

South Africa: Macroeconomic challenges after a decade of success¹

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Abstract

More than halfway through the decade, the South African economy has done very well. This report asks whether such achievements provide grounds for complacency. In particular it discusses the current account challenge in light of the Accelerated and Shared Growth Initiative for South Africa (ASGI-SA) program. Our assessment is that a cautionary note on the need to reduce external imbalances is needed. We provide policy recommendations to minimize the negative impact of a possible sudden stop of capital inflows. On the consistency of ASGI-SA program, we note that, given South Africa's recent employment and productivity performance a large investment program would be required to deliver the desired growth

Received: February 17, 2008; Acceptance: April 2, 2008

¹ The authors would like to thank Philippe Aghion for his contribution to Part III and to Federico Dorso, Pablo Gluzmann and M. Melesse Tashu for very capable research assistance. Ricardo Hausmann helped with significant input and Lawrence Harris provided a wonderful discussion in the July meetings with Treasury in Pretoria. Stan du Plessis provided careful and comprehensive comments of an earlier draft. This report has also nurtured from extensive discussion with all the team engaged in the project as well as with talk with government officials and South African academics, particularly at a seminar held at the University of Stellenbosch in-late January 2007. We particularly thank Johannes Fedderke, Brian Kahn, Ismael Momoniat, and Theo van Rensburg, for sharing ideas and suggestions for this report. Alan Hirsch also provided guidance as to the main issues that should be covered. Trevor Manuel enlightened us with a careful description of the issues in our several trips to South Africa.

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Published by Blackwell Publishing Ltd, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main St, Malden, MA 02148, USA

rates. In our view this imposes a large burden on public investment and on the current account itself.

JEL classifications: E2, E6, E65.

Keywords: South Africa, growth, external vulnerability.

1. Introduction

By 2006 the South African economy was 'making history,' in the words of local analysts. The *Bureau of Economic Research* (BER) second quarter 2006 Economic Prospects pointed out some of the outstanding facts: real GDP growth had averaged 4.9 percent in 2005, the fastest growth rate since the (short-lived) spurt of 1984; the current business cycle upswing was running at a record 79-months old; 2004 and 2005 showed the lowest inflation rates recorded in 37 years; long-term interest rates registered a 35-year low of 7.3 percent early in 2005; the budget deficit was estimated at 0.5 percent of GDP for fiscal 2005/6, which was the lowest in 25 years; and the financial account of the balance of payments recorded an inflow of Rand 98.4 billion, the largest ever. Of course, this net capital inflow financed a large current account deficit of Rand 64.4 billion, or 4.2 percent of GDP; and in the first quarter of 2006, the deficit hit 6.4 percent of GDP, the highest since 1982.

An outsider could have strengthened this list with a few additional but important long-term factors that make the South African economy stronger than the typical emerging market economy: a well-developed financial sector, no 'original sin' in the currency denomination of inflows, world-class corporations, a central bank with strong credibility, low-budget deficits, low public sector debt levels, and a successful political transition towards a democratic government which has been able to improve social policies.

Is this rosy picture sufficient to justify complacency? This paper aims to analyze this question. The preceding list already hints at some of the problems, most importantly a burgeoning current account deficit, and its counterpart, significant capital inflows that may have led to an undesirable real exchange rate appreciation. Although it can be argued that the real exchange rate is now comfortably within range of its long-run PPP value, the economy combines a large current account deficit with a very high unemployment rate, while export volume performance has been more lackluster over recent years. Thus, it came as no surprise when the current account deficit topped 6 percent of GDP in 2006 and remained high subsequently.

The current account deficit may or may not cast doubts on external sustainability; it can always be argued that capital inflows will be large enough to compensate the disequilibria. Regardless, it would be natural to expect that under a large investment expansion, as expected in the Accelerated Shared Growth

Initiative-South Africa (ASGI-SA) proposal, external imbalances are poised to widen further. Furthermore, in the context of an increase in consumer debt ratios, consumers are exposed to a sudden increase in interest rates. What do these risks imply for policy decisions?

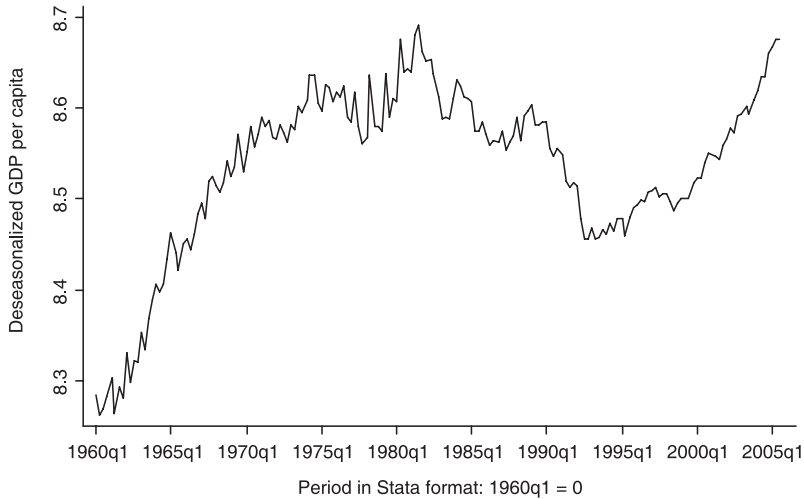
Pursuing these motivations, we address several specific questions. First we ask about the sustainability of the current trends in the South African economy. What are the drivers of the current boom? Is this a demand-driven expansion with little potential for sustainability? Will growth be constrained by external factors? We find that the expansion is driven by a mild consumption boom (mostly durables) and an increase in investment. But the increase in investment has focused on the non-tradable sector, thus auguring future imbalances. When we use the BER's and the Treasury's macro model to simulate the future path of the economy, we find that without an exogenous improvement in the terms of trade, South Africa will show increasing external imbalances.

Given the size of external imbalances, we discuss the possibility of a sudden stop to capital inflows, as in the late-1990s (a possibility that has become more topical with recent global financial market turmoil) and what implications such a sudden stop would have for the South African economy. Were it to materialize, how prepared is the South African economy to deal with it? A period of interest rate tightening in the large economies might precipitate a reversal of the booms in commodities and emerging markets that developed over the preceding five years. How vulnerable is the South African economy to such a sudden stop to capital inflows? We find that the South African economy is much better prepared than other emerging economies, but would still undergo an adjustment if a sudden stop did occur: output would stagnate, consumption would fall, and the government accounts would deteriorate. Thus, we explore a series of actions that may decrease this vulnerability.

We then turn to an analysis of the consistency of the ASGI-SA program. The program is fairly comprehensive, including proposals in a wide range of areas. From a macro perspective the main question relates to the fact that ASGI-SA anticipates a sizable increase in public investment. But how will this increase in investment be financed, and what is its potential effect on the current account? (And does the government have a sufficiently large number of attractive projects?) We discuss what options are available to take the pressure off investment as the main driver of growth dynamics, in particular the need for employment expansion to complement investment more actively as a source of growth.

2. Long-term trends

Any analysis of South Africa's macro performance needs to start with a historical overview of the long-term dynamics of output growth. Figure 1 shows how income per capita increased rapidly during the 1960–80 period, but then experienced a

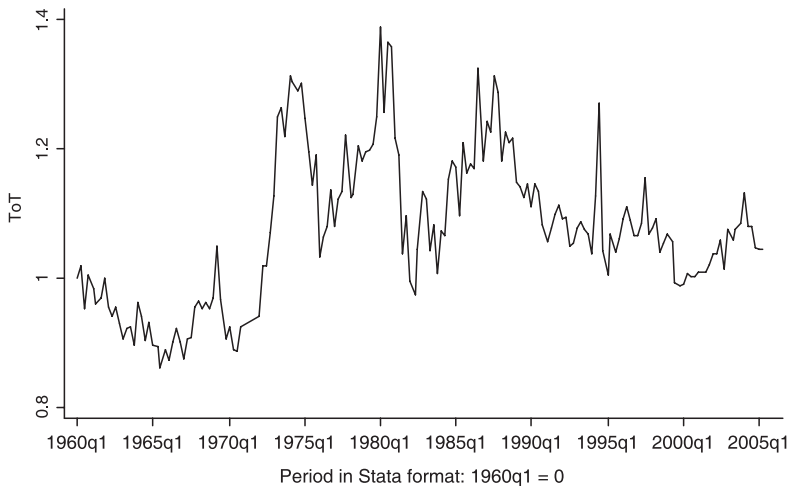
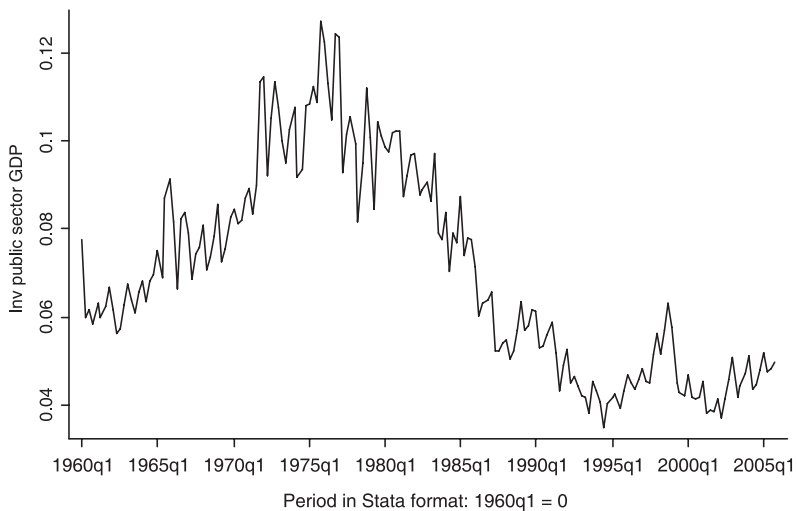
Figure 1. Income per capita

sharp reversal that lasted for the ensuing 15 years. Only since mid-1995 has the economy recovered its upward trend.

These wide swings beg for an explanation. How can an economy experience such a sharp and long turnaround in its growth performance? Among the candidate negative factors were the collapse of the Portuguese empire in 1973, which worsened the regional environment, and especially the increased isolation of the South African economy, particularly after sanctions were imposed in 1986. Three additional factors can be highlighted: a significant weakening of the terms of trade in the 1980s and 1990s, relative to the averages enjoyed during the 1975–1980 years (Figure 2); a worsening environment in international financial markets, and the anticipation of a change of political regime that led to a collapse of private and public investment (Figure 3).²

This begs the question of whether the recovery of recent years is just a cyclical recovery or whether it has reflected sustainable increases in potential output. Du Plessis, Smit and Sturzenegger (2007, 2008) estimate a structural VAR methodology that allows decomposition of the output dynamics for the South African economy into the movements originating in long-run permanent supply shocks (such as technological improvements), and shocks originating from monetary and fiscal policy.

² See Du Plessis and Smit (2006) for a comprehensive review of recent South Africa growth experience including an analysis of the relative contribution of productivity capital and labour and a review of existing literature. Where not specified, data for our graphs were obtained from the *IFS*, *WEO* or official government statistics. Du Plessis, Smit and Sturzenegger (forthcoming) show that the terms of trade and international conditions are responsible for most of the collapse in output.

