

PRELIMINARY DRAFT

Capital flows: the South African experience

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1 Introduction

Large swings in capital flows can have a significant bearing on macroeconomic developments. Access to foreign savings help offset domestic savings constraints by reducing the cost of capital and stimulating investment, consumption and economic growth. On the other hand, significant capital inflows can lead to increased macro-economic vulnerabilities through the overheating of the economy as a result of large surges in asset prices. Thus, the size, volatility and nature of capital flows can have a significant bearing on economic policy through its effect on macro-economic outcomes. For example, the impact of capital flows on exchange rate movements and long-term bond yields has implications for monetary policy through its impact on the monetary policy transmission mechanism. Also, volatile capital inflows concentrated in short-term maturity instruments can have significant adverse financial stability effects if changes in investor risk sentiment were to result in capital flow reversals or sudden stops.

Hence, it is not surprising that there has been a significant rise in the empirical work distinguishing between episodes of sharp slowdowns and surges in capital inflows. Much of this analysis has centred on gaining a better understanding of the cyclical behaviour of capital flows. This paper continues in this vein by identifying capital flow episodes for South Africa and analyses the nature and main drivers of cross-border flows during these episodes. These issues are of importance to economic policy formulation since it contributes to a better understanding of the macro-economic impacts of cross-border capital flows.

The rest of the paper is structured as follows. Section 2 provides a brief overview of the empirical literature on capital flows. The identification of capital flow episodes is undertaken in Section 3. The next section analyses the role of domestic and foreign agents in South Africa cross-border flows. The penultimate section gives attention to

the issue of capital flow reversals. Some policy implications and conclusions are made in the last section.

2 Capital flows: a brief review of the empirical literature

The voluminous literature on cross-border capital flows has been motivated by the increased volatility of these flows that has accompanied the financial globalisation of the world economy (Ghosh et al, 2012). These studies have, *inter-alia*, tended to focus on the determinants of cross-border capital flows and the identification of the defining characteristics of capital flow episodes.

On the issue of the determinants of capital flows, the main drivers have been identified as external ("push") factors or domestic ("pull") factors (Taylor and Sarno, 1997; Fernandez-Arias, 1996; Eichengreen and Mody, 1998; Ferrucci et al, 2004). "Push" factors typically include influences such as global interest rates and foreign investor risk appetite while growth potential, quality of institutions, trade openness and returns on domestic investment are among the major "pull" factors identified in the empirical literature (Levy-Yeyati et al, 2007; IMF, 2007, 2011; Fratzcher, 2011).

Much of the empirical work on South Africa has focussed on the determinants of capital flows. Fedderke and Liu (2002) focusing on South Africa's pre-democracy period (i.e. when capital controls were still in place) find that both "push" and "pull" factors were responsible for the trends in South Africa's capital flows. The international interest rate environment, economic growth and political risk were among the major determinants of capital flows during this period. Wesso (2001) finds that with the liberalisation of the capital account in 1995, economic growth continued to exert a significant influence on capital flows but other important influences included the role of government deficits, relative returns on investment and inflation differentials. Aron et al (2010) focusing on portfolio flows find that US economic growth and annual changes in the real US stock market index promotes inflows while inflation and long-term bond differentials exert negative effects on capital inflows. Looking at developments in South Africa within a panel context, Ahmed et al (2005) find that "pull" factors in the form of higher growth, better institutions and higher domestic interest rates were the main determinants of portfolio and FDI inflows to

South Africa. The resurgence in portfolio inflows since the financial crisis has been attributed to both "push" and "pull" factors (IMF, 2011).

It is generally accepted that large swings in cross-border capital flows can have significant macro-economic implications. Hence, it is not surprising that increasing attention in the international empirical literature has been given to the identification of capital flow waves or episodes and the characteristics accompanying these episodes. In general, these studies have focussed on the cyclical behaviour of net capital flows (Dornbush et al, 1995; Kaminsky et al, 1998; Calvo et al, 2008; Levchenko and Mauro, 2007) or gross capital flows (Lane and Milesi-Ferretti, 2001; Kraay et al, 2005; Devereux, 2007; Gourinchas and Rey, 2007).

