South African Capital Flows and Capital Flight over the 1960-95 period

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1 Introduction

Emerging economies are usually net foreign borrowers during their developmental process. By supplementing domestic savings with external resources, a more desirable growth path can be attained. Often, however, residents of these countries place their wealth abroad simultaneously with their search for external finance. This pattern of behaviour is a concern for policy makers. Capital flight largely escapes domestic taxation, and is therefore an impediment to the country's ability to make future debt repayments. Moreover, capital flight imposes a constraint on economic growth by exacerbating the unavailability of domestic sources of investment financing. Effectively capital flight means that foreign borrowing contributes less to domestic resources than initially anticipated[1]. Given its possible disruptive effects on domestic investment, the foreign exchange market and public finances, capital flight thus becomes a serious policy concern. Considering the magnitude and causes of flight provides a basis for choosing the appropriate policy response.

In South Africa the protracted period of political and economic instability, which prevailed during the 1970's and 1980's, increased the probability of substantial capital flight. It is thus plausible that the lower average growth rate attained by South Africa during the course of these decades was due at least in part to capital flight. While South Africa has of course undergone a political transformation, it is at least arguable that the transformation has not as yet removed the uncertainties and risks which are conventionally held to be central determinants of capital flight. In such a context, an understanding of the nature and the determinants of capital flight remains as salient as it is important for an understanding of the economic history of South Africa in the last decades of the twentieth century[2]. This is all the more so since domestic savings stands at a relatively meagre 16% of GDP.

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[1] There is also a downside attached to large capital inflows, including rapid monetary expansion, inflationary pressures, real exchange rate appreciation, and widening current account deficits.

[2] Given the strength of short term capital inflows into South African capital markets in the 1990's, and the volatility of such capital flows, the danger of a 1994 Mexican-type financial crisis is frequently cited for South Africa. The Mexican crisis was triggered by risk-return considerations of capital holders, given the composition of the Mexican current account deficit and capital inflows, the nature of productivity gains in the domestic economy, and the credibility of government monetary and fiscal policy (see Burki and Edwards 1995 for a fuller discussion).

But the interest of the South African case extends beyond the parochial. South Africa since the 1960's represents an intriguing test-case for the impact of piolitiucal factors on capital flows. South Africa experienced periods of autocratic repression in conjunction with both political stability and instability. And the period of political liberalization similarly has seen periods of both stability and relative instability. South Africa thus represents an important test case for the growing number of hypotheses in the literature concerning the impact of piolitical factors on economic growth - here mediated by their impact o capital flows[3]. In this paper we undertake a first application of two new political risk measures to the study of capital flows.

We begin by determining the extent of capital flows and capital flight for South Africa over the 1960-95 period in terms of a number of distinct definitions which have emerged in the literature. The sample period of the study represents a significant extension of previous studies of capital flight in South Africa. Given the extension of the study into the 1990's, the study will also provide an insight into the extent to which capital inflows to South Africa in the 1990s (if any) have reversed episodes of flight in earlier periods.

The development of a number of capital flight measures which are distinct from those normally reported in balance of payments statistics, raises the question of whether there exists a *conceptual* difference between "normal" capital flows and capital flight (as opposed to conceiving of flight simply as an outlfow of capital). While the literature does make some attempt at a conceptual disntiction between normal flows and flight, there does not seem to be general agreement on the conceptual meaning of capital "flight", beyond the truism that it represents that part of private capital outflows which cannot be characterized as "normal". Normal outflows include those resulting from private investors' attempts to diversify their international portfolio holdings to maximize returns; enterprises promoting trade via providing export credits, accumulating working balances abroad, and then investing directly in the acquisition of productive capacity abroad; and commercial banks accumulating deposits with foreign correspondent banks and acquiring claims on nonresidents through portfolio and direct investment. The challenge is to obtain a characterization of capital flight which captures capital movements distinct from such "normal" flows. We present a model in order to allow for a distinction between normal capital flows and capital flight, and leave it to the empirical results to establish whether such a distinction is borne out.

A further difficulty with the concept of capital flight is that even where the various conceptual definitions are accepted, depending on the data sources used *measurement* of the magnitude of capital flight can vary substantially. The literature provides four alternative measures of capital flight, which we will follow: the balance of payments measure (see Cuddington 1987); the direct measure (see Bank of England 1989); the indirect measure (see Pastor 1990); the derived measure (see Dooley 1988). Of these, the direct measure was not available over the full 1960-95 sample period due to data limitations, and we omit it from the present study.

Even if we were to agree that there might be meaningful differences in the conceptualization of normal capital flows and capital flight, and that the alternative measures of capital flkight are coherent, this still leaves the question of whether such distinctions

[3] See Fedderke (1997) for a review of the literature. Fedderke and Klitgaard (1998) and Klitgaard and Fedderke (1997) report on the methodological problems associated with cross-sectional studies incorporating social and political indicators.

are associated with significant differences in the manner in which the different flows are determined. This paper further provides estimates of the determinants of both "normal" capital flows, and of capital flight. The question here is not only to what extent capital flows and capital flight have the same determinants, but whether the determinants of capital flight and flows carry similar weight. Appropriate policy responses vary with the determinants and relative importance of the determinants of capital flight and capital flows. An understanding of the determinants of capital flight is thus vital, and a central concern of the present paper.

It is thus a matter of some ambiguity in conceptual, measurement-related, and estimation terms, as to whether capital flight can be conceived of as something distinct from "normal" capital flows. We keep an open mind on the issue, and examine the empirical evidence. However, to preempt the conclusion we reach: the alternative measures of capital flight generate quite distinct intimations of the magnitude of capital flows to and from South Africa, but they are not without their own problems; and the determinants of capital flows and flight do not support the possibility of a conceptual distinction between the alternative measures.

To our knowledge, only one previous study has undertaken estimations of capital flight determinants in South Africa. Smit and Mocke (1991) first provide measures of the magnitude of flight over the period 1970-1988. The four prevailing methods of measuring capital flight already mentioned are used in the estimation of the determinants of capital flight. The main systematic causes of capital flight from South Africa over the period 1970-1988 (19 observations), according to Smit & Mocke, are adverse domestic political developments, an overvalued exchange rate, poor macroeconomic performance, and the availability of foreign exchange to finance capital outflows. While there may be no *prima facie* reason to doubt these conclusions, the underlying econometric techniques used are invalid. Applying OLS regressions to non-stationary time-series data is fundamentally inappropriate. The explanatory power of the small sample used by Smit & Mocke is also limited. It follows that one distinct feature of this paper is the application of a suite of appropriate tools available for time-series analysis to the investigation. Furthermore, we enhance the scope of coverage by extending the period of analysis to 1960-1995 (36 observations), though our sample remains small in statistical terms.

