Risk and Speculation in the South African Economy

By:
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We have standardized every other unit in commerce except the most important and universal unit of all, the unit of purchasing power. What businessmen would consent for a moment to make a contract in terms of yards of cloth or tons of coal, and leave the size of the yard or the ton to change? (Fisher, 1913 by Lok Sang Ho, 2000)

Introduction

According to pure economic theory, free capital flows improve global resource allocation and the transfer of technology. However, due to economic crisis or increasing risk, it can result in instability in the markets with large interest rates swings, speculative runs on financial markets, destabilizing macroeconomics and imposing adjustments in the fiscus, with detrimental consequences for socio-economic environment (Schoeman, *et al*, 2000: 235 and Lok Sang Ho, 2000: 939). This 'problem' with free capital flows seems to be the case with emerging markets in particular. The events in Mexico (1994), South Africa (1996 and 1998), Thailand (1997) and Malaysia (1997), are clear examples of the excessive foreign exchange volatility that can arise from free international capital flows (Abedian, 1998:21). This was again clear in recent times in Turkey and Argentine, but as Palley (2001) mentioned, developed countries, including the United States, have also been injured in some of these crises. In the wake of the Russian financial crisis of summer 1998, Wall Street was rocked by a crisis of its own.

The objective of this paper is to investigate the influence and impact of increasing risk in the markets. Is an increase in risk followed by an outflow of capital and vice versa; does it increase the volatility and interest rates and do exchange rates depreciate? A glance is given at the movements of capital, speculation and risk; especially in South Africa. It investigates some of the reasons (events) for the speculative attacks on the currency and looks at the response on interest rates and excess return. A suggestion is made concerning policy, which may reduce some speculative attacks on the economy.

Theories and studies explaining capital flows and risk premiums (Excess return)

In an open and well-integrated financial market, in which movement of capital is as easy as the pressing of a key, a reduction in interest rates would be followed by a capital outflow and consequent depreciation in the exchange rate (De Angelis, 1999/2000 and Mishkin, 2001:168). High interest rates on the other hand, are thought to be able to prevent a currency from sliding; but as Lok Sang Ho (2000: 940) mentioned, in the case of most emerging economics, they experienced a substantial depreciation, notwithstanding sharply higher interest rates. According to Dornbuch (1976: 1061), the domestic currency depreciates when nominal interest rates rise because of an increase in expected domestic inflation, which is typically thought to be larger than the increase in the domestic interest rate.

Another problem that arises with the high (real) interest rates is that it keeps investors out of the economy. This reduces economic growth and creates large fiscal deficits. A vicious circle

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develops; the deprecation leads to higher interest rates, it leads to weaker economics and thus more pressure on the currency to depreciate. The expected inflow of foreign capital that should counteract the depreciation, seems not to take place (De Angelis, 1999/2000).

This increases the risk of borrowing abroad in a turbulent world, and it could ruin those firms whose income is denominated in domestic currency. This fear of depreciation ignites herd behaviour and foreign lenders may scramble to call back their loans or dump their bonds. An otherwise containable problem could then cascade into a full-scale catastrophe.

Conventional economic theory has relied on a model of portfolio investment to explain the international movement of capital. This theory postulates interest rate differences among countries as the cause of international capital flows (Root, 1984: 456). However Schoeman, *et al* (2000: 237) mentioned that "*in South Africa the data do not support the hypothesis that interest rate differentials explain the net flows of capital… which foreign investors apparently still perceive as a high risk country*."

One of the important implications of the rational expectations hypothesis is that unanticipated events or news drive asset prices. The appearance of new information should immediately cause changes in asset prices as the markets absorb the news. Short-term fluctuations in exchange rates seem to be dominated by receipt of new information. These fluctuations (over and undershooting) are much larger than can be explained by fundamentals – such as differences in national inflation rates or interest rates. Over longer periods of time the transient information effects tend to cancel each other out so that the latter continuing influences become more important (MacDonald & Taylor, 1992: 34 and Ethier, 1995: 394).

Under some circumstances it might be necessary to pay traders a risk premium in order to induce them to hold a currency perceived as unusually risky (from the importer/exporter point of view), the difference between the forward rate and the expected future spot rate would furnish the required risk premium. Efforts to explain these premiums empirically have not yet been conclusive (Ethier 1995: 393). A reason why risk premiums have not yet been conclusive is because of perceptions of risk. A risk premium for a person that is risk adverse might be much larger then a premium for a person that is risk neutral or risk loving (Nicholson, 1998: 222-233). So maybe the search for risk premiums that explain the movement of financial markets is just a search for a proxy for a premium of risk that explain movements.

According to Jiang (*et al*. 2000: 95) the research on (foreign exchange) risk premiums calls for relating excess return to various risk measures directly.

In order to explain excess return of the forward exchange contract, various asset-pricing models exist. One approach is derived from the consumption-based model that maximizes an agent's utility function; (it can be shown as the excess return on the forward exchange market). The second approach is to use the Capital Asset Pricing Model (CAPM), to measure the covariance between the forward excess return and the 'market' excess return. A third approach is to utilize an equilibrium version of the Arbitrage Prizing Theory (APT), that postulates that the excess return on forward exchange markets is correlated to the excess returns on a benchmark portfolio (Jiang et al. 2000:95).