Figure 2. Terms of trade**Figure 3. Public investment**

The methodology estimates the contribution of supply (s), fiscal (f) and monetary (m) shocks, and allows us to compute the evolution of output as if only one shock at a time existed. Thus, when we shut down the fiscal and monetary policy shocks we can estimate a measure of potential GDP, that is, the evolution of output

Figure 4. Supply shocks

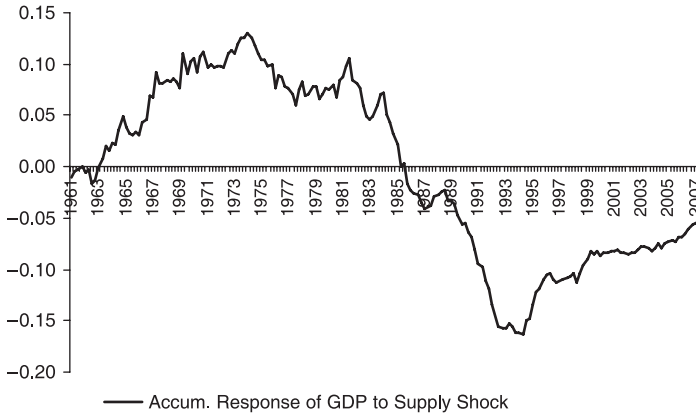
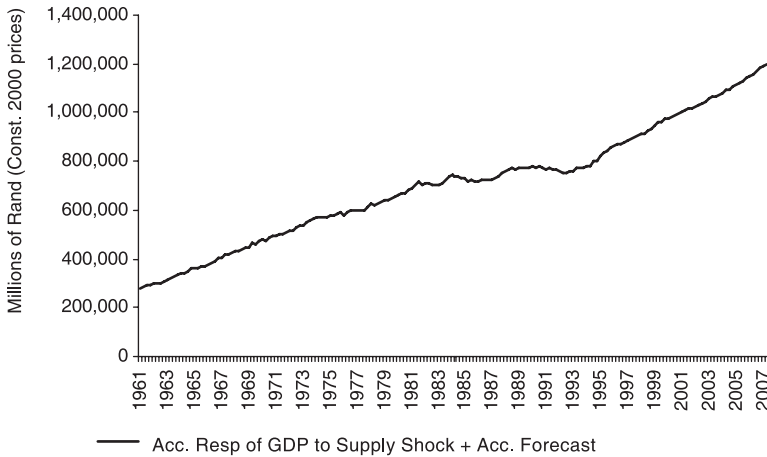


Figure 5. Potential GDP



dynamics resulting from long lasting shocks.³ Figures 4 and 5 show the result of this exercise. Figure 4 shows the component of output arising from long-run shocks, together with many events that provide some background as to the resulting dynamics. The data show some interesting features. First, that since the early-1970s there was a loss in potential output of close to 30 percent of GDP, resulting from a string of adverse external shocks, increased isolation as a result of apartheid,

³ We have estimated the model with two samples, since 1960 and since 1983, and running through the fourth quarter of 2006. To see a longer perspective Table 1 uses the sample starting in 1960.

Table 1. Potential output growth

	Model from 1960q2 (%)	Model from 1983q4 (%)
From 1994Q1 to present	3.26	3.42
From 1996Q1 to present	3.04	3.56
From 1998Q1 to present	3.04	3.55
From 2000Q1 to present	2.86	3.75
From 2002Q1 to present	2.97	4.28
From 2004Q1 to present	3.13	4.62

the mismanagement of the economy, as well as human and physical capital flight. The data also show that the recovery in trend dynamics was extremely fast once democracy was instituted and confidence re-established. At that time, trend GDP started moving up very quickly, with an average increase in the trend of 0.75 percent since 1994, which combined with organic growth gives a potential output growth of about 3.2 percent per year. Figure 5 shows the evolution of total output including this organic growth for a sample starting in 1960. The model starting in 1983 gives about the same result since 1994, but the dynamics within the period are different. Although the sample since the 1960s seems to show a flattening of potential output in recent years, the sample from 1983 shows trend GDP to be accelerating. Table 1 shows the increase of potential GDP using different subsamples of recent periods.

Table 1 indicates that a range between 2.9 and 4.6 percent covers the whole spectrum of feasible rates for potential output growth for the South African economy, with a number close to 3.5 percent being a reasonable average guess. While this may be regarded as a healthy growth rate for potential output, it is below the ASGI-SA objective.

3. Recent dynamics and looking forward

Figure 6 describes the business cycle since 1960 as computed by Du Plessis, Smit and Sturzenegger (2007, 2008) when shutting down the effect of permanent shocks and focusing only on the effect of policy shocks. The figure compares the business cycles thus obtained with those from an alternative classification obtained from Du Plessis (2006). In all cases the match is surprisingly good, considering the alternative methodologies used in each case.

What are the drivers of the business cycle and how can they be expected to evolve? We review these in turn.

First, the data show that investment is on the rise, with private investment at a historical peak. To understand current investment trends further, in Figure 7 we split investment into tradables and non-tradables.

Figure 6. South Africa's business cycle

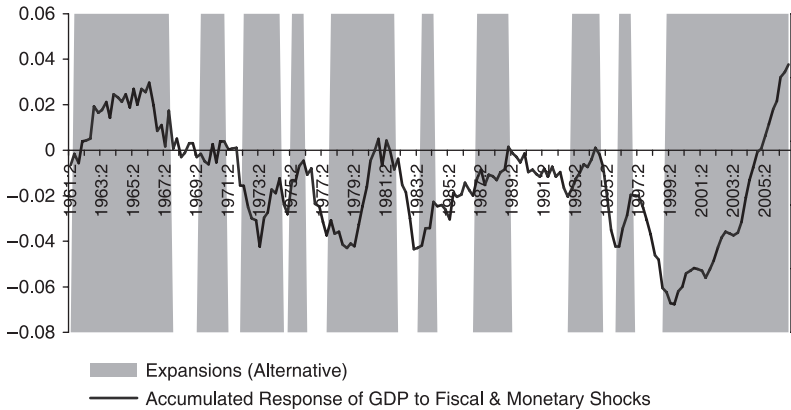
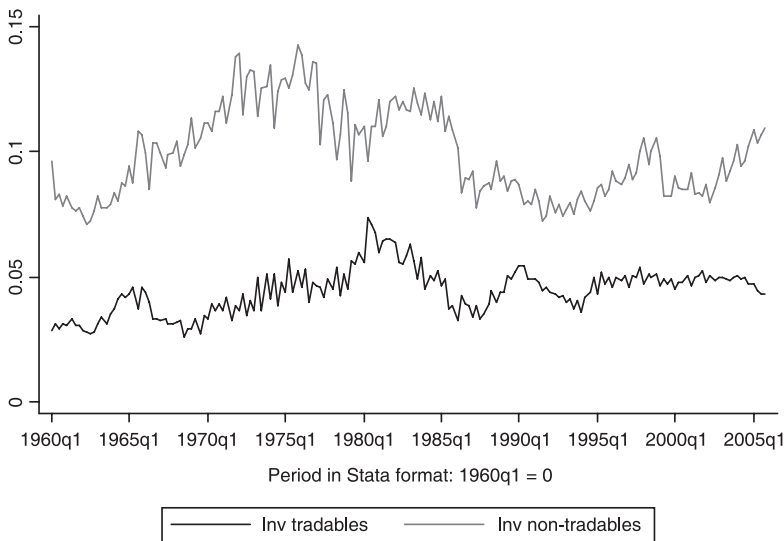
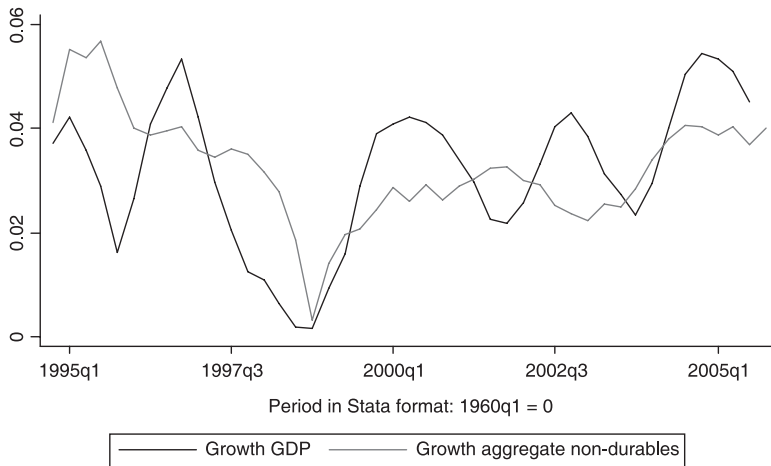


Figure 7. Investment in tradables and non-tradables



When investment is split into tradables and non-tradables (investment in tradables is defined as investment in the mining and manufacturing sectors), it can be seen that investment in the tradable sector has generally oscillated around 5 percent of GDP. In the recent boom, however, it has edged down. In fact, the data show that the recent recovery of investment is mostly in non-tradables investment.⁴ To

⁴ This includes investment in electricity, telecommunications, construction, etc. Some of these may be complementary to tradables production so the distinction should be taken with care.

Figure 8. Non-durables consumption

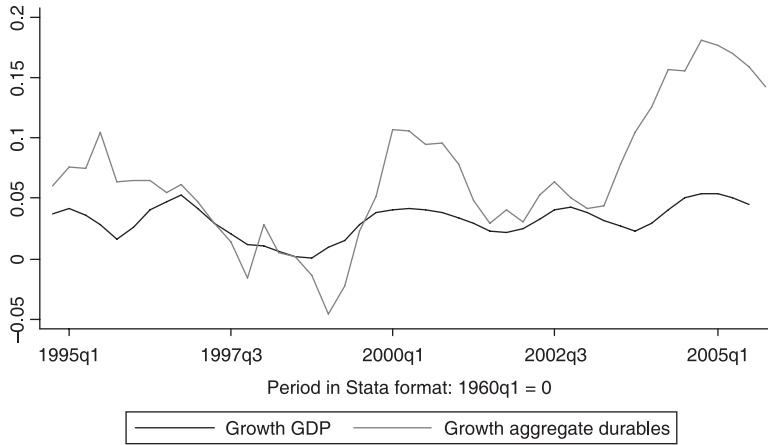
an extent, the recent expansion of the South African economy could be read as suggesting the lack of interesting investment opportunities in the tradable sector (a potential 'binding constraint' on the economy). We should keep in mind, however, that this result is largely dominated by a decline of 27 percent in mining investment between 2003 and 2005: investment in manufacturing increased 28 percent during the same period. Yet the weakness of mining investment does pose the important question of why some tradable sectors have not responded as enthusiastically as one would expect given the favourable external environment.

To discuss the evolution of consumption it is useful to split the total into consumption of non-durables and consumption of durables. To spot an unsustainable consumption boom one quick check is to verify whether non-durables consumption seems to outrun the business cycle. Figure 8, which graphs the rate of growth of output and of non-durables consumption, shows that consumption of non-durables has been smoother than the business cycle. The recent upward cycle does not therefore suggest anomalous behaviour.

Figure 9, on the other hand shows the evolution of durables consumption, which does actually show a significant divergence relative to the cycle, in the form of a large recent upswing. In fact, it is quite predictable that durables consumption will adjust as interest rates fall. In South Africa this led to an increase in the annual growth rate of durables consumption that reached 18.7 in 2005, though it decreased somewhat in 2006.

