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OBEN 2401* – June 2023 Change of the SARB's preferred inflation target in 2017: the conditional forecast story

Ekaterina Pirozhkova and Nicola Viegi

Abstract

This note analyses the effects of the South African Reserve Bank's Monetary Policy Committee communicating a change in its preferred inflation target in July 2017. Prior to 2017Q3, the MPC indicated its inflation targeting range to be 3–6%. From 2017Q3 onward, the MPC shifted to emphasising the midpoint of the range, 4.5%, as its preferred inflation target. We estimate the implications of this shift by means of a Bayesian vector autoregression-based counterfactual exercise. Our results show that this change in the preferred inflation target allowed a reduction in prices and inflation expectations without negative effects on real output and employment. This was achieved via the reduction in the South African–United States long-term interest rate spread (i.e. by a reduction in risk) and by a subsequent positive effect on asset prices.

1. Introduction

In its Monetary Policy Committee (MPC) announcement of 20 July 2017, the South African Reserve Bank (SARB) communicated a change in its preferred inflation target. Prior to this announcement, SARB had indicated that it was targeting inflation in the range of 3–6%, whereas the July 2017 MPC statement postulated that the mid-point of the range, 4.5%, would be targeted going forward. We use this episode to study the effects of a change in the inflation target of the SARB.

The MPC's announcement in July 2017 coincided with the start of a downward trend in surveyed inflation expectations and in market-implied expectations derived from break-even rates. The latter emerged against the backdrop of reduced actual inflation in South Africa and globally, and de-anchoring of some inflation drivers from the upper band of the inflation target level domestically. As shown in Figure 1, the Bureau for Economic Research (BER) two-year ahead inflation expectations hovered around the upper bound of the 3–6% range until mid-2017 and gradually fell to the 4.5% midpoint after that.¹ This suggests that the 3–6% targeting range was effectively perceived by agents as the inflation target set near the range's upper band of 6%. One can therefore consider the change in the inflation target in July 2017 as a de facto reduction from 6% to 4.5%.

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The path of the break-even inflation rate as shown in Soobyah (2022) follows a similar pattern.

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Figure 1: BER two-year ahead inflation expectations vs the inflation target

Source: SARB, BER.

It is typically understood that the transition towards a lower inflation target is costly. While the long-term benefits of this transition are very likely to be significant due to better predictability of returns on investment and savings and clearer relative price signals, its potential short-run costs make changing the inflation target a contentious issue.² This is particularly relevant in the context of South Africa with its low growth and dramatic level of unemployment. Evaluating the transition cost is therefore an important exercise for a policymaker considering a reduction in the inflation target.

This note contributes to existing literature that evaluates the implications of lowering the inflation target in South Africa. The recent work of Loewald et al. (2022) estimates the sacrifice ratio for South Africa as a measure of the costs of reducing the inflation target by employing trend analysis (Ball 1994) and a structural vector autoregression (VAR) (Cecchetti and Rich 2001). It finds a very low sacrifice ratio in a two-variable VAR at a four-quarter horizon, and shows a significant degree of uncertainty associated with estimates for longer horizons and in a three-variable VAR model. Gereziher and Nuru (2021) use a structural VAR model as well, estimate it over a different sample and show even lower sacrifice ratio estimates, while Kabundi, Schaling and Some (2016) find a higher value of the sacrifice ratio that decreased after the global financial crisis.

In this context, this note aims to refine the existing empirical evidence on the effects of changing the inflation target in South Africa by using an approach that is data-driven, i.e. relying on historical correlations as opposed to imposing a particular model structure, and employing the latest methodological tools suitable for this exercise (Giannone, Lenza and Reichlin 2010; Banbura, Giannone and Lenza 2015; Caruso, Reichlin and Ricco 2019). We focus on the 2017Q3 episode, when the SARB embarked on anchoring inflation expectations at the 4.5% midpoint of the inflation target range, and estimate the effects of this event by means of a Bayesian VAR-based counterfactual exercise. Specifically, we compare the realised macroeconomic dynamics in the period after 2017Q3 with the patterns of business cycle

