The determinants of the South African current account

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Abstract

The current account dynamics have been at the centre of policy debates particularly given the historical perspectives of the last decades showing that large deficits are often followed by crisis and severe economic downturns. Based on the intertemporal approach to the current account, the paper investigates the long-run and short-run impact of net foreign assets, the real effective exchange rate, the degree of openness to international trade and the relative income on the South African current account for the period 1980Q1 to 2011Q1. The paper uses a cointergrated VAR approach.

The paper finds that there is a strong relationship between the current account, net foreign assets, the real effective exchange rate, the degree of openness to international trade and relative income. The estimated error correction indicates that having deviated from its long run path; the current account tends to converge at a fairly moderate speed.

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1.   INTRODUCTION

The current account dynamics have been at the centre of policy debates particularly given the historical perspectives of the last decades showing that large deficits were often followed by crisis and severe economic downturns. Research has since been pre-occupied by the estimation of the determinants of the current account dynamics, the optimal and sustainable size of the current account deficit.

The intertemporal approach to the current account was initially proposed by Sachs (1981) and Buiter (1981), with extensions by Obstfeld and Rogoff (1995). The applications of the intertemporal approach have generally followed two streams. Firstly, studies, see for example, Bergin and Sheffrin (2000), Nason and Rogers (2006), establishing evidence in favour of the baseline model using different testing strategies. Secondly, those, see for example, Debelle and Faruquee (1996), Chinn and Prasad (2003), Gruber and Kamin (2007), that test for the long-run relationship between the current account and its fundamental macroeconomic determinants by applying standard econometric techniques.

The paper draws upon the stream of research that examines the long-run and short-run between the current account and its fundamental macroeconomic determinants. The implications of the stock of net foreign assets, the real effective exchange rate, the degree of openness to international trade and relative income on the South African current account are tested using the cointegrated VAR approach.

The paper finds that there is a strong relationship between the current account, net foreign assets, the real effective exchange rate, the degree of openness to international trade and relative income. The sign of the domestic NFA suggests that the initial level NFA has allowed for the country to run current account deficits for extended periods of time and still remain solvent.   The findings for trade openness suggest that a higher degree of trade openness is often associated with greater output volatility and indicates the need to accumulate a substantial amount of net foreign assets for the purpose of income smoothing and trade surpluses for risk

diversification. The results with respect to the REER are consistent with the consumption smoothing hypothesis, which argues that the current account can act as a buffer to smooth consumption when there are shocks to domestic savings.

The estimated error correction indicates that having deviated from its long run path, the current account tends to converge at a fairly moderate speed of 21 per cent per quarter. This implies that in the absence of further shocks the current account gap closes in roughly five quarters i.e. within one and half year.

The paper is structured as follows: section two and three briefly look at the literature review and empirical studies, section four presents the theoretical specification section five briefly reviews some stylized facts on the South African current account, section six presents the data and the results, and lastly section seven concludes.

2.   Literature review

There are mainly two opposing theoretical views that analyse the current account namely the competitiveness approach and the intertemporal approach. The competitiveness approach was developed within the framework of fixed exchange rate and is based on the elasticities approach with the equilibrium view of export equals imports i.e. a net export balance of a country. In this view a trade surplus or deficit is equivalent to a disequilibrium position which can be resolved by the adjustments in the exchange rate (relative price changes and trade flows). However, this view is limited in its explanation of real world conditions in that the development of the capital account, current account and the change in foreign reserves is not accounted for.

The intertemporal approach uses microeconomic techniques within a utility maximising framework to analyse the determinants of the current account imbalances. This approach emphasises the current account balance as the difference between saving and investment and these factors are as a result of

forward[1] looking calculations based on the expected values of various macroeconomic factors. In this manner the approach establishes a nexus between trade, financial flows and macroeconomic developments and their influence on future relative prices and how these prices affect the saving and investment decisions.

The approach is also viewed as the extension of the absorption approach through its recognition that government and private saving and investment decisions result from forward looking calculations based on factors ranging from expectations of future productivity growth, government spending demands, real interest rates, etc. The intertemporal approach also achieves a synthesis of the absorption and elasticities views by accounting for the macroeconomic determinants of relative prices and by analysing the impact of current and future prices on saving and investment (Obstfeld and Rogoff, 1994).