The Risk Premium hypothesis (RPH) proposed by Fama (1984) investigates the variability of a risk premium and the expected currency depreciation in the foreign exchange market. Fama argued (mentioned by Sequeira et al. 2000: 278) that under market efficiency and rational expectations, the forward exchange rate is equal to the expected future spot rate plus a risk premium. This RPH is specified as the natural logarithms of:

$$f_{t+k|t} = E_t(s_{t+k}) + \pi_{t+k|t} \qquad (1)$$

Where $f_{t+1|t}$ is the price of a k-periods futures contract at time t, $E_t(s_{t+k})$ is the forecast of the future spot price at time $t+k$. Setting $k=1$ involves a 1 period contract, Equation 1 can be rewritten as:

$$f_{t+1|t} = E_t(s_{t+1}) + \pi_{t+1|t} \qquad (2)$$

The risk premium view of futures pricing has witnessed a long and continuing controversy that is based on the two aspects of the formulation, namely whether the expected risk premium is non-zero and whether the future spot is an unbiased estimator of the future's price (Sequeira, et al 2000: 278).

The South African Reserve Bank (Quarterly Bulletin 2000: 36) calculated sovereign risk premium (SRP) on South African bonds as the difference between the real yield of South African Government bonds and bonds in the United States Federal Government:

$$(i_{SA} - \pi_{SA}) - (i_{US} - \pi_{US}) = SRP \qquad (3)$$

where i_{SA} and i_{US} are the nominal interest of South African and United States bonds respectively, and $\eth_{SA}$ and $\eth_{US}$ are the different inflation rates. They mention that changes in risk premium reflect foreign investors' perceptions of risk reward opportunities in the country. The currency risk premium (CRP) 'signaled a fairly sanguine outlook for inflation' (Reserve Bank Quarterly Bulletin 2000: 37). This is measured as the difference between the nominal yield on South African Government bonds and United States government bonds.

$$(i_{SA}) - (i_{US}) = CRP \qquad (4)$$

In a study by Schoeman (et al 2000: 241) an empirical model of the impact of fiscal discipline on foreign direct investment clearly showed the impact of risk (that consists of the foreign debt/GDP ratio, interest payment/export earnings and the extent of import cover). If risk increases, there is a decline in foreign direct investment. It was tested using a long-run cointegrated equation of:

$$f(y,R,(t_u - t),x,d) = FDI_s \qquad (5)$$

where y = income, R = risk premium, $(t_u - t)$ is the tax differential, x = deficit/GDP ratio and d = dummy.

Capital movement, the exchange rate and interest rates

> '*No government can afford to upset speculators with policies that are not compatible with the priorities set by international capital'* (De Angelis, 1999/2000).

Capital available for movement between countries and for speculation has increased dramatically. In 1995, while world exports of goods and services totalled about $6.1 trillion, the daily foreign exchange market turnover amounted to about $1.2 trillion - that is about fifty times as much annually as capital movements (De Angelis, 1999/2000). Currently this amounts to around $1.5

trillion (Piggott, 2001: 97). In 1975, cross-border transactions in bonds and equities were a negligible percentage of GDPs (ranging from 1 percent in the case of Italy to 5 percent in the case of Germany, and 4 percent in the case of the United States). In 1997 these have reached phenomenal levels: in the case of Italy, more than six times greater than GDP; for the United States 213 percent and for Germany 253 percent of GDP, respectively (De Angelis, 1999/2000).

Table 1 clearly indicates the vulnerability and openness to foreign speculators on the South African capital market and increase in the volatility and amount of bonds and shares sales and purchase by non-residents in South Africa (indicated as Rands per month). This clearly increased from 1996 after markets were increasingly opened and there is a clear reduction in trade with the Asian crisis. Table 2 shows the net bond purchasing by foreigners in the capital market, with again the net decline with the Asian crisis and volatility from 1996 onwards.

Table 1: Purchasing of sales of bonds and shares by foreigners in South African markets from 1991 to 2001

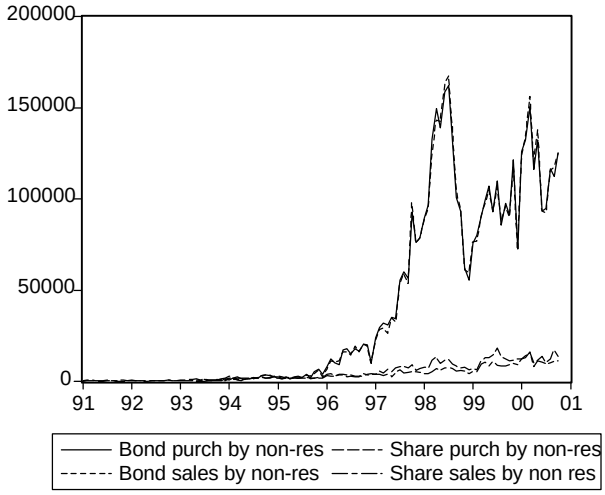
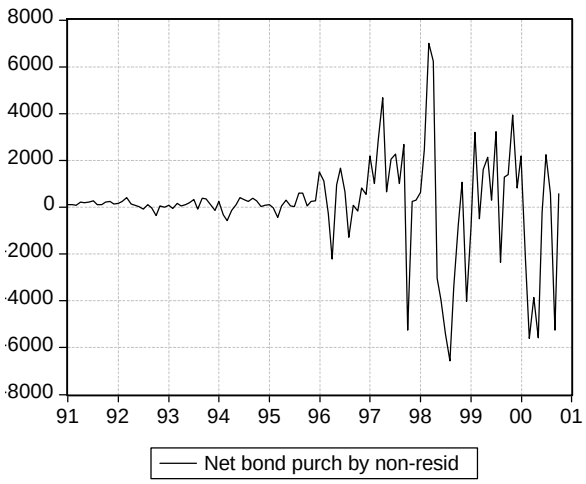


Table 2: Net purchasing of bonds in South Africa by non-residents.



