

Nedbank

Economic commentary

June 2009

INFLATION

KEY POINTS

- The rand has been one of the main drivers of inflation, particularly following bouts of significant volatility.
- To what extent will the strengthening of the rand alleviate inflationary pressures?
- One way to measure the impact of the exchange rate on consumer inflation is to view price behaviours in the supply chain, where changes in the exchange rate are passed from import to producer and ultimately through to consumer prices. This note describes a model that mimics this supply chain.
- The results suggest that for every 10% appreciation in the rand, inflation falls by 1,5 percentage points over 18 months.
- The results show that if the rand maintains present levels inflation should fall below 6% by the fourth quarter of 2009, before bouncing out again by the end of the year largely due to technical factors relating to the decline in the oil price late last year.
- Thereafter, inflation should be firmly back below the target range by March 2010.

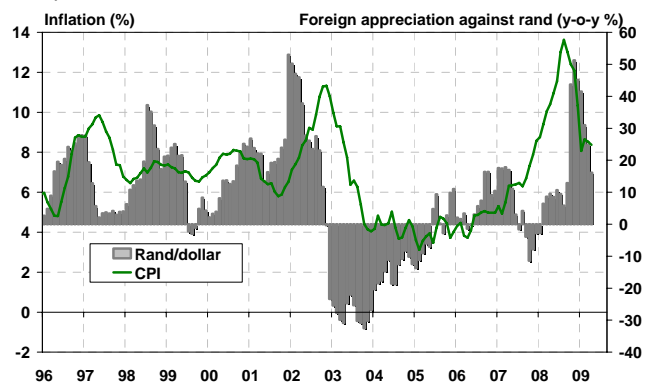
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WILL THE RAND HELP PUSH INFLATION BACK BELOW 6%?

Inflationary pressures have been abating, but slower than was initially anticipated. Backward-looking services inflation and food prices, which have not come down in line with international prices, have been the main culprits. The recent spike in the oil price as well as administered price increases will also make the task of bringing inflation back below 6% more difficult. The rand's recent recovery may provide some relief, once it feeds through into lower domestic prices. To what extent is this likely to be the case?

The rand effect¹

Graph 1: The rand effect



The rand has been one of the main drivers of inflation, particularly following periods of significant weakness or strength. Graph 1 shows how a depreciation or appreciation in the exchange rate ultimately filters through to consumer prices. Each crisis and subsequent rebound has differed in its impact on prices. In 1996 the rand tumbled by 21,5% on a trade-weighted basis. Since domestic demand was healthy at the time, the weaker currency quickly flowed through to prices. However, the rise in inflation proved to be

¹ All data from Statistics South Africa, unless otherwise indicated



MAKE THINGS HAPPEN

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temporary, largely because of the rand's strong pullback within four months of the initial decline. In 1998 the rand was battered by the emerging-market crisis, depreciating by 19,2% on a trade-weighted basis. The impact of the rand's depreciation on inflation was more muted than in 1996, reflecting weaker economic conditions and a strong monetary response.

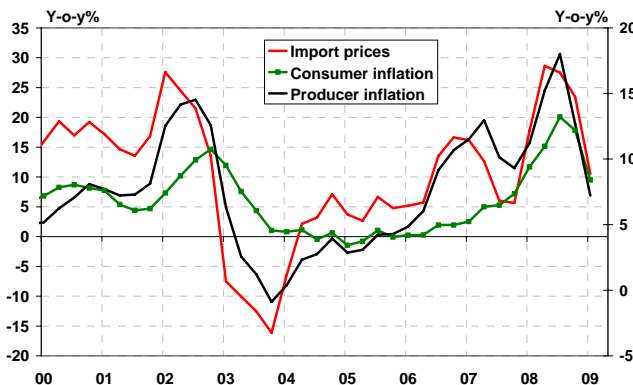
The next bout of rand weakness came in February 2000 and intensified in late 2001. On a trade-weighted basis the rand fell by 15% and 33,5% in 2000 and 2001 respectively. The initial impact of the rand's decline on consumer inflation was surprisingly small, suggesting that at least a portion of the rand-related cost increases were absorbed along the supply chain. However, the final plunge in the currency in late 2001 reduced both the desire and the ability of retailers to absorb further price increases. The rand's rapid recovery thereafter, appreciating by 20% on a trade-weighted basis over the following year, combined with a low-inflation global environment, helped to push inflation towards the lower end of the target range during 2004 and 2005.

More recently, the 16% decline in the rand late last year, has gone some way to keeping inflation higher for longer, particularly as it has resulted in higher durable goods prices and has helped to keep food prices at elevated levels.