The intertemporal approach became commonly used in the 1980s but came from developments in trade and growth theories. Studies mentioned in this area are those by Buiter (1981), Sachs (1981), Obstfeld (1982), Svensson and Razin (1983) Campbell (1987), Campbell and Shiller (1987) and Obstfeld and Rogoff (1994). These studies separate intertemporal current account models into deterministic and stochastic models.

The broad class of deterministic models imply that there is complete certainty of the current account. Whereas, stochastic models of the current account introduce

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[1]Obstfeld and Rogoff (1994) explicitly mention that Lucas's (1976) critique of econometric policy evaluation was one of most important theoretical motivations for the intertemporal approach. His insistence on grounding policy analysis on actual forward looking decision rules of economic agents meant that open economy models might yield more reliable policy conclusions if demand and supply functions were derived form the optimization problems of household and firms rather than specified to match reduced form estimates based on *ad hoc* econometric specifications.

Further justification to develop the intertemporal approach emanated from world capital markets as there were huge current account imbalances following the sharp increases in world oil prices in 1973 – 1974 and 1979 – 1980. The divergent patterns of current account adjustments by industrialized and developing countries raised the intertemporal problem of characterizing the optimal response to external shocks. The increase of bank lending to developing countries raised concerns about the sustainability of the external debt levels (Moccero, 2006). As well the fact that both savings and investment decisions are based on intertemporal factors such as life cycle considerations and expected returns investment projects (Edwards, 2001)

uncertainty over the changes of relevant macroeconomic variables that are subject to random shocks.

Extensions of the earlier simple current account optimising models have been developed over time. Simple models expanded Campbell's (1987) idea that consumers save for a rainy day in an open economy. Such that a country's current account surplus is equal to the present value of expected future declines in output, net of investment and government purchases i.e. net output. In these early models international interest rates were considered to be constant and there was room for non-tradeable goods.

Razin and Svensson (1983) built an optimising framework to explore the validity of the Laursen-Metzler-Harberger condition and concluded that the insights of these models were largely valid in fully optimising, two period general equilibrium models. Blanchard (1983) developed a current account model with investment installation costs to investigate the dynamics of debt and the current account for the Brazilian economy. They found that Brazil would have to accumulate foreign debt in excess of 3000 per cent of its Gross National Product (GNP) and run a trade surplus of 10 per cent to the Gross Domestic Product (GDP).

Edwards and van Wijnbergen (1986) explored the current account implications of alternative speeds of trade liberalisation and found that a country faced with borrowing constraints preferred a gradual liberalisation of trade. Frenkel and Razin (1987) analysed the manner in which alternative fiscal policies affect the current account overtime. Sheffrin and Woo (1990) used an annuity framework to develop a number of specific testable hypothesis form the intertemporal framework.

Gosh and Ostry (1995) tested the intertemporal model using data for a group of developing nations and argue that their results adequately capture the important features of modern optimising models of the current account. Obstfeld and Rogoff (1996) developed a model of a small open economy with AK technology, a constant

world interest rate, no borrowing constraint and a constant rate of productivity growth rates that exceed world productivity growth. The results show that in steady state the trade surplus is equal to 45 per cent of GDP and the debt-to-GDP ratio is 15 per cent.

Fernandez de Cordoba and Kehoe (2000) developed a small economy intertemporal model to analyse the effects of tilting capital controls on the dynamics of the current account assuming that the rate of technological progress is equal to that of the rest of the world. The results show that the optimal response to a financial reform is to run a current account deficit that peaks at 60 per cent of the GDP. They later extended the simple model by imposing a greater degree of curvature into the production possibility frontier and assumed costly and slow factor mobility across sectors.

Bergin and Sheffrin (2000) extend the model to account for the external shocks by allowing interest rates and exchange rates to vary overtime based on the observation that the actual current account was in fact more volatile than the theoretical current account. More so, since capital flows to and from small open economies have been much more volatile than have been justified by expected changes in national net output. Therefore, these external shocks do not pass through changes in net output but through movements in the interest rates and exchange rates.