The paper proceeds in three sections. In the first, we address issues surrounding the definition and measurement of capital flight, providing an assessment of their relative strengths and weaknesses. In the second, we present a model of capital flows and capital flight. Third, we report estimates of the determinants of both "normal" capital flows, and of the determinants of three alternative measures of capital flight. The ARDL methodology proposed by Pesaran (1997) is applied to the study. We conclude with an assessment of the implications which flow from such estimates.

2 Defining and Measuring Capital Flight

2.1 Alternative Conceptions of Capital Flight

To the extent that capital flight is not just employed to refer to capital outflows, three types of capital flight definitions can be found in the literature. Capital flight is distinguished from normal capital flows due to:

1. Its *volume*. Capital flight is characterized as a massive exodus of capital from an economy. The suggestion is that capital flight is determined by essentially the same variables as normal capital flows, though it proves more sensitive to determining variables than normal capital flows. In effect, capital flows and capital flight are conceived as the movement of funds motivated by portfolio diversification, though in some instances such flows can reach "large" proportions. The difficulty with such a conception of capital flight is that it does not really constitute a *conception* of capital flight at all, failing to distinguish between those capital flows which are "normal" and those which are not, reducing the difference between the two to one of degree. Moreover, the distinction of degree is itself one which imposes difficulties, since the cut-off point between what is "normal" and what is flight, is necessarily arbitrary.

2. Its *nature*. Here the attempt is explicitly one of distinguishing a *conceptual* difference between different types of capital flow. While normal capital movements are related to trade financing, domestic investment, and debt-servicing, capital that flees is not available for these purposes. Instead, capital flight has a specific concern with risk - in particular the possibility of an asymmetric distribution of risk across domestic and international assets (See Deppler & Williamson (1987:41), Kahn and Ul-Haque (1985), Lessard & Williamson (1987:203), the Morgan Guaranty (1986:13) report, and Walter (1987:105)). The suggestion is that asset markets in developing countries have greater exposure to expropriation risk, exchange rate risk, and problems of policy credibility, to name a few, and that this generates distinctive capital flows.

3. The need for a *different policy response*. With no clear-cut definition of capital flight, a further suggestion has been to define the phenomenon in a way that is consistent with policy concerns that initiated the investigation in the first place (see Gibson & Tsakalotos (1993)). Thus, for instance, stocks of capital and flows of income that escape domestic taxation or that are volatile and disruptive to macroeconomic stability, are a concern for policy makers. In the case of developing countries the main policy issue to address has been the excessive level of external debt and the intensification of the foreign exchange constraint as a result. Hence, the flight of capital depletes available resources for debt repayment and interferes with macroeconomic stabilization and growth policies.

To the extent that the purpose is the establishment of a distinct concept of capital movements in capital flight, our *a priori* preference is for the second approach to the conceptualization of capital flight, given its greater clarity in terms of theoretical foundations in choice theory.

2.2 Measuring Capital Flight

We have suggested that a number of alternative conceptualizations of capital flight are possible. This is true not only theoretically, but also in terms of any attempt to concretely measure the phenomenon of capital flight[4]. Capital flight measures must be constructed

[4] Wood & Moll (1994) suggest that the definitions and measurement of capital flight must be adjusted to purpose, and all capital flight measures may be flawed due to the inaccuracies in the balance

since they are not readily available[5]. The four measures are characterized as follows:

1. The *balance of payments* approach (exemplified by Cuddington, 1987). This measurement essentially narrows the focus to short-term "hot money" flows. Specifically, capital flight is regarded as the sum of private short-term capital outflows and errors and omissions. Both series of data can be found in the balance of payments statistics (Source: IMF Balance of Payments Statistics). Each of the measures of capital flight has limitations. Deficiencies of the balance of payments approach include its failure to distinguish between normal and flight capital movements (a large measure may simply indicate large trade-financing capital outflows and not capital fleeing the economy). This might lead to an overstatement of capital flight. Second, it does not account for flight in the form of the acquisition of long-term financial and real assets, leading to an understatement of capital flight. Finally the problems of trade misinvoicing and smuggling are neglected (trade misinvoicing could either underestimate a current account surplus or overestimate a deficit, distorting the "errors and omissions" component). The net bias of the measure is thus ambiguous.

2. The *direct measure* represented by the Bank of England (1989) report and Lessard & Williamson's (1987) study. Capital flight is measured as the increase in cross-border bank deposits by private residents of a country (Source: IMF International Financial Statistics). Again, the direct measure has limitations. Some deposits are held in institutions that do not report them. Moreover the nationalities of depositors may not be known or accurately reported. This might lead to an understatement of capital flight. Both limitations are likely to be particularly severe for developing countries, and countries that create incentives for deliberate misreporting of capital holdings through capital controls. Lastly, bank deposits are not the sole form of holding financial assets abroad, again leading to an understatement of capital flight. The net bias of the measure should thus be towards an underreporting of capital flight.

3. The *indirect method* is based on the identification of both the sources and uses of international funds by a country. Source funds consist of the increase in recorded gross external debt and net foreign direct investment, which in turn are used to finance the current account and/or to increase official reserves. In essence, the indirect approach captures the change in a country's foreign assets and is therefore a flow measure. To construct the measure, we sum the increase in external debt and inflows of foreign direct investment and then subtract from it the current account deficit plus the increase in official reserves. This is the approach taken by the World Bank (1985), Morgan Guaranty (1986) and Pastor (1990). (Source: IFS and South African Reserve Bank, Quarterly Bulletin) Revisions of foreign debt statistics or exchange rate changes on the level of debt reserves will influence the measure directly, and may introduce errors of measurement. Since it does not specifically distinguish between normal and "abnormal" non-official portfolio movements, the indirect measure overestimates flight by the amount of normal portfolio flows stemming from differences in tastes and technology. It also suffers from the trade misinvoicing problem discussed above. The net bias of the measure is thus

of payments statistics and government secrecy. We concur, but proceed on the basis of data which is available. Needless to say, better and more complete data would be welcomed.

[5] Full details of the construction of the measures are included in the Appendix.

ambiguous.

4. The residual or *derived method* as presented by Dooley (1988), captures the increase in the stock of foreign assets that do not yield a recorded investment income. The difference between the total stock of foreign assets and the capitalised value of recorded non direct foreign investment income is taken as an indication of the magnitude of capital flight. We report the series in flow terms. Should all capital outflows and investment income on them be reported, no capital flight would be recorded under this approach. (Source: IFS and South African Reserve Bank, Quarterly Bulletin). Since not all foreign investment generates income which can be factored into capital flight calculations (we capitalise the income stream from foreign investments to obtain an indirect indication of assets retained abroad), capial flight will be underestimated in the absence of such income. Moreover, since estimates of recorded investment income in the balance of payments statistics are sometimes gathered by applying market rates of return on estimated asset stocks, such imputation may differ from actual income. The accuracy of the measure depends on the accuracy of balance of payments data on investment income. Selection of an interest rate to capitalise the investment income for the calculation carries further distortionary potential. Lastly, the measure assumes errors and omissions in the balance of payments statistics exclusively capture capital movements. The net bias of the measure is thus ambiguous.

