

Macroeconomy, Economic Bias & Employment

Volatility of the Real Exchange Rate of the Rand: 1990 – 2004

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1. Introduction

Since its low point in December 2001, the rand has appreciated almost uninterruptedly against most other currencies for over three years. Against the US dollar, the rand has appreciated by about 75 percent to September 2004. This is quite exceptional given the previous history of the exchange rate. For most of the 1980s and the 1990s the rand depreciated against the currencies of our main trading partners, notwithstanding short-lived episodes of appreciation. This has raised concerns that the more recent volatility and sustained strength of the rand have restricted growth and employment, particularly in the manufacturing export and import-substitution industries.

This working paper serves as a preliminary study of the volatility of the rand. Before the effects of changes in the rand exchange rate on the economy can be studied, it must first be established more accurately what the nature of these changes are. This working paper studies four main related aspects: the level of the real effective exchange rate of the rand; the volatility of the exchange rate; reasons for the observed volatility and protection against such volatility. The methodology of the study is based on a non-econometric qualitative analysis of these issues.

Before commenting on the behaviour of the exchange rate of the rand, section 1 explains the nature of the foreign exchange market briefly. After all, it is this market in which the exchange rate is determined most directly. The influence of changes in other markets (for example, the goods market and the money and capital markets) is transmitted via the foreign exchange market to the exchange rate. Understanding how foreign exchange markets work also helps us to see why structural macroeconomic models of exchange rates have had little empirical success.

Speculation based on changes in expectations plays a key role in the foreign exchange market. Section 2 explains how speculation can occur in the South African foreign exchange market even though such activities are prohibited by local exchange controls. Speculation in the local foreign exchange market is explained by the factors contributing to leads-and-lags liquidity pressures in the market.

The concept of 'the exchange rate' is a theoretical fiction. In reality there are many different exchange rates. In an applied study the empirical choice of an exchange rate indicator depends on the type of question being asked. The main focus of this study is on the competitiveness of South African manufactured goods in foreign markets. Section 3 explains briefly how the real effective exchange rate of the rand is derived and why it is the best single indicator in this regard.

Measuring the volatility of the exchange rate also depends on the question we want to answer. Is the concern about the effects of a sustained misalignment of the exchange rate at the macroeconomic level or of short-term changes at the microeconomic level? In this regard Section 4 distinguishes between the existing level of the exchange rate, the volatility of the trend in the exchange rate, and the volatility of the exchange rate

around its trend. Section 4 also contrasts the standard model-building approach to exchange rate determination with the qualitative analysis used in this study of the behaviour of the rand for the period 1990 – 2004.

Sections 5 and 6 describe the level and volatility in the trend of the real effective exchange rate of the rand respectively. The level of the exchange rate at the end of 2004 suggests that the competitiveness of South African manufactures is around its longer-term historical average. However, the more recent volatility in the trend of the rand may have led to a negative hysteresis effect on manufacturing in the export and import-substitution industries.

Section 7 gives a qualitative analysis of the reasons for the volatility in the trend of the real effective exchange rate of the rand. The 1990–2004 period is divided into three main episodes of rand depreciation and two main episodes of appreciation, each of which are examined with regard to balance of payments pressures on the foreign exchange market. Significant changes in the current and financial accounts of the balance of payments as well as Reserve Bank intervention in the foreign exchange market are examined more closely. The response of portfolio capital flows to changes in real interest rate differentials is divided into debt and equity investments. International equity investments have been much greater than debt investments since 1994 as regards both inflows and outflows of foreign capital. Expected returns on equity versus debt investments may change in opposite directions with regard to interest rates. If so, the adjustment of the exchange rate to changes in real interest rate differentials is indeterminate: it cannot be assumed that a narrowing of the differential will lead to a depreciation of the rand or vice versa.

Section 8 measures the volatility of the rand around its trend. Both the annual mean absolute value and standard deviation of the monthly percentage changes in the real effective exchange rate have increased significantly since the early 1990s. These short-term measures of exchange rate volatility peaked in 1998, 2001 and 2004 but were more subdued between 1990 - 1995 and 1999 – 2000.

Section 9 describes the various types of risk companies are exposed to through changes in the exchange rate and how they might protect themselves against such risks. The transactions and translation risks from short-run volatility of the exchange rate can be covered using forward exchange contracts or more sophisticated hedging facilities using foreign currency options, futures and swaps. These are readily available at relatively low cost through local banks. However, economic risk resulting in declining competitiveness through sustained real appreciation of the rand cannot be hedged against as easily. It is this type of risk that is implied by the possible negative hysteresis effects due to the sustained recovery in the real value of the rand since its nadir in December 2001. Empirical studies of the size of these effects are the subject of subsequent Working Papers in this area. Section 10 concludes.

2. The foreign exchange market and models of the exchange rate

The modern view of the foreign exchange market is that it resembles an efficient asset market. As such it may be characterised as a financial asset market in which changes in expectations determine the relative demand for different currencies and hence the exchange rate. The foreign exchange market is characterised primarily by stock rather than flow adjustments, in which the exchange rate adjusts to maintain the desired stocks of different currencies.

Opinion and research findings differ as to the degree to which the foreign exchange market is efficient. There is considerable debate to what extent and how quickly market participants assimilate new information and, via their decisions to buy or sell currencies, reflect this in the asset price (in this case the exchange rate, defined as the price of one currency in terms of another). However, irrespective of the empirical issues and tests of the efficiency of the foreign exchange market, the role of speculation based on changes in expectations is central to the question of the determination of exchange rates.

The asset market view explains certain features of exchange rates that are otherwise difficult to account for. The most obvious feature is that exchange rates are characterised by periods of relative calm, punctuated by episodes of turbulence and high volatility. Changes in exchange rates are for the most part unpredictable and defy most attempts to forecast them using standard macroeconomic models.

For example, purchasing power parity theory and the traditional monetary model of exchange rate determination (in which inflation rates are determined by relative money demand and supply conditions) predict that the exchange rate should adjust in proportion to inflation differentials. But since inflation differentials change relatively slowly, such theories fail to explain the observed volatility in exchange rates. At most such models help to explain the change in exchange rates over the very long run, or when inflation rates are so high that they override any other relevant factors considered by the markets. By contrast, under the asset market view the observed volatility and inherent unpredictability of exchange rates is readily understandable since the release of new information assimilated by the markets is by definition unpredictable.

Studies by Meese and Rogoff (1983; 1984) suggested that popular models of exchange rate determination, including the flexible and sticky price versions of the monetary model and a portfolio balance model, were unable to outperform a naïve random walk forecast of changes in exchange rates (for a study questioning their methodology and findings and using an alternative forecasting technique with superior results, see Schinasi and Swami 1989). Research by Cheung, Chinn and Pascual (2003) also studied various models of the exchange rate and concluded that none of them could explain satisfactorily the empirical behaviour of exchange rates during the 1990s. Some models are able to track the movements in some exchange rates over certain

time horizons but not others. The parameter estimates of the models are unstable over time and a good fit of the model as regards the in-sample estimates is not matched by good out-of-sample forecasts for very long.

There is considerable debate about the way in which speculators assimilate and react to market information and whether asset prices 'overshoot' their equilibrium value. 'Overshooting' implies that speculation is destabilising rather than stabilising. Speculation in the foreign exchange markets is generally regarded as stabilising when foreign currency is purchased after its domestic price has fallen, in the expectation that it will soon appreciate thereby resulting in a profit. Speculation is destabilising when foreign currency continues to be sold after its domestic price has fallen in the expectation that it will continue to depreciate. Destabilising speculation thus magnifies fluctuations in exchange rates whereas stabilising speculation dampens them (see Salvatore 2004 for a textbook definition of stabilising versus destabilising speculation).

However, whether speculation in the foreign exchange market is stabilising or destabilising also depends on the fundamental variables believed to determine the exchange rate. If changes in such variables (such as interest rate differentials, inflation rate differentials, the terms of trade and so on) suggest that a currency should continue to weaken, then speculation that brings forward such depreciation should be seen as stabilising rather than destabilising. In other words, speculation is destabilising only if it pushes exchange rates away from their equilibrium values according to a benchmark model of the fundamentals (Sohmen 1969; Kohlhagen 1979).

Thus the foreign exchange market may be regarded as efficient to the extent that speculation is based on changes in expectations about such fundamentals, notwithstanding the observed volatility in the exchange rate (see also Levich 1985; 2001). Expectations based on such a model of equilibrium returns (which may include a time-varying risk premium if speculators are not regarded as risk-neutral) are rational expectations (see Sarno and Taylor 2002). Empirical tests of efficiency in the foreign exchange market are thus tests of a joint hypothesis: a negative test result could mean that the market is inefficient or that the chosen model of equilibrium expected a return is wrong. In practice, especially where the models include a time-varying risk premium, it is difficult to decide which.