Saksonovos (2006) used the intertemporal approach to the current account to test if models based on this approach have predictive power for currency crisis. Furthermore, whether the assumption of a country having unlimited access to international financial markets and ability to borrow at the prevalent world interest rate holds in the aftermath of a crisis given the fact that foreign investor fears may impede access to financial markets following a crisis.

Belkar, Cockerell and Kent (2007) also introduce innovations on the intertemporal approach by accounting for the effect of the capital market opening and financial market deregulation. In the case of the Australian economy, they find evidence in support of the intertemporal model in the period after financial liberalisation in line

with the removal of capital controls and the easing of credit constraints. Their results show that the current account seems to adjust in a way that is consistent with consumption smoothing in the face of temporary shocks to output, government expenditure and investment. They also find evidence of consumption tilting implying that Australian residents appear impatient than the rest of the world, hence the persistent current account deficits since the mid-1980s.

Papers modelling the South African current account dynamics using the intertemporal approach are few:

Sturzenegger *et.al* (2006), simulate the evolution of the current account taking into account the ASGI-SA scenarios. Their results show that although a lot has changed within the South African economy since the East Asian crisis and the 2002 Rand exchange rate crisis, a sudden stop will certainly have destabilising effects.

Draper and Freytag (2008), use the macroeconomic analysis together with institutional economics (rules, habits morale, infrastructure, education, fiscal and monetary policies, etc) to analyse developments in the South African current account economy and conclude against the manipulation of the exchange rate and selective industrial and trade policies to support industries. Their recommendations are along the same lines as those of the OECD 2008 report, that government should rather make use of instruments that increase domestic competition and productivity, open up the telecommunications, transport and energy sectors; and improve education.

Blignaut (2010), using the standard intertemporal model to track the behaviour of South Africa's current account by testing a version of the permanent income hypothesis for a small open economy with in a VAR framework, finds that the consumption-smoothing model is able to predict the direction and the turning points in the current account.

This paper contributes to existing research on the dynamics of the South African current account by testing for the long-run relationship between the current account and its fundamental macroeconomic determinants using a cointergrated VAR approach.

3.   The Intertemporal Approach to the Current Account

Initially, the current account was mostly expressed through the trade elasticity approach i.e. as the net export balance of a country. Such that, relative international prices and their determinants played a central role in the dynamics of the current account. Nonetheless, the trade elasticity approach is limited in its ability to explain long-run current account positions although it is useful in examining the short-run implications of the exchange rate changes on the current account balance.

The intertemporal approach to the current account views the current account (CA) as the difference between domestic savings (S) and domestic investment (I):

$$CA = S - I$$

This approach emphasises the macroeconomic factors that determine **S** and **I** and the fact that decisions on **S** and **I** result from forward looking calculations that are based on the expected outcomes of various macroeconomic factors. Within this approach the current account is explained through the intertemporal decisions about consumption, savings and investment. Moreover, the approach has achieved synthesis between the trade and financial flows perspectives by recognizing how macroeconomic factors influence future relative prices and how these in turn (relative prices) affect saving and investment decisions, highlighting the fact that the current account can act as a shock absorber that enables a country to smooth consumption and maximise welfare in the presence of temporary shocks in a country's cash flow (Obstfeld and Rogoff, 1995).

The basic permanent income model can be used to analyse long-term variation in the current account through the relation between the current account, investment and the

stage of economic development. This is based on the crucial role played by the stage of economic development as an explanatory variable of the current account developments in the long-run. As an example, a small open economy that is initially capital and income deprived (poor), if it has access to international capital markets, will run current account deficits for prolonged periods as it builds its capital stock and maintaining its long-run rate of consumption. During this period, it is assumed that a relatively high marginal product of capital will attract capital inflows and raise external indebtedness, but eventually, as output grows towards its long-run level and the return on capital converges to international levels, the current account will improve and tend to balance (as net exports move into surplus to facilitate for the payment of the interest obligations on the accumulated external debt).