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For the discussion and empirical findings on the transition to a lower inflation target, see, among others, De Gregorio (1992), Frenkel and Mehrez (2000), Mankiw (2000), Cecchetti and Rich (2001), and Belke and Boing (2014).

fluctuations formed during the period (2004Q1–2017Q2) in which the 3–6% inflation target range was adopted; we follow Caruso, Reichlin and Ricco (2019) in implementing this. To derive the counterfactual, we estimate a large VAR model on the 2004Q1–2017Q2 sample. The wide set of real, nominal and financial variables included in the model allows us to incorporate the effect of financial channels on business cycles. Importantly, we account for the expectations channel of monetary policy by introducing the survey-based inflation expectations variable in our framework.³

2. Conditional forecast view

Our approach to estimate the effects of the SARB's transition to anchoring inflation expectations at the 4.5% midpoint is to compare the actual macroeconomic dynamics after 2017Q3 with the counterfactual history. The counterfactual history is generated as a Bayesian VAR model forecast conditional on variables' historical correlations with the macroeconomy over 2004Q1–2017Q2 and on the realised path of monetary and fiscal policy variables. The period 2004Q1–2017Q2 is chosen as an estimation sample to capture the cross-correlations prevalent in macroeconomic and financial variables during the period in which the 3–6% range was adopted by SARB as the inflation target. We condition the forecast on the actual path of short-term interest rates and government expenditures, which are used as respective monetary and fiscal policy variables, to provide a role to realised macroeconomic policies in driving the economy.

Thereby, we focus on a once-off event of the central bank's preferred inflation target change in mid-2017, and by employing a large VAR model that includes a broad set of real, nominal and financial variables, we provide an overview of this event's effects on the economy accounting for interactions across business and financial cycles. Bayesian shrinkage is used to address the dimensionality problem of the VAR with a large number of predictors (De Mol, Giannone and Reichlin 2008; Banbura, Giannone and Reichlin 2010). Our quarterly frequency dataset consists of 27 aggregate time series, specifically: real output and its components, unemployment, monetary and fiscal policy variables, consumer prices, asset prices, and financial and credit variables for the period 2004Q1–2019Q4.⁴ Table 1 in the Appendix provides details on the variables used in the model. With the exception of those measured in rates, variables are used in their log levels and are deflated with the GDP deflator. We follow Caruso, Reichlin and Ricco (2019) in addressing challenges associated with incorporating this broad set of variables in the VAR model. Minnesota and sum-of-coefficients priors are used in the empirical specification (Litterman 1979; Litterman 1986; Doan, Litterman and Sims 1983), with the priors' strength being set optimally according to Giannone, Lenza and Primiceri (2015).

We derive the conditional forecast for the South African economy in two steps. First, the Bayesian VAR model is estimated on the 2004Q1–2017Q2 sample. Second, the conditional expectations for all variables for the 2017Q3–2019Q4 period are obtained. The conditioning information we use is, first, the 2004Q1–2017Q2 model variables' data; second, the model's

³ Botha, Kuhn and Steenkamp (2020) show that inflation expectations play a key role in explaining inflation in the case of South Africa.

⁴ As a robustness check, unit labour costs (ULCs) were also included in the model. That did not change our results significantly, implying that the role that the ULCs played in putting downward pressure on inflation is implicitly accounted for by dynamics of other variables in the baseline Bayesian VAR specification. Notably, the actual path of ULCs after 2017 is significantly below the counterfactual in the robustness test, implying that producers' labour costs have also gone down following the change in SARB's preferred inflation target.

estimated parameters reflecting the variables' historical correlations; and third, the realised path of short-term interest rate and government expenditures in 2017Q3–2019Q4.

