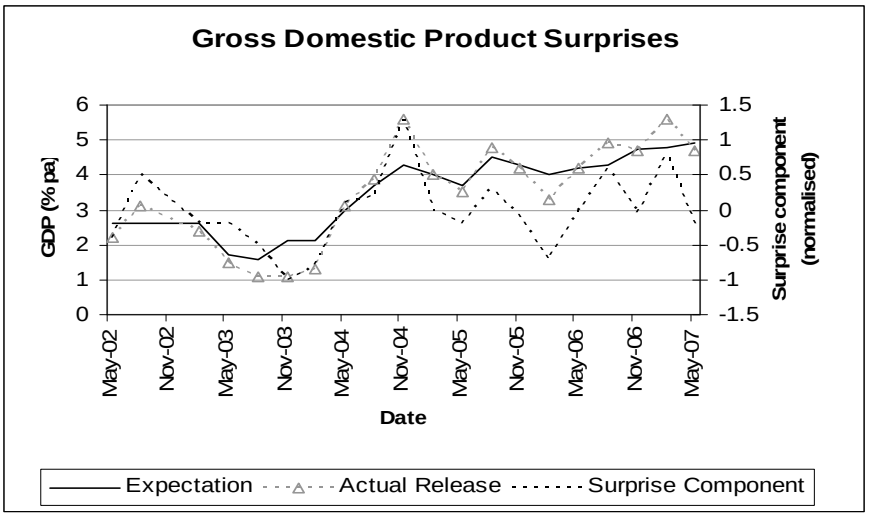


Source: Bloomberg, Stats SA (as above).
Surprise Component - own calculation

GDP:

Publication dates of the quarterly GDP series were collected from consecutive, electronic statistical publications by Stats SA (2002 – 2007). The first releases of the actual data were collected from SARB Quarterly Bulletins (2002 – 2007). The GDP forecasts were received from Bloomberg.

Figure 3:



Source: Bloomberg, SARB Quarterly Bulletins (2002 - 2007), Stats SA (as above).
Surprise Component - own calculation

Current Account:

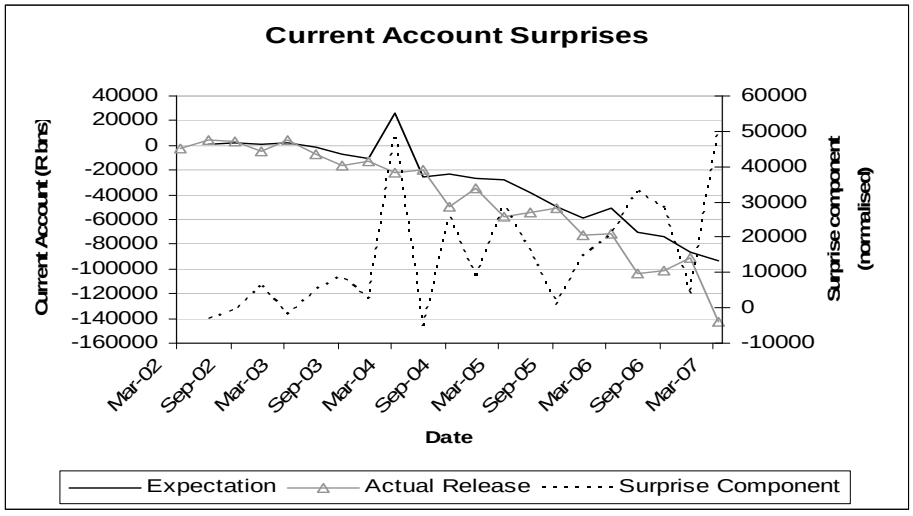
The first releases of the actual data were collected from consecutive issues of the SARB Quarterly Bulletin (2002 - 2007). The dates on which the SARB Quarterly Bulletins were released by the Reserve Bank, which would be the first public release of the current account data, was provided by the SARB[8].

Bloomberg did not provide forecasts of the current account releases the week before the data release. Instead, the Reuters Econometer was used, but this was not as much of a problem as for the CPIX, as the actual current account data is only released once a quarter. As described above, the Reuters panel forecasts monthly their expectation for

[8] Gratitude is expressed to Adri Cronjé of the SARB for providing the dates on which the Quarterly Bulletins were distributed.

the end of the quarter, so there are three forecasts of each quarter. The last forecast of the three before the release of the actual current account data (here the panel forecasts for the end of the month) was used in an attempt to capture the market's expectation of the current account balance as close to the data release as possible.