Exchange rate pass-through

The trade-weighted rand's 20% recovery since January will clearly help to alleviate inflationary pressures. In order to assess how much, it is necessary to determine what the exchange rate pass-through (ERPT) is. In other words, by how much does inflation change following a 1% rise or fall in the exchange rate. One way to assess the impact of the exchange rate on consumer inflation is to view prices within the economy like a supply chain, where the exchange rate effect passes from import to producer and ultimately to consumer prices.

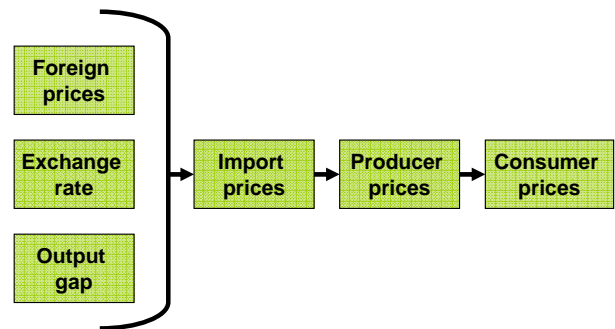
Graph 2: Inflation along the supply chain



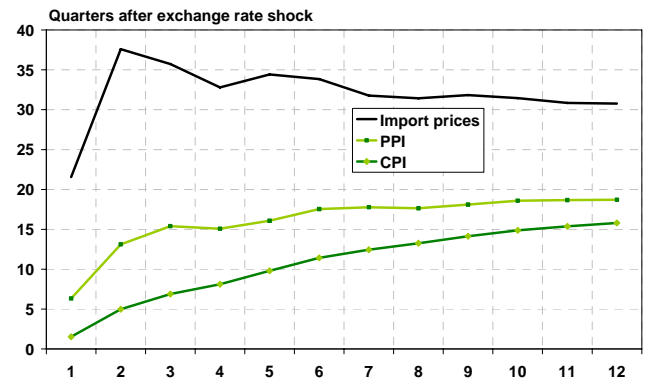
In this note the ERPT is determined through a model that mimics this supply chain (see figure 1), where changes to the export prices of South Africa's major trading partners, movements in the exchange rate as well as domestic economic conditions - measured by the output gap -

impact on import, producer and eventually consumer prices.

Figure 1: Inflation along the supply chain



Graph 3: Inflation along the supply chain



Graph 3 presents the results of the model (see appendix for details) and shows – unsurprisingly – that import prices are affected immediately and more severely than either producer or consumer prices when the exchange rate moves. Most of the impact on import prices is felt within two quarters. The effect on producer prices is more modest, with a 10% appreciation of the rand causing producer inflation to fall by 1,5% after three quarters and 1,8% after 18 months. Although consumer inflation is least affected by movements in the exchange rate, the impact can still prove to be quite significant overall, as the rand tends to be extremely volatile. For every 10% appreciation in the value of the rand, consumer inflation declines by roughly 1% over a year and about 1,5% over two years. These results are similar to those obtained by Bhundia (2002), suggesting that average ERPT has remained relatively consistent over time.

Does the direction and size of the exchange rate movement matter for inflation?

Another question that needs to be answered is whether the direction and size of the exchange rate movement matters for inflation. Theoretical arguments as well as empirical evidence from both developed and developing countries seem to suggest that it does. However, some disagreement remains over whether pass through is greater in the case of an appreciation or a depreciation of the currency. Some argue that pass through will be greater when the currency appreciates, as importers will attempt to gain market share by cutting prices, but will opt to cut margins rather than hiking prices when the exchange rate rises.

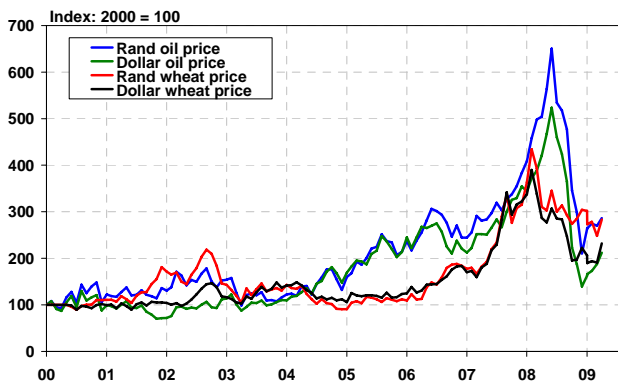
However, particularly in South Africa, there seems to be greater evidence to suggest that prices are stickier coming down, compared to when they're going up. This implies that prices will come down more slowly when the exchange rate appreciates, but will rise faster when the exchange rate depreciates. Instead of cutting prices in order to move stock, particularly in a downturn, local companies seem to opt to rather maintain prices and cut volumes.

What does the empirical evidence on South Africa suggest? The preliminary evidence shows that pass through is higher when the rand depreciates and is even greater in the event of a large 6% rise in the exchange rate during a month. Unfortunately this implies that a steady modest appreciation of the currency will have a smaller positive impact on inflation, that a once-off depreciation of a similar magnitude.