How unprecedented or unusual are these numbers? De Gregorio, Guidotti and Vegh (1998) look at some stabilization programs where interest rates have also fallen (sometimes by a much larger amount than in the South African case) and have found that an average increase of 2.3 percent in income per capita comes

Figure 9. Durables consumption



typically with an initial increase of real private consumption of 7 percent and of durables consumption of 29 percent. Later on, the increase in durables consumption abates, in fact becoming negative (-21 percent in successful programs and -71 percent for failed programs where the interest rate increases sharply again). In South Africa the numbers indicate that roughly a 4 percent growth in income per capita during the latest expansion led to an annual growth rate in durables consumption of 18 percent/14 percent and to growth rates in non-durables consumption of between 3 and 4 percent. Although it is difficult to make a comparison from these numbers it seems that the income elasticities have been significantly smaller in the South African case.

Of course, because non-durables consumption and investment have moved ahead of output, the current account has deteriorated. Since 2002 it has been in clear negative territory. The current account deficit of 6 percent of GDP raised alarm in the first quarter of 2006. Subsequently the deficits became even larger.

Theoretically at least, there is not necessarily anything wrong with running a current account deficit, and many economies have managed to sustain large current account deficits for many years (for instance, Australia). To the extent that the current account is used to smooth consumption in anticipation of future increases in output, or especially to finance investment, there is in principle no reason to worry about a current account imbalance. But agents may not fully internalize the costs of their lending or the adverse costs of the exchange rate overvaluation that comes with the domestic absorption boom, costs for the long-run sustainability of the tradable sector.⁵ A current account imbalance may signal the build-up of excessive

⁵ Caballero and Lorenzini (2007).

accumulation of foreign liabilities that will lead to a sharp reversal in the future. Among the ways that agents may fail to internalize fully the costs of their borrowing are that they: expect to be bailed out in a crisis, simply do not understand the inter-temporal budget constraint that they face (due, for example, to misleading marketing by financial institutions), or accelerate consumption in anticipation of a collapse of the currency because they believe that the current exchange rate is unsustainable.

Our review of the facts seems to suggest that, whereas investment has been a main driver of the current account increase, it has taken place in the non-tradables sector, and that the economy exhibits an increasing current account deficit in spite of a high unemployment rate.⁶ It follows that an acceleration of growth is poised to deteriorate the current account, potentially into risky territory.

To see how quickly the current account can get out of control we projected the South African economy scenario through 2014 using both the Treasury's macro model and BER's forecasting model. In the following we present the results from the BER's model, and discuss differences with the Treasury's model where relevant.

A run of the model assuming a scenario in which the goals of the ASGI-SA in terms of output growth are attained, shows a current account that maintains a sizable deficit, but without a significant deterioration relative to 2005 levels. However a more careful look reveals two underlying trends that explain this result. First, there is a significant increase in corporate, personal and government savings, which brings consumption to GDP down by close to 4 percent through the estimation period. It is this reduction in consumption that allows a sharp increase in corporate savings, while avoiding a deterioration of the current account beyond recent values. This result suggests behaviour that would be at odds with current trends in consumption (which has been moving ahead of output though the durables consumption boom is expected to abate). The relatively good performance of the current account is also sustained by an optimistic scenario regarding the terms of trade, which improve throughout the estimation period. If we jettison the assumption that the terms of trade continue to improve and replace it by the assumption that terms of trade remain at their current levels, it does not affect investment that much, but it does require further decreases in consumption to keep

⁶ While the official statistics indicate a sizable current account deficit, we can also compute the current account 'inclusive of dark matter' in the terminology of Hausmann and Sturzenegger (2006), that is, relying on annual data for the net income service to estimate a notional stock of net foreign assets the change of which is the current account. This computation would imply that South Africa is a net debtor with total net foreign debt that is currently close to one hundred billion US dollars. When tracking this stock of notional capital through the recent decades we find a significant increase in the stock of net liabilities in the 1970s and 1980s and again, consistent with official figures, in 2003/2004. However, when these estimates are expressed as percentage of GDP a different picture emerges, with a substantial reduction in real foreign liabilities between the early-1980s the mid-1990s and an oscillating pattern after that. In short, while the current account has recently deteriorated and may be on an unsustainable path its balance sheet looks relatively strong.

the current account balance in check. Even then the current account balance does deteriorate significantly.

4. Why is South Africa running a current account deficit when most emerging markets this time around are running surpluses?

As already noted, South Africa has been using the recent boom in capital inflows not just to finance an increase in foreign exchange reserves but also to finance a large current account deficit. Is this cause for concern? Some current account deficits take place for good reasons, others end in crisis. Unfortunately, some have both characteristics. There is less cause to worry if the recent South African deficits are an adjustment to a new equilibrium based on high-growth fundamentals – whether stimulated by an investment and productivity boom, permanently higher commodity prices, or long-postponed consumption by a newly established black middle class. There is more cause to worry, in light of past historical experience around the world, if the current account deficit is stimulated by temporarily easy credit on world financial markets, excessive government spending, temporarily high commodity prices, or other bubble-like factors.

The question of whether the current account is too low is closely related to the question whether the rand is too high. One first pass at this question is to estimate whether the rand is overvalued in some well-defined sense. The rand has undergone large movements in recent years. What explains these swings? Frankel (2007) offers an econometric analysis of the determinants of the exchange rate. Ideally, this would help us form a judgment as to whether the value of the rand in 2007 is appropriate. Specifically he runs.

$$\begin{aligned} \text{Log real rand value} = & a + \beta_1 \text{ Log Real Price Minerals}_t \\ & + \beta_2 \text{ Log (SA GDP per cap/foreign GDP per cap)}_t \\ & + \beta_3 \text{ Log real rand value}_{t-1} \\ & + \beta_4 \text{ Inflation Differential}_t \\ & + \beta_5 \text{ Real Interest Differential}_t \\ & + \beta_6 \text{ Country Risk Premium}_t \\ & + \beta_7 \text{ trend}_t + u_t. \end{aligned}$$

He tried various versions of this equation with the value of the rand defined in nominal terms or real terms, and bilateral against the dollar, or trade weighted.⁷ 'Real Price Minerals,' is computed as a weighted average of the prices of the specific

⁷ Further details on data sources and how these variables were computed are given in the appendix to Frankel (2007), written as part of this project.

mineral products that South Africa produces and exports. It is intended to capture the terms of trade, and so is expressed in real form by deflating by the foreign (US) price level. $(SA\ GDP/foreign\ GDP)_t$ captures an important determinant of the demand for money (domestic relative to foreign). When the dependent variable is expressed in nominal terms, then the GDPs are expressed in nominal terms (which amounts to imposing the constraint that the elasticity of demand for money with respect to income is 1, as in the quantity theory of money). When the dependent variable is expressed in real terms, then the GDPs are also expressed in real terms. It is only possible to include the GDP variable when we are working with quarterly data; we are forced to drop it when working with monthly data. 'Log Rand Value $_{t-1}$ ' is entered to capture the idea of momentum or 'dragging anchor' elements. The remaining three variables capture rates of return. It is not enough simply to add interest rates as a rate of return, and hope for a positive coefficient, because high nominal interest rates in developing countries usually reflect expected inflation, default risk, and devaluation risk. The Expected Inflation Differential (South African minus Foreign) should have a negative effect on the expected rate of return to holding rand, and therefore on the demand for rand, and thence on the value of the rand. Here Frankel uses the one-year lag in the inflation rate to capture the expected future inflation rate.⁸ The Real Interest Differential (nominal interest rate on rand government bonds, minus expected inflation, minus the same for abroad) should have a positive effect on the perceived rate of return to holding rand assets and therefore on the value of the rand. Finally, a Country Risk Premium is included to control for risk of default, or risk of future imposition of capital controls, when looking for a positive coefficient on the real interest differential.

The results are reported more completely in Frankel (2007) but the central tendencies across a variety of specifications are robust: the real commodity price index is significant with the hypothesized positive sign. Real GDP per capita is significant when included on its own, but when included alongside the real commodity price index (with which it is correlated) the latter drives out the former.⁹ Thus, there is no evidence of a Balassa–Samuelson effect in operation. The lagged real exchange rate is highly significant, suggesting a 'dragging anchor' phenomenon. The real interest differential has the hypothesized effect, namely, positive, enhancing the attractiveness of rand assets. It follows that a Mundell–Fleming-like switch in the policy mix, to tighter fiscal policy and looser monetary policy and therefore a lower real interest rate, would lead to a real depreciation of the rand. The country

⁸ We have also obtained an *ex ante* measure of inflation expectations from BER forecasts, in place of lagged inflation. But we have not learned a lot from re-estimating the equation with this measure, in part because it is only available quarterly, which requires a big drop in the number of observations.

⁹ Frankel (2006) included equations for the determination of the nominal real exchange rate, in addition to the real exchange rate. It tested for an effect of total income, in addition to per capita income. Again, the real commodity price index drove out the income term.

Figure 10. Actual and fitted exchange value of the rand



risk premium, measured by the sovereign spread, has the hypothesized negative effect, while controlling for the real interest differential. There is little evidence of a structural break when capital controls were removed in 1996. If anything, a point estimate of the coefficient on the interactive term seems to indicate a fall in the sensitivity of rand demand to the real interest differential, rather than the rise that would be expected.

The fit, illustrated in Figure 10, is surprisingly good. The estimated equation is able to track the appreciation of 2003–2006. This is true even relying solely on the macroeconomic fundamentals, that is, even without making use of the lagged actual exchange rate.¹⁰ Especially after the depreciation of 2006–2007, it is hard to say that the value of the rand lies above what could be expected based on its past relationship with economic fundamentals. But this does not necessarily mean that the current level is optimal as a signal for the allocation of real resources.

Even if the terms of trade have not risen spectacularly – the big rise in prices for South African mineral exports having been substantially offset by a big rise in

¹⁰ Again, see Frankel (2007).

the price of oil imports – the global commodity boom was nonetheless responsible for the appreciation of the rand over the recent years. The rand has been a ‘mineral play’ for speculators. The reason is that investors have piled into South African assets (especially equities), thus bidding up their price not only in the form of higher rand prices of equities but also in the form of an appreciation of the currency. Easy money emanating from the world’s major central banks (Fed, BoJ, ECB, and PBoC) over the period 2002–2005, together with a possible bubble component over the period 2005–2006, have probably been one force behind the movement into commodities generally, emerging markets generally, and commodity-based emerging markets in particular (the ‘carry trade’).

The bad news is that the bubble component may be more applicable to South Africa than to other emerging markets that are currently running trade surpluses and accumulating reserves. One must consider the possibility that a sudden stop would have painful effects on the South African economy. Thus, macro policy needs to pay attention to the current account imbalances. In the end this requires avoiding large real appreciation of the rand, as well as stimulating output with a vigorous growth of the export sector.

Depreciation of the rand accompanied global financial turmoil in the spring 2006 and winter of 2007, an indication that some adjustment may already be taking place. But if the pattern of inflows and appreciation were to resume (that is, if the reversals of 2006–2007 prove to have been temporary), we would support a more active intervention strategy to avoid further appreciation. The reason is that we believe that the strengthening of the rand from 2003 to 2006, while fully explainable by economic fundamentals, was an important factor in the large current account deficit.