More recently, the empirical work on gross flows has tended to scrutinise the actions of foreigners and domestic agents as the main drivers of capital flows. Much of this analysis has been based on private capital flows by scrutinising developments in the capital account of the balance of payments. In general the results show that the shocks driving cross-border capital flows affect foreigners and domestic agents asymmetrically (Broner et al, 2011) which allows for a "finer delineation of different types of capital flow episodes" (Forbes and Warnock, 2011: 4).

This paper makes two major contributions to the empirical work on South African capital flows. Firstly, specific attention is given to some pertinent measurement issues in the identification of capital flow episodes for South Africa. The analysis concentrates on the post capital account liberalisation period (post-1995-period) which is delineated into what could be considered a "normal" period (when capital inflows were close to historical averages) and an "abnormal" period (when capital inflows deviated significantly from the historical average). Secondly, the paper identifies some defining characteristics during these two periods. In this regard, the behaviour of domestic and foreign agents as drivers of capital flows and the probability of capital flow reversals across asset classes are given particular attention. While these issues have significant policy implications they have, to date, been given limited attention in the empirical work on South African capital flows.

3 Some conceptual and measurement issues

Starting off with the standard balance of payment identity:¹

$$NR = CAB + CTA + FA + UT \dots\dots\dots(1)$$

$$NR - CAB = CTA + FA + UT \dots\dots\dots(2)$$

where *NR* = net change in foreign reserves

CAB = net balance on current account

CTA = net balance on capital transfer account²

FA = net balance on financial account

UT = unrecorded transactions³

In terms of equation 1, net capital flows (*NR - CAB*) is equal to the sum of net changes in unrecorded transactions (errors and omissions) and the net balances on the capital transfer and financial accounts. According to Reinhart and Reinhart (2009: 9), equation 1 provides the best indicator of net capital flows. It is a broad indirect measure of the change in domestic liabilities as a result of the purchases or sales of resources by domestic citizens and foreigners. Its popularity in empirical work is essentially due to the consistent way in which it is measured and its prompt and wide availability across countries at short time frequencies (Reinhart and Reinhart, 2009).

Figure 1 depicts net capital inflows calculated on the basis of equation 1 and the components of net inflows expressed as a ratio of trend GDP for the period 1961q1 to 2011q4.⁴ Three brief points are warranted at this stage. Firstly, South Africa has been a net recipient of capital flows following the advent to democracy in 1994 and the liberalisation of the capital account in 1995. In fact, the widening current account deficit since 2004 has been financed by a surge in capital inflows. Secondly, in the pre-democracy period, capital controls were used to limit the constraint on the balance of payments. In the decade preceding the advent to democracy, the intensification of financial sanctions resulted in a net outflow of capital from South

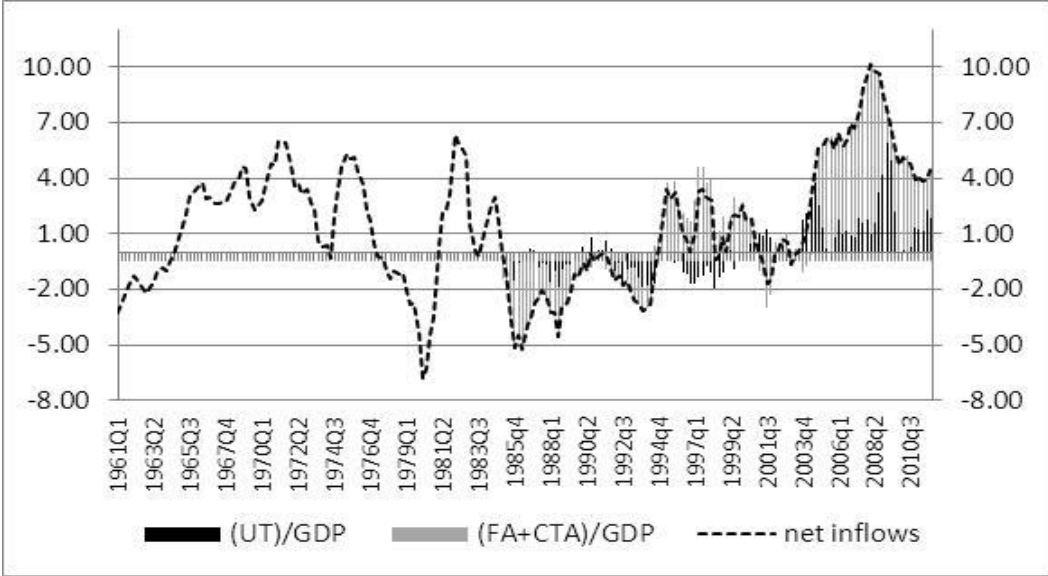
¹ The analysis in this paper is based on the 5th version of the Balance of Payments manual which South Africa currently subscribes to.