While we provide a brief comparison of the alternative capital flight measures below, we focus on the indirect measure for the purposes of estimation. The balance of payments measure's focus on short term capital flows is too exposed to the impact of trade financing, while being unable to capture the impact of long term capital flight to be useful. The direct measure is simply not available over the 1960-95 sample period. The derived measure, while potentially conceptually attractive, has severe limitations in terms of data collection. A consistent series over the sample period requires strong assumptions regarding the consistency of various data series published by the IMF. While we have made some attempt at providing a consistent series (see the Data Appendix), the indirect measure provides the best combination of conceptual coherence and empirical continuity over the 1960-95 period.

2.3 Empirical Comparison

Given the distinct measurement problems of the alternative measures, it is useful to begin by comparing the alternative empirical measures of capital flight.

We start by examining the pattern of total normal capital flows (TNORM). Averaging about US $39 million (outflow) for the entire 1960-1995 period (Table 1), this figure is small compared to the three measures of capital flight calculated[6]. The balance of payments measure shows an average of US $676 million (outflow) while the outflow according to the indirect measure averages about US $128 million for the same period. The magnitude of capital flight based on the derived method registers a net average outflow of approximately US $292 million. The balance of payments measure indicates the greatest net volume of capital flight (US $24,3 billion) for the full period, compared to US $10,5 billion for the

[6] The convention we follow throughout is that a negatively signed capital flow denotes an *outflow*, while positively signed flows denote *inflows*.

derived measure, and US $4,6 billion from the indirect measure - see Table 2. Compared to this, for the same period, net total flows of normal capital add up to a relatively moderate outflow of US $1,4 billion. For all measures capital flight is concentrated in the 1980-95 period.

Figure 1 shows the pattern of normal capital flows for South Africa in the period 1960-1995. Normal flows include those pertaining to the private sector and the monetary sector and are disaggregated into their short- and long-term components. As illustrated, the volatility and volume of capital flows increased substantially from the mid-1970s to 1995. Outflows of long-term capital (LT) occurred over most of the 1980s (corresponding to the sanction years) until the general elections in 1994. Once the 1994 elections had taken place, long-term inflows increased.

Although short-term (ST) and long-term flows trend mostly together, the most noticeable exception is the 1981-1983 peak in short-term inflows, which coincides with the post-1981 gold price boom, and the opposite direction of short- and long-term flows in 1991-1992. While short-term inflows were positive, long-term capital declined substantially. Declines in long-term capital flows in 1990 and 1994 are perhaps attributable to political uncertainty surrounding political liberalization and the election period.

The three capital flight measures are shown in Figure 2. Of the three, the indirect measure (KFIND) shows the most overall volatility. Standard deviations confirm the visual evidence - see Table 1.

All three capital flight measures show sensitivity to political shocks - following the Soweto riots of 1976 and the failure to opt for political liberalization in the so-called "Rubicon Speech" of 1985, all three measures show that capital flight increased (in 1976-1977 and 1985-1986, respectively).

Comparison of the three capital flight measures with total normal flows suggests that the sample period falls into two broad subsamples. Prior to 1987, the three capital flight measures show higher correlations with normal capital flows, than they do post-1987. Table 3 illustrates.

The various measures of capital flight are sufficiently distinct to validate their treatment as separate indicators of capital flight. Moreover, flight measures differ from that of "normal" capital flows. Given our preference for the indirect flight measure (see the preceding section's discussion) we thus proceed with a separate treatment of "normal" capital flows, and the indirect flight measure.

3 Modelling Capital Flows

In terms of portfolio allocation theory, normal capital flows and capital flight are both fundamentally driven by two classes of determinants - rates of return and risk factors. Thus:

$$CF = f(r, RSK) \tag{1}$$

where CF denotes capital flows (of either type), r a vector of rates of return, RSK a vector of risk factors, such that $f_r > 0$, $f_{RSK} < 0$.

While the literature makes a distinction between residents and nonresidents in the conceptualization of rates of return and risk, with increasing financial liberalization the distinction loses its relevance. With higher financial liberalization, capital flows and

Period	**KFBOP** ($Mil)	**KFIND** ($Mil)	**KFDRV** ($Mil)	**TNORM** ($Mil)
1960-95	−676.06 (1026.8)	−128.11 (2497.9)	−292.47 (1389.0)	−39.19 (1262.6)
1960-69	30.90 (51.78)	38.40 (534.14)	209.10 (187.72)	62.80 (206.69)
1970-79	−395.70 (453.78)	806.00 (2325.2)	331.10 (764.68)	−72.50 (1082.9)
1980-89	−1078.00 (1362.2)	−470.50 (3702.1)	−628.00 (1971.6)	−253.80 (1846.6)
1985-95	−1737.2 (1012.6)	−1872.6 (2007.1)	−462.82 (1872.7)	−542.82 (1582.2)

1. Annual Averages over Periods Indicated. Figures in parentheses are standard deviations. Negatives denote outflows, positives inflows.

Period	**KFBOP** ($Mil)	**KFIND** ($Mil)	**KFDRV** ($Mil)	**TNORM** ($Mil)
1960-95	−24338	−4612	−10529	−1411
1960-70	271	2681	1485	993
1970-80	−5899	1109	2279	−713
1980-90	−9703	−3558	−4802	−3767
1985-95	−15766	−18476	−5721	−4102

2. Period Sums

	KFBOP	**KFIND**	**KFDRV**	**TNORM**
1960-95				
KFBOP	1			
KFIND	0.46	1		
KFDRV	−0.003	0.24	1	
TNORM	0.47	0.79	−0.54	1
1960-87				
KFBOP	1			
KFIND	0.59	1		
KFDRV	−0.32	−0.51	1	
TNORM	0.72	0.89	−0.63	1
1988-95				
KFBOP	1			
KFIND	−0.51	1		
KFDRV	−0.11	0.18	1	
TNORM	0.17	0.60	−0.38	1

3. Correlation Matrix

investment are driven by underlying rates of return and fundamental risk factors rather than risk asymmetries between foreign and domestic residents. Since capital flight explicitly avoids capital controls our approach generalizes across domestic and foreign residents. Instead of risk asymmetry between domestic and foreign residents, such asymmetry attaches to foreign or domestic *assets*. However we recognize the impact of capital controls as an explicit cost of adjustment to desired asset balances.