(Source: constructed from data from the SARB)

This data is a clear indication of the degree of financial integration and the exposure of national economies to the whims of financial markets. This vulnerability and instability were visible during 1996 in South Africa, when uncertain political events combined with persistently high crime levels and unrest, led to the withdrawal of foreign capital. The capital market rates increased rapidly by more then 300 base points. It was again clearly visible in 1998 when heavy speculative selling against the rand caused a sharp rise in bank lending rates by 725 base points[2]. (Harmse & Du Toit, 1999: 336-337). The heavy speculation in these instable times seems to be a contributing factor in the depreciation and increased volatility of the rand against the large currencies.

The Risk factors in the Economy

> "*Country risk is potentially more significant. Conceivably, a crisis might arise that would induce the political authorities to close down the foreign-exchange market, impose exchange controls, or take other measures that might prevent the trader from converting the proceeds of maturing foreign bills into domestic currency*." (Ethier, 1995: 371)

[2] In the period between April and August 1998 there was a speculative selling of securities to the value of $4 billion.

Risk and the concept of sovereign risk relate to the soundness of the entire economy. In a time when movement of capital and people across borders is easier, regional risk also becomes more important than just 'in country' risk. Summers (2000: 348) stated that in the next two or three decades, we would see a substantial convergence between the economy of South Africa and the other economies of sub-Sahara Africa. The question that will determine the future of Africa and its people is whether that convergence is upwards convergence on behalf of the other economies, or downward convergence for sub-Sahara Africa.

According to the World Investment Report 2000, foreign direct investment on the African continent appears to be the least palatable destination, as only a paltry 1.2% (mainly to South Africa, Angola and Nigeria) of the total world FDIs came from Africa (Mabotja, 2001: 14). Investment rating services listed Africa as the riskiest region in the world. Indeed, there is some evidence that Africa suffers from being perceived by investors as a 'bad neighborhood.' Analysis of the global risk ratings shows that while they are largely explicable in terms of economic fundamentals, Africa as a whole is rated as significantly more risky than is warranted by these fundamentals. Private investment also seems to be significantly lower in Africa than is explicable in terms of economic fundamentals (Collier & Gunning, 1999: 21).

The risk factors in Southern Africa's economy are not new. It is a lurking threat to 'stability' and it seems as if this has already been taken into account in the value of the currencies. Some of the main regional factors threatening 'stability' are the Zimbabwean crisis, the HIV-AIDS crisis and other diseases like malaria and TB, the crime factor, large regional deficit/GDP- and dept/GDP ratios, corruption in government, jobless growth with strong labour unions and strict labour laws, low education levels and productivity and a lack of leadership.

The ICRG (International Country Risk Guide) (The PRS Group) risk rating system monthly rates objective and subjective aspects of political, economic and financial risks.

Political Risk, according to the mentioned group, consists of economic expectations vs. reality; economic planning failures; political leadership; external conflict; corruption in government; military in politics; organised religion in politics; law and order tradition; racial and nationality tensions; political terrorism; civil war; political party development; and quality of the bureaucracy.

Financial Risk comprises of loan, default or unfavourable loan restructuring; delayed payment of suppliers' credits; repudiation of contracts by governments; losses from exchange controls; and expropriation of private investments.

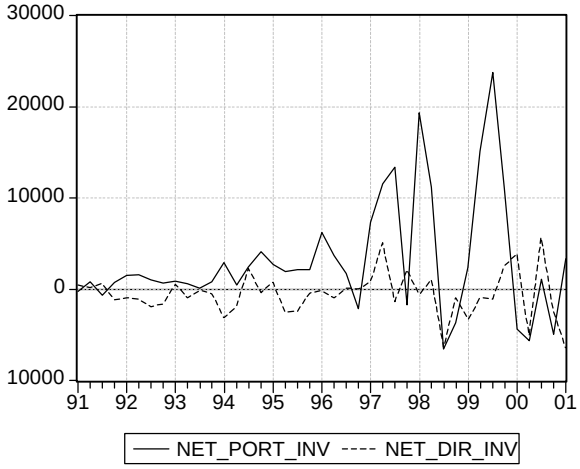
Economic Risk is comprised of inflation; debt service as a percentage of exports of goods and services; international liquidity ratios; foreign trade collection experience; current account balance as a percentage of goods and services; and parallel foreign exchange rate market indicators.

If regional stability is important to attract long-term investors and not just shorter-term speculation to the economy, it is worthwhile to look at the regions' risk. According the ICRG guide, Zimbabwe is currently the 5th riskiest country (135 out of the 140 countries where 1 is least riskiest and 140 is the riskiest). This makes Zimbabwe riskier than countries like the Democratic Republic of the Congo, and Iraq that are respectively sixth and seventh on the list.

In 1999, South Africa went down to 75th (from 57th in 1998). Mozambique was in the 108th place and Zambia and Malawi shared the 96th place. The only 'light' in the southern part of Africa was Botswana that was 20th on the list and Namibia 25th (Sealy, 1999). Looking at these rankings of

Southern Africa, and hoping to attract international investments in an open market competing with developing countries for a share of investment, it can be argued that foreign investors apparently still perceive South Africa as a risky country (moderate risk according to ICRG).

Table 3: Net portfolio investment and direct investment in South Africa (R millions)



It seems as if South Africa is starting to get the macro fundamentals right. Manuel (2001: 7) mentioned in his budget speech this year, that the budget set out on a growth-orientated agenda. It signals a shift from macroeconomic stabilisation to microeconomic reform -if the country can just reduce its vulnerability and give positive incentives for investors to invest long-term money or direct investment in the country. The net direct investment over the last 10 years (from 1991/1 to 2001/1) is on average minus R553 million per year. This has decreased to R944 net outflow per year from the first quarter 1998 to the first quarter 2001. The average net portfolio in-flow into the country is R3157.268 from the first quarter 1991 to 2001.