Although there are periods of stability in the foreign exchange markets and information is assimilated efficiently under rational expectations, there are times when exchange rates seem to stray far from what any reasonable set of fundamentals would suggest to be their equilibrium value. Destabilising speculation sets in and causes 'bubbles' in the foreign exchange markets with no observed tendency by exchange rates towards mean reversion. The sustained strength of the US dollar from 1982 - 1985 and its sharp correction after February 1985 is often given as an example of such a bubble and its aftermath (see Koromzay, Llewellyn and Potter 1987).

3. Speculation in the South African foreign exchange market

Given the key role played by speculators in the foreign exchange market, an obvious objection as regards the local market is that such activities are prohibited by the exchange control regulations, despite the gradual relaxation of such controls since 1994. The regulations expressly forbid authorised dealers from providing foreign exchange to customers without documentary evidence of an underlying real transaction in goods. However, speculation can take many different forms and can circumvent such regulations. The size of the unrecorded transactions item on the South African balance of payments is possibly a good indicator in this regard.

Moreover, local transactions with a speculative motive need not contravene exchange control regulations. For example, the passive decision by importers and exporters not to take forward cover may imply the expectation that the rand will change in their favour within the relevant time horizon. Decisions taken on the basis of expectations about changes in the rand are inherently speculative and will affect liquidity conditions in the foreign exchange market. For example, if the view prevails that the rand will weaken substantially, importers rush to take forward cover while exporters refrain there from. Moreover, importers will try to speed up payment of foreign currency commitments while exporters will try to delay receipts thereof. This creates the familiar leads-and-lags phenomenon that has periodically debilitated the local foreign exchange market.

A further way in which transactions with a speculative motive can occur is through the ruling that exporters may hold their foreign currency proceeds offshore for up to 180 days before converting them to rands. The timing of the decision to hoard or dishoard such proceeds within this period may also be influenced by expectations about the exchange rate and similarly affects liquidity conditions in the local foreign exchange market. Such liquidity pressures eventually unwind but they can be very disruptive in the short run.

There is also a considerable offshore pool of rands that falls outside the ambit of the local exchange control regulations. Decisions by offshore dealers to buy or sell rands in this market are inherently speculative. The offshore rand market is not insignificant although it is difficult to estimate its size accurately – some estimates put the figure as high as 30 percent of total turnover.

The different episodes of rand depreciation and appreciation should be explained in the context of the basic asset market view of the foreign exchange market in mind. As discussed more fully below, each episode was qualitatively different as regards the circumstances and the nature of the main forces at work. Because it is difficult to capture these elements satisfactorily in a standard econometric modelling approach, the explanation takes the form of a qualitative analysis supported by some selected empirical facts:

4. Different measures of the exchange rate

There are various measures or indicators of the rand exchange rate and these give a different picture of the observed volatility in each case. The four main measures of the rand exchange rate are: nominal bilateral exchange rates (e.g. the rand/dollar exchange rate); real bilateral exchange rates (egg the bilateral rand/dollar exchange rate adjusted by inflation differences between the two countries); the nominal effective exchange rate (the weighted average of the main bilateral exchange rates); and the real effective exchange rate (the nominal effective exchange rate adjusted by the inflation differences between the countries concerned).

The choice of exchange rate indicator depends on the type of question we want to ask. Since the main concern in this study is the competitiveness of South African goods in foreign markets, then real exchange rates are the appropriate indicator.

The real effective exchange rate of the rand is the best single indicator of the competitiveness of South African goods in international markets. The time series data of this exchange rate index is calculated by the Reserve Bank and published in the SARB *Quarterly Bulletin*. Presently, the real effective exchange rate is weighted according to trade in manufactured goods between South Africa and its thirteen most important trading partners. Before 1 January 1999, the weightings were based on total trade in goods and services. Also, after this date the euro replaced the separate European currencies previously used in calculating the index weights. The rationale for the new weighting structure is explained in an article in the September 1999 edition of the *Quarterly Bulletin* (Walters and de Beer 1999). The authors note that despite the different way of calculating the weighting structure, there was not a great difference in the newly constructed nominal and real effective exchange rate series compared to the old series.

5. The level and volatility of the rand

In studying the behaviour of the rand three distinctions should be made depending on the type of question we want to answer: the level of the rand; volatility of the trend in the rand and volatility of the rand around its trend. The first two are important from a macroeconomic perspective while the last is of greater concern from a microeconomic viewpoint.

The standard approach to examining the behaviour of the exchange rate is to build a model thereof. Such models specify the variables (sometimes called the fundamental variables) thought to be the main determinants of the exchange rate. The model is then estimated using various econometric techniques and tested for its in-sample forecasting ability. By comparing the actual (observed) exchange rate with the model's predicted (unobserved) equilibrium exchange rate, one can then see to what extent the currency is under- or overvalued relative to the benchmark model.

For example, in a recent report commissioned by the DTI the real effective exchange rate of the rand was modelled using the interest rate differential, capital flows, real government consumption spending, the terms of trade and a trend variable from 1994 to capture the shift towards greater trade liberalisation and openness of the economy (Economic Policy Research Institute 2003). The EPRI model gives useful insights into the variables that have influenced the path of the real exchange rate of the rand.

In contrast to the formal econometric modelling approach taken in the EPRI report, the present study takes a qualitative approach to analysing and evaluating the empirical evidence on the rand. Each approach has its individual strengths and weaknesses and it is hoped that this study will complement the more formal model-building approach. Where relevant, both similarities and differences with regard to the EPRI findings are referred to in sections 5 – 7 below.

6. The level of the rand

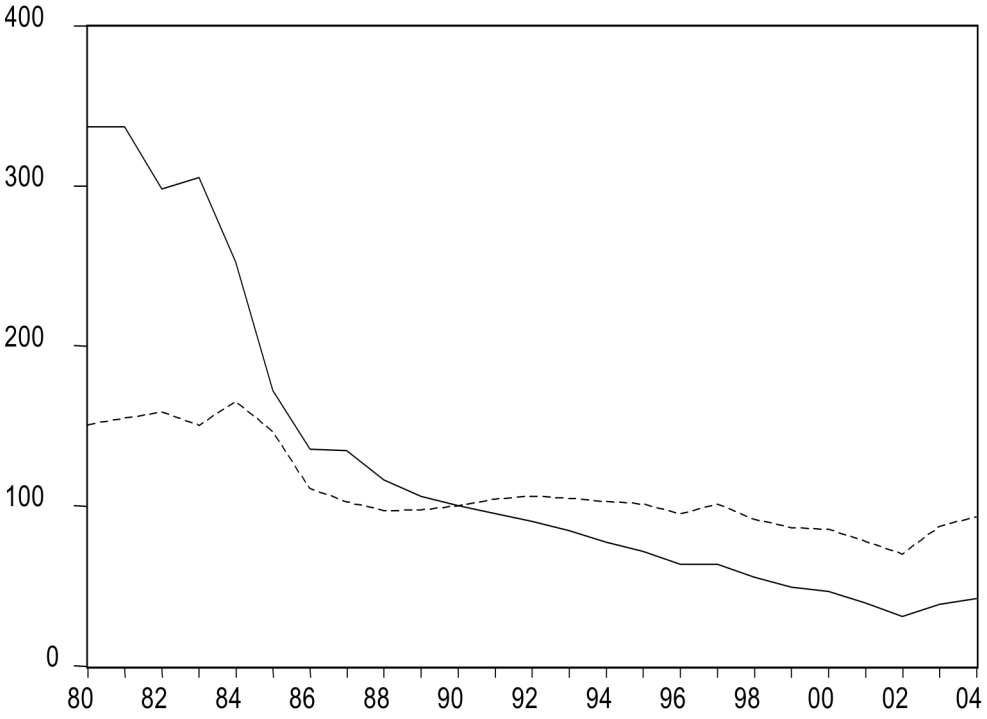
Currently, the sustained strength of the rand has prompted the question whether the currency is overvalued and thus damaging growth and employment, especially in the manufacturing export and import-competing industries. If the answer to this question is yes, then it suggests that there is a misalignment in the value of the currency. The response to such a misalignment might be a change in macroeconomic policy to bring the currency within a more competitive range.

To answer this question it is helpful to examine the behaviour of the real effective exchange rate of the rand since, as explained above, it is the best single indicator of the competitiveness of South African manufactured goods in world markets.

A nominal depreciation of the rand becomes a real appreciation if it is less than the extent to which the domestic inflation rate exceeds the foreign inflation rate. In this case the competitiveness of our goods decreases (despite the nominal depreciation of the rand). Conversely a nominal appreciation of the rand becomes a real depreciation if it is less than the inflation differential. In this case the competitiveness of our goods increases (despite the nominal appreciation of the rand).

Figure 1 shows the annual average value of the indexes of the nominal and real effective exchange rates of the rand from 1980 to 2004.