5. Managing capital outflows in a sudden stop

There are reasons to be sanguine about the odds of a sudden stop or a large depreciation in South Africa. The government is not running large deficits financed by money printing in the context of a fixed exchange rate regime system, the typical setup that often leads to a speculative attack. South Africa has a low debt ratio and one that has a relatively high share in domestic currency, thus reducing the possibility of a self-fulfilling run generated by fears about the implications of devaluation on the balance sheets of corporations and the government. In fact in 2001, when the rand/dollar rate almost doubled – South Africa’s version of the currency crashes that hit other emerging markets between 1997 and 2001 – growth went down by only 1.5 points, from 4.2 percent in 2000 to 2.7 percent in 2001.

But there are also reasons to worry. Past cycles of large capital inflows to other emerging markets have usually ended in tears. When might it be the turn of South Africa?

5.1 Could there be a repeat across all emerging markets, as in 1982, and 1997–1998?

South Africa has in the current decade experienced large capital inflows, upward pressure on the currency, low spreads on borrowing, upward pressure on securities prices, and faster-than-usual growth. There is a temptation for each country to think that its problems are unique – and in many ways they are, of course. But the recent macroeconomic situation in South Africa in some respects mirrors that of many other emerging markets around the world. Furthermore, the entire international pattern looks suspiciously like a repeat of two earlier inflow/boom phases that ended, respectively, in the international debt crisis of 1982 and the Asia/Russia crises of 1997–1998.

It is probably too early for a full-fledged repeat of those crises. Memories of global investors are still too fresh to have allowed themselves to have become over-extended. After all, it was only a few years ago that Argentina agonizingly devalued and defaulted on its debt. Nevertheless, the recent developments make the question particularly salient. In March–May of 2006, turmoil in international financial markets was triggered by tightened monetary policy in the United States and expectations that other major central banks were going to follow suit. In February of 2007, a new round of stock market contagion began in China. In January of 2008, the crash in US housing markets and the simmering US sub-prime mortgage crisis spilled over into fears for the entire real economy, and led to sharp falls in stock markets around the globe.

Thus, one must be alert to the possibility of new sudden stops of capital inflow, at least in vulnerable countries. We will first consider the odds of a sudden stop globally, and then consider the vulnerability of the South African economy to such a development.

5.2 Or have things fundamentally changed?

Two things are striking about the past boom–bust cycles. First, they seem to follow complete cycles of roughly 15 years. (The same was true in the late 19th century.) Second, when the boom phase is in full swing, most investors develop historical amnesia regarding how past booms have ended. Perhaps the reason for the 15-year cycle is that, it is how long it takes for those investors who were burned in the last crash to move out of their jobs and to be replaced by investors too young to remember. Usually they know there were crises in the past, but they think ‘this time it is different.’¹¹

Having said that, there are several respects in which the recent episode of capital inflows has taken place under more propitious conditions than in the past.

¹¹ Rogoff (2004) was one of the first to warn that spreads were too low to reflect rationally the chances of another turn in the cycle.

The first is that more currencies are flexible than ever before. A floating exchange rate virtually rules out a speculative attack by assumption.¹² Exchange rate flexibility deprives speculators of a one-way bet. It also forces firms to confront the possibility of large changes in the exchange rate, and thus discourages them from incurring large unhedged dollar liabilities. To be sure, only a few of the developing countries that claim to be floating are really floating purely, that is, without intervention by the monetary authorities. But the degree of flexibility is higher (with the exception of a handful of small countries that have opted for European integration, dollarization or currency boards).

The second thing that is different this time around is that a far higher fraction of the capital flows is going into reserves. Indeed in many countries the reserves are going up by even more than 100 percent of capital inflows. This is especially true in Asia – where China passed the \$1 trillion mark and became the largest holder of foreign exchange reserves in the world in 2006 – and among oil producers. Having a high level of reserves – as a ratio, for example, to short-term liabilities – is statistically perhaps the most reliable protection against a currency crisis.¹³ Many economists agree, however, that reserves in many developing countries are by now higher than needed.¹⁴ (On the current account question, South Africa this time around is one of those that is following the traditional pattern. But more on that below.) In any case, that reserve levels are high globally suggests a low probability of new crises.

Multilateral discussions to improve the ‘international financial architecture’ accelerated after the East Asian crisis that began in 1997, although in truth they had been underway at the time of the 1994 Mexican peso crisis and before. Many reform ideas, such as the IMF’s proposed Sovereign Debt Restructuring Mechanism (SDRM) or its Conditional Credit Line either were not adopted or came to little in practice. One proposal, however, has been adopted by countries such as Brazil and Mexico: the inclusion in bond contracts of a Collective Action Clause, which would make it easier to restructure the terms of borrowing in the event of a crisis by preventing a small minority of creditors from blocking such restructurings – in particular, for private sector bonds.¹⁵ Thus, like the SDRM and other proposals, it was motivated

¹² Larrain and Velasco (2001) and Levy-Yeyati and Sturzenegger (2001) are two supporters of floating.

¹³ E.g., Frankel and Rose (1996), Berg *et al.* (1999) and many others. Such measures as the composition of inflows (e.g., maturity) and the uses to which they are put (e.g., reserves), turn out to be better predictors of future crises than the simple levels of the aggregate current account deficit or foreign debt. The ratio of reserves to short-term debt captures both aspects. The Guidotti (2003) rule suggests that countries should maintain a level of reserves at least sufficient to cover short-term debt, defined as all debt of maturity less than one year or debt otherwise maturing within one year. The logic is to protect themselves against a sudden stop to capital inflows for one year, which should be long enough to generate the needed improvement in the trade balance.

¹⁴ Rodrik (2006) says reserves held by developing countries have climbed to 30 percent of GDP, or eight months of imports, and estimates the income loss due to low returns at 1 percent of GDP. Also Summers (2006).

¹⁵ Eichengreen (1999), Eichengreen and Mody (2000a), Eichengreen and Mody (2000b), Eichengreen and Portes (1995), and Portes (2000). See Sturzenegger and Zettelmeyer (2006) for a discussion on whether CACs can mimic the workings of domestic courts.

by the belief that the main failure of international capital markets was an absence of an efficient mechanism, analogous at the domestic level to corporate bankruptcy law, for renegotiating payment terms when adverse developments such as a collapse in exports made it impossible for debtors to pay on the original terms. Others, however, believed that the existing system – conditional new loans from the IMF and sometimes the G7, together with Private Sector Involvement – was working about as well as the system was ever going to work.¹⁶ Bonds issued in London, moreover, had always essentially carried the CAC feature. It is not clear that this feature will make much difference in the next crisis, especially for countries that had always borrowed in London.

One of the most widely agreed diagnoses of the emerging market crises of the 1990s was that currency mismatch had rendered large devaluations contractionary through the balance sheet effect. Output fell sharply following the Mexican devaluation of 1994 and the Asian devaluations of 1997, rather than rising in response to the improved competitiveness of Asian exports. The debts were denominated in dollars (and other foreign currencies), and were unhedged, whereas the revenues of the local corporations and banks were in pesos, baht, won and rupiahs. The result was that after a big devaluation, even otherwise healthy companies were forced to cut back output and employment to service their newly expensive debts, or in some cases to go out of business altogether.

What is the origin of the currency mismatch, the excessive reliance on foreign-currency denominated debt? An obvious part of the explanation is that foreign investors are reluctant to hold locally denominated debt out of fear that it will be inflated or devalued away, which has a moral hazard dimension. But devaluation proved in the 1990s as costly to the debtor as to the creditor, which somewhat attenuates the moral hazard danger. And given that the alternative, under dollar-denominated debt, is default, this is not a complete answer to the question of why foreigners have been reluctant to hold locally denominated debt. Hausmann attributed it to original sin – an unwillingness of international investors to take open positions in small local currencies that was inherited from history and beyond the control of current policy makers.¹⁷ Others attributed it to the illusion of exchange rate stability under declared pegs.¹⁸ A third hypothesis is that the dollar-composition of debt – like the short-term composition – often increases sharply during the brief interval between the month that a stop in inflows begins and the month of the ultimate speculative attack, thus worsening the balance sheet effect when the crisis finally arrives.¹⁹ The second hypothesis – that currency mismatch is a side-effect of adjustable pegs – looks better now than it did a decade ago, because many

¹⁶ See Roubini (2000) and Frankel and Roubini (2003).

¹⁷ Eichengreen and Hausmann (1999), and Eichengreen, Hausmann, and Panizza (2003).

¹⁸ Eichengreen (1999).

¹⁹ Dornbusch (2002), Frankel and Wei (2004), and Frankel (2005).

countries have indeed been able to increase the proportion of their debt denominated in their own currencies at the same time as having moved to increased exchange rate flexibility. Regardless of the extent to which the flexibility was the cause of the shift in currency composition, the trend is again reassuring.

In most countries there has been a continuation of the trend of increased globalization, as measured for example by the ratio of trade to GDP, despite some setbacks in 2001. A high ratio of trade to GDP is in general good for long-term economic growth.²⁰ But it also reduces the frequency and severity of currency crises, according to various econometric studies.²¹

A number of different specific mechanisms have been proposed to flesh out the view, which many find counterintuitive, that openness to trade makes countries less vulnerable to crises. Rose (2002) argues that the threatened penalty of a loss of trade is precisely the answer to the riddle 'why do countries so seldom default on their international debts?' and offers empirical evidence that strong trade links are correlated with low default probabilities. International investors will be less likely to pull out of a country with a high trade : GDP ratio, because they know the country is less likely to default. A higher ratio of trade is a form of 'giving hostages' that makes a cut-off of lending less likely.²²

Another variant of the argument that openness reduces vulnerability takes as the relevant penalty in a crisis the domestic cost of adjustment, that is, the difficulty of eliminating a newly unfinanceable trade deficit. The argument goes back at least to Sachs (1985). He suggested that Asian countries had been less vulnerable to debt crises than Latin American countries – despite similar debt/GDP ratios – because they had higher export : GDP ratios. The relatively worse performance observed in Latin America was due to the lower availability of export revenue to service debt. He concluded that: 'After a decade of rapid foreign borrowing, too many of Latin America's resources were in the non-exporting sector, or abroad. When financial squeeze in the early 1980s caused banks to draw their loans, the only way that Latin countries could maintain debt servicing was through a recession and a large reduction in imports combined with debt rescheduling' (p. 548). More recently, Guidotti *et al.* (2004) made a similar point by providing evidence that economies that trade more recover fairly quickly from the output contraction that usually comes with the sudden stop, while countries that are more closed suffer sharper output contraction and a slower recovery.

²⁰ E.g., Frankel and Romer (1999) find that every 0.01 increase in the ratio $(X + M)/GDP$ raises income over the subsequent 20 years by an estimated 3 percent. Rodríguez and Rodrik (2001) critique such findings.

²¹ E.g., Calvo, Izquierdo and Mejia (2003) and Edwards (2004a, 2004b). Cavallo and Frankel (2008) find that openness reduces crises even correcting for endogeneity; that paper also gives further arguments and references, including on the other side of the debate.

²² The point was originally made by Eaton and Gersovitz (1981). They argue that countries that trade more are subject to more harmful trade-related retaliation in the aftermath of default and therefore are less likely to default.