The influence of news on the South African Economy

> *'All these countries have spent 40 years trying to build up their economies and a moron like Soros comes along with a lot of money to speculate and he ruins things.' (Mahathir Mohamad, prime minister of Malaysia, January 1998 named by Baily et al. 2000: 80)*

In figure 4, it is clearly visible how the exchange rate depreciates every time there is some form of local or international risk. Each time there is large overshooting with volatile movements; and this behavior seems to have increased in the last few years.

In recent times this interest rate has been declining. This decline is, according to Preece (2001: 27), one of the reasons - together with the political situation and profit taking - that there was a net sell of bonds of R20 billion in 2000 by foreigners. Up to March 2001, R7 billion worth of SA bonds have already been sold.

After the elections in April 1994, the economy experienced a relative large inflow of promised investments into the economy. The rand performed fairly stable around R3.55 to the dollar (see above figure); but the bigger part of the investment was short-term. In the first 10 months of 1995, foreign investors 'snapped' up South African shares on the Johannesburg Stock Exchange (JSE) worth 4.2 billion rand ($1.2 billion). This was partly due to the withdrawal of controls on foreign investors in March 1995 (Economist, 11 November, 1996: 89). The net total inflow of

portfolio investment in 1994 amounted to R10 008 million, but direct investment declined by R4557 million.

On the 16th of February 1996 rumours were spread of the illness of President Mandela; and the rand dropped in one day from R3.66/$ to R3.80. It continued to drop to R4.50 seven months later. On the 25th of April the rand has suffered the sharpest drop since a sanction related run in 1985. According to *The Economist* (4th May 1996: 76) the slide has exposed both the fragility of South Africa's reputation in the foreign exchange markets and its government's lack of experience. The reason for this depreciation of the rand is mainly due to a lack of confidence in the economy, political events and because economists agree the exchange rate had been overvalued - with about 10% in February 1996.

The political events at this stage and among other things, the resignation (beginning of August 1996), of Chris Liebenberg, the Minister of Finance and his replacement by Trevor Manuel caused the rand to drop to R4.58 (almost 20% decline from February) during this time. Later on '*Mr. Manual flew to America to calm down investors at the same time his party was backing a national strike*' (Economist, 4th May1996: 76). This was not seen as 'good news' for investors. Mr. Mbeki on the other hand (then Deputy President), '*…says a little about economic policy, and what he does say is often confusing*'. It was mentioned in *The Economist* (4th May 1996: 76) that he declared that the government was pressing for privatization, and the next day he '*back-pedaled'*, saying that he had not '*meant this at all*'. Lower confidence in the economy leads to lower investment. The reasons for the depreciation in the rand, mentioned by the *Finansies en Tegniek*, (Schoombee, 1996:9) are the consistent high crime levels, problems with unions and investors not being sure of the new government's ideas, goals and implementation skills. Further 'characteristics' are the low levels of foreign reserves (just enough for one month's import), high real interest rates (that went up to 16% in April to counter inflation pressures caused by the devaluation of the rand), a deficit on the current account and the risk of capital outflow due to increasing interest rates in the US and decreasing stock prices in New York.

In August 1998 the rand depreciated to a new 'all time low' of R6, 64 = $1 from a level of R5.09 on 22 May 1998. This was mainly due to the economic crisis in the East Asian countries, which was an external shock to the economy. This fear of depreciation ignites herd behaviour all around in developing markets and foreign lenders scramble to call back their loans or dump their bonds. This resulted in interest rates shooting up, also in South Africa. Together with heavy speculative selling against the rand, bank lending rates rose sharply by 725 base points[3] (Harmse & Du Toit, 1999: 336-337). In this time, the announcement was also made, that the governor of the Reserve Bank, Chris Stals, would be replaced in 1999 by Tito Mboweni (at that time the labour minister). On the 17th of July Moody also gave a warning that it was considering downgrading South Africa's sovereign debt to sub-investment grade (Economist, 1998: 25th July). This led to a drop from around R6.20/$ to R6.39/$ the following day.