We employ a standard variational approach, and begin by defining the expected return on a portfolio of capital assets, which we denote as $E(R)$, as:

$$E(R) = D^R - D^C + F^R - F^C \tag{2}$$

where D^R and F^R are defined as the return on domestic and foreign capital assets respectively, and D^C and F^C are defined as the cost of adjustment of domestic and foreign capital asset holdings respectively. Such costs of adjustment are held to arise due to information and transactions costs associated with altering the composition of capital asset portfolios.

Returns on domestic assets are held to be *net* of relevant country specific risk factors. Factors influencing the gross rate of return on domestic assets include domestic structural and institutional reforms[7], higher expected rates of return on domestic financial instruments due to short-term macroeconomic policies (such as tight monetary policy) generating positive interest rate differentials, and liberalization of the domestic financial market to foreign direct investment via, for instance, the removal of capital controls - see Fernandez-Arias and Montiel (1996). As pointed out by Calvo, Leiderman & Reinhart (1993) the distortion of intertemporal relative prices induced by trade liberalizations and price stabilization programs that lack credibility[8] would serve to lower the gross domestic rate of return.

Country specific risk depends on both domestic and foreign factors. Conceptually it can be conceived of as reflecting the expected present value of the resources available for payments relative to the country's liabilities - raising the importance of a country's gearing ratio[9]. Its present value nature suggests sensitivity to the investor's discount rate, which would reflect available world financial returns[10]. The resources being discounted depend on resource bases such as domestic production capacity and government revenues, which depend on both external and internal factors like growth rates, the terms of trade, expected future exchange rates, the efficiency of resource allocation in the domestic economy, and the

[7] Relevant institutional reforms are those that improve long-run expected rates of return or subdue the perceived risk on real domestic investment. Sustainable fiscal adjustment in conjunction with inflation stabilisation would fall into this category.

[8] For instance, in an environment of price rigidity, tariff cuts may invoke expectations that the relative price of imports will rise when tariff levels return to previous levels.

[9] By comparing the present value of repayment obligations with the accumulated stock of liabilities, a country's capacity to accumulate further liabilities can be gauged. If the present value of resources available to make repayments falls short of the outstanding stock of liabilities, country creditworthiness is adversely affected and capital inflows decline. Conversely, if the present value exceeds the stock of external liabilities, capital inflows occur with an attached risk premium to cover the risk of the present value falling below the stock of external liabilities. The implication is of an *optimal* level of gearing. We also note that a non-linear relationship between creditworthiness and capital flows is possible. Initially, as the country's credit rating increases, capital inflows may increase in conjunction. However, beyond a certain level of capital accumulation, the country's creditworthiness may begin to be negatively impacted as the debt repayment burden swells.

[10] Suggesting that changes in international interest rates potentially have an immediate impact on country-specific risk.

domestic absorptive capacity relative to income. We include also institutional considerations such as debt restructuring or sustainable debt service reduction agreements (such as debt-equity swaps)[11]. Since the object here is a determination of ability to pay in terms of endowments of natural resources, capital and labour services, and the efficiency of the institutional environment which governs their interaction, we subsume such factors under what we term the "raw" or "natural" country risk profile, as distinct from the expropriation risk to be outlined below.

Returns on foreign assets, or the opportunity cost of using funds in the domestic economy, are exogenous factors such as foreign interest rates and the health of economies abroad, and bandwagon effects which may reflect financial markets following fashions or overreacting to new information (Schadler et al., 1993)[12].

Returns on domestic assets are further distinguished from returns on foreign assets by having a non-zero probability of "expropriation", denoted by $0 \leq \pi_d \leq 1$. Expropriation may be held to include factors such as the nationalization of assets, periods of domestic instability which might lower the returns to domestic investment (to zero in the case of bankruptcy), capital controls, and the direct or implicit taxes faced by foreign and domestic investors are all relevant to "expropriation" risk assessments (Fernandez-Arias and Montiel, 1996; Corbo and Hernandez, 1996). We assume that there exist at least some countries (developed economies) in which "expropriation" risk factors are negligible.

We therefore postulate:

$$\begin{aligned} D^R &= \left[\alpha\left(K^d\right) - \beta\left(K^d\right)^2\right](1-\pi_d) \quad , \quad 0 < \pi_d < 1 \\ F^R &= \left[\gamma\left(K^f\right) - \delta\left(K^f\right)^2\right] \end{aligned} \tag{3}$$

where K^d, K^f denote domestic and foreign capital asset holdings respectively, and $\alpha, \beta, \gamma, \delta > 0$. In both instances an upper bound defined by the first order conditions $\frac{\partial D^R}{\partial K^d} = 0$, $\frac{\partial F^R}{\partial K^f} = 0$, is present for returns on domestic and foreign assets, given the decreasing rate of return to both classes of assets, $\frac{\partial^2 D^R}{(\partial K^d)^2} < 0$, $\frac{\partial^2 F^R}{(\partial K^f)^2} < 0$. The implausibility of unbounded returns to asset holdings drives the choice of functional form.

For adjustment costs we assume that the cost of adjustment is increasing in the magnitude of adjustment for both domestic and foreign capital assets. Thus we have:

$$\begin{aligned} D^C &= a\left(K^{d'}\right) + b\left(K^{d'}\right)^2 \\ F^C &= c\left(K^{f'}\right) + d\left(K^{f'}\right)^2 \end{aligned} \tag{4}$$

where $a, b, c, d > 0$. Thus positive marginal adjustment costs, $\left(\frac{\partial D^C}{\partial K^{d'}} > 0, \frac{\partial F^C}{\partial K^{f'}} > 0\right)$, are increasing at an increasing rate $\left(\frac{\partial^2 D^C}{\left(\partial K^{d'}\right)^2} > 0, \frac{\partial^2 F^C}{\left(\partial K^{f'}\right)^2} > 0\right)$.

The net present value of the expected return on a portfolio of capital assets over an

[11] These measures not only subordinate old claims, but also raise expected returns on activities financed by new inflows (Schadler et al, 1993).