Similarly, a high level of inward Foreign Direct Investment generally not only helps raise long-term growth, but also helps reduce the probability of currency crises.²³ This is another one of the findings to the effect that the composition of capital inflows matters as much or more than the total in determining the probability of crises:

1. FDI is safe, while portfolio inflows are risky;
2. long-term borrowing is safer, while short-term borrowing is riskier;²⁴
3. domestic-currency denomination is safe, while foreign-currency is riskier;
4. and all types of equity are safe, while bank loans are risky. Also
5. concessional loans (for example, from IDA) are far safer, not because they carry a lower interest rate (indeed, that can feed the danger of excessive borrowing), but because they tend to be countercyclical, in contrast to market loans.²⁵

FDI has been a relatively high share of the capital inflows in the current decade, just as bank loans were high in the 1982 episode and bonds in the crises of 1994–2001. In short, the trend toward greater openness with respect to trade and FDI is yet another basis for perhaps believing that ‘this time is different.’

So, some things are different this time around. Along with the increased exchange rate flexibility, higher propensity to hold reserves, and lower proportion of dollar-denominated debt, the high levels of FDI and trade augur well for the prospects of getting through the decade without any new economically catastrophic crisis. What are the theories behind these empirical regularities? In each case, one of the easiest rationales to see is that if a country does face a sudden stop to capital inflows, the adjustment is easier, with fewer adverse effects on the real economy. The adjustment is accomplished.

1. without the deadweight loss of negotiations over debt restructuring and of debt overhang during this prolonged period,
2. without the adverse balance sheet effects that higher interest rates have via short-term debt and that higher exchange rates have via dollar-denominated debt,
3. and without the sharp falls in output that are necessary – via either large devaluations and large contractions in demand – to raise a given quantity of export revenue in countries with low ratios of exports to GDP.

On the negative side, for those who view capital controls as having been helpful in the past (for example, in Chile, Malaysia, India and China), it must be worrisome that capital markets are more open than ever. More importantly, the global economic leadership that was exercised by the G7 and the IMF in the 1980s and 1990s may be missing this time around. The IMF has been attacked from all directions and weakened, while the US government’s style of leadership has since 2001 diverged

²³ E.g., Frankel and Rose (1996), among others.

²⁴ Rodrik and Velasco (2000).

²⁵ Frankel and Rose (1996) and Levy-Yeyati (2006) among others.

sharply from the multilateral vision that others have in mind. Reversals in capital flows turn out to be fairly common events. Guidotti *et al.* (2004) show that about 8 percent of non-industrial countries do experience reductions in their capital flows of 5 percent of their GDPs or more in a typical year. How long will it take until South Africa experiences a reversal?

Summing up, there is less reason to worry now than there was in 1982 or 1997. But crises ultimately are not predictable. Few on the eve of 1982 or 1997 expected a crisis. So the lesson is that one should always be vigilant.

5.3 *Could it happen now?*

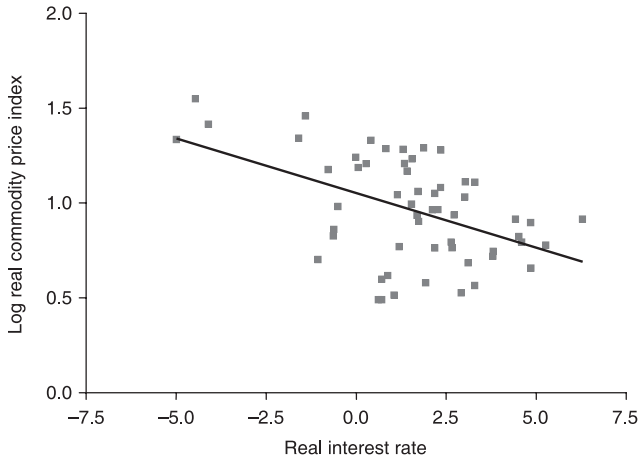
It was noted above that four years into a boom phase seems early for a major correction. Is there any reason to be particularly vigilant at this point in history?

Monetary ease in the United States and other major countries contributed to the late-1970s and early-1990s boom phases, and tightening by the Fed in 1980–1982 and 1994 helped precipitate the international debt crisis of the 1980s and the Mexican peso crisis, respectively. In both episodes, investors ventured far from home in search of high yields when domestic interest rates fell below what they had become accustomed to, but then scurried back home when the US interest rates again rose. The swings in this capital account cycle often exacerbated swings in developing countries' trade accounts. In theory, when their output and exports are weak, developing countries should be able to borrow on international capital markets to smooth the path of spending. In practice, capital flows in developing countries tend to be procyclical rather than countercyclical: global investors only have the confidence needed to lend to developing countries when their economies are booming, and get cold feet when problems develop.

It does not help that the world markets for mineral and agricultural products, as measured by dollar prices, appear to be negatively correlated with real interest rates. From the viewpoint of a commodity-producing debtor like South Africa, if international finance becomes scarce at precisely the time that world markets for its exports are weak, then the capital account exacerbates the trade deficit rather than offsetting it. It may not be a coincidence that the commodity booms of the 1970s and 2002–2008 both came at times of globally low real interest rates, while the commodity crash that began in the early 1980s came at a time of high real interest rates. Intuitively, high interest rates reduce the demand for storable commodities, or increase the supply, through a variety of channels: by increasing the incentive for extraction today rather than tomorrow (think of the rates at which oil is pumped, zinc is mined, forests logged, or livestock herds culled), by decreasing firms' desire to carry inventories (think of oil inventories held in tanks) and by encouraging speculators to shift out of commodity contracts (especially spot contracts), and into treasury bills.

All three mechanisms work to reduce the market price of commodities, as happened when real interest rates were high in the early 1980s. A decrease in real

Figure 11. CRB Commodity prices index vs. real interest rate (annual, 1950–2003).



Source: Reproduced from Frankel (2008).

interest rates has the opposite effect, lowering the cost of carrying inventories, and raising commodity prices, as happened during 2002–2008. Call it part of the ‘carry trade.’²⁶ Results obtained from Frankel (2008) for data since 1950 suggest that on average an increase in real interest rates of 1 percent usually leads to a fall in commodity prices of about 6 percent, with an expected half life of three years (see Figure 11). All results are strongly significant statistically when using price index data that are available for 50 years.

The Fed, BoJ and PBoC had been following extraordinarily easy monetary policies during the beginning of the most recent boom phase (2002–2004). The Fed returned to raising interest rates from 2004–2006. This raised the question of whether investors might once again start pulling their money out of emerging markets.

Initially, private investors continued to pour money into assets around the world that seemed to offer a higher rate of return than US Treasury bills: stocks and bonds generally, but especially real estate, emerging markets, and agricultural and mineral commodities. Valuations in all three sectors reached historically high levels, as measured for example by price/rental ratios, sovereign spreads, and real mineral prices, respectively – even record prices of various mineral products. Why the pattern continued three years after the United States began to raise short-term interest rates is an interesting question. (In the case of long-term bonds, Chairman

²⁶ Frankel (2008) presents the theoretical arguments, updated empirical evidence, and further references. Or see <http://ksghome.harvard.edu/~jfrankel/CP.htm>.

Alan Greenspan famously labelled the puzzling lack of response to rising short-term rates a 'conundrum'. One possible answer is that on a global basis, money remained easy by historical standards: liquidity continues to spill outward from China, and real interest rates remain low. Another is that a momentum component or bubble sustained these markets for another year or two after monetary fundamentals had begun to turn around.²⁷

Indeed, currencies and securities prices fell abruptly in many emerging markets (for example, Turkey and Hungary) after an abrupt re-pricing in Iceland in late-March 2006, and again in May-June. A year later, the Shanghai stock index fell 9 percent on February 27, 2007, followed the next day by worldwide declines in stock and other markets, which had all the hallmarks of contagion. The question is whether these reversals of the triple boom in commodities, emerging markets and real estate (quintuple boom, if one counts long-term bonds and stocks) were merely passing blips – a partial transitional unwinding of the carry trade left over from a few years ago – or the harbinger of a more serious and prolonged downswing to come.

5.4 How does South Africa compare to others in indicators of vulnerability?

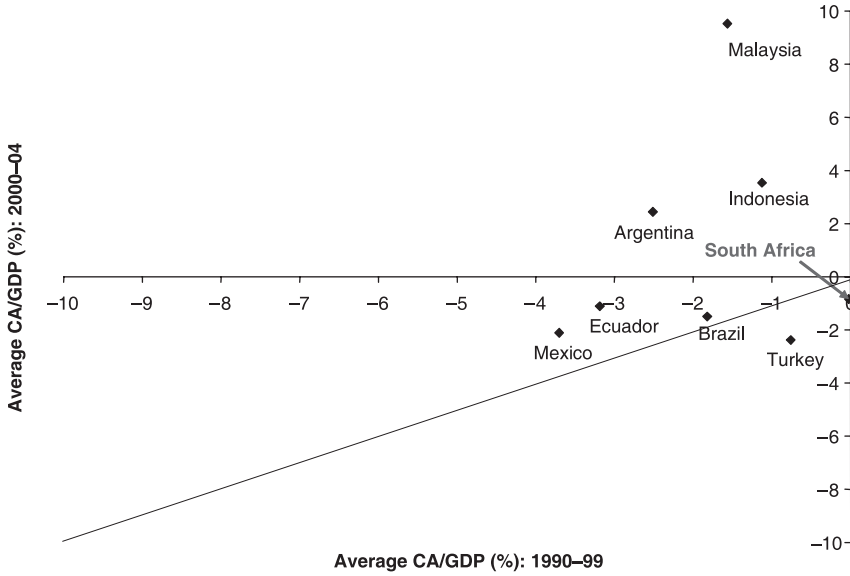
As already noted, the major respect in which South Africa is among the more worrisome developing countries currently is that the capital inflows are going to finance a huge current account deficit, more than to build-up reserves.

Figure 12 compares the deterioration in South Africa's current account to that of other comparable countries. Countries above the 45° degree line are those that have improved their current account balances in recent years. South Africa and Turkey stand out as the two that have experienced the strongest fall in their current account balances relative to the 1990s.

On the positive side, South African debt levels are not high, perhaps because much of the capital inflow takes the form of equity and FDI. Figure 13 shows that the country has generally run what is easily the lowest ratio of external debt to GDP of the comparison set, about 20 percent. Figure 14 shows that debt service/exports has fallen to only 10 percent, the lowest in the group except for export-crazy Malaysia.

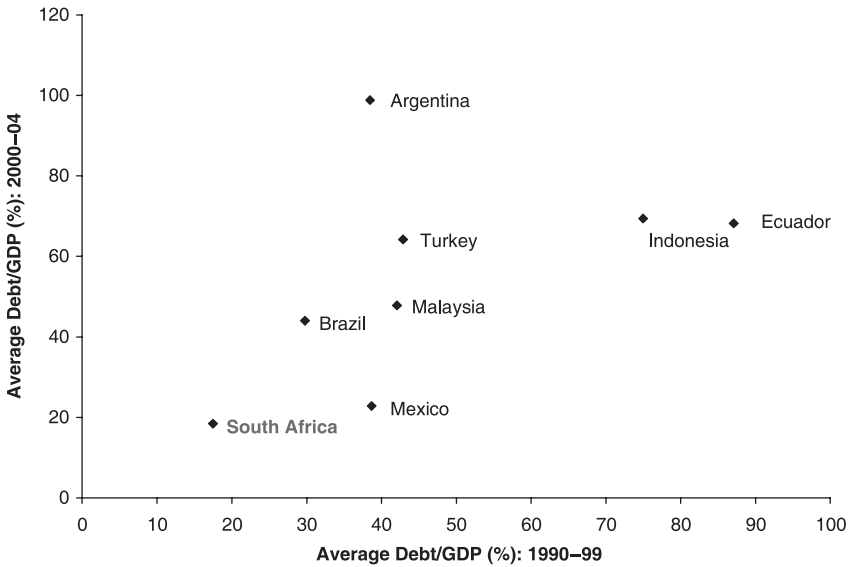
²⁷ This lag would arguably be consistent with the historical pattern. The international debt crisis of 1982 lagged two years behind the sharp rise in US interest rates and associated collapse of dollar prices for international commodities. The 1985 peaking of the dollar came a year after real interest rates and other fundamentals had reversed. The 1994 Mexican peso crisis came a year after the beginning of a new Fed tightening cycle. The 1995 peaking of the yen came several years after Japanese fundamentals had turned around. The 2002 peaking of the dollar (vs. the euro) came a year after a US recession and the abrupt shift to extraordinarily open-ended expansionary monetary and fiscal policy.