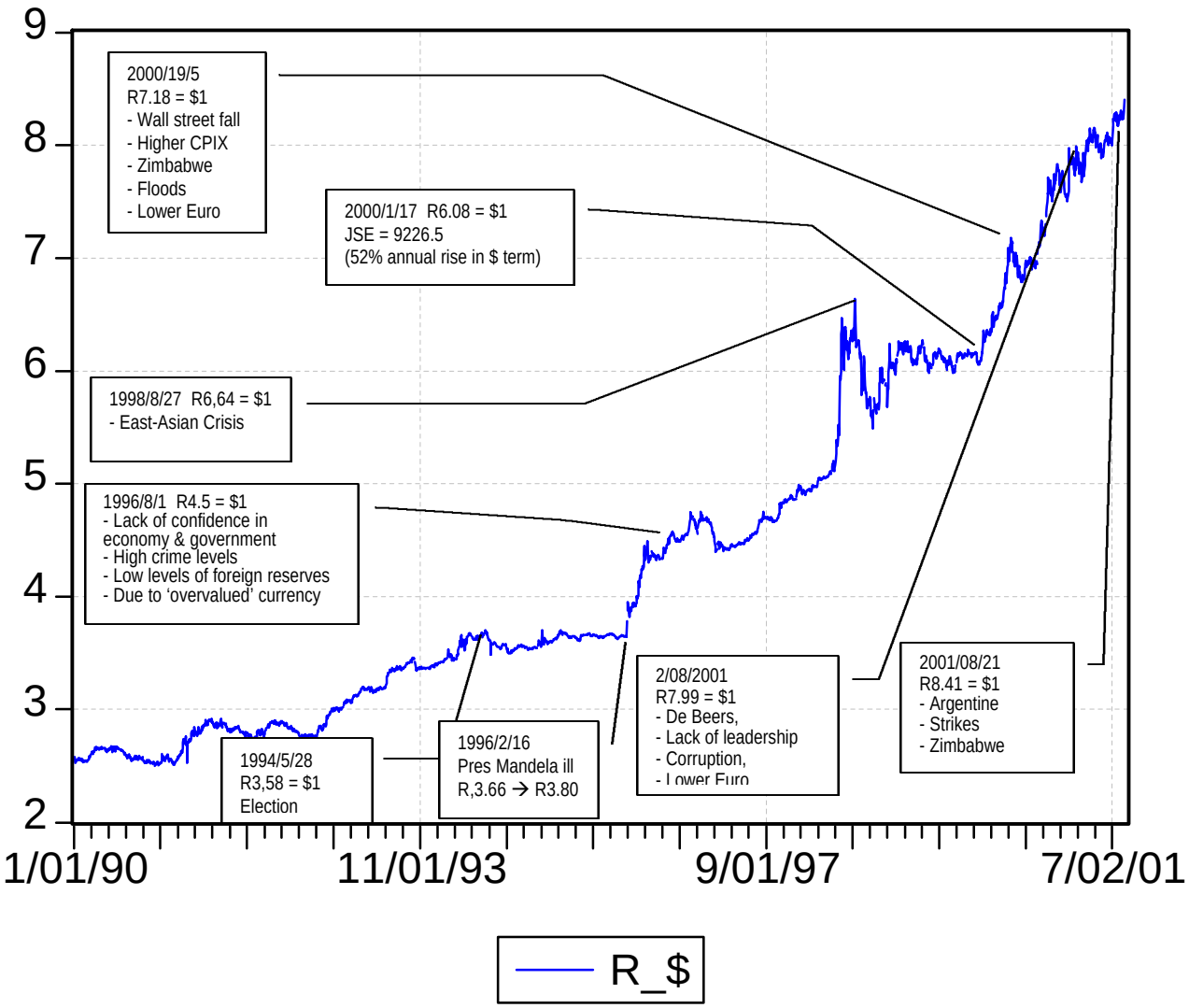
After the East Asian crisis, the rand appreciated to R5.5/$, after initial overshooting, stabilizing until the beginning of 2000 on a level of just above R6/$. The all share index of the Johannesburg Stock Exchange (JSE) increased during this time to a high of 9226.5 points - 52% annual rise in dollar terms and a 58% rise in rand terms.

Since the start of 2000 the one event after the other struck our economy. Firstly the floods in the Northern Province and Mozambique; thereafter the invasions of the farms in Zimbabwe, a fall in Wall Street, a lower Euro, the ever increasing danger of AIDS, corruption in government and also a higher CPIX in May 2000, that drove the rand to R7.18.

[3] In the period between April and August 1998 there was a speculative selling of securities to the value of $4 billion.

In 2001 the Zimbabwean crisis continues to be as big a threat as the past year to the region's stability. The debt crises in Argentine again showed the weakness of the economy to external shocks and together with a lower Euro, the strikes in the motor industry and of COSATU and the possibility that the privatization programs of the government are not progressing according to plan, the rand depreciated to R8.41/$ in August 2001.

Figure 4: The daily movement of the rand/dollar exchange rate form 1991 to 2001



The data evidence

Daily and monthly data from the Reserve Bank of South Africa and the Federal Reserve of United States of America are used from 1991 to 2001.

The South African rand and interest rates are compared with the United States (US) dollar and treasury bills. The reason for this is because the US is the largest world economy, its dollar is a vehicle currency and it is seen as the most important single currency (Ethier, 1995: 359). Default risk on the US treasury bills is negligible since they are the obligation of the government of a wealthy nation (Ethier, 1995: 370); so in general it is common practice to view Treasury bills (shorter term) as 'risk-free assets' (Bodie, et al. 1999:181).

The daily correlation between the rand/dollar exchange rate and the SA ninety-one day Treasury bill seems to have negatively correlated over the period from the beginning of 1991 to August 2001 (Table 1). This may just be due to the general downward trend of the interest rates during this time relative to the depreciation (upward trend) of the rand. It seems as if positive correlations occur during 'crisis' times where the rand depreciates more rapidly and the interest rates increase. This is for instance during the Asian crisis where a correlation of 0.92 occurred and also in 1996 when the news was made available that President Mandela was ill and that the rand was undervalued. It appears, from this that if there is increasing risk in the economy, the interest rates and exchange rate movements are positively correlated (exchange rate depreciates and interest rates increase).

Table 1: Daily correlation between the rand/dollar exchange rate and SA 91 day t-bills in different periods.

Period	Variables	Correlation
1991/01/01 to 2001/08/31	R_$ and SA_91D_T	-0.334
1998/01/05 to 1998/9/30	R_$ and SA_91D_T	0.924
1996/2/16 to 1997/01/01	R_$ and SA_91D_T	0.670

The concept of *post hoc, ergo propter hoc*[4] is not clear between the Rand Dollar exchange rate and the interest rates, and correlation does not necessarily imply causation. From the data in Table 2, using a Granger causality test with two lags, it seems as if there is a bi-directional causality between the Rand dollar and the interest rates in first difference form, using daily data from 1991 to August 2001 and also in 1998 for the Asian crisis. This causality makes sense, thinking about economic integration and the immediate response of financial markets.