Based on the intertemporal approach, the dynamics of long-run growth for developing economies can be impacted upon by the stock of net foreign asset. Under the assumptions that the stock of wealth does not outpace output growth, the ratio of the current account balance relative to GDP that is necessary to stabilise net external indebtedness can be determined within the framework that expresses the current account as follows in the long-run:

$$CA/Y = g * NFA/Y$$

Where, $g = \Delta Y/Y$, CA is the current account, Y is output (GDP), NFA is net foreign assets. During the process of convergence to this long-run state, the relationship stated above can be influenced by other factors such as the valuation effect of the exchange rate movements on the NFA and Y.

4. The empirical framework

The function for the current account balance used in the paper is specified below as:

$$ca = f (nfa, to, reer, sa\_us) \qquad (1)$$

where, **ca** is the current account balance relative to GDP; **nfa** is the net foreign assets relative to GDP; **to** is the indicator for international trade openness; **reer** is the real effective exchange rate; **sa_us** is the domestic real income relative to the US real income.

Theoretically, the relationships in the function above are predicted as follows:

(i) The initial stock of net foreign assets relative to GDP serves as an important initial condition since the current account is the sum of the trade balance and the return on an economy's stock of net foreign assets. The stock of NFA can influence the current account as follows: (a) A country with a higher initial stock of NFA can benefit for a higher level of investment income. From a saving-investment perspective, an increase in foreign income has a positive effect on the current account balance, implying the existence of a positive relationship between NFA and the current account balance;

(b) Given the fact that the sum of the current account and capital account must be zero in a flexible exchange rate regime *(ex post)*, a country with a higher level of NFA can afford a higher trade deficit for extended periods of time but remain solvent. This therefore implies that, there can exist a negative relationship between NFA and the current account balance. In all, at any given point within models the sign of the relationship can be different.

(ii) Trade openness as measured by the sum of export and imports relative to the GDP, is expected to have a negative relationship with the current account balance. This is based on the fact that the degree of international trade openness not only has implications for the movement of goods and services but also serves as a signal to foreign investors and therefore tends to attract foreign capital.

(iii) From a savings-investment perspective, an increase in the REER can lead to a decrease in overall domestic savings ratio given the fact that it increases the purchasing power of the domestic currency on foreign goods and services. This can therefore, encourage domestic residents to

purchase more imported goods and foreign services. Such an increase in spending on foreign goods and services, can lead to an increase in real consumption expenditure relative to total output and thus lower the overall savings ratio. It is this lowering in the savings-ratio that is expected to impact on the current account balance.

On the other hand, the consumption smoothing hypothesis suggests that the current account acts as a buffer to smooth consumption in the presence of shocks to the national cash flow (defined as output less investment). It is for this reason that in an open economy, an increase in the REER can result in a current account surplus as there is an increase in investment abroad as opposed to an increase in consumption. This therefore, implies that an increase in the REER can result in an improved current account balance. Nonetheless, the link between the REER and the current account can only be determined empirically.

(iv) The stages of development hypothesis for the balance of payments (Debelle and Faruqee, 1996), suggest that, at an early stage of the development process, where the relative income is low, an economy runs current account deficits as it imports capital due to its external financing requirements. However, at later stages of development and as relative income increases, the economy can run current account surpluses and repay the previously accumulated external liabilities and also increase its exports. This therefore, implies that a positive relationship between relative income and the current account is expected to be positive.

5.   South African current account dynamics

This section looks at the trends of key balance of payments indicators over time. Figure 1 presents the evolution of the South African current account relative to the GDP over time.

**Figure 1. Current account as a percentage of GDP**
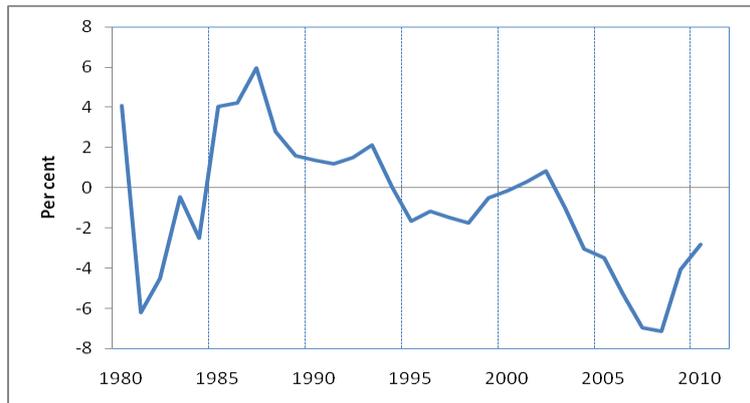
It is clear that the period of the mid-1980s to the mid-1990s was characterised by surpluses and that the period 2003 to date has experienced the longest and pronounced deficits. The breakdown of the current account into its major components indicates that from a trade perspective, the main contributor to the current account deficit has been the decline in the trade balance, whereas, the deficit on the services and income balance has not been helpful in neutralising this effect as it has been negative throughout the sample period.