² the capital transfer account mainly records donor funding for capital projects. In general, these inflows are small relative to overall BOP flows.

³ Unrecorded transactions essentially refer to errors and omissions in the recording of transactions in the current, capital transfer and financial accounts

Africa. Finally, from a balance of payments accounting perspective, unrecorded transactions have been an important component of net capital flows. This is an important issue that warrants specific attention in the classification of capital flow episodes.

Figure 1: Composition of net flows



How are periods of significant increases (decreases) in capital flows identified? The term "sudden stop" was first used by Dornbusch et al (1995) to define a period in which there is a sudden and large decline in capital inflows. This is the convention followed in this paper.⁵ On the other hand, a "surge" occurs when there is a sudden and large increase in capital flows (IMF, 2011).

In terms of equation 1, it is assumed that the unrecorded transactions are essentially due to measurement errors in the capital account. Given the importance of unrecorded transactions in the South African case (see figure 1), it is imperative that in identifying periods of excessive capital inflows or outflows, the focus should be on total net capital inflows rather than on private capital flows.

⁴ The calculations are done as annual equivalents calculated as the 4 quarter moving sum. In this way the impact of seasonal fluctuations are eliminated. The HP filter is used to calculate trend GDP. The components of capital flows are only available for the post 1985 period.

⁵ More recently, a sudden stop has been associated with a currency crisis (Hutchison and Noy, 2006; Arteta, 2003; Razin and Rubinstein, 2004) and current account reversals (Milesi-Ferretti and Razin, 2000; Edwards (2003).

Following the convention in the empirical literature, capital flow episodes can be determined as follows:⁶

$$C_t = \sum_{i=1}^4 CI_{t-i} \quad \text{where } t = 1, 2, 3, 4, \dots, n \dots\dots\dots(3)$$

$$\Delta C_t = C_t - C_{t-4} \quad \text{where } t = 5, 6, 7, \dots, n \dots\dots\dots(4)$$

where C_t is the four quarter moving sum of net capital inflows (CI_t) expressed as a percentage of trend GDP and ΔC_t refers to the year-on-year change in net capital inflows (C_t).

In essence, the classification of an episode is determined by comparing ΔC_t to some threshold or benchmark. Conventionally, in the empirical literature, the threshold has been based on a certain number of standard deviations around the mean. There have been two broad approaches to the estimation of the mean, namely, recursively (as in Calvo et al, 2004) or on a rolling basis (as in Forbes and Warnock, 2011).⁷ The basic difference between the two approaches is that the latter is defined relative to its immediate or recent past, while the former to its historical trend.

How does one decide between the mean based on the recursive estimate or that obtained on a rolling window basis? Deviations from rolling averages take account of the shifts in capital flows, and as a result, may incorrectly classify episodes if capital flows have been persistent for some time (Ghosh et al, 2012). On the other hand, it is possible that small changes in capital flows by historical standards could be classified as abnormal changes simply because the mean during the rolling window period is low. Evidence suggests that a combination of both rolling forecasts and recursive estimates enhance the accuracy of forecast results (Clark and McCracken, 2009). Thus, for our purpose, the mean is a simple average of the recursive estimate and that based on a rolling window calculation.