Table 2: Granger Causality test on the first differences between the rand/dollar exchange rate and the SA 91 day t-bill in different periods

Period	Causality test	Obs	F-value	Probability
1991/1/1 – 2001/8/31	d_R_$ does not Granger Cause d_SA_91D_T	2497	57.4955	0.00000
	d_SA_91D_T does not Granger Cause d_R_$		14.4955	5.5E-07
1998/1/1 – 1998/12/1	d_R_$ does not Granger Cause d_SA_91D_T	207	17.9903	6.5E-08
	d_SA_91D_T does not Granger Cause d_R_$		5.04147	0.00730

Trends in the data can lead to spurious regression correlations that imply relationships between the variables in a regression equation, when all that is present are correlated time trends (Harris, 1995: 19). Using the Engle and Yoo (1989) three-step procedure that includes an error correction model (ECM) to conclude to a correction of the long run cointegration equations.

Table 3 No1 indicates the relationship between the SA ninety one-day Treasury bills and the rand/dollar exchange rate, using monthly data during 1998 for the Asian crises. (The period from 1991 to 2001 is not significant and is not included in this paper). If the rand/dollar depreciates, there is an increase in the treasury bill-rates, but it only seems to be significant during a crisis time.

Looking at the relationship between the SA ninety one-day Treasury bills and the forward premium (forward minus the spot exchange rates -logrisk_3mf) from 1996 to 2001(Table 3 No 2), it seems as if the difference between the spot and forward increase (that may be due to increase in interest rates and risk) there is a increase in the SA ninety one-day Treasury bills (for every one percent increase in the forward minus spot difference there is a 22.9 percent increase in the Treasury bill) (See Appendix 1 for ECM details).

[4] Which means that if one event occurs after another, the second event must have been caused by the first, only if the first event is an exogenous event (Mishkin, 2001: 643)

Table 3 Elastisities of variables during different time periods

No	Dep variable	Indep Variable	Period	Coefficient	Std Error	t-ratio
1	ln(SA 91-day t-bill)	Ln_R_$	1998:01 to 1998:09	1.73156	0.01640	10.549***
2	ln(SA 91-day t-bill)	LOGRISK_3MF	1996:01 to 2001:01	22.9295	1.21368	18.892***
3	Net flow of bonds	LN_R_DIFF_SA_US	1998:01 1998:12	-13818.01	67.2723	-205.40***
4	Net flow of bonds	LN_R_DIFF_SA_US	1996:02 2000:10	-1580.49	1052.54	-1.5

*** Significant at a 10% level

The coefficient between the real interest rates of SA and US and the net flow of bonds is investigated in Table 3 (No 3 and No 4). An increase in the difference between the real interest rate of the two countries, leads to a net outflow of bonds out of South Africa. It is however just significant during the Asian crisis time (see Appendix 1 for ECM details).

From this data it seems if there is depreciation in the exchange rate, there is an increase in the Treasury bill rate in times of crises. The net flow of funds to South Africa is not explain by the difference in real interest rates over longer periods of time, but is significantly explained during 'crisis' times when risk in developing markets increase.

What can South Africa do against this speculation?

Against this background of ‘unsuitability’ in financial markets, the controversial ‘Tobin tax’ on foreign exchange transactions was proposed (initially by Tobin), that puts a penalty on short-term speculation. According to Lok Sang Hon (2000: 939), this was also the reason why Malaysia introduced foreign exchange control after the Asian crisis and found sympathy from a mainstream economist, Paul Krugman.

De Angelis (1999/2000) mentioned that the so-called Tobin tax is one of the most debated proposals to limit the movement of speculation and capital flow. This implies a small tax levied on foreign exchange transactions that penalises short-term round-trip movements of speculative capital, thus helping to "put grains of sand in the wheels of international finance." The possible advantages of this tax are that it may reduce the profitability of short-term speculation and allow exchange rates to better reflect long-term factors in the real economy, rather than short-term speculative flows. The second rationale is based on the greater autonomy this tax would give governments in pursuing economic policies, by being a bit more shielded from financial market discipline on domestic fiscal and monetary policy. Finally, the third rationale for such a tax (that may vary between 0.02% and 0.05%) is its revenue-raising potential for the government. On the negative side, Davidson (1999/2000) said that this tax did not make it possible to reduce international speculation, and would be very hard to implement and enforce it with a large excess burden.

Baily (et al: 2000: 80) mentioned that sceptics who are thinking about imposing capital controls or otherwise curtailing the activities of hedge funds and other portfolio investors, should pause. Most of the money for emerging economics comes from bank lending, not from hedge funds or other non-bank investments such as pension funds and mutual funds. The reason for this is because the vast majority of bank lending has taken the form of short-term loans between banks - not long term financing. He argues that as capital markets continue to grow, eventually replacing traditional lending as the primary source of international financing, capital flows are likely to become less volatile. But it is important for domestic capital markets to develop.

Rather than to try and limit hedge-fund activities, policy makers should focus on the quality of the information that investors use to make decisions. They can accomplish this by improving disclosure, financial transparency, and investor protection.

This shift from capital markets will help both individual countries and the world. Markets may stabilize as more financial instruments begin to adjust through price rather than quantity. Due to more people who invest on these markets, risk will be increasingly diluted as it is spread across a larger investor base, ultimately resulting in lower interest rates for issuers. Competition among intermediaries will increase and improve efficiency.

Perhaps it is time for some studies on 'Tobin' tax, to see if there may be positive results from such a tax, with longer-term tax incentives in return. However, the only way it could really work sufficiently, is if there is more co-operation in the world for such a tax.

The most important players in reducing the risk in a country are the leaders and people in control. The policies, judgments, actions and reactions of the leaders of developing countries should be less according to own criteria and agenda, but more according to what the market and international arena expect from them.

Conclusion

It seems that increasing volatility in the South African markets exists especially in times when new information becomes available. The increase in interest rates, depreciation in currency and outflow of funds can to a certain extent be due to risk in the economy. Each time the rand seems to depreciate rapidly there seems to be a 'herd' effect in the markets that leads to an increase in interest rates and an outflow of funds; speculation may also increase in these high risk times that lead to the further depreciation of the rand.