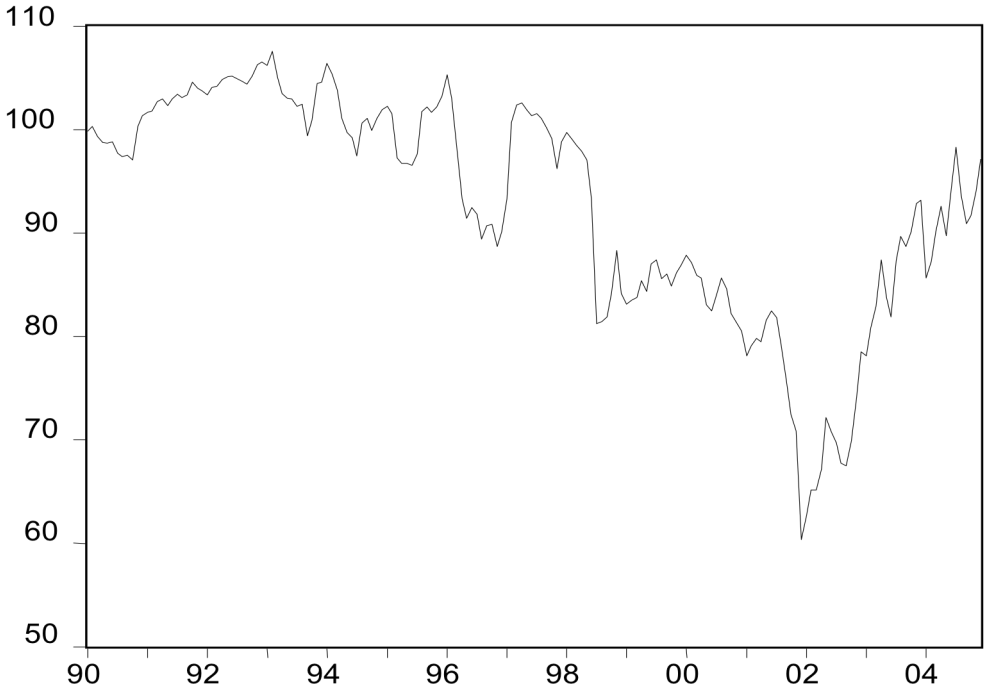
Figure 1 – Nominal and real effective exchange rates of the rand, 1980 –2004 (1990 = 100)



There is a clear difference in the relative behaviour of the two exchange rates of the rand in the 1980s compared to the experience after 1990. In the 1980s the large declines in the nominal effective exchange rate mostly reflected our much higher average inflation rate compared to that of our main trading partners. Thus the nominal effective exchange rate diverged significantly from the real effective exchange rate. After 1990 the average inflation rate in South Africa began to fall and fluctuated in a much lower range so that the difference between the two exchange rates became much less pronounced. In the 1980s, monetary policy was on average much looser and more variable than has been the case since the early 1990s. This contributed to a much higher average inflation rate and a more variable real economic growth rate in the 1980s compared to the 1990s (see Hodge 2001).

Figure 2 focuses on the real effective exchange rate of the rand from 1990 onwards (monthly averages).

Figure 2 – Exchange rate of the rand (1995 = 100)



From Figure 2 it is clear that the sharp and sustained appreciation in the real value of the rand from the beginning of 2002 to its present levels represents a correction from the very low levels it had fallen to. The real value of the rand at the end of 2004 is roughly where it was before the emerging markets crisis that destabilised the currency markets in 1998 (the emerging markets crisis originated in the South East Asian currency markets in 1997 but only affected the rand the following year). The sharp depreciations of the rand in 1996, 1998 and towards the end of 2001 were primarily due to speculative shocks to the balance of payments.

Given the above it does not appear that, using the real effective exchange rate as a broad indicator, the competitiveness of our manufactured goods in world markets has changed significantly compared to the average experience over the period 1990–97. If anything, this indicator suggests that our manufactured goods are somewhat more competitive now than they were then. The average of the *lowest* monthly value of the index for each year over this period is 97,6 compared to its highest value of 98,3 in July 2004. Unless one asserts that the rand was at an uncompetitive level over the 1990-97 period, it is difficult to argue that it is at an uncompetitive level now.

The 1990–97 period saw relative stability in the real value of the rand and the balance of payments while merchandise exports grew steadily in real terms. As reported in Bell, Farrell and Cassim (2002), total manufacturing exports grew at an average annual rate of 8 percent in real US dollar terms over this period, despite slow growth in the world economy and a downturn in the commodity cycle between 1990-93. Excluding exports of natural resource based manufacturing, exports of the metal products sub-group (including machinery and equipment, motor vehicles and other transport

equipment) grew at an even more impressive average annual rate of 16,7 percent between 1990–97 (see Bell et al. 2002: 193–198). Thus there is little to suggest that the rand was overvalued at that time, in the sense of making our manufactured goods uncompetitive in world markets.

It is important not to confuse the notion of overvaluation implied by a specific model of the real exchange rate and the historical comparison given here. For example, the EPRI model suggests that the rand was undervalued in 2002 but that it became overvalued in 2003 (and even more so early in 2004). However, the meaning of 'overvalued' in the EPRI report means overvalued relative to what the model predicts the equilibrium exchange rate should be. By contrast, in the present study 'overvalued' simply means overvalued compared to its longer-term history. The EPRI model says the rand is overvalued because it is higher than what the determining variables say it should be. The model predicts that the exchange rate should revert to its equilibrium value but this does not necessarily mean that, at its present levels, the exchange rate is uncompetitive. More information is needed to establish whether the different periods of 'overvaluation' detected by the model also means that the exchange rate made South African goods uncompetitive in world markets (as in section 2.2 of the EPRI report using another model).

7. Volatility in the trend of the rand

The volatility in the trend of the rand, as opposed to its existing level, is also an important concern. The current level of the real value of the rand, and thus the competitiveness of our manufactured goods, is virtually the same as it was at the beginning of 1998. But the sharp depreciations of the rand in the second half of 1998 and 2001, followed by its equally steep appreciation from 2002 to 2004, may have resulted in a serious welfare-reducing misallocation of resources.

The successive real depreciations of the rand and the big competitive advantage this represented may have drawn resources towards the export and import-competing industries and away from other sectors of the economy. Certainly this period was marked by general pessimism about the rand by residents and expectations that it would either drift along at its lower levels or depreciate further. The unanticipated recovery and sustained strength of the rand since 2002 would thus have penalised businesses that had taken advantage of its earlier weakness.

If the reallocation of resources between tradable and non-tradable goods were costless, then there would be little cause for concern. However, because the markets are not perfectly competitive, there are likely to be significant costs in this regard. In other words, the steep V shape of the exchange rate between 1998 and 2004 shown in Figure 2 may have had, and might continue to have, negative consequences for manufacturing exports and the import-substitution industries even though the starting and end points are the same.

These real consequences of the volatility of the rand are an example of what are called hysteresis effects. Hysteresis refers to any situation where a temporary change in a variable has a lagged effect. In other words, the equilibrium value of a variable depends upon its own recent history (see Kreinin 2002 and Krugman 1989 on the applicability of the hysteresis effect in international trade). Considerable empirical research has investigated the possible extent of such effects in international trade for countries such as the US (for example, Baldwin 1988). These issues are examined further in Working Paper 2 as regards the effect of the volatility of the rand on exports and manufacturing.

8. Reasons for the volatility in the trend of the rand

Since 1990 there have been three main episodes of rand depreciation and two episodes of rand appreciation. The episodes in which the rand appreciated significantly were essentially recoveries, to varying degrees, from undervalued positions due to the prior episodes of depreciation. The main episodes of rand depreciation took place in the first half of 1996 and 1998 and the second half of 2001. The main episodes of rand appreciation occurred in the first half of 1997, followed by the more sustained recovery from 2002 to 2004. Figure 3 below focuses on the changes in the real effective exchange rate of the rand from 1996 to 2004, which can be referred to in the explanation of each episode in subsections 8.1 –8.5.

Figure 3 – Real effective exchange rate of the rand, 1996 – 2004 (1995 = 100)

8.1 Rand depreciation: January – November 1996

From January to November 1996, the average real effective value of the rand depreciated by 18,7 percent. This sharp decline followed five years of relative stability: from 1990 to 1995 the maximum change in the real value of the rand in any calendar year was the 9,2 percent depreciation between January and July 1994, straddling the landmark election in April. The average of the maximum absolute change in the rand for each calendar year from 1990 to 1995 was only 5,8 percent.

An underlying reason for the decline in the currency was a growing current account deficit. The current account deficits in 1995 and 1996 were the first in over ten years. Since the debt standstill in 1985, restrictive policies were necessary to ensure sufficient current account surpluses for the repayment of foreign loans. The abnormal political situation in South Africa before 1994 meant that, unlike the norm in other developing countries, it could not rely on capital inflows to finance deficits on the current account. This unenviable position changed for the better with the historic 1994 election and the normalisation of the political landscape. Net capital inflows (including unrecorded transactions) from the rest of the world turned positive in 1994 for the first time since the foreign debt crisis and moratorium in 1985 (and have remained so every year since, despite being highly volatile).