⁶ See Ghosh et al (2012) for a similar application.
⁷ Calvo et al (2004) use all available data up to a given point t with the data beginning in period t-2 (i.e. with at least 2 years of data prior to period t) while Forbes and Warnock (2011) use a five year rolling window in the calculation of the mean.

The recursive estimate of the mean in this paper starts in 1961Q1 and uses 5 years of data in the calculation of the first estimate (1966Q1). In the case of rolling means, a decision has to be made on the appropriate length or size of the window. Evidence suggests that averaging across rolling windows makes the estimate more robust to structural breaks and hence improves accuracy (Pesaran, Schuermann and Smith, 2009). In this paper, the rolling mean is a simple average across 2, 3, 4 and 5 year periods.

In defining a capital flow episode, a "surge" ("stop") is a period in which the ratio of net capital flows to trend GDP is significantly larger (smaller) than the mean. In a practical sense the episodes are identified as follows:

- (a) a "surge" ("stop") episode starts in a period t when the net change in capital flows ΔC_t is at least one standard deviation above (below) its mean and ends when inflows are no longer at least one standard deviation above (below) its mean.
- (b) In addition, in order to ensure that capital flow episodes only reflect excessive capital flow movements, "surges" ("stops") are characterised by net capital flows as a percentage of GDP falling in the 75th ((25th) percentile of the distribution for the entire period under analysis.⁸

An episode is defined as a period in which both these criteria are met for at least two quarters.

Figure 2 presents the capital flow episodes ("stops" and "surges") based on equation 1 for the period 1966Q1 to 2011Q4.⁹ As is to be expected, the "significant" peaks (troughs) in net capital flows are captured in the "surge" ("stop") episodes. For comparative purposes, net private capital flows are also depicted in figure 2.¹⁰ While the trends are roughly the same, there are significant divergences in the peaks of the

⁸ In essence what this implies is that normal flows fall in the inter-quartile distribution. See Ghosh et al (2012) for an application of this criterion in a cross-country panel context.

⁹ The actual starting period is 1961 but given that a five year moving average is used as one of the criteria in the calculation of the mean, this in effect reduces the sample period to 1966q1 to 2011q4.

¹⁰ Private capital flows is the net balance on the financial account.

two series - in general the peaks are much higher for private capital flows for the period under analysis.¹¹