The developments in the South African current account are consistent with the economic view that periods of strong economic growth tend to be accompanied by high imports and therefore large deficits on the current account.

From the savings-investment perspective, as shown in figure 2, it is clear that the current account deficit in part was a reflection of an increase in investment relative to savings.

Figure 2. Capital formation and saving as a percentage of GDP
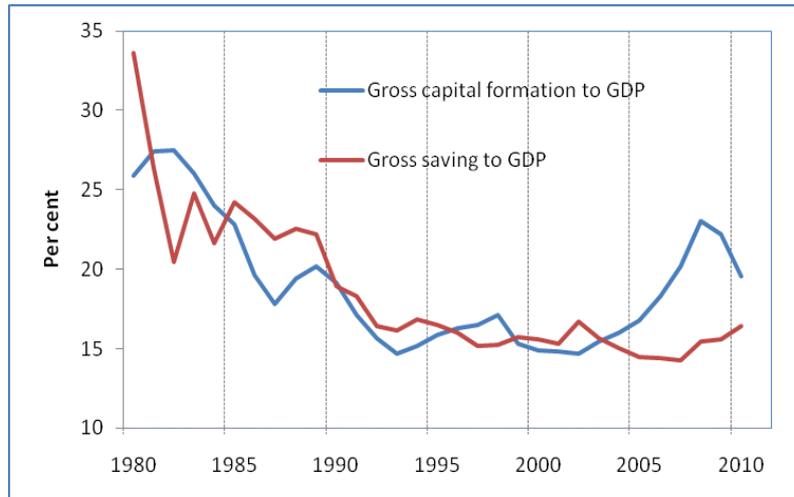
The shortfall in the domestic savings rate, implies that the domestic economy has to rely on foreign capital inflows as a means to finance investment spending. As shown in figure 3, the country has relied to some extent on foreign capital to finance the deficit on the current account, over and above taking advantage of these flows to accumulate foreign currency reserves.

Figure 3. Current account and capital flows as a percentage of GDP
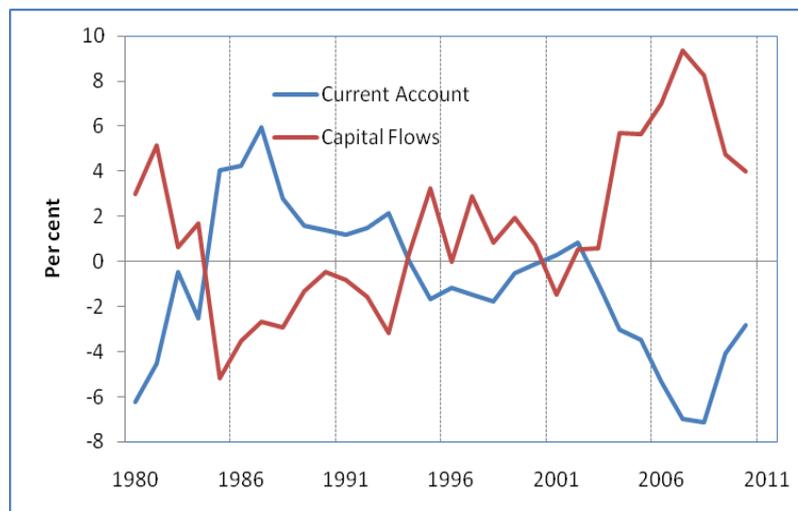
6.   Data and empirical results

Quarterly time series data for the period 1980Q1 to 2011Q1 are used in the study. All the data is sourced from the South African Reserve Bank database with the

exception of data for the US GDP variable which is sourced from the US Department of Commerce (see data appendix for more detail).