Some of the ways in which the volatility in the markets can be decreased, are with a Tobin-tax type tax, increase in private savings and private investment and also leaders that must follow policies not according to own agenda, but to what the international markets expect from them.

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Appendix 1

Table 5 Difference in the three and six month forward and spot exchange rate in cents.

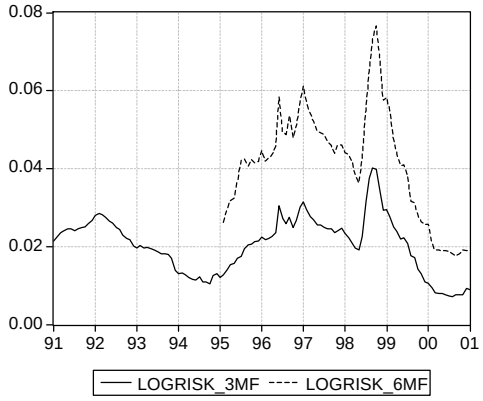


Table 6: The real and nominal difference between the South African and United States interest rates

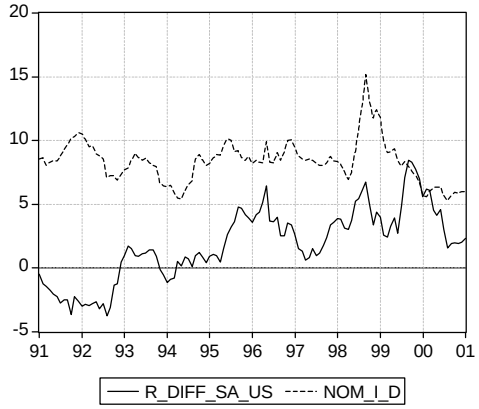


Table 7 The SA 91-day t-bill

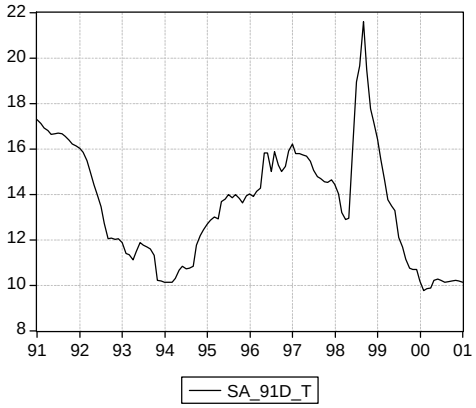
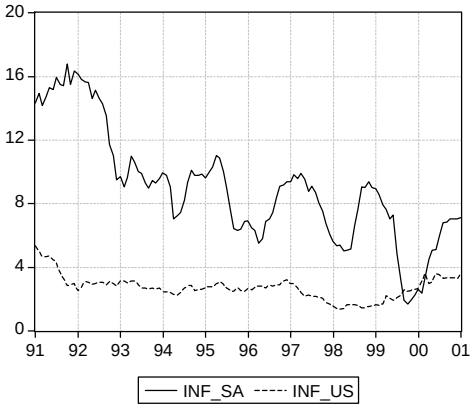


Table 8 The SA and USA inflation



Variable	**Meaning**
SA 91 D T	South African 91 day Treasury bill
Inf_SA	Inflation South Africa
Inf_US	Inflation United States
Logrisk_3mf	log difference between forward exchange and spot exchange rate of rand/dollar 3 month
Logrisk_6mf	log difference between forward exchange and spot exchange rate of rand/dollar 6 month
R_diff_sa_us	Real difference between South African interest rates and United States interest rates
Nom_i_d	Nominal interest differential between South African interest rates and United States
Net flow of bonds	Net flow of South African bonds (RB 2051)
ln_r_s	log of the rand/dollar exchange rate
Net_port_inv	Net portfolio investment in South Africa
Net_dir_inv	Net direct investment in South Africa
Diff_infl	Difference in inflation between South Africa and US
Dum_risk	Risk dummy 1 = high risk periods and 0 = low risk periods
Ln_bond_n_trans	Log number of bond transactions

Appendix 2

Augmented Dicky-Fuller test for non-stationary, levels 1991:01 – 2001:01

Series	**Model**	**Lags**	τ_τ,τ_μ,τ	ϕ_3,ϕ_1
Ln_rand_dollar	Trend Constant None	0 0 0	-2.124114 0.413552 4.423499	2.585155 0.171026
ln_sa_91d_t	Trend Constant None	0 1 0	-1.458210 -1.962413 -1.054369	1.064520 3.312550
SA_inf	Trend Constant None	4	-2.095329	8.525621**
US_inf	Trend Constant None	0	-2.050853	7.139809
	Trend Constant None	1	-3.025145*	9.281716**

*(**) Significant at 5%(1%) level.

Augmented Dicky-Fuller test for non-stationary, 1st difference 1991:01 – 2001:01

Series	**Model**	**Lags**	τ_τ,τ_μ,τ	ϕ_3,ϕ_1
Ln_rand_dollar	Trend Constant None	4	-4.697090**	7.695531**
ln_sa_91d_t	Trend Constant None	0	-4.624071**	10.69113**
SA_inf	Trend Constant None	3	-7.782084**	13.89559**
US_inf	Trend Constant None	3	-3.752326*	6.264239**

* (**) Significant at 5%(1%) level.