Figure 2: Capital flow episodes in South Africa

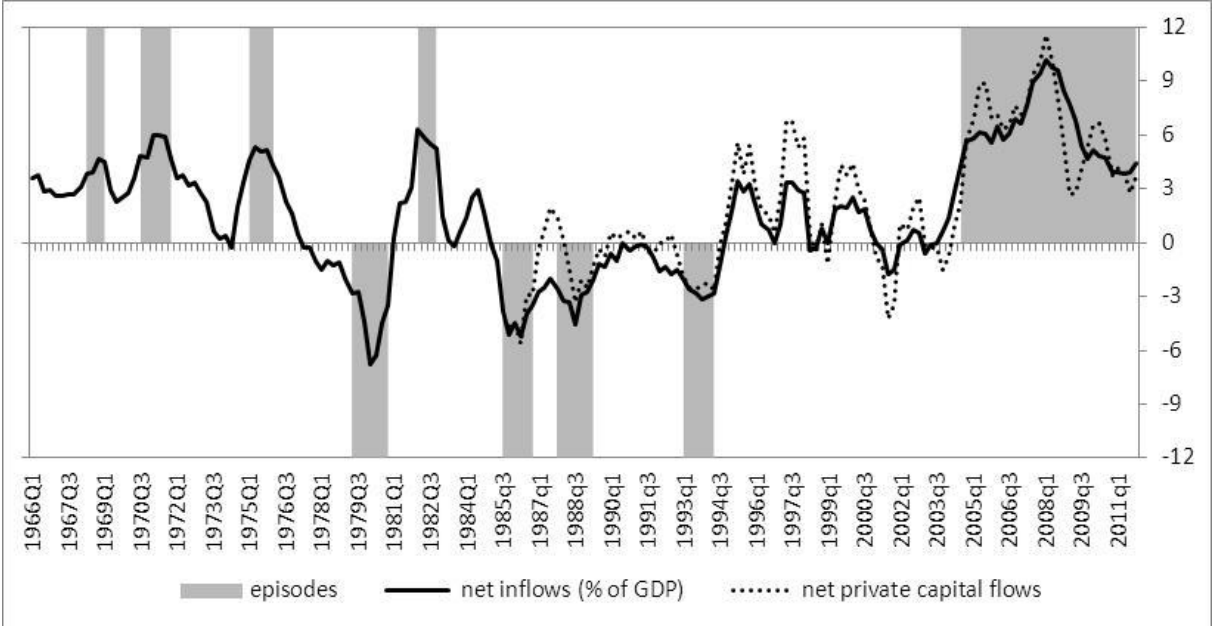


Table 1 reflects some characteristics of the capital flow episodes. There were four "stop" and five "surge" episodes during the period under analysis. On average, the "stop" episodes averaged 6,5 quarters. The first period of significant net capital outflows in the late 1970s was due to political uncertainties related to the Soweto uprisings in 1976. The two "stop" episodes in the mid-to-late 1980s were precipitated by the debt standstill arrangement implemented in 1985 which placed a moratorium on the repayment of foreign loans and the intensification of sanctions against South Africa which began in earnest in 1986. Negative investor perceptions also led to capital outflows in the years preceding the advent to democracy in 1994. There were no "stop" episodes since the advent to democracy in April 1994.

¹¹ If the classification was based on private capital flows, then there would have been two addition

Table 1: Some characteristics of capital flow episodes in SA

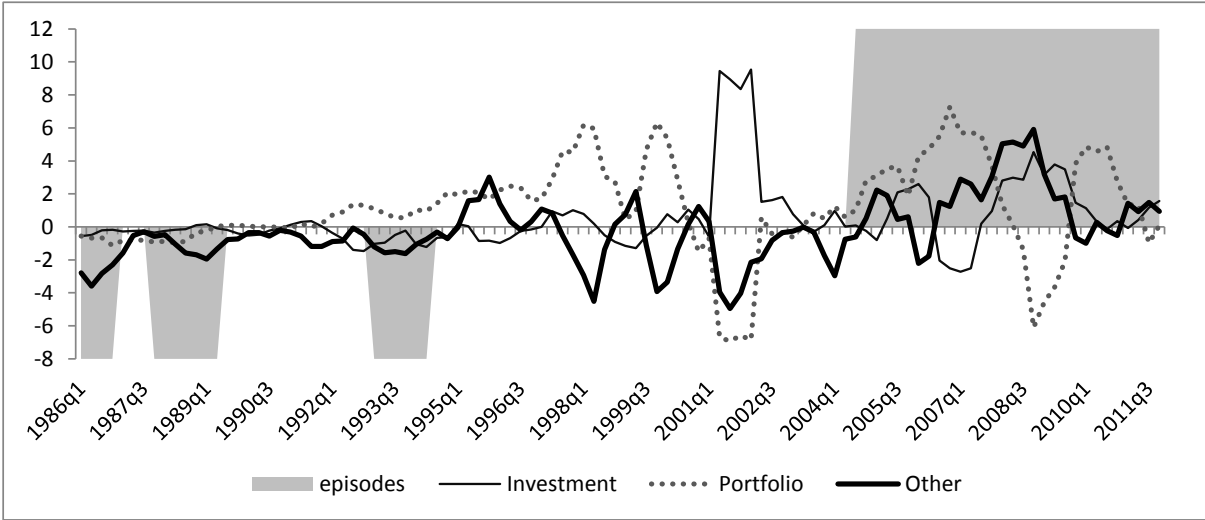
	Stops	Surges
Number of episodes	4	5 (4)
Average duration (quarters)	6.5	9.75 (3.75)
Average magnitude	-3.4	5.3 (5.5)