3. Results

In this section we discuss the results of the counterfactual exercise. We compare the realised path of macroeconomic and financial variables with their VAR model-based forecast that is conditional on the variables' historical correlation with the macroeconomy in 2004Q1–2017Q2 and on the path of monetary and fiscal policy variables after 2017Q3. Given that SARB anchored inflation to the 3–6% target range in the period 2004Q1–2017Q2, the conditional forecast indicates what would be expected if the central bank continued adopting the same inflation target range. A deviation of the actual path from the forecast shows the contribution of SARB's shift to anchor inflation to the 4.5% midpoint of the target range in 2017Q3.



Figure 2: Conditional forecast – consumer prices

Note: The actual data (red) and the counterfactual path of the variables. The blue lines are the medians of the forecast conditional on the path of 3-month Johannesburg Interbank Average Rate (Jibar) and government expenditures, plotted with 68% (dark blue) and 90% (light blue) coverage intervals. The consumer price index (CPI) is an index; BER inflation expectations are in annual rates; GDP deflator is a ratio.

Figures 2, 3 and 4 show the actual path of model variables together with their conditional forecast, summarised as the median, the 68% and 90% coverage intervals. Several of our results are noteworthy.



Figure 3: Conditional forecast – asset prices

Note: The actual data (red) and the counterfactual path of the variables. The blue lines are the medians of the forecast conditional on the path of 3-month Jibar and government expenditures, plotted with 68% (dark blue) and 90% (light blue) coverage intervals. Johannesburg Stock Exchange and house prices are indices; South African-US long-term interest rate spread is in annual rates.

First, since 2017Q3 prices have dropped as a result of the inflation target shift by the central bank, as expected. The realised path of the CPI is below the lower bound of the 68% coverage interval implied by the model (see Figure 2, 'CPI' panel), meaning that the SARB's change in the inflation target has contributed to reduced prices. Crucially, the survey-based inflation expectations have also dropped significantly post-2017Q3 (Figure 2, 'BER 2Y ahead infl exp' panel). The observed path of BER two-year ahead inflation expectations lies below the 90% model-implied coverage band, meaning that the realised levels of the inflation expectations measure were exceptionally low according to the model. This implies that given the actual path of monetary and fiscal policy variables, there has been an unprecedented reduction in prices and inflation expectations since 2017Q3. This evidence points to a strong expectations channel from central bank communication and the high credibility of SARB, consistent with previous findings (Botha, Kuhn and Steenkamp 2020).

Second, the change in the communication by SARB has contributed to increased asset prices. The stock market has recorded anomalous peaks post-2017Q3, in contrast with conditional expectations consistent with lower expected inflationary risk and reduced uncertainty (Figure 3, 'JSE' panel). Real house prices have gone up as a result of the inflation target shift – they have been close to the upper bound of 68% in model-implied coverage interval (Figure 3, 'House Prices' panel). The South Africa-US long-term interest rate spread has fallen compared to its forecasted level, reflecting reduced inflationary risk at the long horizon since 2017Q3 and indicating the expansionary effect of disinflation via a reduction in the country risk premium (Figure 3, 'SA-US LT IR' panel).

The big drop in the stock market in the counterfactual could be explained, first, by reduced foreign investors' demand for domestic shares and bonds, reflecting their higher riskiness, and second, by tighter conditions in domestic financial markets – long rates are elevated, reflecting higher inflation risk going forward. Tighter financial conditions result in subdued private sector credit issuance in the counterfactual, which reduces financial resources for both companies and individuals to purchase equity. In addition, higher expected inflation in the counterfactual aggravates market expectations of further increases in short-term policy rates to contain inflation.



Figure 4: Conditional forecast – aggregate demand and its components

Note: The actual data (red) and the counterfactual path of the variables. The blue lines are the medians of the forecast conditional on the path of 3-month Jibar and government expenditures, plotted with 68% (dark blue) and 90% (light blue) coverage intervals. Unemployment is in percent, other variables are in millions of rand, with 2015 as the base year.