[12] During episodes of capital inflows to developing countries in the 1990s, the volume of inflows may have exceeded what would have been expected from policy or external changes alone.

infinite time horizon is thus:

$$N\left[K^d, K^f\right] = \int_0^\infty E\left(R\right)e^{-\rho t}dt \tag{5}$$

in which the assumed functional forms ensure that $E(R)$ is bounded, rendering the present value convergent. The general solution to the Euler equation for the K^d state variable is given by:

$$K^{d^*}(t) = A_1 e^{r_1 t} + A_2 e^{r_2 t} + \overline{K^d} \tag{6}$$

where $r_1, r_2 = \frac{1}{2}\left[\rho \pm \left(\rho^2 + \frac{4\beta}{b}\right)^{\frac{1}{2}}\right]$, such that $r_1 > \rho > 0$, and $r_2 < 0$, and the particular integral $\overline{K^d} = \frac{(1-\pi_d)\alpha - a\rho}{2\beta}$. Given the boundedness of D^R for profit maximizing agents, the holding of domestic capital assets cannot exceed $K^d = \frac{\alpha(1-\pi_d)}{2\beta}$, which follows immediately from the relevant first order condition. The general solution to the K^d Euler can satisfy the boundedness implication only under the assumption that $A_1 = 0$ given $r_1 > 0$. Hence, given an initial holding of domestic capital assets of K_0^d, the specific solution is given by:

$$K^{d^*}(t) = \left(K_0^d - \overline{K^d}\right)e^{\frac{1}{2}\left(\rho - \left(\rho^2 + \frac{4\beta}{b}\right)^{\frac{1}{2}}\right)t} + \frac{(1-\pi_d)\,\alpha - a\rho}{2\beta} \tag{7}$$

such that the optimal time path of investment in domestic assets is given by:

$$I^{d*}(t) = K^{d^{*'}}(t) = \frac{1}{2}\left(\rho - \left(\rho^2 + \frac{4\beta}{b}\right)^{\frac{1}{2}}\right)\left(K_0^d - \overline{K^d}\right)e^{\frac{1}{2}\left(\rho - \left(\rho^2 + \frac{4\beta}{b}\right)^{\frac{1}{2}}\right)t} \tag{8}$$

Similarly, the general solution to the Euler equation for the K^f state variable is given by:

$$K^{f^*}(t) = A_3 e^{r_3 t} + A_4 e^{r_4 t} + \overline{K^f} \tag{9}$$

where $r_3, r_4 = \frac{1}{2}\left[\rho \pm \left(\rho^2 + \frac{4\delta}{d}\right)^{\frac{1}{2}}\right]$, such that $r_3 > \rho > 0$, and $r_4 < 0$, and the particular integral $\overline{K^f} = \frac{\gamma - c\rho}{2\delta}$. Again, given the boundedness of F^R for profit maximizing agents, the holding of domestic capital assets cannot exceed the $K^f = \frac{\gamma}{2\delta}$ level implied by the relevant first order condition. The general solution to the K^f Euler can satisfy the boundedness implication only under the assumption that $A_3 = 0$ given $r_3 > 0$. Hence, given an initial holding of domestic capital assets of K_0^f, the specific solution is given by:

$$K^{f^*}(t) = \left(K_0^f - \overline{K^f}\right)e^{\frac{1}{2}\left(\rho - \left(\rho^2 + \frac{4\delta}{d}\right)^{\frac{1}{2}}\right)t} + \frac{\gamma - c\rho}{2\delta} \tag{10}$$

such that the optimal time path of investment in domestic assets is given by:

$$I^{f*}(t) = K^{f^{*'}}(t) = \frac{1}{2}\left(\rho - \left(\rho^2 + \frac{4\delta}{d}\right)^{\frac{1}{2}}\right)\left(K_0^f - \overline{K^f}\right)e^{\frac{1}{2}\left(\rho - \left(\rho^2 + \frac{4\delta}{d}\right)^{\frac{1}{2}}\right)t} \tag{11}$$

We now define the ϖ-ratio as the ratio of foreign to domestic capital holdings after agents have adjusted to optimal capital holdings:

$$\varpi \equiv \frac{\overline{K^f}}{\overline{K^d}} = \frac{\beta\left(\gamma - c\rho\right)}{\delta\left[\left(1 - \pi_d\right)\alpha - a\rho\right]} \tag{12}$$

The ϖ-ratio has intuitively appealing characteristics noted below.

First we note that the optimal time paths in asset holdings are symmetrical in the investment paths. By contrast, optimal asset holdings are non-symmetrical, and are distinguished by the presence of expropriation risk on domestic asset holdings.

Given the marginal rate of return on domestic and foreign asset holdings of $\frac{\partial E(R)}{\partial D^R} = \left[\alpha - 2\beta K^d\right](1 - \pi_d)$ and $\frac{\partial E(R)}{\partial F^R} = \left[\gamma - 2\delta K^f\right]$, an increase in returns on domestic assets at the margins follows from $d\alpha > 0$ and $d\beta, d\pi_d < 0$. Such changes have the plausible consequence of increasing domestic asset holdings relative to foreign asset holdings, given $\frac{\partial \varpi}{\partial \alpha} < 0$, $\frac{\partial \varpi}{\partial \beta} > 0$, $\frac{\partial \varpi}{\partial \pi_d} > 0$. Equally plausibly, an increase in the marginal rate of return on foreign assets $(d\gamma > 0, d\delta < 0)$ raises the ϖ-ratio, given $\frac{\partial \varpi}{\partial \gamma} > 0$, $\frac{\partial \varpi}{\partial \delta} < 0$.

The implication of our model is thus plausibly that :

$$Capital\ Flight = f\left(\overset{+}{Expropriation\ Risk}, \overset{+}{Foreign\ Return}, \overset{-}{Domestic\ Return}\right)$$

with explicit grounding in choice theoretic foundations[13]. The model has the further advantage of being able to handle both steady state, and the dynamics of adjustment to steady state. The distinction between flow measures of capital flight and stock measures noted above can thus be accommodated theoretically.

Finally we note that the model has the capacity to introduce an explicit conceptual distinction between two alternative types of capital flows. First are those that represent a response to returns and country specific risk. Second are those that also respond to expropriation risk. One interpretation might be that "normal" capital flows are those that occur independently of $Expropriation\ Risk$, though they reflect "raw" country specific risk. Capital flight might be said to represent a further response to $Expropriation\ Risk$. Capital flight thus demonstrates sensitivity to a wider range of risk measures than normal capital flows. We turn now to the question of whether estimation bears out the suggestion that standard capital flow measures can be said to respond differently to risk measures than does our chosen capital flight measure.

4 The Data

The literature on capital flight and capital flows has identified a number of variables to correspond to the determining variable categories identified in the model above. Thus, the balance on the current account has been suggested as relevant to trade related capital flows. Domestic inflation, the exchange rate adjusted interest differential, the ratio of tax revenue to GDP, the budget deficit as a percentage of GDP, the GDP growth rate, the percentage of GDP allocated to labour remuneration have been suggested as proxies for rates of return on capital assets. For risk factors, the degree of over/undervaluation of the exchange rate in PPP terms, capital availability, the ratio of total foreign debt to GDP, and political factors have been identified. Financial liberalization has also been identified as of potential importance to capital flows and capital flight. Table 4 outlines the variables employed in the present study. Our concern was to develop a parsimonious vector of explanatory variables. Expected signs of the coefficients with respect to capital flows and capital flight are specified in accordance with our assumption that a positive (negative) magnitude in both normal and flight capital represents an inflow (outflow). All data are in annual form, and cover the 1960-95 sample

[13] Recall that $Domestic\ Return$ is net of raw country specific risk factors.