Source: own calculations

On the other hand, the "surge" episodes spanned an average of 9,75 quarters (almost two and half years). The last "surge" episode which began in the third quarter of 2004 is the longest in South Africa's history and is currently still on-going.¹² When this episode is excluded, the average surge episode is approximately 3,75 quarters which is almost half that for the stop period. Net inflows averaged -3,4 per cent of GDP during the "stop" episodes and +5,5 per cent of GDP during the "surge" episodes.

Capital flows are classified under investment flows, portfolio flows and "other" investment flows. Investment flows refer to foreign direct investment (FDI) including net equity flows and other capital involving at least a 10 percent ownership of the enterprise. Portfolio investment entails investment in debt and equity securities while "other" investment includes trade finance, loans, currency and deposits at banks.

Figure 3: Composition of capital flows



surge episodes. One between 1994Q3 to 1996Q1 and the other between 1997Q3 to 1998Q3.

Portfolio and other investment flows (mainly bank flows) have been the main drivers of the movements in capital flows. During the 1990s there were net portfolio inflows into South Africa. These developments were very much in line with South Africa's reintegration into the world economy in 1990 and intensified with the advent to democracy in 1994. In addition, the liberalisation of the capital account in the mid-1990s also encouraged capital inflows into South Africa. The abolition of the financial rand coupled with the introduction of the "asset swap" mechanism in 1995 also served to encourage portfolio flows into South Africa (Aron et al , 2010).¹³

The large spike (decline) in investment (portfolio) flows during 2001 was the result of the restructuring of the ownership of Anglo American and De Beers mining interests. This did not entail cross-border capital flows but merely a reclassification of existing assets (SARB, Quarterly bulletin, September 2001). Similarly, the disinvestment by Rembro from British American Tobacco in 2008 did not entail cross border capital flows as mentioned earlier. This is an important issue and is given particular attention in the econometric estimations undertaken in section 5.

4 Role of domestic and foreign agents in capital flows

Recently, there has been increasing attention given to the analysis of gross capital flows (Faucette et al, 2005; Cowan et al., 2008; Forbes and Warnock , 2011; Broner et al., 2013). In part, the shift in focus has been motivated by the need to distinguish between the actions of foreign and domestic investors in driving cross-border capital flows.

By considering foreign assets and liabilities data, as well as changes in the foreign reserve position, one could apportion the movements in cross border capital flows to the actions of domestic and foreign agents (Broner et al, 2013). In terms of balance of payments data, the net balance of foreign liabilities (assets) captures the capital movements due to foreign (domestic) agents. Capital inflows due to the actions of

¹² It spanned thirty quarters from 2004q3 to the end of 2011.

¹³ The asset swap mechanism allowed institutional investors to diversify their portfolios without placing undue pressure on the balance of payments. See Aron et al (2010) for a more detailed review of the swap mechanism.

foreign agents (CIF) are given by the sum of direct investment liabilities, portfolio investment liabilities and other investment liabilities. In this case, net capital inflows (outflows) are given by the net increase (decrease) in the country's liability position .

On the other hand, the sum of the net balances in direct investment assets, portfolio investment assets, other investment assets and net changes in domestic reserves reflect the value of foreign assets acquired by domestic agents. Hence, net capital outflows due to the actions of domestic agents (COD) is given by the negative of the sum of the net change in the asset positions of the capital account and the net change in reserves.¹⁴ Capital outflows (inflows) are represented by a positive (negative) COD value. Net capital flows is given by the difference between CIF and COD .