There were more than adequate inflows across the financial account to accommodate the current account deficit of R7,1 billion in 1996. The main contributor to the surplus of R13,4 billion on the financial account was large net inflows of portfolio capital. However, there were almost as big outflows of foreign exchange of R10,3 billion from unrecorded transactions in the balance of payments. The net result of the above-the-line transactions in the balance of payments was a significant decline in the net gold and foreign exchange reserves, indicative of the selling pressure against the rand.

The extent to which the positive net inflows of foreign capital were offset by the outflows from unrecorded transactions shows the schizophrenia present in the financial markets at this time. On the one hand, foreign capital was attracted by the relatively higher expected risk-adjusted returns on portfolio investments in South Africa, especially since the scrapping of the financial rand in March 1995. However, this did not extend to large increases in longer-term commitments of foreign direct investment.

Moreover, South African residents wanted to diversify out of rands into foreign assets but were largely prevented from doing so legally by tough exchange controls. In 1996 such controls had yet to be relaxed significantly on residents. But, as noted above, there are various ways in which these restrictions can be circumvented. The large outflows from unrecorded transactions give some indication of the extent to which this occurred at this time.

Changes in the net gold and foreign exchange reserves due to above-the-line transactions in the balance of payments are only part of the explanation of changes in the exchange rate. The explanation is incomplete without also examining Reserve Bank intervention in the foreign exchange market. Depending on the circumstances, the effect on the exchange rate due to changes in the above-the-line transactions can

be offset to varying degrees by such intervention. For example, in 1993 the decline in the net reserves owing to balance of payments transactions was almost double that in 1996 and yet the rand depreciated far less. Sarno and Taylor (2002) explain how official intervention in the foreign exchange markets can influence the short-run behaviour of the exchange rate.

There are two main ways in which the Bank can intervene in the foreign exchange market. It can either use the reserves or it can use the forward exchange market. The main reason why the rand depreciated less than one would have expected in 1993 was that the Bank provided foreign exchange to the market from its reserves. An indication of the extent to which it did so was the increase in the Bank's foreign liabilities of R7,4 billion in that year. The idea behind such intervention is that the foreign borrowings can be repaid later when the above-the-line balance moves back into a surplus.

In 1996 the Bank's net foreign borrowings were virtually nil suggesting that it did not use the reserves on a large scale to cushion the depreciation of the rand. However, it intervened on a much larger scale via the forward exchange market as indicated by the massive decline in the Bank's international liquidity position, from -US$8,1 billion in February to -US$22,2 billion by the end of December 1996.

The rationale for the Bank's intervention in the forward exchange market needs further explanation. For most of the 1990s the Bank tried to maintain both the internal and external value of the rand. The Bank thus followed a managed floating exchange rate policy in which it sought to reduce sharp fluctuations in the exchange rate but without changing the market led trend in the currency. However, the country's foreign exchange reserves were too small to resist sustained market pressure against the rand. Thus, when the rand came under such pressure, the Bank effectively increased its purchases of dollars forward against sales thereof in the foreign exchange market. Such intervention, at least temporarily, relieved the excess demand for dollars in the market and cushioned the decline in the rand. But the more the Bank intervened in this way, the greater the increase in its oversold forward book and the decline in its international liquidity position. This left the country exposed to the risk of losses if the rand depreciated again later.

The Bank's oversold position on the forward book was nothing new. As explained by Van der Merwe (1990), various factors had led to an escalation of the oversold position on the forward book from the late 1970s, culminating to about US$23 billion in 1989. What was new was the much greater extent to which the Bank intervened in the forward exchange market on its own account to actively manage the exchange rate, especially when the rand came under intense market pressure to depreciate. Without such intervention the rand might have depreciated even more sharply during the episodes described above. Conversely, the extent to which the Bank took advantage of recoveries in the rand to lower its oversold forward position may have lessened its rate of appreciation.

8.2 Rand appreciation: November 1996 – April 1997

In the tug-of-war between foreign investors wanting to increase their rand asset portfolio investments (and, to lesser extent, their direct investments in South Africa) and residents wanting to increase their stock of foreign assets, the former prevailed decisively in 1997. In the first half of the year, the surplus on the financial account surged to R23.7 billion and outflows from unrecorded transactions fell to R4.9 billion. Thus, the net capital surplus far exceeded the current account deficit of R5.2 billion over this period. The real effective exchange rate of the rand recovered, with the currency appreciating by 15,7 percent between November 1996 and April 1997. It thus retraced most of the ground it had lost during the prior episode of depreciation.

The widening real interest rate differential, with bank rate reaching 17 percent in November 1996, was the main reason for the large net surplus on the financial account. Bank rate had been increased steadily from its lows of 12 percent in 1994 in an effort to keep the domestic inflation rate within single digits. Real bank rate climbed even more sharply, from 2 percent early in 1994 to over 10 percent in the second quarter of 1996. Thus the recovery of the rand after this peak in local interest rates was an indirect result of the tight monetary policy deemed necessary to control inflation.

Attracted by the relatively high interest rates, portfolio investment inflows grew to a massive R51.6 billion in 1997 – the second largest inflow ever recorded in this regard. More than half the inflows comprised investments in fixed income securities. Normally it might be expected that the high real interest rate differential would also dull the appetite by resident investors for foreign assets. However, portfolio investment outflows also grew substantially to R21 billion as residents largely ignored the high interest returns available locally. The composition of the outflows was the exact opposite to that of the inflows, with most of the increase in foreign assets comprising equity investments by residents.

As mentioned above, this was due to the desire by residents to diversify their investments – within the limits allowed by the gradual relaxation of exchange controls. Although difficult to establish empirically, it is likely that the schizophrenia in the markets extended to expectations about the exchange rate and the more speculative motive behind such flows. Foreigners clearly saw the high interest returns available locally as more than sufficient compensation for the possibility that the rand might depreciate further. Negative perceptions of the rand by residents, however, added a further inducement to sell rands in exchange for hard currencies beyond the desire to simply diversify their investments. Continued outflows of foreign exchange from unrecorded transactions, although much less than experienced in 1996, reinforce this suspicion.

Reserve Bank intervention from the last quarter of 1996 until the second quarter of 1997 was fairly muted, allowing the rand to recover from its earlier episode of depreciation. However, the massive improvement on the financial account referred to above gave the Bank scope to bring down its oversold position on the forward book. The Bank's international liquidity position improved accordingly, from its low of -US$22,2 billion in December 1996 to -US$16,8 billion by June 1997.

To summarise, the qualitative analysis given here suggests that the appreciation of the rand from November 1996 to April 1997 reflected the extent to which net foreign exchange inflows via the financial account were able to compensate for the outflows from growing current account deficits and unrecorded transactions. Intervention by the Reserve Bank probably lowered the rate of appreciation in the rand over this period.

8.3 Rand depreciation: January – July 1998

The recovery in the rand was not to last very long. The emerging markets crisis that originated in South East Asia in 1997 soon caught up to the local markets. Initially it was hoped that South Africa would escape the 'Asian contagion' as local circumstances were quite different as regards the factors that had invited the speculative attacks on the currencies of Thailand, Malaysia, Indonesia and the Philippines.

However, the rand remained vulnerable to a growing current account deficit that topped R13 billion in 1998. Moreover, in the flight to the safe haven of hard currencies like the US dollar, the rand was dumped indiscriminately along with other emerging market currencies. The sell-off occurred despite a huge widening of the real interest differential as bank rate was hiked by nearly 7 percentage points to 21,85 percent between April and August 1998. Most of the selling was concentrated in a single month with the rand depreciating by 13 percent in July 1998 (compared to a decline of 18,5 percent over the entire January – July period). Monthly data on financial flows are not readily available, but the quarterly data show that foreigners sold R1,1 billion of rand portfolio investments in the third quarter 1998 compared to inflows of R26,5 billion and R22,5 billion in the first and second quarters respectively.

Unlike the sharp recovery of the rand from its depreciation in 1996, the rand staged only a mild rebound following the emerging markets crisis. In 1999 the rand ended the year only 6,9 percent higher than its low point in July 1998, despite a resumption of hefty financial account surpluses from the fourth quarter of 1998. This presents something of a conundrum in two respects, as explained below.

First, between October 1998 and January 2000, the repo rate (which had replaced bank rate in June 1998) was almost halved, falling by over 10 percentage points. Without further examination one might assume that such a dramatic narrowing of the interest rate differential would naturally lead to a decrease in portfolio investment inflows and a lower surplus (or even deficit) on the financial account, which would thus explain the muted recovery of the rand. However, despite the repo rate being lowered even more dramatically than bank rate had been raised during the emerging markets crisis, the cumulative surplus on the financial account actually grew to R35,3 billion from the last quarter of 1998 to the end of 1999.