Figure 12. Average CA/GDP (percent) in 2000–2004 vs. in 1990–1999

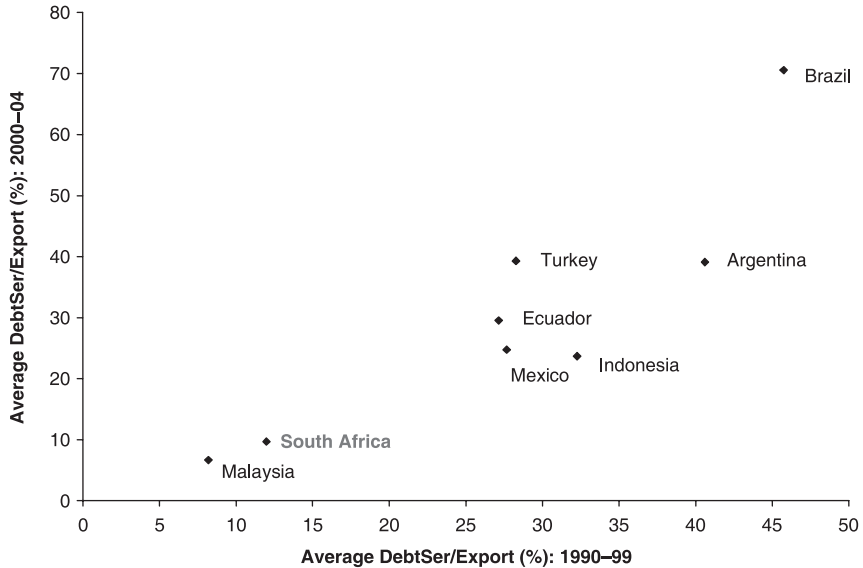


Source: Reproduced from World Development Indicators.

Figure 13. Average debt/GDP (percent) in 2000–2004 vs. in 1990–1999



Source: Reproduced from World Development Indicators.

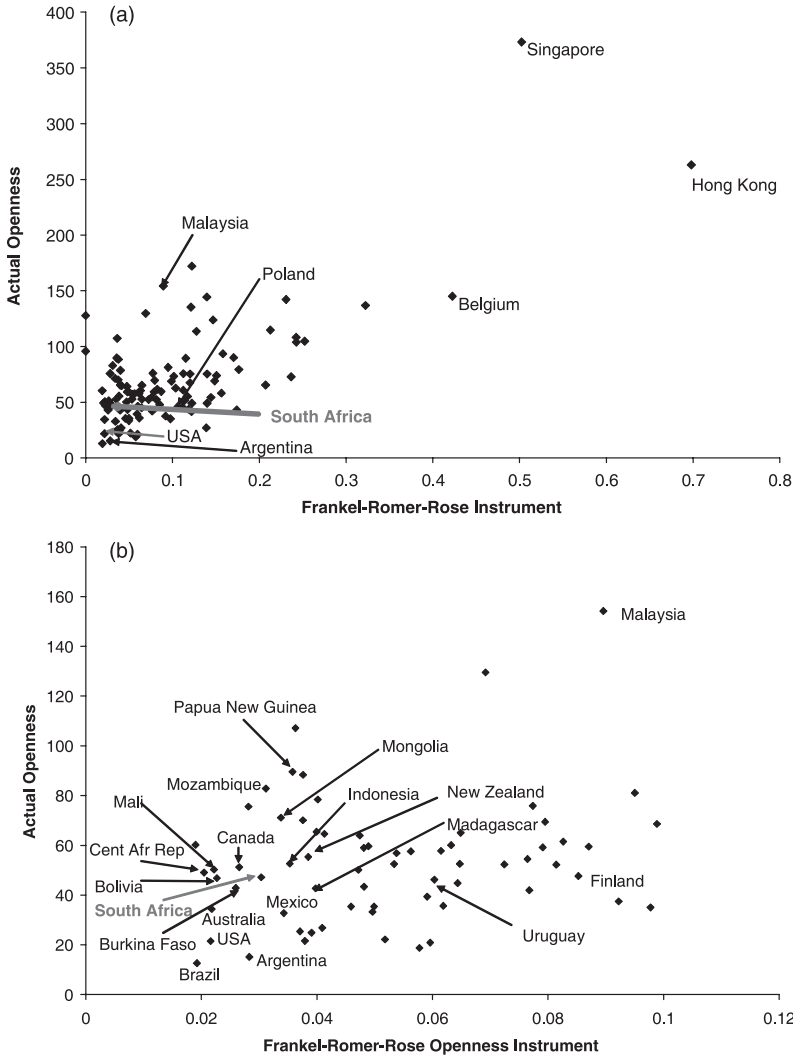
Figure 14. Average debt service/export (percent) in 2000–2004 vs. in 1990–1999

Source: Reproduced from World Development Indicators.

We noted above that openness not only tends to raise the level of income per capita in the long run, but also reduces the probability of sudden stops and currency crashes in the short run. Trade openness is often measured by exports, total trade, or some measure of the aggregate tradable goods sector, in each case as a ratio to GDP. The data suggest that South Africa looks moderately open within the comparison set, before we even take account of the remoteness of its geographic location – better than Argentina and Brazil, worse than Malaysia. But Malaysia is the outlier, with one of the highest ratios in the world (after Singapore).

One can use the gravity model of trade to test whether South Africa is more or less open than one would expect from the geographical determinants (size, remoteness, landlockedness, common languages, membership in Free Trade Areas, and so on). This question is relevant because if it is less open than would be predicted by the geographical and other determinants, this strengthens the argument for removal of tariffs and other trade barriers. Figure 15a shows countries' actual ratios of trade to GDP on the vertical axis, and the level that would be predicted by the gravity model on the horizontal axis. As is clearer when we omit the extremely open city states Singapore and Hong Kong from the graph (Figure 15a), South Africa's trade openness is in the middle of the range predicted by the gravity determinants. It is neither as closed as Argentina nor as open as Mozambique, even though all three countries are similarly situated with respect to geographical determinants of trade

Figure 15. (a) Trade/GDP vs. prediction by the geographical determinants in the gravity model. (b) Trade/GDP vs. prediction by the geographical determinants in the gravity model, excluding Singapore and Hong Kong.



Source: (a) Reproduced from Frankel–Romer–Rose variable, available at <http://ksghome.harvard.edu/~jfrankel/currentpubsspeeches.htm#On%20Globalization%20and%20Trade>. (b) Reproduced from Frankel–Romer–Rose variable, available at <http://ksghome.harvard.edu/~jfrankel/currentpubsspeeches.htm#On%20Globalization%20and%20Trade>.

(remote from the global economic centres, on the one hand, but with plenty of access to the sea on the other hand).

The policy conclusion remains that trade liberalization would help raise openness, which in turn would eventually promote growth and reduce the vulnerability to sudden stops. Another way of achieving the goal of increasing openness is to fix the exchange rate or join a currency union.²⁸ While there are other countervailing arguments for keeping the rand flexible against the dollar, euro and other major currencies – and these arguments will and should continue to dominate – there is the possibility of establishing a southern African currency union, based on the rand or a sort of African version of the EMS or Bretton Woods based on the rand. As long as South Africa can maintain its monetary policy discipline, it can gain from extending the reach of the rand throughout the region. Econometric results suggest that this would boost trade in the region, and overall trade at the same time.

As noted, the ratio of exports to GDP is related to the capacity of an economy to respond to an external shock (Guidotti *et al.* 2004). The ratio has also been shown to reduce the probability of facing a sudden stop in the first place (Cavallo and Frankel 2008).²⁹ In the case of South Africa, the exports to GDP ratio has increased somewhat from its lows during the 1980–1985 period, but remains at 25 percent, lower than it could be.

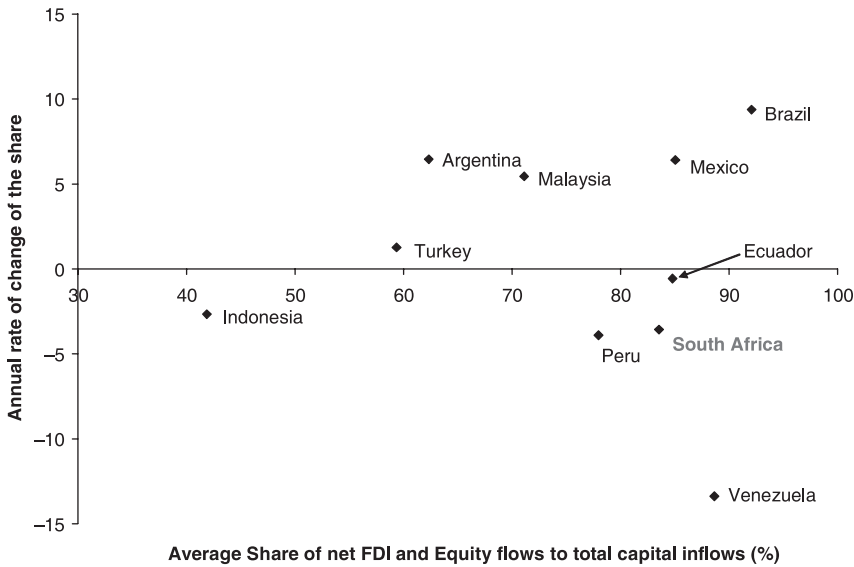
South Africa has a reputation for being one of the few developing countries with financial markets so developed that it has long been able to borrow in rand. We need not dwell further here on this well-known fact. More interestingly, we have examined the share of identifiable net inflows that consist of equity plus FDI (as a fraction of the total that includes bank loans and bonds), for South Africa and the rest of the list of ten comparison countries. One can think of this share as an inverse measure of financial leverage – as related to a sort of debt : equity ratio. Being net flow numbers, the shares are sometimes less than 0 or greater than 1. But the fluctuations tend to average out over the 11-year period. Figure 16 summarizes the information by putting on the horizontal axis the average share consisting of equity plus FDI, and on the vertical axis the average rate of change of the share over the sample period. Brazil looks very good in terms of both the level and trend in the share of equity and FDI. Of the 10 countries, Indonesia looks the worst. By this measure, South Africa is in the middle: better than the mean or median in terms of the level of the equity share, but with a downward trend. It is surprising that South Africa does not do better in equity and FDI.

Within the category of ‘borrowing’ or fixed-income inflows, one can distinguish between bank loans and bond sales. There is a large literature suggesting that countries that rely on the banking system for their inflows are more likely to have

²⁸ Rose (2000).