Figure 4:



Source: SARB, SARB Quarterly Bulletin (various issues, 2002 – 2007), Reuters Econometer. Surprise Component - own calculation

In order to ensure comparability of the macroeconomic 'surprises' and ease interpretation, the different macroeconomic surprises were normalised, by dividing by each series by its standard error (Gürkaynack, Sack and Swanson, 2005a). The coefficient on each macroeconomic surprise in the regression should be interpreted as the variation in the forward inflation compensation caused by a 1 standard deviation of the surprise.

4.1.2. Monetary policy surprises

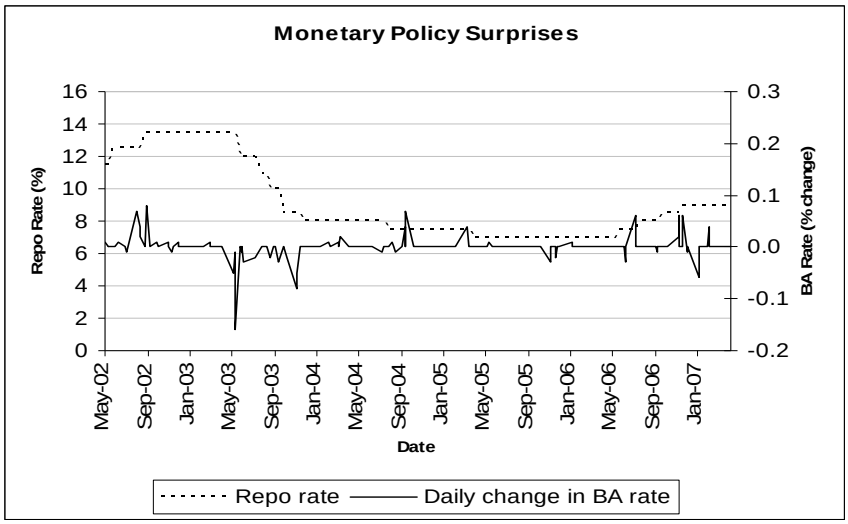
The surprise component for monetary policy was calculated using market data, rather than the surveys as this is available at a much higher frequency, and is of higher quality. The change in the 3 month Bankers Acceptance (BA) Rate (SARB, 2007) on the day after the monetary policy committee (MPC) makes its statement[9] was used as a proxy for this surprise component. The MPC announcement is made at 2pm, whereas the BA rate

[9] Dates of MPC meetings from MPC Statements (2002 – 2007).

is set by the banks at midday, so the BA rate would only reflect any surprise experienced by the markets the following day.

The monetary policy surprise series was not normalised, and the coefficient on REPO is interpretable as the basis point variation in the forward interest rate due to a basis point variation in the monetary policy surprise variable. Bear in mind that the MPC statement communicates the decision of the monetary policy committee regarding the present changes in the policy instrument, but it may also provide an indication of the possible *future* policy stance of the committee.

Figure 5:



Source: Data from the SARB

Figure 5 represents the surprise of the markets following a monetary policy decision (solid line) and the path of the actual monetary policy decisions (dashed line). Sharp movements of the solid line represents the times when the market was surprised by the monetary policy decisions. During the second half of 2002 and first half of 2003 when the repo rate was being adjusted frequently to manage the peak in inflation at the time, the market was more likely to misjudge the movements of the SARB. The two instances referred to earlier (April 2005 and June 2006), when the market strongly criticised the SARB for its lack of predictability, are also reflected in the figure.

4.1.3. Measurement of inflation expectations

Gürkaynack, Sack and Swanson (2005a) isolated the inflation expectations of the market by finding the forward inflation compensation, which is the difference between the nominal and real forward interest rates. Forward rate agreements, which are traded in the markets, are only available with horizons of up to one year, whereas longer horizons are more appropriate for this study. However yield, spot and forward rate curves all present the same underlying term structure information in different ways, so nominal and real implied forward rates could be calculated using bond data (Coleman, 1998). Implied forward rates and inflation compensation calculated for South Africa for the period May 2002 – March 2007 in a previous paper (Reid, 2008) will be used here as a measure of inflation expectations.

According to the Fisher equation, the nominal interest rate can be decomposed into the real interest rate and inflation expectations (Walsh, 2003):

$$i_t = r_t + \Pi_{t+1} \quad (3)$$

where i_t = nominal interest rate

r_t = real interest rate

π_t = inflation expectations

Svensson (1994) proposed the use of forward interest rates for analysing monetary policy because a forward interest rate is related to an ordinary yield curve in the same manner as average and marginal cost curves are related. Forward rates at a long term horizon show the expected short term interest rates at that horizon. Relying on the Fisher equation, forward inflation compensation can be presented as the difference between the nominal and real forward rates:

Fwd inflation compensation (9-10) = nom fwd rate (9-10) – real fwd rate (9-10) (4)

Inflation compensation is however an imprecise measure of inflation expectations, because according to the asset pricing model a term for the risk premium should be added to the Fisher equation (the nominal interest rate should be decomposed into the real interest rate, expected inflation and the risk premium).