Expected Sign	Variable Name	Description
RATES OF RETURN VARIABLES		
$-$	IDIFFL	Exchange rate adjusted interest differential. We follow Pastor's (1990) formulation: $i_f - (i - e)$. The US and South African Treasury Bill rates are used for the foreign (i_f) and domestic (i) interest rate, respectively. The exchange rate (e) is the principal Rand-dollar rate (Source : IFS)
$+$	GROWTH	Percentage change of gross domestic product (Source : SARB) We proceed on the assumption that the maximum rate of return in developed countries proxied by their growth rates remain relatively stable. Relative rates of return are thus proxied by the SA real growth rate.
RISK VARIABLES		
$+$	OVAL	Over/Undervaluatiuon of the exchange rate in terms of PPP, with 1987 as base year. $PPP = (CPI_{SA}/CPI_{US})\,(R/\$)$. OVAL is the percentage deviation of the actual $R/\$$-rate from PPP. A positive figure indicates undervaluation. (Source: IFS)
$+$	POL1	Political Rights Index (Source: Fedderke et al 1998)
$-$	POL2	Political Repression Index (Source: Fedderke et al 1998)

4. Variable Descriptions

period.

4.1 Univariate Time Series Properties of the Data

Table 5 reports ADF tests for stationarity of the data series employed in the study. For a number of variables included in the study *a priori* expectations might be of stationarity. This is relevant particularly since the study includes both capital flow measures, a growth rate (in real GPD), and variables such as interest differentials which might be expected to manifest constant mean and variance over the long run. Examination of both the capital flow variables (recall Figures 1 & 2), and the explanatory variables (see Figure 3) does not support this expectation. Consideration of ADF test statistics suggests that variables included in the study are $I(1)$[14].

ADF statistics may be misleading in the present instance, however, since the financial flow variables in particular may well have been subject to structural breaks over the sample period. 1980 coincides with a potential change in mean and increased variance in a number of variables. Since 1980 saw a liberalization of South African financial markets, with an increased reliance on market forces in the determination of interest rates, it is not implausible that 1980 marks a structural break. Under such circumstances, ADF statistics will underreject the null of a root inside the unit circle. We therefore report the Perron (1994) innovational outlier test for a unit root, which allows for the presence of a structural break. For the political rights index and the political repression index, we set the structural break to correspond to 1976.

[14] Partial autocorrelation functions and spectral density functions of the variables support this conclusion.

Variable	τ_μ: $\mathbf{I}(0)$	τ_τ: $\mathbf{I}(0)$	τ_μ: $\mathbf{I}(1)$	τ_τ: $\mathbf{I}(1)$	Perron	Break
	$Int.$	$Int.$ $\&Trend$	$Int.$	$Int.$ $\&Trend$		
$TNORM$	-3.15^*	-3.07	-3.68^*	-3.67^*	-0.95	Yes
$KFIND$	-2.82	-3.48	-4.71^*	-4.61^*	-0.60	Yes
$GROWTH$	-2.09	-3.85^*	-4.20^*	-4.17^*	-4.37	No
$IDIFFL$	-1.31	-2.82	-4.85^*	-4.87^*	-3.13	Yes
$OVAL$	-2.60	-3.31	-4.00^*	-3.93^*	-6.49^*	Yes
$\ln(POL1)$	0.46	-1.16	-2.18	-3.80^*	-0.99	Yes
$\ln(POL2)$	-2.71	-2.96	-3.47^*	-3.36^*	-2.08	Yes

5. Stationarity Tests: third order augmentation is employed for ADF tests; Perron test is Perron (1994) innovational outlier test for unit root.

	$\mathbf{F-test}$
$TNORM$	6.51^*
$DIDIFFL$	4.21
$GROWTH$	4.77
$D\ln(POL1)$	2.89
$\ln(POL2)$	2.73

6. Test for Long Run Relationship: TNORM

The OVAL series allows the rejection of the null of non-stationarity under the hypothesis of a structural break at 1980[15]. While for the other series in the study the null of a unit root continues to be accepted, it should be borne in mind that 1980 was not the only year in which a potential structural change took place in South African financial markets. More rigorous testing under the appropriate identification of the structural breaks might thus well allow more variables to be identified as $I(0)$. The implication is that the identification of the appropriate order of integration of the data is subject to some degree of ambiguity in the present context given the low power of unit root test statistics.

This poses some difficulties for the now standard time series methodology provided by

[15] Given the non-standard distribution of the Perron test, choice of the break point is potentially critical. Perron (1994) reports critical values for the mid-point of the sample. 1980 lies sufficiently close to the mid-point of our sample (1960-95) for us to have some degree of confidence in the use of the Perron critical values.

	$\mathbf{F-test}$
$KFIND$	5.75^*
$DIDIFFL$	4.90
$GROWTH$	4.66
$D\ln(POL1)$	2.93
$\ln(POL2)$	2.78

7. Test for Long Run Relationship : KFIND

Johansen (1988)[16], Johansen and Juselius (1990, 1992). Such difficulties are compounded by the uncertain small sample properties of the Johansen method[17], and its sensitivity to short lag lengths[18]. In the present context, a further difficulty arises from the potential need of imposing over-identifying restrictions on the cointegration space where more than one cointegrating vector is present in the data[19]. Our theory does not provide much guidance as to the nature of such overidentifying restrictions. Identifying long run relationships from Johansen estimation is thus potentially severely constrained.

4.2 Estimation and Inference

Fortunately Hsiao (1997) lays the foundations for the use of conventional estimation techniques where the forcing variables are strictly exogenous, regardless of whether the variables are $I(0)$ or $I(1)$. Hsiao demonstrates that where forcing variables are strictly exogenous, conventional Wald statistics are asymptotically distributed (under the null of reduced rank cointegration). This allows for the restriction of the parameter space at the most general stage, economizing on degrees of freedom. Pesaran and Shin (1995b) advocate the use of autoregressive distributed lag models for the estimation of long run relations, suggesting that once the order of the ARDL has been established, estimation and identification can proceed by OLS.