Figure 4: Role of domestic and foreign agents in capital flows

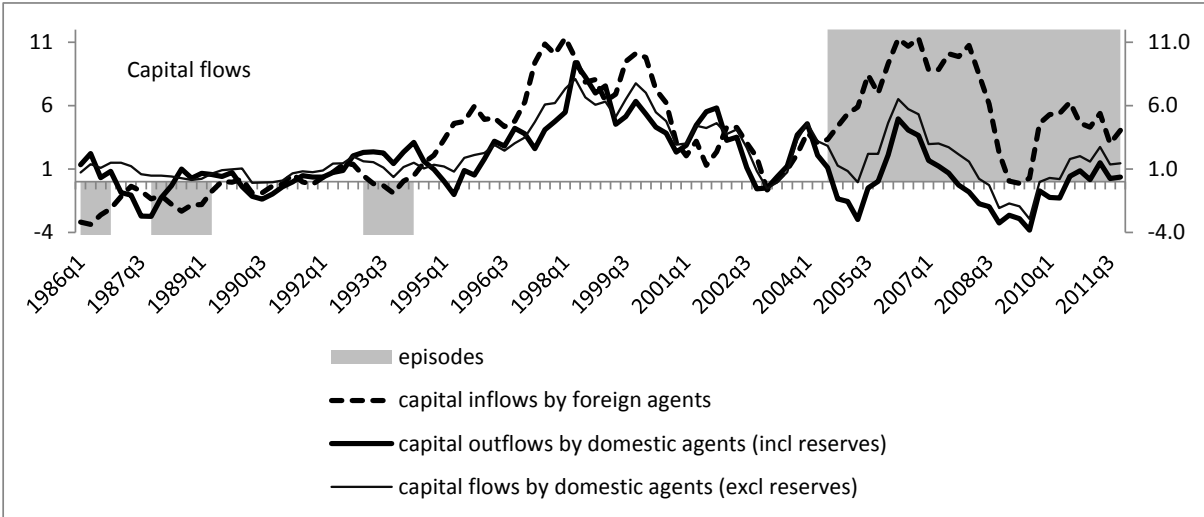


Figure 4 shows a strong positive correlation between inflows by foreigners and outflows by domestic agents. This, in effect, implies that outflows by domestic agents were offset by inflows by foreigners. This result is in line with the findings by Broner et al (2011) for a group of high, middle and low income countries. In part, this could

¹⁴ Note that a negative entry in the asset position in the financial account means that domestic agents have increased their foreign asset position. Thus, the sign shows the direction of capital flows with a negative sign depicting capital outflows and a positive sign showing inflows. So by considering the negative sum of the net change in the asset position, an upward movement in DCO means an increase in capital outflows.

be due to domestic agents using the opportunity presented by foreign capital inflows to diversify their investment portfolios.

In the post-democracy period, foreigners have been the main agents underpinning inflows into South Africa. However, reserve accumulation by the South African Reserve Bank, has also had a positive impact on the net inflow position for much of the post-democracy period. During the last surge period, capital inflows due to the actions of foreigners reached the record levels registered during the latter half of the 1990s following the liberalisation of the capital account.

Capital inflows by domestic agents in 1995 and 2004-05 were essentially due to the rise in foreign exchange reserve. The international empirical evidence indicates that financial crises affect the behaviour of foreigners and domestic agents asymmetrically - during financial crises, capital inflows by foreigners tend to decline while inflows by domestic agents increase (Broner, 2011). This is borne out in the South African experience which showed a significant increase in capital inflows by domestic agents between 2008 and 2010. In fact, the surplus in the financial account was essentially due to the actions of domestic agents during the financial crisis.