Both Sack (2002) and Gürkaynack, Levin and Swanson (2006) acknowledge that inflation compensation does not capture expected inflation precisely and they do not lightly disregard the influence of risk premia, but they insist that these factors do not discredit their results. If the variations in the risk premia over time are at lower frequencies than the daily variation of forward inflation compensation (the dependent variable), the risk premia should not have much influence on the coefficient estimates (Gürkaynack, Levin and Swanson (2006)). Even if the premia decrease substantially over time, their movement in one day is very small.

4.2. REGRESSION RESULTS

Over this sample period, South Africa was an inflation targeter, and the one-year forward inflation compensations, ending in five and ten years time, are expected to be well anchored. Using the variables created above, this was investigated by regressing the forward inflation compensation rates on the surprise variables using the method of ordinary least squares adopted by Gürkaynack, Sack and Swanson.

The dataset consists of daily observations of the changes in the inflation compensation on the day of each announcement. Only days on which an announcement was made are included and usually only one announcement was on each of the dates, so on any particular day only one non-zero coefficient was measured. Therefore the regression results can be interpreted as the extent to which inflation compensation responds (on average) to the surprise components of macroeconomic announcements over the sample period (May 2002 – March 2007).

The surprise components of the macroeconomic data and monetary policy announcements are listed vertically in the rows of table 1 below. The regression results reporting the sensitivity of the one-year forward inflation compensation ending in five years time, to these surprise

components are presented in the first column of table 1. Similarly, the sensitivity of the one-year inflation compensation ending in ten years time, to the surprise components is reported in column two.

Table 1: Impact of Macroeconomic Surprises on Forward Inflation Compensation Rates

	1-year Forward Inflation Compensation ending in 5 Years Time	1-year Forward Inflation Compensation ending in 10 Years Time
CPIX Surprise	0.002 (1.076)	0.0002 (0.1889)
PPI Surprise	0.001 (0.768)	0.0003 (0.320)
GDP Surprise	0.0015 (0.929)	0.002 (1.428)
Current Account Surprise	-0.002 (-1.176)	-0.002 (-1.387)
REPO Rate Surprise	0.011 (1.743)	0.003 (0.964)
Number of Observations	151	151
R^2	0.024	0.01
Probability value of the F statistic	0.61	0.93

Note: The sample period for the study is May 2002 to March 2007. The numbers in the columns are the coefficient values and those in brackets are the corresponding t-statistics (heteroskedasticity-robust standard errors were used). The coefficient on each of the macroeconomic surprises should be interpreted as the variation in the forward inflation compensation caused by a 1 standard deviation of the surprise. The coefficient on REPO is interpretable as the basis point variation in the forward interest rate due to the variation in the monetary policy surprise variable, measured in basis points. The probably value of the F statistic represents the probability that all the coefficients are jointly equal to zero.

If inflation expectations are well anchored we would expect the surprises to have little impact on forward inflation compensation at longer horizons. The coefficients measuring the impacts of the surprise variables on the one-year inflation compensation, ending in five years time are all insignificant. Using the F test, the null hypothesis that all the coefficients are jointly equal to zero cannot be rejected and the R^2 is only 2.4% (0.024). This all suggests that the surprises have very little, or no impact on inflation compensation at the four to five year horizon. The results for the regression of the one-year forward, ending in ten years time are even stronger. The coefficients are all insignificant, the probability value of the F statistic is 93%, and the R^2 is only 1% (0.01).

These results are in line with those of Gürkaynack, Levin and Swanson (2006) for Sweden and the UK (after the BoE was granted independence). When using the one year inflation compensation, ending in ten years time, the coefficients for the surprise variables in Sweden were insignificant, the R^2 was 1%, and the hypothesis that all the coefficients were jointly equal to zero was not rejected. The results for the UK were very similar, except that one of the seven surprise variables was significant and the R^2 was 3%. The results of these inflation targeting countries contrast favourably with those found by Gürkaynack et al (2005) for the US (which is not an inflation targeter).