The cointegration literature's insistence on the importance of establishing the presence of a long run relationship between variables remains critical to valid estimation and inference. Pesaran and Shin (1995b) demonstrate that valid asymptotic inferences on short- and long-run parameters can be made under least squares estimates of an ARDL model, provided the order of the ARDL model is appropriately augmented to allow for contemporaneous correlations between the stochastic components of the data generating processes included in estimation. Hence ARDL estimation is applicable even where the explanatory variables are endogenous, and, since the existence of a long run relationship is independent of whether the explanatory variables are $I(0)$ or $I(1)$, ARDL remains valid irrespective of the order of integration of the explanatory variables. The ARDL thus has the advantage of not requiring a precise identification of the order of integration of the underlying data.

What remains critical, however, is the need to establish the existence of a long run relationship, and that an appropriate order to the ARDL is selected. We follow Pesaran and Shin (1995b) in a two step strategy, selecting the ARDL orders on the basis of the Schwarz Bayesian criterion (SC), then estimating the long and short run coefficients on the basis of the selected model.

We specify two risk variables, and two rates of return proxies for the purposes of estimation. Since the capital movement variables represent flows, we employ the change in interest differentials (DIDIFFL), and the growth rate in real GDP (GROWTH) to represent rates of return. We included two proxies for risk, $D\ln(POL1)$ (the first difference of

[16] At the very least, wrongly including an $I(0)$ in the Johansen VAR as $I(1)$ would result in an overestimation of the number of cointegrating vectors by one.
[17] Banerjee et al (1993:286) report that Reimers (1991) finds that the Johansen test rejects too often in small samples. The Johansen (1988) test statistic $T\sum\log(1-\lambda_i)$ is adjusted by $(T-nk)\sum\log(1-\lambda_i)$ by Reimers, where n is the number of variables, and k the order of the VAR.
[18] Which becomes all the more pressing in small samples.
[19] See the discussion in Pesaran and Shin (1995a), and Wickens (1996).

$\ln(POL1)$), and $\ln POL2$. The justification for the change in the political rights index is that the risk of domestic assets may be influenced not only by the level of political repression, but by the *direction* of change in the political rights environment. Worsening rights may have one of two alternative impacts: (a.) increased levels of political "control" may dampen political destabilization, attracting additional capital flows, or (b.) may induce expectations of increased political instability in the future, decreasing capital flows. $\ln POL2$ has the straigtforward interpretation of representing increased instability, and hence higher risk.

Table 6 reports F-tests for the existence of a long run relationship between the TNORM capital flow measure and the specified explanatory variables. Table 7 repeats for the KFIND capital flight measure. Given the use of annual data, in both instances the ARDL model is based on an ARDL(1,1,1) error correction version[20]. The tests are for the significance of levels of the variables in the error correction form of the underlying ARDL model. While the asymptotic distribution of the F-tests is non-standard, Pesaran *et al* (1996) tabulate critical value ranges[21] for different numbers of explanatory variables for the presence of intercepts and/or trends in the ARDL, and on the basis of alternative assumptions regarding the order of integration of the underlying data ($I(0)$ vs $I(1)$). Tests for the presence of a long run relationship are conclusive only where computed F-tests fall outside the band of critical values. For the present purpose we take the relevant band to be 3.793 - 4.855. For both TNORM and KFIND tests prove to be inconclusive, in the sense that only the capital flow or flight measure is conclusively outside the range of critical values, while a number of variables have indeterminate test statistics. It is thus not possible to conclude that the risk and rate of return proxies are "long run forcing variables" of capital flows and capital flight.

Fortunately Greenside, Hall and Henry (1998) suggest a way forward. They point out that the provision of the over-identifying restrictions required for a dynamic system such as that provided by a structural VECM such as $\Delta Z_t = \sum_{i=1}^{p-1} \Gamma_i \Delta Z_{t-i} + \Pi Z_{t-p} + v_t$, where we impose cointegrating rank on of the system r by the standard decomposition of the long run matrix $\Pi = \alpha\beta'$ in which α and β are $N \times r$ matrices, can come from one of four possible sources (see Greenside et al, 1998:3ff):

1. Restrictions on the cointegrating rank of Π, $r < N$
2. Restrictions on the dynamic path of adjustment (the Γ_i)
3. Restrictions on the cointegrating vectors, the β of $\Pi = \alpha\beta'$
4. Restrictions on the exogeneity or long run causaility of the system, the α

We therefore test further for the presence of cointegrating relationships under conditioning restrictions. In particular, we specify the two political risk proxies and growth to be exogenous[22]. Johansen reduced rank tests are reported in Tables 8 & 9 for TNORM and KFIND respectively. Both maximal eigenvalue and trace statistics favour the presence of a single cointegrating vector under the conditioning restrictions. We therefore proceed on the assumption that a single long run relationship can be confirmed betweeen the variables.

[20] In both instances we allow for the presence of a structural break in 1980.
[21] See Pesaran and Pesaran (1997:305-6).
[22] While capital flows may contribute to economic growth, the suggestion that the current model contains the only determinants of economic growth is implausible even in terms of the simplest growth theories.

	TNORM	**KFIND**
$DIDIFFL$	0.93	0.64
$GROWTH$	0.52	0.14
$D\ln POL1$	1.03	0.68
$\ln POL2$	0.60	0.74

8. Table 8 : Standardized Coefficients

On the SC criterion ARDL(1,0,0,0,0) is selected for TNORM, and ARDL(1,0,1,1,1) for KFIND - maximum lag length specified was 2. For both ARDL processes we include a dummy for financial liberalization in 1980 (DU). Moreover, for TNORM it is necessary to include a dummy for the gold price boom over the 1981-84 period (GOLD), and a forward lag for the change in the overvaluation of the exchange rate (DOVAL). Use of the first difference is again justified on the grounds that capital *flows* are being modeled, and the lead in the variable may be justifed by rational expectations.

Tables 10 & 11 provide the ARDL estimations for TNORM and KFIND respectively. All diagnostics are sound. Estimates of long run coefficients based on these models are reported in Tables 12 & 13 for TNORM and KFIND respectively, while the two respective Error Correction Models follow in Tables 14 & 15. Long run parameter values are of the correct sign, and both error correction terms are significant and of the correct sign.

Both long run and error correction results prove to be suggestive. Table 8 reports standardized coefficients for the long run model:

1. In terms of long run parameters, TNORM and KFIND show dissimilar degrees of responsiveness to rates of return proxies. Normal capital flows appear more responsive to both interest differentials and to the aggregate real growth rate.

2. Responsiveness to our risk proxies is mixed, with TNORM more responsive to $D\ln POL1$, while KFIND is more responsive to $\ln POL2$.

3. The distinction between the responsiveness of TNORM and KFIND to rates of retrun and risk factors is thus not congruent with prior theoretical expectations if the two forms of capital movement are distinct. Our suggestion was of a greater responsiveness to risk on the part of capital flight than for normal capital flows.