6.1 Unit root tests

Table 1 reports the results of the Augmented Dickey-Fuller. The tests show that the null hypothesis of a unit root (non-stationarity) in levels for all the variables could not be rejected.

Table 1.   Unit root tests: Augmented Dickey Fuller

Variables	Level Form (Intercept and Trend)	First difference (Intercept and Trend)	Order of integration
CA	-2,93 [0,16]	-15,92 [0,00]***	I(1)
NFA	-2,67 [0,25]	-5,26 [0,00]***	I(1)
TO	-3,68 [0,03]	-5,85 [0,00]***	I(1)
REER	-3,30 [0,07]	-4,94 [0,00]***	I(1)
SA_US	-1,61 [0,08]	-4,63 [0,00]***	I(1)

***/**/* indicate rejection of the hypothesis at the 1/5/10 per cent level of significance.

This means that the tests must be conducted on the first differences. As reported in table 1, the null hypothesis of a unit root is rejected for all the variables meaning that they are all integrated of order one i.e. I(1).

6.2 Lag Order Selection for the VAR

The Unrestricted Vector Auto Regression model (VAR) for equation 1 were estimated and the results Schwaz (SC) and the Akaike information criterion suggest 2 lags as the optimal lag length.

6.3 Cointegration Rank

Table 2 reports the results of the cointegration tests. The results show that there is only one cointegrating relationship among the variables at a 5 per cent significance level. This therefore means that the tests confirm the existence of a unique long-run

relationship between the current account and the explanatory variables specified in equation 1.

Table 2.   Johansen cointegration test results

Null hypothesis	Alternative hypothesis	Test statistic	Critical value	Probability
Trace Test				
r=0	r=1	49.9	47.85*	0.003
r=1	r=2	11.1	15.49	0.204
r=2	r=3	2.99	3.84	0.083
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				
Maximum Eigenvalue				
r=0	r=1	51.71	33.87*	0.000
r=1	r=2	8.12	14.26	0.366
r=2	r=3	2.99	3.84	0.083
Max-eigenvalue test indicates 1 cointegration eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

6.4   Long-run determinants of the current account

The results presented in table 3 suggest the existence of a long-run relationship between the current account, net foreign assets, openness to international trade, the real effective exchange rate and relative income.

Table 3.   Cointegrating vector

CA	=	-0,09 *NFA*	+0,37 *TO*	+0,09 *REER*	-0,03 *SA_US*
		(2.38)**	(3,97)**	(3,87)**	(2,47)**
		ECT	**-0,21 ΔCA**		
			(-2,05)**		

The sign with respect to NFA is negative and significant implying that the level of the domestic NFA (and partly the exchange rate arrangements) has allowed for the country to run current account deficits for extended periods of time and still remain solvent.

The coefficient of trade openness is positive and significant contrary to the expected negative relationship predicted by the intertemporal approach. These findings are comparable to Lane (2000) and Yang (2011), and are interpreted to indicate the fact that a higher degree of trade openness is often associated with greater output volatility and indicates the need to accumulate a substantial amount of net foreign assets for the purpose of income smoothing and trade surpluses for risk diversification.

The REER is positive and significant and is consistent with common findings explained through the consumption smoothing hypothesis, which argues that the current account can act as a buffer to smooth consumption when there are shocks to domestic savings.

The coefficient for domestic income relative to US income is negative and significant, rejecting the stages of development hypothesis, which expects the developing nations to run current account deficits as they import capital due to its external financing requirements. These results are comparable to the findings of Aristovnik (2007) for the Middle East and North African region, Yang (2011) for India, Korea, Malaysia and Thailand.

6.5   Short-run dynamics of the current account

As shown in table 3 the estimated error correction is negative and significant indicating that having deviated from its long run path, the current account tends to converge. The speed at which it converges is fairly moderate as it amounts to 21 per cent per quarter. This implies that in the absence of further shocks the current account gap closes in roughly five quarters i.e. within one and half year.

For robustness, equation 1 was estimated and the dummy variables for the liberalisation of the trade and financial accounts, and the global financial crisis were included. The results are not significantly different from those reported in table 3.