²⁹ Cavallo and Frankel (2008) find that an increase in the trade/GDP ratio of 10 percentage points decreases the likelihood of a sudden stop by 32 percent!

Figure 16. Net inflows of equity +FDI as a share of total inflows including borrowing (in percent) (Mean and time trend over the period 1994–2004)



Source: Global Development Finance, World Bank.

crises, perhaps because of a greater tendency toward moral hazard in the form of government bailouts.

The final aspect of the composition of the capital inflow is maturity. Short-term borrowing has been found risky, but long-term inflows much less so. Figure 17 suggests that South Africa has always had a low ratio of short-term to long-term debt.

Nonetheless, there is still room for an improved composition of the debt, especially since South Africa’s reserves are not that high. Rodrik (2006) has suggested, as a response to the high level of low-return foreign exchange reserves that many developing countries have been accumulating, that paying down short-term debt could be a better use of the funds, since the interest rate charges are higher than what is earned on reserves (US treasury bills). But it would be better still to shift from short-term dollar debt to longer-term bonds denominated in rand. In fact South Africa is close enough to the point of being able to wipe out completely its short-term debt.

To summarize our analysis of the implications for South Africa of a sudden stop we modelled a sudden reduction in the capital flows to South Africa starting in 2008.³⁰ Again the simulations were run with two independent macro models typical of

³⁰ The reason we delay the starting point for the sudden stop is to let foreign liabilities increase even further, thus stacking the cards in favour of finding sizable effects.

Figure 17. Short-term/long-term debt

Source: Reproduced from Global Development Finance, World Bank.

those used to analyze the workings of the South African economy. Here we will only discuss the results from the BER model macroeconomic forecasting models.³¹

Assuming a decline in capital inflows to zero in 2008 (and beyond), we evaluate several alternative policy scenarios. One scenario assumes that the SARB increases its discount rate by 10 percentage points in 2008 and 2009 but keeps the exchange rate endogenous, another that the bank rate increases by 5 percentage points, another that the exchange rate remains endogenous but is shocked with a 30 percent depreciation in 2008 while the bank rate remains endogenous. The third scenario results in a full reversal of the current account in two years, with the inflation rate (CPI) exceeding the baseline by 4.8, 4.0 and 2.1 percentage points in 2008, 2009 and 2010 respectively. The results of all scenarios are fairly similar. The important point is that they show an economy that, in spite of being quite prepared and thus able to avoid a sharp contraction, would still suffer considerably as a result of a sudden stop: growth falls (less so in the scenario with the largest devaluation of the rand) and fiscal accounts deteriorate while consumption and investment fall. These results confirm that this is an important risk that needs to be addressed.

6. The consistency of the ASGI-SA program

In this section we ask whether the ASGI-SA strategy is feasible or not. We understand feasibility to relate basically to two main issues. The first refers to whether the amount of resources and their associated productivity levels will be sufficient

³¹ One key difference between the BER model shown here and the Treasury model is that the Treasury's model shows a devaluation to improve fiscal accounts.

to deliver the levels of output and growth rates envisioned by the program. The program suggests that investment should be raised from 18 to 25 percent (at constant prices): are there any grounds to think that the private sector will want to increase investment by as much?, and if not, will/can the public sector fill the gap? Finally, are there sufficiently productive private or public investment opportunities in the economy?

The second feasibility question refers to whether the resources can be obtained to finance the increase in investment. Such a large increase in spending will put pressure on domestic resources requiring important increases in government and private savings if it is not to lead to important increases in external imbalances. Pressure on domestic resources may increase interest rates, crowding out other projects. Or, if it is financed with external resources, the induced vulnerability of the current account will be too big to bear, eventually also leading to an increase in financing costs.

This leads to a number of problems. First, there is little evidence that firms have an incentive to increase investment in the magnitudes anticipated. Second, it seems to be a program relying on capital deepening, when international experience suggests that this is not where the key to growth accelerations lies. (Recent South African experience also suggests that capital deepening has not been the most important driver of growth.) Finally, there is no clear explanation of how the resources for the financing of such an ambitious investment program will be obtained without worsening external imbalances. Our previous discussion of scenarios already showed a significant deterioration of the current account when the ASGI-SA scenario was combined with stable terms of trade.

What does the evidence from other countries have to say on the chances for South Africa to endogenously generate the required resources to sustain the program? Tables 2 and 3, taken from Rodrik (1998), shed some light on this issue. Table 2 shows how growth and investment respond to savings transitions (defined as substantial and sustained increases in savings rates), while Table 3 shows how savings responds to growth transitions (defined in a similar way but using growth rates). What can be concluded from both tables is that growth leads to an increase in savings but not necessarily the other way around. In both cases, however, the increase in savings appears to be significantly higher than the increase in investment, pointing to the fact that growth accelerations have come hand in hand with improvements in the external balances of the economies involved. Our forecasts however, seem to suggest that South Africa will see a deterioration of its external position, rather than an improvement as it moves forward.³² Overall, while there is some chance that savings may actually increase as required to avoid the external imbalance, we remain relatively skeptical given the current scenario that the problem will just go away on its own.

³² In addition the above refers to 'successful' experiences and it is thus not clear to what extent it may replicate in an investment led growth strategy.

Table 2. Savings transitions

Country	Transition year	Savings (GNS/GNDI)				Investment (relative to world average)				Growth (relative to world Savings (GNS/GNDI) average)			
		[T - 5, T - 1]	[T, T + 4]	[T + 5, T + 9]	[T + 10, T + 14]	[T - 5, T - 1]	[T, T + 4]	[T + 5, T + 9]	[T + 10, T + 14]	[T - 5, T - 1]	[T, T + 4]	[T + 5, T + 9]	[T + 10, T + 14]
Belize	1985	11.5	23.5	24.8	-2.0	1.0	6.7	0.4	4.5	2.9	-2.6		
Chile	1985	7.8	18.0	25.4	25.8	-5.3	2.0	5.9	5.8	-3.5	4.7	4.0	3.7
China	1970	22.6	29.1	32.6	34.6	0.7	6.3	8.0	10.0	2.6	4.1	1.7	6.8
Costa Rica	1983	13.6	20.9	22.2	23.1	3.2	4.7	4.8	5.9	-4.0	2.3	2.2	1.7
Egypt	1974	11.7	18.6	17.8	12.2	-8.9	3.1	4.7	2.6	-0.7	4.4	5.1	2.6
Jordan	1972	10.2	18.1	24.7	17.0	-7.8	-6.3	0.7	0.2	0.3			
South Korea	1984	24.7	33.2	35.8	35.0	7.6	9.1	14.6	14.5	3.6	6.9	4.4	5.7
Lesotho	1977	8.5	22.3	22.2	32.8	-11.6	-8.6	-3.2	5.1	8.7	1.8	-0.8	0.7
Malta	1975	19.5	26.6	27.8	25.6	0.0	-2.7	0.8	3.6	2.8	8.0	1.2	1.5
Mauritius	1984	14.5	24.6	26.8	24.9	-1.4	3.5	7.5	9.8	-2.0	4.4	3.0	0.8
Pakistan	1976	10.4	17.7	22.6	21.6	-8.6	-8.5	-7.2	-4.9	-1.0	3.3	4.7	1.4
Panama	1968	15.5	22.8	22.8	21.5	-1.8	6.7	7.8	5.3	3.1	0.1	-2.0	4.6
Paraguay	1972	11.7	18.0	21.4	18.8	-5.4	-2.3	3.9	1.4	-0.6	2.3	7.3	-2.8
Philippines	1972	20.0	26.0	26.9	20.0	-0.3	3.0	5.1	0.3	-0.7	1.6	1.3	-3.9
Portugal	1965	20.3	25.6	28.6	20.9	2.4	1.9	4.2	1.5	1.5	0.9	2.0	-2.0
Singapore	1971	17.4	25.3	33.6	42.3	6.0	19.2	17.3	24.6	6.2	4.6	2.9	5.4
Sri Lanka	1976	11.9	17.0	19.6	18.2	-6.8	-3.4	2.4	-0.1	-1.1	1.0	3.1	0.2
Suriname	1972	20.2	40.6	29.3	11.0	4.8	13.7	3.3	-4.1	5.5	1.9	-0.6	5.3
Syria	1973	12.2	23.2	22.7	14.1	-6.1	-0.9	-2.8	-0.1	4.6	3.9	3.6	-3.4
Taiwan	1970	22.4	30.4	31.9	32.0	2.3	6.9	5.8	3.3	4.5	4.8	5.2	5.1
Median	14.1	23.4	25.1	21.6	-1.6	2.5	4.8	3.3	1.5	3.9	2.9	1.5	
Mean	15.3	24.1	26.0	23.8	-2.0	2.4	4.5	4.5	1.5	3.4	2.7	1.6	

Source: Rodrik (1998).