The main reason for this was that the focus of foreign investors had shifted to South African equities and the bond market rather than money market investments. The shift to equities was especially pronounced in the third quarter of 1999. Lower interest

rates enhanced the prospects for economic growth and a rebound in an oversold equity market in the aftermath of the emerging markets crisis. An opportunity for quick capital gains in the bond markets as yields fell and prices rose also presented itself to canny investors.

In this respect, models of the exchange rate that include the interest rate differential as an explanatory variable must be treated with caution since there is no stable relationship between them. For example, a widening of the differential may lead to an increased net inflow of capital and an appreciation of the currency, as was the case between November 1996 and April 1997. But a narrowing of the differential may lead to the same result since it may alter the composition of capital flows without necessarily changing the net inflow thereof, as was the case in 1999. Figures 4 and 5 below show the changing composition of annual portfolio inflows (liabilities) and outflows (assets) between debt and equity securities respectively for the period 1990-2004. Figure 6 shows the change in the real interest rate differential between South Africa and the US, Germany, Japan and the UK over the same period.

Figure 4 – Annual portfolio inflows (liabilities), 1990 - 2004

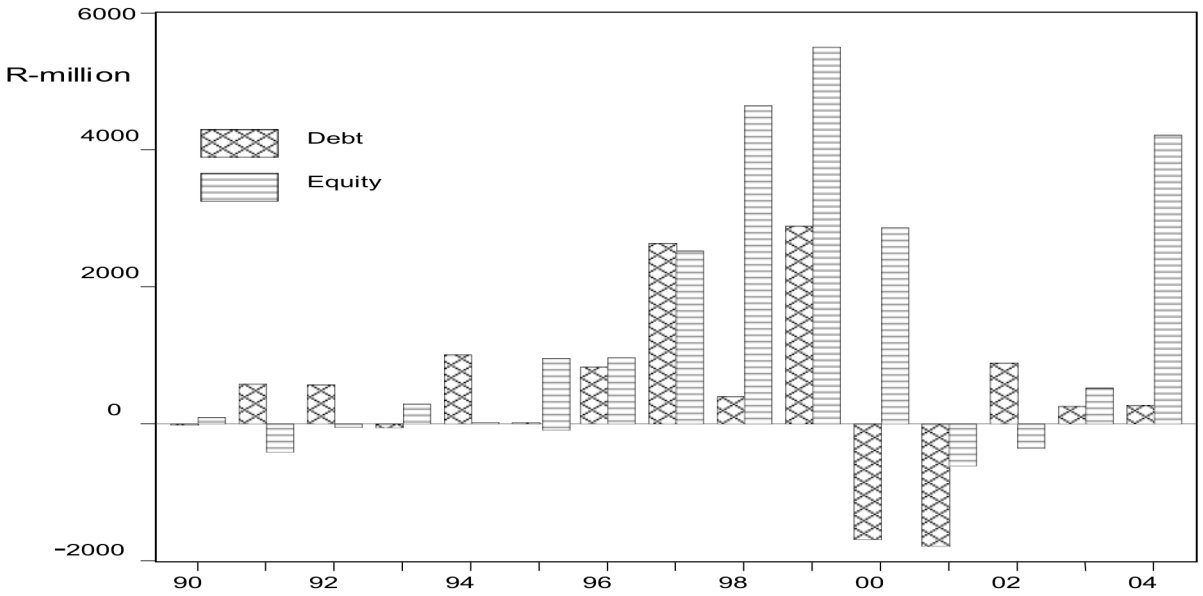
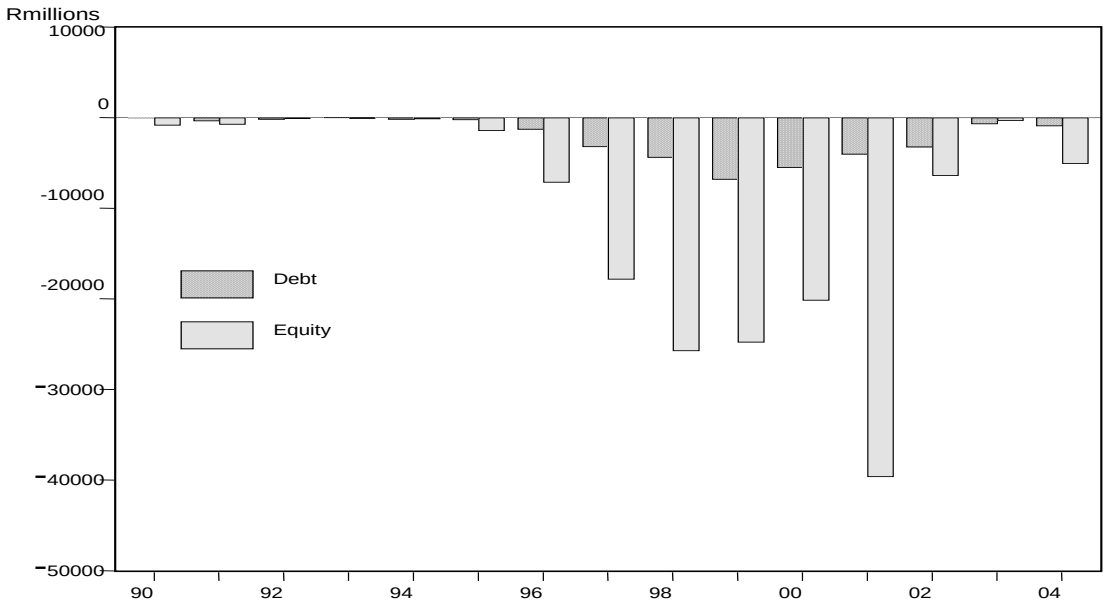
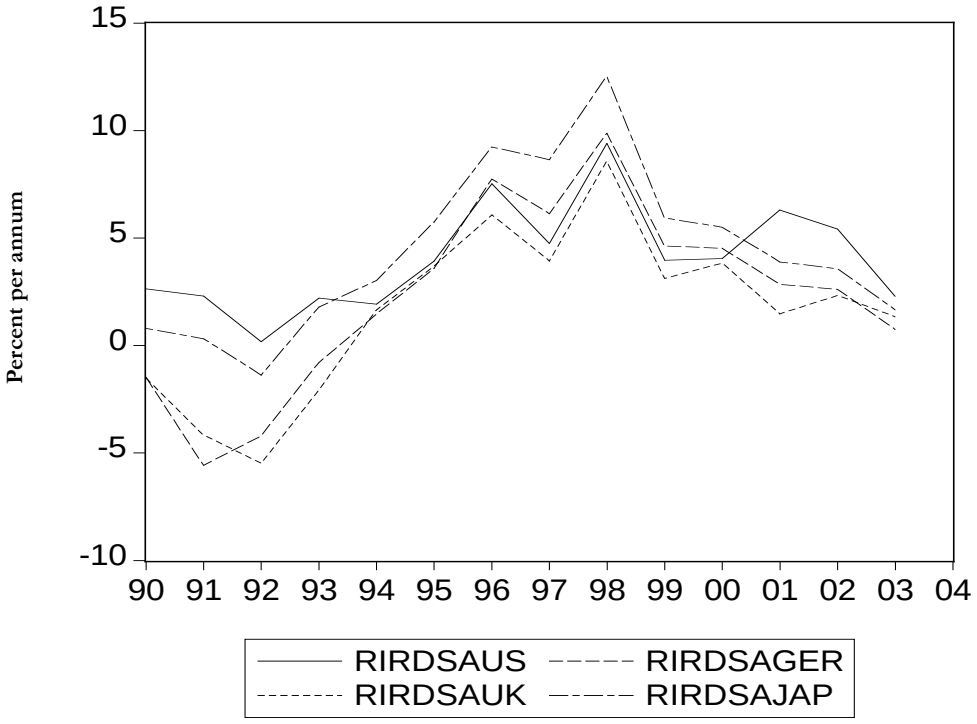


Figure 5 – Annual portfolio outflows (assets), 1990 – 2004



A feature of the foreign capital flows shown in Figures 4 and 5 is that equity investments have been greater than investments in interest bearing securities over the sample period. This is the case for both foreign capital inflows (liabilities) and outflows (assets). As regards outflows, it is evident in Figure 5 that South African residents have primarily invested in foreign equities and that even when interest rate differentials have widened considerably, this has been largely ignored in favour of such investments. Figure 6 shows how the real interest rate differential between South Africa, the US, Germany, Japan and the UK peaked in 1998, approaching 10 percent against the US. Despite the attractive domestic returns, foreign equity investments by SA residents surged in 1998.

Figure 6 – Real interest rate differentials between South Africa and the US, Germany, Japan and the UK



There are several reasons for this but the most important is probably the relaxation of exchange controls after 1994. This gave South African residents the opportunity to diversify their assets abroad legally. Before 1994 strict exchange control regulations severely limited the extent to which this could be done. (But, as noted above, the at times massive outflows of foreign exchange via unrecorded transactions on the balance of payments may reflect the extent to which this was done illegally by circumventing the exchange control regulations in various ways).