7.   Conclusion

The paper estimated a vector error correction model to determine for the long-run relationship between the current account and its fundamental macroeconomic determinants, namely net foreign assets, trade openness, the real effective exchange rate and relative income. The paper finds that there is a strong (significant) relationship between the current account and these macroeconomic variables. The sign of the domestic NFA suggests that the initial level NFA has allowed for the country to run current account deficits for extended periods of time and still remain solvent.   The findings for trade openness suggest that a higher degree of trade openness is often associated with greater output volatility and indicates the need to accumulate a substantial amount of net foreign assets for the purpose of income smoothing and trade surpluses for risk diversification. The results with respect to the REER are consistent with the consumption smoothing hypothesis, which argues that the current account can act as a buffer to smooth consumption when there are shocks to domestic savings.

The estimated error correction indicates that having deviated from its long run path, the current account tends to converge at a fairly moderate speed of 21 per cent per quarter. This implies that in the absence of further shocks the current account gap closes in roughly five quarters i.e. within one and half year.

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Data Appendix

Data Description and Sources

1. *CA* = Current account as ratio of GDP

2. *NFA* = Net Foreign Assets as ratio of GDP

3. *TO* = Trade Openness (measured as the sum of exports and imports) relative to GDP

4. *REER* = Real Effective Exchange Rate

5. *SA_US* = Relative income (measured as South African GDP relative to US GDP)

Responses of Current Account to
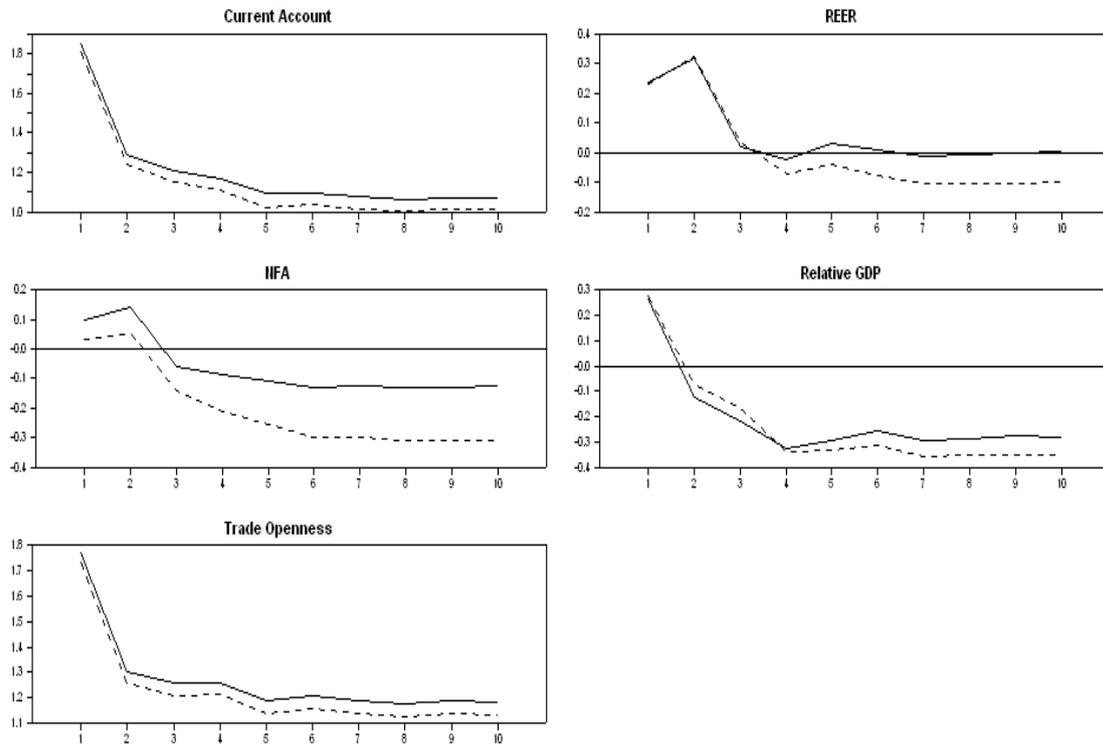
Generalised Impulse responses

Note: Dotted line without; solid with dummies