Implications for inflation

The recent strengthening of the rand is good news for inflation and may mean the difference between falling back within the target range this year or just missing it.

Graph 4: Commodity prices are on the rise

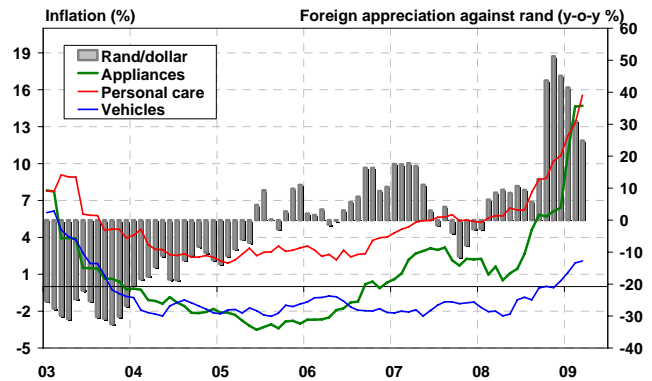


Source: Reuters

The rebound in international oil and food prices (see graph 4) has been offset to some extent by the stronger rand. In

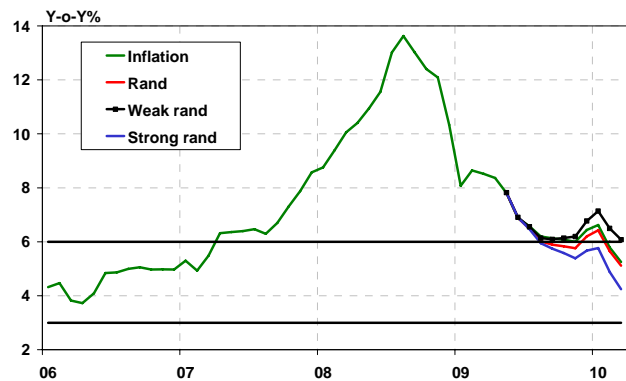
dollar terms Brent crude oil and wheat prices have risen by 55% and 28% respectively since February 2009. However, priced in rand, the increases have been more modest, with prices rising by 25% and 3%.

Graph 5: Durable and semi-durable goods



The prices of durable goods, particularly cars, household items and electronic goods, have ticked up in recent months (see graph 5), following the rand's decline late last year. Perversely they have stayed high despite these sectors having been hardest hit by the consumer recession. The stronger rand should help to reverse this trend in the coming months. The extent of the pass-through may prove to be greater than anticipated, given the severity of the current consumer recession, the worst since the early 1990s, which may put pressure on retailers to hold off raising prices further.

Graph 6: Inflation scenarios



Our baseline model (in green) takes seasonal factors as well as a very modest increase in the oil price into account. The results of the model are used to determine the likely impact of the rand on inflation. Our central rand forecast assumes that the rand ends the year only modestly weaker (R/\$ 8,30), reflecting sustained appetite for riskier emerging-market assets. If the rand holds at current levels it suggests that consumer inflation could fall within the target range in the fourth quarter, before bouncing out again by the end of the year largely due to technical factors relating to the decline in the oil price late last year. However, should the oil price rise above \$80, Eskom get a larger tariff increase than has already been tabled or should the price of services fail to respond to

deteriorating economic conditions, the probability of falling back within the target range this year is much reduced. Inflation would then only fall below 6% at the end of the first quarter of 2010, nearly three years after first moving out of the band.

However, the danger remains that global risk aversion could resurface, should the 'green shoots' theory prove wrong or if unexpected domestic economic policy surprises emerge, causing the rand to go back above R10 to the dollar. In this scenario, inflation will likely only fall back below 6% well into the second quarter of 2010, it will also add to second-round effects, particularly on services inflation, which has proven to be extremely sticky.

Should the rand strengthen further to below R7,50 to the dollar and remain there for the rest of the year, inflation may be permanently back within the target range by the end of the year.

Implications for monetary policy

If the rand's recent recovery holds, it will help to counter some of the upward pressure on prices coming from higher commodity and administered prices. Despite some concerns about the short-term inflation outlook, the Reserve Bank, along with most analysts, believes that inflation will be firmly back below the upper level of the target by the end of the first quarter 2010, barring any surprises.

Interest rate decisions during the remainder of the year will therefore be based on an assessment of the nature of the downturn and in turn the impact that this will have on consumer prices. If the Monetary Policy Committee (MPC) believes that the worst of the recession, both locally and globally, is over, they could become more cautious as it could imply a less favourable inflation outlook. Under this scenario commodity prices would recover further and retailers, faced with a rosier outlook, would be more inclined to continue raising prices.