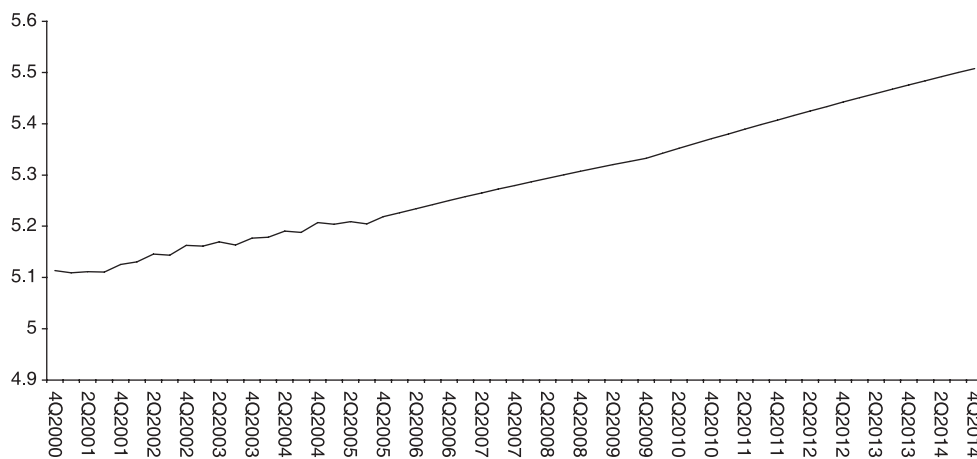
Table 3. Growth transitions

Country	Transition year	Growth (relative to world average)				Savings (GNS/GNDI)				Investment (relative to world average)			
		[T - 5, T - 1]	[T, T + 4]	[T + 5, T + 9]	[T + 10, T + 14]	[T - 5, T - 1]	[T, T + 4]	[T + 5, T + 9]	[T + 10, T + 14]	[T - 5, T - 1]	[T, T + 4]	[T + 5, T + 9]	[T + 10, T + 14]
		Bangladesh	1974	-1.9	4.6	4.8	3.9	-14.4	-17.2	-9.8	-9.0	-13.7	-15.4
Brazil	1966	4.2	8.0	9.8	6.1	1.0	-1.1	-1.5	-2.0	-2.2	-0.9	1.1	-1.3
Cameroon	1976	3.6	7.2	9.3	-3.2	-12.4	-6.0	1.2	-9.0	-2.9	2.6	4.8	1.0
Chile	1984	-1.1	6.8	8.0	5.7	-8.4	-5.1	6.9	6.8	-4.5	-0.3	5.8	5.8
China	1977	3.0	8.1	10.6	7.8	7.4	13.7	17.1	17.7	5.5	9.4	13.2	14.0
Costa Rica	1983	-1.1	5.0	5.2	4.6	-6.0	2.8	3.5	4.4	3.2	4.7	4.8	5.9
Dominican Republic	1969	2.0	12.3	4.7	3.4	-12.4	-5.9	-3.7	-1.4	-5.0	-2.4	-1.6	-1.2
Ghana	1984	-3.1	5.2	4.3	3.9	-14.3	-11.3	-9.4	-7.6	-19.4	-12.0	-8.3	-6.8
Lesotho	1969	6.4	12.0	11.3	3.0	-13.1	-8.8	4.7	-11.3	-11.8	-6.2		
Mali	1985	-2.6	5.8	1.2	7.1	-11.9	-6.7	-1.2	-8.6	-2.9	-1.3		
Malta	1966	0.8	8.7	9.3	10.5	4.9	7.5	-1.5	5.9	-1.5	3.3	-1.7	-2.5
Mauritius	1983	0.9	6.3	6.1	4.0	-4.5	4.1	8.3	8.0	0.7	0.9	7.6	9.1
Pakistan	1976	3.4	7.7	6.7	4.6	-11.0	-3.6	4.9	2.7	-8.6	-8.5	-7.2	-4.9
Paraguay	1972	4.6	6.9	11.0	-0.6	-7.5	-3.8	0.8	1.1	-5.4	-2.3	3.9	1.4
Philippines	1986	-1.8	5.2	3.1	3.4	0.8	1.2	1.6	-2.0	-0.1			
Seychelles	1985	-0.7	5.6	5.3	3.2	12.8	2.9	4.4	1.9	0.0			
Syrian Arab Republic	1969	1.3	7.8	11.3	5.3	-8.0	-5.7	1.8	2.4	-7.7	-6.8	1.1	-2.6
Thailand	1986	5.0	10.0	7.8	6.0	11.0	16.6	6.2	11.5	20.4			
Median	1.1	7.0	7.2	4.6	-7.5	-3.7	1.2	2.5	-2.9	-1.4	0.5	-1.2	
Mean	1.3	7.4	7.2	4.4	-5.0	-1.5	1.6	2.3	-3.4	-1.7	1.1	0.2	

Table 3 also addresses the second question, how to benchmark the required increases in public investment in ASGI-SA with that of other countries experiencing acceleration in their growth rates. ASGI-SA aims to increase the growth rate by roughly 2 percent, with an increase of investment of roughly 6 percent, that is, it requires an increase in investment three times as large as the expected increase in growth rates. Table 3 on the contrary shows that in growth accelerations the median increase in growth rate was 6.1 percent which came about with an increase in investment of 3.4 percent, that is, the relative 'productivity' of investment seems to have been dramatically higher in successful growth transitions than what is envisioned in ASGI-SA. This is confirmed by Jones and Olken (2005) who find that capital at most explains about a third of growth accelerations.

Why is the program set up this way? Table 4 is computed assuming both GDP and investment evolve roughly as in the ASGI-SA framework. We use the investment figures to estimate the capital stock assuming a depreciation rate of 6 percent. Critically, employment is carried forward assuming the output labour elasticity/productivity growth relation observed during the nineties. Because employment has been stagnant, so is our assumed employment. Productivity is computed as a residual assuming labour and capital shares of 60 and 40 percent. Figure 18 shows that for the program to deliver its growth results productivity needs to continue growing at a fairly brisk pace.³³

Figure 18. Expected productivity



³³ It is also to be seen if the economy can match recent productivity growth if it actually enters into a growth mode with higher incorporation of labour. Certainly it could, but it would require a challenge much superior to what occurred in the recent past.

Table 4. Growth estimations (in billions of 2005 rands)

Quarter	Output	Capital Stock	Employment	Productivity	Total investment	Private investment			Public investment (if private investment is ...)		
						Investment estimation	Investment at today's level	Investment w/Fedderke's	Investment estimation	Investment at today's level	Investment w/Fedderke's complementarity
4Q2005	283	2182	12.1	185	48	34	34	34	14	14	14
1Q2006	286	2197	12.1	186	49	35	34	35	13	14	14
2Q2006	289	2213	12.1	188	50	36	35	35	14	15	15
3Q2006	293	2229	12.1	189	51	36	35	36	15	16	15
4Q2006	296	2247	12.1	191	52	37	35	37	15	17	16
1Q2007	299	2265	12.1	192	53	37	36	37	16	17	16
2Q2007	302	2285	12.1	193	54	38	36	38	17	18	17
3Q2007	306	2305	12.1	195	56	38	37	39	17	19	17
4Q2007	309	2326	12.1	196	57	39	37	39	18	20	18
1Q2008	313	2348	12.1	198	58	39	37	40	19	21	18
2Q2008	316	2371	12.2	199	60	40	38	41	20	22	19
3Q2008	320	2395	12.2	200	61	40	38	42	21	23	19
4Q2008	323	2420	12.2	202	62	41	39	42	21	23	20
1Q2009	327	2446	12.2	203	64	41	39	43	22	24	20
2Q2009	330	2473	12.2	204	65	42	40	44	23	25	21
3Q2009	334	2500	12.2	206	66	42	40	45	24	26	22
4Q2009	338	2529	12.2	207	68	43	41	46	25	27	22
1Q2010	343	2560	12.2	209	70	44	41	47	26	28	23
2Q2010	348	2591	12.2	211	71	44	42	48	27	29	24
3Q2010	353	2623	12.2	213	73	45	42	48	28	30	2
4Q2010	358	2656	12.2	215	74	45	43	49	29	31	25
1Q2011	363	2691	12.2	217	76	46	44	50	30	32	26
2Q2011	368	2726	12.2	219	78	47	44	51	31	33	26
3Q2011	374	2763	12.2	221	79	47	45	52	32	35	27
4Q2011	379	2801	12.2	223	81	48	46	53	33	36	28
1Q2012	385	2840	12.2	225	83	48	46	54	35	37	29
2Q2012	391	2881	12.2	227	85	49	47	55	36	38	29

Table 4. (cont) Growth estimations (in billions of 2005 rands)

Quarter	Output	Capital Stock	Employment	Productivity	Total investment	Private investment			Public investment (if private investment is . . .)		
						Investment estimation	Investment at today's level	Investment w/Fedderke's	Investment estimation	Investment at today's level	Investment w/Fedderke's complementarity
3Q2012	396	2922	12.2	229	87	50	48	57	37	39	30
4Q2012	402	2965	12.2	231	89	50	48	58	38	41	31
1Q2013	408	3010	12.2	233	91	51	49	59	40	42	32
2Q2013	414	3055	12.2	235	93	52	50	60	41	43	33
3Q2013	420	3102	12.2	237	95	52	50	61	43	44	34
4Q2013	426	3151	12.2	239	97	53	51	62	44	46	35
1Q2014	433	3200	12.2	241	99	54	52	64	46	47	35
2Q2014	439	3252	12.2	243	101	54	53	65	47	49	36
3Q2014	445	3304	12.2	245	104	55	53	66	49	50	37
4Q2014	452	3358	12.2	247	113	56	54	72	57	59	41

Source: Authors' calculations.

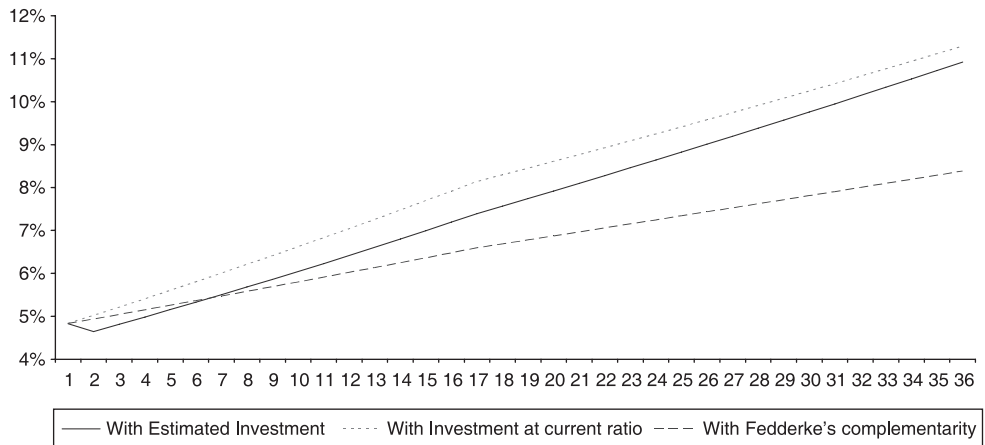
In other words, the fact that the combined employment/productivity growth has been so poor implies that, if this performance is to continue, then accelerating growth needs to rely on increasing capital accumulation. Table 3 showed that growth accelerations have been achieved when the economies have been able to move large segments of their population to high productivity jobs. Thus, solving the labour market issue appears critical to reduce pressure on the capital accumulation process.

What is reasonable to expect from private investment? We provide three alternative estimates for the evolution of private investment. Our first estimate relies on the expected effect of infrastructure investment on private investment. Perkins *et al.* (2005) and Fedderke *et al.* (2006) conclude that there are strong complementarities between public and private investment in South Africa, with private investment increasing on average about 2.4 times a given increase in public investment. When we use this ratio going forward, to achieve the investment goals of ASGI-SA public investment would dauntingly still need to triple, from its current 14 billion Rand to about 41 billion Rand. These strong complementarities result from the fact that historically large infrastructure investments were needed to develop the mining sector. Some may argue that this need will be less in the future; others will point to looming critical constraints in the power and transportation infrastructure.

Our second estimate simply assumes that private investment stays at its current share of GDP. In this case public investment needs to increase from 14 billion Rand to about 59 billion Rand. Finally, we estimate an investment function that relates investment to past investment and future growth. In this case the requirements for public investment reach close to 57 billion Rand.³⁴ (Figure 19 shows the numbers as a percentage of GDP.)

What do we know about the productivity of public investment? Perkins *et al.* (2005) and Fedderke *et al.* (2006) have looked at this issue and found that most items in the infrastructure are Granger-caused by output and not the other way around, with electricity and roads two exceptions. Fedderke *et al.* (2006) estimates the 2.4 relation above, but also find that only electricity infrastructure enters separately in the GDP equation with other infrastructure projects having their effect in terms of stimulating private investment. They also emphasize that the 'infrastructure mix' has changed dramatically over time, suggesting that a careful planning of infrastructure is needed if it is to deliver the desired increases in production in the future. Thus, it seems rather difficult to think that public investment will be able to stand up to the challenge of attaining an expansion in productive ventures large enough to deliver the desired private investment.

³⁴ The equation relates investment to the last four lags of investment and three forward values of growth. More specifically the equation was $\text{Investment} = 0.01 + 0.52^{***} \text{Inv.}(-1) + 0.25^{**} \text{Inv.}(-2) - 0.14 \text{Inv.}(-3) + 0.23^{**} \text{Inv.}(-4) + 0.06^* \text{Growth}(+1) + 0.01 \text{Growth}(+2) - 0.04 \text{Growth}(+3) + 0.83^{***} \text{Terms of trade} + 0.04 \text{RER}$, which was estimated with data since 1960. *, ** and *** indicate significance at the 10, 5 and 1 percent level.

Figure 19. Estimates of public investment as percent of GDP

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