5. Conclusion

It is important to realise that although some of the most successful and influential central banks have chosen not to adopt inflation targeting, their execution of monetary policy is converging with that of the inflation targeting central banks (King, 2004). Both groups recognise the strategic nature of monetary policy and use communication and transparency extensively in order to influence expectations and increase the effectiveness of monetary policy. The methodology of Gürkaynack, Sack and Swanson (2005) was applied in this paper to South African data and the results were encouraging. The sensitivity of South African inflation expectations for the period under review are comparable with the inflation targeting countries analysed in the international studies suggesting that inflation targeting is offering a useful framework for monetary authorities in South Africa to communicate with the public and thereby anchor inflation expectations. However, credibility building is not a once-off exercise. The South African Reserve Bank should continually strive to promote coordination with the financial markets through transparent and predictable monetary policy.

References

ARON, J and MEULLBAUER, J. 2006. Review of Monetary Policy in South Africa since 1994. Revised Version of a paper prepared for a joint CSAE_Stellenbosch University conference: South African Economic Policy Under Democracy: a 10 Year Review, 27/28 October 2005.

BALLIM, G, and MOOLMAN, E. 2005. Testing the potency of transparency of the South African Reserve Bank's inflation targeting policy. Hardcover, Standard Bank.

BLOOMBERG. Macroeconomic Consensus Forecasts, received by email 2007.

BUSINESS DAY. Various issues, 2002-2007.

COLEMAN, T.S. 1998. Fitting Forward Rates to Market Data (January 27, 1998). Available at SSRN: http://ssrn.com/abstract=994870

FRIEDMAN, M. 1968. The Role of Monetary Policy. American Economic Review, 58:1-17.

GÜRKAYNACK, R, SACK, B, and SWANSON, E. 2005a. The sensitivity of long-term interest rates to economic news: evidence and implications for macroeconomic models. American Economic Review 95(1): 425-436.

GÜRKAYNACK, R, LEVIN, A, MARDER, A, and SWANSON, E. 2005. Inflation Targeting and the Anchoring of Inflation Expectations in the Western Hemisphere. Prepared for the Bank of Chile Conference in October 2005 on Inflation Targeting.

GÜRKAYNACK, R, LEVIN, A, and SWANSON, E. 2006. Does Inflation Targeting Anchor Long-Run Inflation Expectation? Evidence Form Long-Run Bond Yields in the U.S, U.K., and Sweden. Federal Reserve Bank of San Francisco Working Paper Series, Working Paper 2006-09.

JOFFE, H. 2006. Bank must get message right on next interest rate movement. Business Day, 18 July 2006.

KING, M. 2004. Comments on 'Risk and Uncertainty in Monetary Policy' by Alan Greenspan, AEA Annual Conference, 2004.

KYDLAND, F and PRESCOTT, E. 1977. Rules Rather than Discretion: The Inconsistency of Optimal Plans. Journal of Political Economy, vol 85, no 3.

LARRAIN, M. 2005. Monetary Policy and Long-Term Interest Rates in Chile. Central Bank of Chile Working Paper No 335.

LUCAS, R. 1976. Econometric policy evaluation: a critique. The Phillips curve and labour markets. K. Brunner and A.H. Meltzer. Amsterdam, North Holland.

MISHKIN, F.S. 1999. International Experiences with Different Monetary Policy Regimes. National Bureau of Economic Research. Working Paper 7044.

REID, M. B. 2008. Isolating a Measure of Inflation Expectations of the South African Financial Market Using Forward Interest Rates, Stellenbosch, mimeograph

REUTERS. Econometer, received from by email 2006.

SACK, B. 2002. A Monetary Policy Rule Based on Nominal and Inflation-Indexed Treasury Yields. Board of Governors of the Federal Reserve System (U.S): Finance and Economics Discussion Papers.

SARGENT, T and WALLACE, N. 1981. Some Unpleasant Monetarist Arithmetic. Federal Reserve Bank of Minneapolis Quarterly Review, 5:1-17.

SOUTH AFRICAN RESERVE BANK. 2002 - 2007. Statements of the Monetary Policy Committee.

SOUTH AFRICAN RESERVE BANK. South African Reserve Bank Quarterly Bulletin, various issues from 2001 to 2007.

SOUTH AFRICAN RESERVE BANK. 2007. Statistical and Economic Information. http://www.reservebank.co.za

STATSSA. Statistical Publications. http://www.statssa.gov.za/publications/findpublication.asp

SVENSSON, L.E.O. 1994. Estimating and Interpreting Forward Interest Rates: Sweden 1992 – 1994. National Bureau of Economic Research, Working Paper No. 4871.

VAN WALBEEK, C. 2006. Official revisions to South African national accounts data: Magnitudes and implications. South African Journal of Economics, December 2006: 745 – 765.

WALSH, C. E. 2003. Monetary Theory and Policy. Second Edition. Cambridge: MIT Press.