Foreign capital inflows were also largely dominated by the demand for South African equities rather than debt although there were times when the widening interest rate differential proved just too tempting, as shown in Figure 4.

In 1999 the cumulative surpluses on the financial account far exceeded the by then declining deficits on the current account. The main reason for the surge on the financial account was the massive inflow of foreign equity investment as shown in Figure 3. The net result on the balance of payments was an increase in the foreign exchange reserves of nearly R25 billion. The conundrum here is thus to explain why the rand did not appreciate far more than the mild recovery it staged after the emerging markets crisis.

The explanation again appears to be Reserve Bank intervention in the forward exchange market. Throughout 1999 the Bank purchased surplus dollars in the foreign exchange market to lessen its oversold forward position in foreign currency, which fell

from US$24,9 billion to US$17,4 billion at the end of 1998 and 1999 respectively (in rand terms, a decrease of about R32 billion). This deprived the foreign exchange market of most of the large surplus of dollars flowing from the financial account of the balance of payments.

8.4 Rand depreciation: June 2001 – December 2001

After the emerging markets crisis of 1998, the rand stabilised and moved in a relatively narrow range around its lower levels. But from June to December 2001, the rand depreciated sharply yet again as it came under renewed speculative attack. Over this period the real effective value of the rand fell by 26,9 percent. As was the case during the emerging markets crisis, most of the depreciation was concentrated in a single month. In December 2001 the average real value of the rand fell by 14,8 percent compared to the previous month.

Above-the-line balance of payments transactions were not the main reasons for the depreciation of the rand in this instance. Admittedly, a fairly big current account deficit of R4,6 billion was recorded in the third quarter of the year, but it moved back to a small surplus in the fourth quarter. A net deficit on the financial account was largely offset by inflows from unrecorded transactions. The net result of transactions above-the-line was what would normally have been a manageable balance of payments deficit of about R2,3 billion in the fourth quarter of 2001.

Two main factors may be singled out during this episode of depreciation in the rand. First, the Reserve Bank had stated that it would continue to close out its oversold position on the forward book with the intention of bringing it down to zero as circumstances permitted. To achieve this goal implied that the Bank would buy surplus dollars in the spot exchange market as they became available and would refrain from using the forward exchange market to support the rand if it came under pressure. Moreover, the still paltry gross and net value of the foreign exchange reserves (at US$12,4 billion and US$7,5 billion respectively at the end of December 2001) meant that the Bank could not use the reserves to resist a speculative attack on the rand either. Thus speculators were presented with a golden opportunity for a one-way bet against the rand – the risk of the rand appreciating and losing the bet was very small while the expected rewards from winning the bet were very large.

Second, the Bank announced in October 2001 that it would enforce the existing exchange control regulations regarding foreign-currency trading more strictly. After the announcement, there was a noticeable decline in turnover volumes in the foreign exchange market. Average daily turnover in the market fell from US$9,9 billion in the third quarter to US$8,5 billion in the fourth quarter of 2001. In relatively thin foreign exchange markets, the effect of individual transactions on the exchange rate is magnified considerably. Speculative foreign exchange deals aimed at depreciating the rand would thus have had a much greater chance of success in such an environment, especially as the Bank's announcement may had led those taking an opposing view of the rand to avoid the market temporarily. In other words, the sharp depreciation of

the rand may have been due to a temporary absence of stabilizing speculation rather than excessive destabilizing speculation.

8.5 Rand appreciation: December 2001 – December 2004

Unlike the short and sharp rebound in the rand following its depreciation in 1996, the recovery of the currency after its low point in December 2001 has now extended for over three years. The real effective value of the rand appreciated sharply by 30,2 percent to December 2002, followed by milder appreciations of 18,6 percent and 4,3 percent to December 2003 and 2004 respectively.

As in the second half of 1996, the sharp appreciation of the rand in 2002 was a recovery from a very oversold position at the end of 2001. Contributing to the rand's rise was a turnaround on the current account. After six years of deficits, the current account balanced in 2001 and recorded a substantial surplus of R7,2 billion in 2002. This was partly due to the continued upturn in the commodity price cycle and partly due to the large competitive edge bestowed on exports and import-substitutes following the depreciation of the rand in 2001 (production of which tends to lag changes in competitive advantage via the exchange rate). The balance on the financial account also surged in 2002; the main items being the surpluses on net direct and net other investment. In addition, outflows from unrecorded transactions, which had been negative every year since 1990, switched to inflows in 2000 and have been on a rising trend since then.

In 2003 the current account fell back to a deficit and grew rapidly to R25 billion by the third quarter of 2004 as the strong rand began to bite into exports and imports began to flood in. However, large surpluses on the financial account and the inflows from unrecorded transactions heavily outweighed the current account deficits.

Moreover, at the end of 2003 the Reserve Bank reached its objective of closing out the oversold forward book. It was thus no longer necessary for the Bank to buy surplus dollars in the market in this regard. The international liquidity position of the Bank – the extent to which its future foreign currency obligations are met by the foreign exchange reserves - had already turned positive earlier in the year. Thus an important source of instability in the foreign exchange market had been removed and the Bank could further improve its international liquidity position at its leisure. The Bank described its intervention policy in the markets as 'creaming off' surplus dollars when opportune to do so.

Given the sustained strength of the rand, many felt that the Bank should have intervened on a much larger scale, both to build up the gross reserves and to prevent further appreciation – or even to reverse the trend and weaken the rand. However, the Bank felt that a hands-off policy was best and to let the markets decide the fate of the currency. Intervening on a larger scale would imply taking sides in the market – a sure invitation to speculators on the other side of such bets that could well result in a renewed source of instability. Despite the big improvement in the Bank's international liquidity position, the reserves were still too low to resist a renewed speculative attack on the rand. The strong rand perhaps also suited the Bank's purpose in bringing the domestic inflation rate within the 3 – 6 percent inflation target and keeping it there.

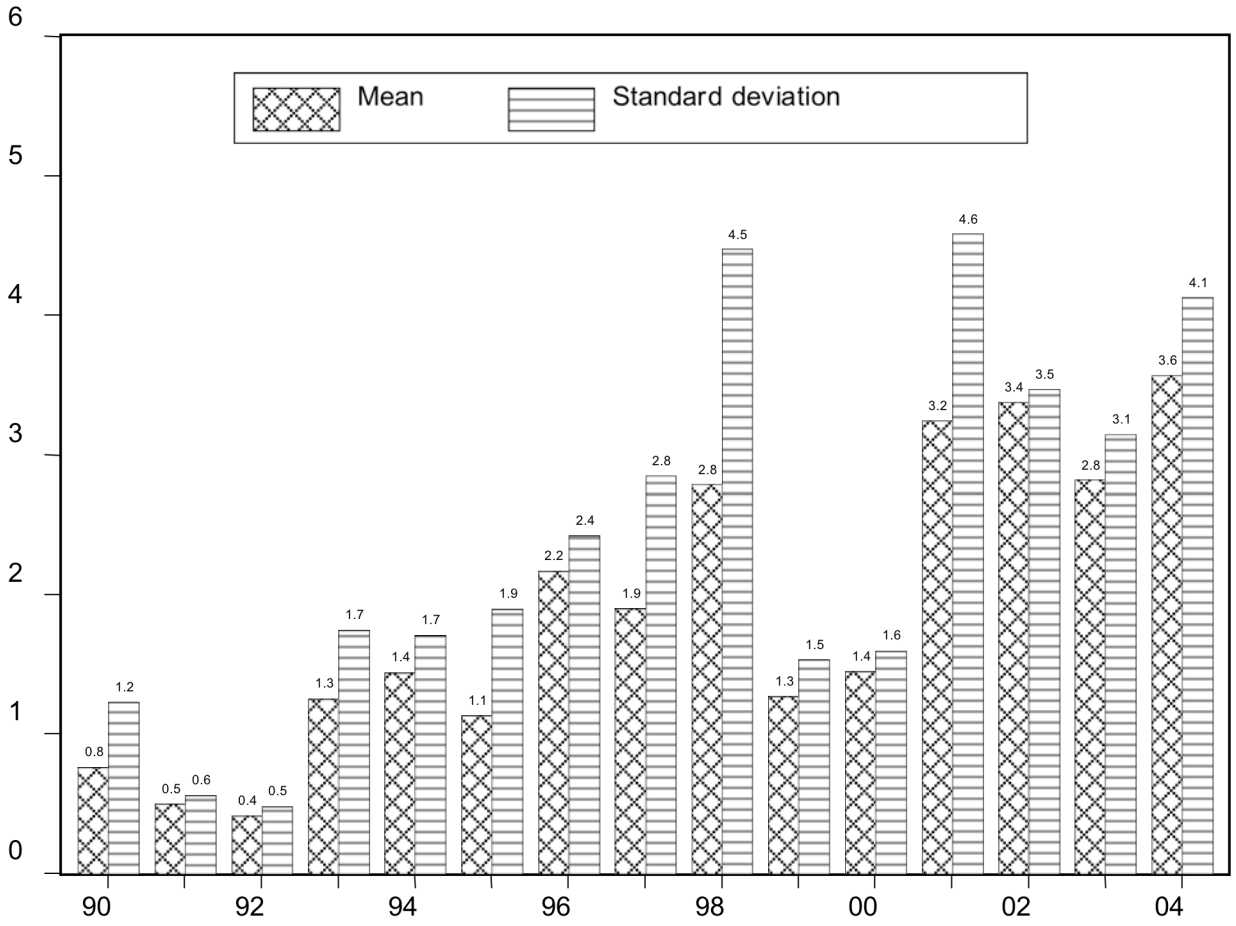
The latest data shows that equity inflows surged in 2004 while outflows fell, as shown in Figures 4 and 5. Thus despite the real interest rate differential having narrowed considerably since the end of 2001, net portfolio flows have increased due to the higher expected returns on South African equities. Thus the commonly accepted positive relationship between interest rate differentials, net portfolio flows and the exchange rate must be treated with caution, at least as regards the experience in South Africa since 1994. Those who demand lower domestic interest rates to weaken what they regard as an overvalued rand might be disappointed as the currency could strengthen instead. The effect of a lower domestic interest rate on net portfolio flows depends on how this affects expected returns on equity versus debt investments in South Africa relative to such investments elsewhere.