Appendix 3

Table 1.1 Cointegrated equation: Dependent variable: Ln(SA 91 day t-bill) From 1998:01 to 1998:09

Variable	Coefficient	Std. Error	t-ratio
LN_R_$	1.731567	0.333457	5.192775
C	-0.128629	0.555974	-0.231357

Table 1.2 ECM: Dependent variable: ∆ln(SA 91-day t-bill) from 1998:01 to 1998:09

Variable	Coefficient	Std. Error	t-Statistic
RES2(-1)	-1.095223	0.149056	-7.347730
D(LN_R_$(-1))	0.476264	0.252020	1.889789
D(LN_BOND_N_TRANS)	0.245602	0.058604	4.190878
D(LN_SA_91D_T(-1))	1.155377	0.149058	7.751207
C	-0.041632	0.016411	-2.536833

R″	0.970669	Normality	JB(2) = 1.03219 (0.597435)
R″	0.931560	Serial correlation	LB(4) = 9.3943 (0.052)
F	24.81987		LM(2) = 6.928610 (0.25937)
s.e. = 0.020175		Heteroscedasticity	ARCH(1) = 1.205939 (0.322184)
		Stability	Reset (3) = 2.551529 (0.404787)

Table 1.3 Cointegrated correction: Dependent variable: ln(SA 91-day t-bill) from 1998:01 to 1998:09

Variable	Coefficient	Std. Error	t-ratio
LN_R_$	1.731567	0.016409	10.5490
C	-0.128629		

Table 2.1 Long run Cointegrated equation: Dependent variable ln(SA 91-day t-bill) from 1996:01 – 2001:01

Variable	Coefficient	Std. Error	t-Statistic
LOGRISK_3MF	22.92956	0.658247	34.83426
C	2.117533	0.015275	138.6229

Table 2.2 ECM: Dependent variable: D ln(SA 91-day t-bill) from 1996:01 – 2001:01

Variable	Coefficient	Std. Error	t-Statistic
RES_3M_T(-1)	-0.200713	0.119129	-1.684841
D(LOGRISK_3MF)	15.31255	2.912930	5.256753
D(LN_SA_91D_T(-1))	-0.279359	0.130175	-2.146020
D(DIFF_INFL)	0.012943	0.005200	2.488932
D(NOM_I_D)	0.031567	0.004661	6.771921
DUM_RISK	0.017720	0.008560	2.070013
C	-0.006825	0.004183	-1.631699

R″	0.777705	Normality	JB(2) = 25.10691 (0.000004)
R″	0.752539	Serial correlation	LB(36) = 30.967 (0.319)
F	30.90363		LM(3) = 2.947381 (0.041651)
s.e. =	0.036046	Heteroscedasticity	ARCH(1) = 0.022216 (0.882039)
		Stability	Reset (2) = 0.423664 (0.657120)

Table 2.3 Cointegrated correction: Dependent variable: ln(SA 91-day t-bill) from 1996:01 to 2001:01

Variable	*Coefficient*	*Std. Error*	*t-ratio*
LOGRISK_3MF	22.92956	1.213688	18.8925
C	2.117533		

Table 3.1 Cointegrated equation: Dependent variable Net capital flow from 1998:01 1998:12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_R_DIFF_SA_US	-13817.32	2968.618	-4.654464	0.0009
C	19497.44	4427.587	4.403626	0.0013

Table 3.2 ECM: Dependent variable: Flow of funds from 1998:01 1998:12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RES_NET_FLOW(-1)	-5.152318	2.366464	-2.177222	0.0659
D(LN_R_DIFF_SA_US)	-13871.76	3826.929	-3.624775	0.0085
RB2051M(-1)	5.044723	2.164162	2.331029	0.0525
D(LN_EXC_RETURN)	19120.68	9781.626	1.954755	0.0915
C	1145.380	881.5478	1.299283	0.2350

R″	0.83	Normality	JB(2) = 0.614057 (.735630
R″	0.74	Serial correlation	LB(7) = 8.3464 (0.595)
F	8.82		LM(2) = 0.923879 (0.455569)
s.e. =	2244.875	Heteroscedasticity	ARCH(1) =
			White test = 1.949870 (0.315322)
		Stability	Reset (3) = 2.421407 (0.206261)

Table 3.3 Cointegrated correction: Dependent variable: Net flow of bonds from 1998:01 1998:12

Variable	*Coefficient*	*Std. Error*	*t-ratio*
LN_R_DIFF_SA_US	-13818.0144	67.27236	-205.404
C			

Table 4.1 Cointegrated equation: Dependent variable: Net flow of funds from 1996:01 to 2000:10

Variable	Coefficient	Std. Error	t-ratio
LN_R_$	-1580.498	645.4645	-2.448621
C	2011.363	865.8029	2.323119

Table 4.2 ECM: Dependent variable: D ln(SA 91-day t-bill) from 1996:01 – 2001:01

Variable	Coefficient	Std. Error	t-Statistic
RES_LT_FLO(-1)	-0.519635	0.393878	-1.319277
D(LN_R_DIFF_SA_US)	-5523.471	1473.447	-3.748673
RB2051M(-1)	0.708613	0.371688	1.906470
D(DIFF_INFL)	-1834.380	584.5691	-3.138004
C	-62.74383	327.4035	-0.191641

R″	0.360523	Normality	JB(2) = 0.50063 (0.77633)
R″	0.311332	Serial correlation	LB(36) = 28.823 (0.227)
F	7.329103		LM(2) = 0.06661 (0.93564)
s.e. =	2456.260	Heteroscedasticity	ARCH(1) = 0.04274 (0.83697)
		Stability	Reset (2) = 0.13053 (0.71936)

Table 4.3 Cointegrated correction: Dependent variable: Net flow of bonds (R10 Million) from 1996:02 2000:10

Variable	*Coefficient*	*Std. Error*	*t-ratio*
LN_R_DIFF_SA_US	-1580.498	1052.549	-1.5
C			

JB = Normality Test
LB = Lung-Box Q test for serial correlation
LM = Serial correlation
ARCH lm test for Heteroscedasticity
Reset = Ramsey reset test for stability