4. More interestingly, perhaps, capital flows (irrespective of the "normal"/"flight" distinction) in South Africa prove to be sensitive to political risk. We note that both the level of political rights, as well as the level of political instability impacts on capital flows. Higher instability, and political liberalization in South Africa both served to stimulate capital outflows.

5. Both normal capital flows and capital flight show a response to the process of financial liberalization of the early 1980's.

6. In terms of adjustment *to* equilibrium, TNORM has a rate of adjustment to equilibrium levels roughly half that of KFIND (see the $ecm(-1)$ coefficients of -0.36 and -0.62).

5 Discussion and Conclusions

In the present environment of foreign investor interest in South Africa as a destination for capital funds, our analysis provides some insight and perspective on what factors are driving these inflows. In terms of how to avoid the episodes of flight in earlier periods from recurring, a more comprehensive understanding of capital flight is valuable for the formulation of policies to sustain the surge in inflows. For policy to be effective in sustaining capital inflows and in stemming or reversing flight, it is important to understand the determinants of normal and flight capital.

In modeling, we treat capital flows as responses to relative expected rates of return (adjusted for risk) between alternative assets. Moreover, domestic and foreing assets are viewed as carrying asymmetric risk due to a domestically undiversifiable risk emanating from, for instance, political instability or domestic policies. Investors would hedge against this risk with foreign asset accumulation. One possibility for distinguishing between normal capital flows and capital flight was to conceptualize flight as distinct from normal capital flows in terms of its higher sensitivity to risk factors. As we have seen, however, present methods of measuring capital flight are imperfect.

Empirical results were confined to normal capital flows and the indirect measure of capital flight on grounds of greater conceptual clarity than the balance of payment approach to capital flight, and greater empirical consistency (for South Africa) than the derived (Dooley) approach to capital flight. While he flight measure registers both a greater outflow of capital over the sample period, and greater volatility, it does not prove to have the suggested greater sensitivity to risk proxies than does the capital flow measure. The one dimension that might have justified the insistence on a conceptual distinction between capital flight and "normal" capital flows, thus fails to deliver the appropriate evidence.

The implication is thus that the flight measure is difficult to justify as conceptually distinct from "normal" capital flows. Given teh ambiguities that attach to the measurement of capital flight, it therefore questionable whether the study of "flight" capital flows as distinct from "normal" capital flows is fruitful.

Nevertheless, estimation results suggest that capital flows for South Africa show strong sensitivity to risk factors, and political risk factors in particular. We note that both the level of political rights, as well as the level of political instability impacts on capital flows. Higher instability, and political liberalization in South Africa both served to stimulate capital outflows.

Further, to the extent that the aggregate growth measure contributes to the long determination of capital flows, the implication is that capital inflows follow on from the creation of favourable growth prospects. Capital inflows are thus potentially secondary stimuli to economic growth, in the sense that they themselves respond to already favourable growth performance. Of course, the additional capital inflow, may further enhance the growth in output, creating the potential of simultaneity between the two measures.

While the use of OLS in estimation limits the usefulness of the Smit and Mocke (1991) results, our findings do not alter the central conclusions of the earlier work. Political factors do feature as determinants of risk, while the aggregate growth rate serves as proxy for generalized rates of return to capital assets. Overvaluation of the exchange rate, financial liberalization and changes in the interest differential also potentially feature in the long and short run models of capital flows and flight. However, use of the ARDL methodology employed for the present study has rendered the model more parsimonious than those employed by Smit and Mocke.

Capital flows and flight have become more favourable to South Africa since the early 1990's. However, lowering political uncertainties, and the need to offer healthy rates of return to potential investors should continue to be a central concern of policy makers. Estimated coefficients of the rate of return variables (DIDIFFL and GROWTH) for the 1960-1995 period suggest the importance of sound macroeconomic management to attract foreign capital.

Growth-enhancing policies, coupled with low inflation, foster the climate of macroeconomic stability required for desirable rates of return. Together with the need to lower uncertainty through political stability this provides clear directives to South African policy makers.

Appendix A. Data Construction

The latest versions of the IMF Balance of Payments Statistics Yearbook (BOPY) follow the classification system discussed in the Balance of Payments Manual 5 (BPM5). All data are in US dollar form and where this is not the case, we use the principal Rand-Dollar exchange rate for the conversion (IMF International Financial Statistic (IFS) line 19900AE0ZF) . Data in electronic form are only available for post-1976. Therefore, for earlier data, we referred to paperback issues of BOPY and IFS. Since older editions of these publications follow different classification systems, and the data we require may not have an exact counterpart, we substitute the closest comparable data series for our purposes.

A.1 Capital flight balance of payments measure:

This is the sum of short-term capital flows and net errors and omissions. In the BOPY, we sum non-bank private short-term capital flows, which are:

Other Investment: Assets: Currency and deposits: Other sectors (code 1994734)

Other Investment: Assets: Other assets: Other sectors: short-term (code 1994748)

Other Investment: Liabilities: Other sectors: short-term (code 1994798)

To this, we add ”net errors and omissions” (code 1994998) to obtain KFBOP.

A.2 Capital flight indirect measure:

The increase in external debt and net foreign direct investment are IFS lines 89a and 78bed, respectively. The current account deficit and the increase in official reserves are from the SARB Quarterly Bulletin codes RB 5007J and RB 5020J, respectively.

A.3 Capital flight derived measure:

Our derived measure is a modification of Dooley’s (1988). Dooley takes the difference between total external claims and the capitalised value of foreign non-direct investment income, which is recorded in the balance of payments statistics, as the stock of capital flight. We regard the flow of income that does not return to South Africa as capital flight.

Part A

In the first part, to determine total external claims the sum of the following 3 steps are involved:

1. The stock of “recorded claims on non-residents” (excluding foreign direct investment) is the cumulated sum of the following data series from the BOPY:

   Other Investment: Assets: code 1994703, and

   Reserve Assets: code 1994800

2. The cumulated sum of “Net Errors and Omissions” (BOPY code 1994998)

3. To determine the stock of “unrecorded external claims” of residents, we capture the discrepancy between external (IMF) and internal (SARB) records of foreign debt. The latter is the increase in total foreign debt (RB 4108J). The former is the net of:

   Portfolio Investments: Assets: code 1994600, and

Other Investment: Liabilities: code 1994753

The sum of (1), (2) and (3) and the US Treasury Bill rate (IFS line 60c) allows imputation of the income stream from external assets.

Part B

In the second part, we determine non-direct investment income receipts which are actually recorded in the BOPY. This is done by adding up the following items:

Income: Portfolio investment income: code 1992339, and

Income: Other investment income: code 1992370.

The difference between the implied income stream from total external claims (Part A) and the income actually recorded (Part B) indicates the flow of capital flight in the sense defined by our derived approach.

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