9. Volatility of the rand around its trend

In contrast to the macroeconomic questions concerning changes in the average level and trend of the rand, short-run changes in the exchange rate and deviations from its trend are primarily a microeconomic issue. Such volatility or 'noise' in the exchange rate may be less damaging than the consequences of sustained changes in the value of the rand, but still exposes exporters, importers and investors to risk. Such risks can be hedged but only at a cost, as explained further in section 8 below.

Figure 6 below shows the mean (absolute value) and standard deviation in the month-on-month percentage changes in the real effective exchange rate of the rand for each year from 1990 onwards. With the exception of 1999 and 2000 these measures of the short run volatility of the rand have increased dramatically over this period.

Figure 7 – Mean absolute value and standard deviation of monthly percentage changes in the real effective exchange rate of the rand, 1990 – 2004



10. Protection against the volatility of the rand

The volatility of the rand implies different types of risk and uncertainty. Depending on the nature of the risk, there are various ways in which they can be covered or hedged. There are three broad categories of exchange rate risk: transaction risk, translation risk, and economic risk. Such risks and protection against them can be explained using the distinction between volatility of the exchange rate *around its trend* and volatility *in the trend* made in section 2.

Both transaction and translation risk concern volatility of the exchange rate around its trend. Transactions risk arises whenever an international transaction involves a time lag either in the payment or in the receipt of a foreign currency. For example, a South African importer may have been granted three months= trade credit by the foreign supplier. In this case, if the goods are priced in foreign currency, the South African importer bears the exchange rate risk (whereas if they had been priced in rands, the risk is borne by the foreign supplier). If the rand depreciates by the end of this period, then the importer will have to pay more rands than if the sale had been settled in cash.

One way to cover this risk is for the importer to buy a forward exchange contract (FEC). Such contracts may be for the purchase or sale of foreign currency. For example, in a three month forward purchase contract for the foreign currency value of the imported goods, the South African importer applies to a bank for the purchase of foreign currency (in exchange for rands) three months hence but at a price (the forward exchange rate) stipulated at the time of the contract. Thus no matter what happens to spot exchange rates over this period, the importer knows exactly how much in rands will have to be paid on the due date. Forward exchange contracts are generally readily available for up to a year at fairly low cost.

Besides a nominal fee, the cost of an FEC depends on the difference between the forward and spot exchange rates. This is determined by the interest rate differentials on the currencies concerned. Because interest rates in South Africa have generally been much higher than that of our major trading partners, the forward exchange rate of the rand has nearly always been at a premium against these currencies. But the cost of forward foreign exchange has affected importers and exporters differently. In both cases forward cover eliminates or lowers the risk of an unfavourable change in the exchange rate. However, exporters with goods denominated in foreign currencies have a greater incentive to buy forward cover because the greater the forward premium is, the more rands they receive from their foreign currency receipts. Conversely, importers have a lesser incentive to buy forward cover because they will have to pay more rands for the same amount of foreign currency.

Translation risk is present whenever there is a mismatch between a company=s foreign currency assets and liabilities. The effects of exchange rate changes will become apparent when the company prepares its balance sheet statement for its annual report. For example, if a South African multinational company reporting in the United Kingdom has more rand assets than liabilities, it has an open rand position. An

appreciation of the pound sterling against the rand will diminish the sterling value of its rand assets more than its liabilities. Depending on the accounting standards or practices of the company, this 'loss' may have to be written down, thus reducing bottom line profits for the reporting period concerned (conversely for a depreciation of the pound against the rand).

The total exposure of the company to translation risk is the sum of its open positions in different currencies. It may be difficult, if not impossible, for some companies to eliminate translation risk entirely. However, this risk may be reduced if one tries to ensure a better match between foreign currency assets and liabilities. A popular option is the borrow-deposit method, whereby companies try to finance the purchase of foreign currency assets by borrowing or otherwise raising capital in the same currencies.

Economic risk is the risk that changes in exchange rates will affect the competitiveness and future profitability of a company. It is thus the result of sustained changes in the trend of the exchange rate. If the real effective value of the rand appreciates and remains at its stronger levels, as described in section 7.5 above, then a South African exporter's competitive position is eroded such that future sales and profits may decline.

The extent of such declines depends on the level of the real exchange rate compared to when the company made its prior capital investment, hiring and production decisions. It is more difficult to cover or hedge this risk using FECs because such contracts rarely extend beyond one year. However, companies can try to counter the decline in profitability by cutting domestic production costs or by otherwise restructuring the production process to reduce costs. Such restructuring may also imply a shift in location of production facilities to another country with a weaker currency.

The risks described above do not fully capture the negative effects of the volatility of the exchange rate on the economy. Existing companies seeking protection against such volatility are already established in the traded goods sector. The effect of exchange rate volatility and risk can be measured in various ways, such as the effect on the profitability, sales or the market value of the companies concerned (see Levich 2001: 600-642). A less visible effect that is difficult to quantify is the degree to which uncertainty about the exchange rate lowers participation in the tradable goods sector.

For example, suppose a decline in the real exchange rate makes it more profitable for a new company (or a company presently established in the non-tradable goods sector) to allocate resources to the production of tradable goods. Despite the expected excess returns at the weaker exchange rate, the reallocation of resources will only take place if the company is sure that the rand will not strengthen significantly over the longer term. The less certainty there is about the exchange rate, the greater any depreciation would have to be for such companies to commit resources to the tradable goods sector.

Thus short-term exchange rate *risk* is something that established companies can hedge against and include as a cost of doing business in the tradable goods sector; whereas longer-term exchange rate *uncertainty* is something that inhibits the establishment or

expansion of such companies and results in a smaller tradable goods sector than might otherwise be the case. Thus exchange rate uncertainty may lead to negative hysteresis effects resulting from the volatility or swings in the trend of the exchange rate, as explained in section 6.

11. Summary and conclusions

This report studies various aspects of the behaviour of the exchange rate of the rand from 1990-2004. This is a preliminary paper describing the behaviour and determination of the rand exchange rate. The effect of changes in the exchange rate on the South African economy, especially on manufacturing output and employment in the export and import-substitution industries is not the focus of this paper but is the subject of another working paper.

A non-econometric qualitative analysis was used to study issues concerning the volatility of the exchange rate. The main focus is on the real effective exchange rate of the rand as this is the best single indicator of the competitiveness of our manufactured goods in foreign markets (see section 3). In describing the behaviour of the exchange rate three distinctions are made: the level of the exchange rate, volatility in the trend of the exchange rate, and volatility of the exchange rate around its trend. The main concern is with persistent changes in the real level of rand, which may imply a macroeconomic misalignment of the exchange rate, and with longer-term volatility or swings in the real exchange rate.

This report suggests that the real appreciation of the rand from its low point in December 2001 to its level at the end of 2004 is essentially a recovery from earlier episodes of depreciation. Presently, the real effective exchange rate is at the same level that it was at before the speculative attacks on the rand during the emerging markets crisis in 1998 and the latter half of 2001. Since this exchange rate index is a broad indicator of the competitiveness of our manufactured goods in foreign markets, the current level of the rand does not appear to be overvalued by this measure.