Third, there has been no negative effect on aggregate demand – the actual real GDP path is in line with or above the median of the conditional forecast following the transition to a 4.5% inflation target in 2017Q3 (Figure 4, 'Real GDP' panel). Unemployment has also not been affected by this transition negatively – if anything, unemployment has fallen since 2017Q3 and has returned to its conditionally expected levels (Figure 4, 'Unemployment' panel). Consumption has fallen post-2018Q3, possibly reflecting households' preference for increased borrowing – household debt and private sector credit have increased over this period in contrast to the median conditional forecast (Figure 4, 'Consumption', 'HH D' and 'Private sector credit' panels). This is consistent with lower expected inflation that reduces uncertainty about the cost of credit going forward. Public investment has been on the rise over 2017Q3–2018Q4 as compared with the forecast with possible crowding-out effects (Figure 4, 'Public Investment' panel).

4. Conclusion

This note used conditional forecasting techniques to evaluate the effect of the 2017 change in the SARB's communication about its monetary policy framework. That episode is the closest we have to an effective reduction in the inflation target from 6% to 4.5%. This note helps to illustrate the short-run macroeconomic effect of a change in the monetary policy framework. The results confirm that a credible reduction in the target has no negative real effects because the credible commitment to the new target is rapidly absorbed by private sector expectations,

induces a reduction of the long-term risk premium and has a consequent positive effect on asset prices and credit to the private sector.

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Appendix

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Table I:	variable	s included	i in the	model

Variables' labels	Description	Source	
Real GDP	Real GDP	SARB QB Database ⁷ , KBP6006D	
Consumption	Final consumption expenditure by households	SARB QB Database, KBP6007D	
Private Investment	Fixed capital formation by private business enterprises	SARB QB Database, KBP6109D	
Public investment	Fixed capital formation by general govt and public corporations	SARB QB Database, KBP6100D+KBP6106D	
Unemployment	Unemployment Rate	SARB QB Database, KBP7019K	
Gov Revenues	Total general govt revenues, ⁸ deflated by GDP deflator	Authors' calculations	
Gov Expenditures	Total general govt expenditure excluding interest payments, ⁹ , deflated by GDP deflator	Authors' calculations	
Interest Payments	General govt interest payments, ¹⁰ deflated by GDP deflator	Authors' calculations	
HH Savings	Household saving ratio to disposable income	SARB QB Database, KBP6287L	
HH Debt	Household financial liabilities, deflated by GDP deflator	Authors' calculations	
Private sector credit	Credit extended to private sector, deflated by GDP deflator	Authors' calculations	
NFC Debt	Non-financial public corporations domestic marketable debt, deflated by GDP deflator	Authors' calculations	
Banks Debt	Total liabilities of banks, deflated by GDP deflator	Authors' calculations	
CA/GDP	Current account / GDP	SARB QB Database, KBP5380K	
House Prices	House price index	FNB South Africa Average House Price Index	
Long Term IR	Yield of govt bonds 10Y and over, end of quarter	SARB QB Database, KBP2003M	
CPI	Consumer price index, end of quarter	SARB QB Database, KBP7170N	
Spread 10Y-3M	Interest rate spread between 10Y govt bonds and 3M Tbill rate	Authors' calculations	
SA-US LT IR spread	Spread South Africa-US 10Y bond yields	Authors' calculations	
Real GDP/Employment	Real GDP / Employment ¹¹	Authors' calculations	
GDP deflator	GDP deflator	Authors' calculations	
3M T-bill rate	3M T-bill rate	FRED data ¹² , IR3TTS01ZAM156N	
JSE	Johannesburg Stock Exchange index	SARB	
USD ZAR	Rand/dollar exchange rate	SARB	
BER 2Y ahead infl exp	Bureau for Economic Research 2-year ahead inflation expectations	SARB QB Database, KBP7125K	
3M Jibar	3M interbank Jibar rate	SARB QB Database, KBP1450	
EMBI+SA	JP Morgan EMBI+ South Africa index - country risk premium	SARB	

⁸The South African Reserve Bank Quarterly Bulletin Database.
⁹Four quarters moving average is used for smoothing.
¹⁰Four quarters moving average is used for smoothing.
¹¹Four quarters moving average is used for smoothing.
¹²Real GDP/Employment is used as a proxy of productivity measure in the absence of reliable data on hours.