In our view the more likely scenario is that the recovery will be weak and lacklustre. If the MPC agrees, further albeit more modest, cuts in interest rates are likely.

While every care is taken to ensure the accuracy of the information and views contained in this document, no responsibility can be assumed for any action based thereon

Appendix: Model methodology and results

Methodology

In order to examine the pass-through of the exchange rate to domestic prices, I use a model of pricing along the distribution chain following McCarthy (1999)² and Bhundia (2002)³. A vector autoregression (VAR) is estimated. Variables are ordered using the Cholesky decomposition, which is simply a way of ordering variables based on the impact that they are likely to have on each other.

For example, consumer inflation (η_t^c) is affected by

- Foreign prices, measured by the trade-weighted average of export prices in our major trading partners⁴ (η_t^{fp})
- Domestic economic conditions (y_t), measured by the output gap⁵.
- The exchange rate (e_t), measured by the nominal effective exchange rate
- As well as import prices (η_t^m) and producer prices (η_t^p)

Or, for example, import prices (η_t^m) are effected by foreign prices, domestic economic conditions as well as the exchange rate, but not in the short-term (1 quarter) by producer and consumer inflation.

Figure 1: VAR Ordering

$$\begin{aligned}\eta_t^{fp} &= E(\eta_t^{fp}) + \varepsilon_t^{oil} \\ y_t &= E(y_t) + a_1 \varepsilon_t^{fp} + \varepsilon_t^y \\ e_t &= E(e_t) + b_1 \varepsilon_t^{fp} + b_2 \varepsilon_t^y + \varepsilon_t^e \quad \eta_t^p = \\ \eta_t^m &= E(\eta_t^m) + c_1 \varepsilon_t^{fp} + c_2 \varepsilon_t^y + c_3 \varepsilon_t^e + \varepsilon_t^m \\ \eta_t^p &= E(\eta_t^p) + d_1 \varepsilon_t^{fp} + d_2 \varepsilon_t^y + d_3 \varepsilon_t^e + d_4 \varepsilon_t^m + \varepsilon_t^p \\ \eta_t^c &= E(\eta_t^c) + e_1 \varepsilon_t^{fp} + e_2 \varepsilon_t^y + e_3 \varepsilon_t^e + e_4 \varepsilon_t^m + e_5 \varepsilon_t^p + \varepsilon_t^c\end{aligned}$$

Results

Test for non-stationarity

Table 1: Augmented Dickey-Fuller (ADF) test

	t-Statistic	Probability
DLog ⁶ (CPIX)	-4.32	0.00*
DLog(PPI)	-3.54	0.01*
Dlog(Import prices)	-9.29	0.00*
Output gap	-4.34	0.00*
Dlog(Foreign prices)	-4.01	0.00*
Dlog(Nominal effective exchange rate)	-8.44	0.00*

1985Q1 – 2009Q2

* indicates rejection of the hypothesis that the series have a unit root (or trend).

² McCarthy, J (1999). "Pass-Through of Exchange-Rate and Import Prices to Domestic Inflation in some Industrialised Economies," BIS Working Paper No. 79

³ Bhundia, A (2002). "An Empirical Investigation of Exchange Rate Pass-Through in South Africa", IMF Working Paper No. 165, September

⁴ (Source: International Financial Statistics, IMF)

⁵ Calculated using the Hodrick-Prescott filter (Source: Statistics South Africa)

⁶ Dlog, refers to the first difference of the logged series

Table 2: Summary Statistics for the VAR model

	DLOG(Foreign prices)	Output gap	DLOG(NEER)	DLOG(Import prices)	DLOG(PPI)	DLOG(CPIX)
R-squared	0.29	0.89	0.16	0.32	0.41	0.58
Adj. R-squared	0.19	0.87	0.04	0.22	0.33	0.52
Sum sq. resids	0.01	20.35	0.32	0.09	0.02	0.01
S.E. equation	0.01	0.50	0.06	0.03	0.01	0.01
F-statistic	2.84	54.57	1.33	3.18	4.82	9.61
Log likelihood	321.47	-61.76	137.27	199.17	282.59	330.38
Akaike AIC	-6.43	1.56	-2.59	-3.88	-5.62	-6.61
Schwarz SC	-6.08	1.90	-2.24	-3.53	-5.27	-6.26
Mean dependent	0.00	99.96	0.02	0.02	0.02	0.02
S.D. dependent	0.01	1.38	0.06	0.04	0.02	0.01

1985Q1 – 2009Q1

Table 3: Residual Diagnostics	χ^2	Probability
Jarque-Bera Normality Test	5.81	0.44*
White's Heteroskedasticity Test	1930.17	0.25*

* The null hypothesis of normality (Jarque-Bera Test) as well as for heteroskedasticity (White's Test) cannot be rejected.