Unless it can be argued that the rand was on average seriously overpriced before the emerging markets crisis in 1998, it is difficult to argue that it is overvalued now. Exports of manufactured goods grew steadily in real terms between 1990-97, especially from 1994 as world growth accelerated and commodity prices picked up. Thus the current level of the rand is not uncompetitive relative to its longer-term history. It only appears to be overvalued relative to its shorter-term history since the emerging markets crisis in 1998 when successive speculative attacks on the rand pushed it to its lows of 2001. This extreme depreciation in the real value of the rand represented a windfall for exporters due to the large but temporary competitive advantage it gave them in world markets. Thus the recovery of the rand since then and the elimination of this windfall should not be seen as an overvaluation but as a long overdue reversion to the mean of the real effective exchange rate.

Although some macroeconomic models of the exchange rate estimate the rand to have been overvalued in 2003 and 2004, this does not necessarily mean that the competitiveness of our manufactured goods is any less than its longer-term average. 'Overvalued' in such models simply means that the actual exchange rate is above the equilibrium value as determined by the fundamental variables chosen by the model-builder (see section 4).

More plausible than the argument that the level of the rand is 'uncompetitive' (section 5) is the possibility of a significant hysteresis effect resulting from sustained swings in the trend of the real exchange rate (section 6). The pronounced V shape of the exchange rate between 1998-2004 may have resulted in some exporters and firms in the import-substitution industries suffering losses. Such firms may have been attracted by the prior episodes of depreciation to start new ventures or to expand existing operations. They would have incurred various costs in doing so. Thus the unexpected sustained recovery of the rand may have penalised such firms, resulting in a negative hysteresis effect inhibiting activity in the traded goods sector.

The sustained recovery in the rand appears to have broken the ingrained belief that the longer-term trend would be forever downward. This implies that firms contemplating the traded goods sector might adopt a wait-and-see attitude and that the rand would have to depreciate significantly more than would otherwise be the case before committing further resources to this sector. Present circumstances in the South African economy reinforce such sentiment as low interest rates and accelerated growth in domestic spending make the home goods sector relatively more attractive. Thus growth in the tradable goods sector might be inhibited for some time by the recent volatility in the rand. More work needs to be done to study these effects on the economy both in the aggregate and at a more disaggregated level.

Section 7 describes the main episodes of rand depreciation and appreciation since 1996. In each case the main developments on the current and financial accounts of the balance of payments are studied. There are similarities but also important qualitative differences in the explanation of the exchange rate during each episode. Two main points emerge from this analysis.

First, intervention in the foreign exchange market by the Reserve Bank, at times on a large scale via the forward exchange market, may have had a significant effect on the exchange rate. These effects were both direct in affecting liquidity conditions in the markets and indirect by influencing expectations. It is difficult to capture the effects of such intervention in an empirical model of the exchange rate. However, changes in the Bank's international liquidity position suggest that it supported the exchange rate during speculative attacks and depreciation of the rand, as in 1996 and 1998, but dampened the subsequent recoveries in the rand (especially in 1999 – see section 7.3). However, the sharp depreciation of the rand in 2001 and the sustained recovery afterwards may have been intensified by the Bank's objective of clearing the oversold forward book (as explained in sections 7.4 and 7.5). The Bank's achievement of this objective and the current policy of minimal intervention have removed a significant source of instability in the markets.

Second, changes in the interest rate differential have had unpredictable and at times perverse effects on capital flows and thus the exchange rate. One reason for this is that a change in the real interest rate differential tends to have opposite effects on expected returns on equity versus fixed interest investments. For example, a decrease in the differential is predicted to lower the return on domestic fixed interest investments relative to such investments abroad and lead to a decrease in foreign liabilities and net capital outflows. *Ceteris paribus* this should lead to a depreciation of

the rand. However, depending on the circumstances, the decrease in the differential may be anticipated to stimulate economic growth and increase the expected returns on equity investments, thereby leading to an increase in foreign liabilities and an appreciation of the rand. Thus the net effect on the exchange rate is uncertain as it depends on the relative strengths of these two forces in the markets.

For example, since the beginning of 2002 real interest rate differentials have declined and yet the rand has continued to appreciate. One reason for this is that net portfolio inflows via equity investments have surged in response to the buoyant domestic economy. In 2004, net equity inflows were R37,1 billion compared to net debt related inflows of only R1,8 billion. Particularly since 1994, equity based portfolio flows have been generally much greater than interest bearing investments, as regards both inflows (changes in foreign liabilities) and outflows (changes in foreign assets) as shown in Figure 4 and Figure 5 in section 7 respectively.

Unlike the volatility in the longer-term trend of the rand, the short-term volatility of the exchange rate around its trend (see section 8) should not be a major concern. Unlike many other developing countries, South Africa has a relatively sophisticated financial infrastructure and this includes the foreign exchange market where the banks provide various hedging facilities at low cost (besides 'vanilla' FECs, foreign currency options and futures contracts are also available). Thus, if importers and exporters do not want to bear short-term exchange rate risk, there are various ways to avoid such risks (see section 9).

Moreover, the leads-and-lags phenomena in the local foreign exchange market suggests that such foreign currency transactions are not entirely motivated by commercial considerations and may at times have a speculative element attached to them. It is perhaps naïve to think that exporters and importers do not, at times, take a view on the rand and attempt to make speculative profits in this regard, over and above anticipated commercial profits. As explained in section 2, there are various ways in which companies can speculate in foreign exchange even though this is prohibited by the exchange control regulations. Even the passive decision by an importer or an exporter not to take forward cover or otherwise hedge against the risk of an unfavourable change in the exchange rate can be speculative as it may imply a view taken on the currency.

Regarding the short-term volatility of the rand around its trend, the EPRI report recommended 'specific DTI programmes to broaden access to exchange rate management instruments' (presumably in collaboration with the banks and other authorised dealers). Part of such a programme could profitably include a foreign exchange information and education centre for instruction on the use and misuse of such instruments.

References

Baldwin 1988. "Hysteresis in Import Prices: The Beachhead Effect", *American Economic Review* (September): 125-46.

Bell T, Farrell G and Cassim R. 2002. "Competitiveness, International Trade and Finance in a Minerals-Rich Economy: The Case of South Africa", in Fanelli L M and Medhora R (eds): *Finance and Competitiveness in Developing Countries*. London: Routledge.

Cheung Y-W, Chinn M D and Pascual A G. 2003. "Empirical Exchange Rate Models of the Nineties: Are Any Fit to Survive?", *UC Santa Cruz International Economics Working Paper*: 02-16 available at http://repositories.cdlib.org/sccie/03-14/.

Economic Policy Research Institute. 2003. "The Volatility of the Rand and Its Impact on the Manufacturing Sector: The Impact on Exporters and Investors", 1-40. Research report commissioned by the Department of Trade and Industry, External Relations and the Policy Coordination Unit Research Management Directorate.

Hodge D. 2001. "A Tale of Two Governors: Monetary Policy and the South African Economy, 1981-1999". *South African Journal of Economic History* Vol. 16 (September): 47-73.

Kohlhagen S W. 1979. "The Identification of Destabilizing Foreign Exchange Speculation". *Journal of International Economics* 9: 321-40.

Koromzay V, Llewellyn L and Potter S. 1987. "The Rise and Fall of the Dollar: Some Explanations, Consequences and Lessons". *Economic Journal* 97: 32-48.

Kreinin 2002. *International Economics: A Policy Approach*. London: Thomson Learning, Inc.

Krugman P. 1989. *Exchange-Rate Instability*. Cambridge, Mass.: MIT Press.

Levich R M. 1985. "Empirical Studies of Exchange Rates: Price behaviour, Rate Determination and Market Efficiency", in Jones R W and Kenen P B (eds): *Handbook of International Economics* Vol. 2, New York: North-Holland: 980-1039.

Levich R M. 2001. *International Financial Markets: Prices and Policies*. New York: McGraw-Hill.

Meese R A and Rogoff K. 1983. "Empirical Exchange Rate Models of the Seventies: Do They Fit Out-of-Sample?", *Journal of International Economics* 14: 3-24.

Meese R A and Rogoff K.1984. "The Out-of Sample Failure of Empirical Exchange Rate Models: Sampling Error or Misspecification?', in Frenkel J A (ed): *Exchange Rates and International Macroeconomics*, Chicago: NBER: 67-109.

Sarno L and Taylor M P. 2002. *The Economics of Exchange Rates*. Cambridge: Cambridge University Press.

Salvatore D. 2004. *International Economics*. New York: John Wiley & Sons, Inc.

Schinasi G J and Swamy P A V B. 1989. "The Out-of-Sample Forecasting Performance of Exchange Rate Models when Coefficients are Allowed to Change", *Journal of International Money and Finance* 8: 375-390.

Sohmen E. 1969. *Flexible Exchange Rates*. Chicago: University of Chicago Press. 59-80.

Walters SS and de Beer B C. 1999. "An Indicator of South Africa's External Competitiveness", *SARB Quarterly Bulletin* (September). Pretoria: South African Reserve Bank.