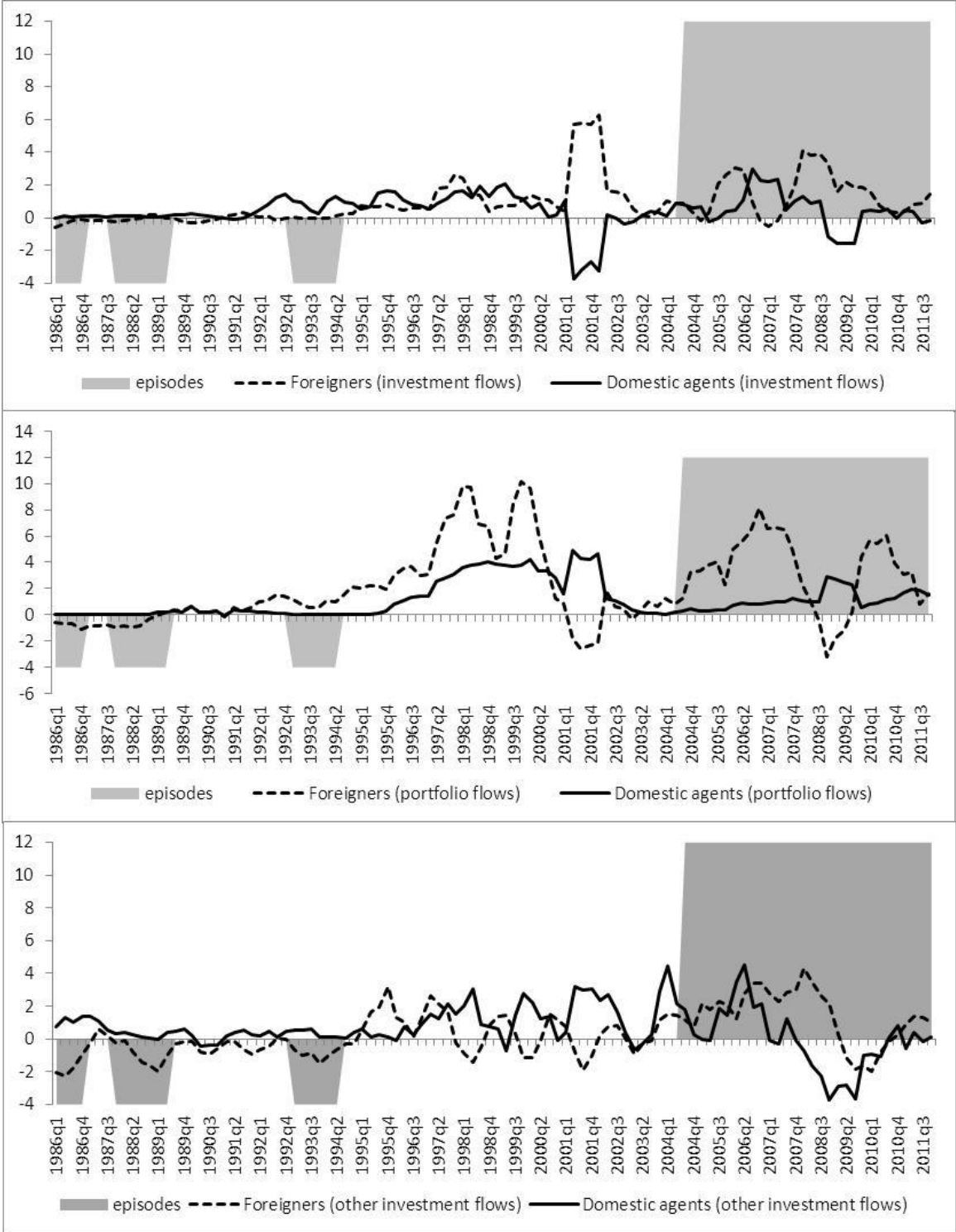
Did the behaviour of domestic and foreign agents differ across asset classes? Figure 5 depicts the trends in the composition of capital flows due to the actions of foreigners and domestic agents. The emphasis here is on the post-democracy period with a special focus on the characteristics of capital flows during the last surge episode. In general, foreign investment inflows by foreigners have been positive since the advent to democracy in South Africa.¹⁵ However, during the recent financial crisis, domestic agents liquidated some of their offshore direct investments and repatriated proceeds back into South Africa following the slump in the world economy.

As far as "other investment" flows are concerned, there was an uptick in foreign investor inflows during the early part of the last surge episode. More recently, during the financial crisis, domestic agents repatriated their "other investment" assets back

¹⁵ As pointed out earlier the spike in the early 2000s was essentially due to a reclassification of assets rather than an increase in capital flows.

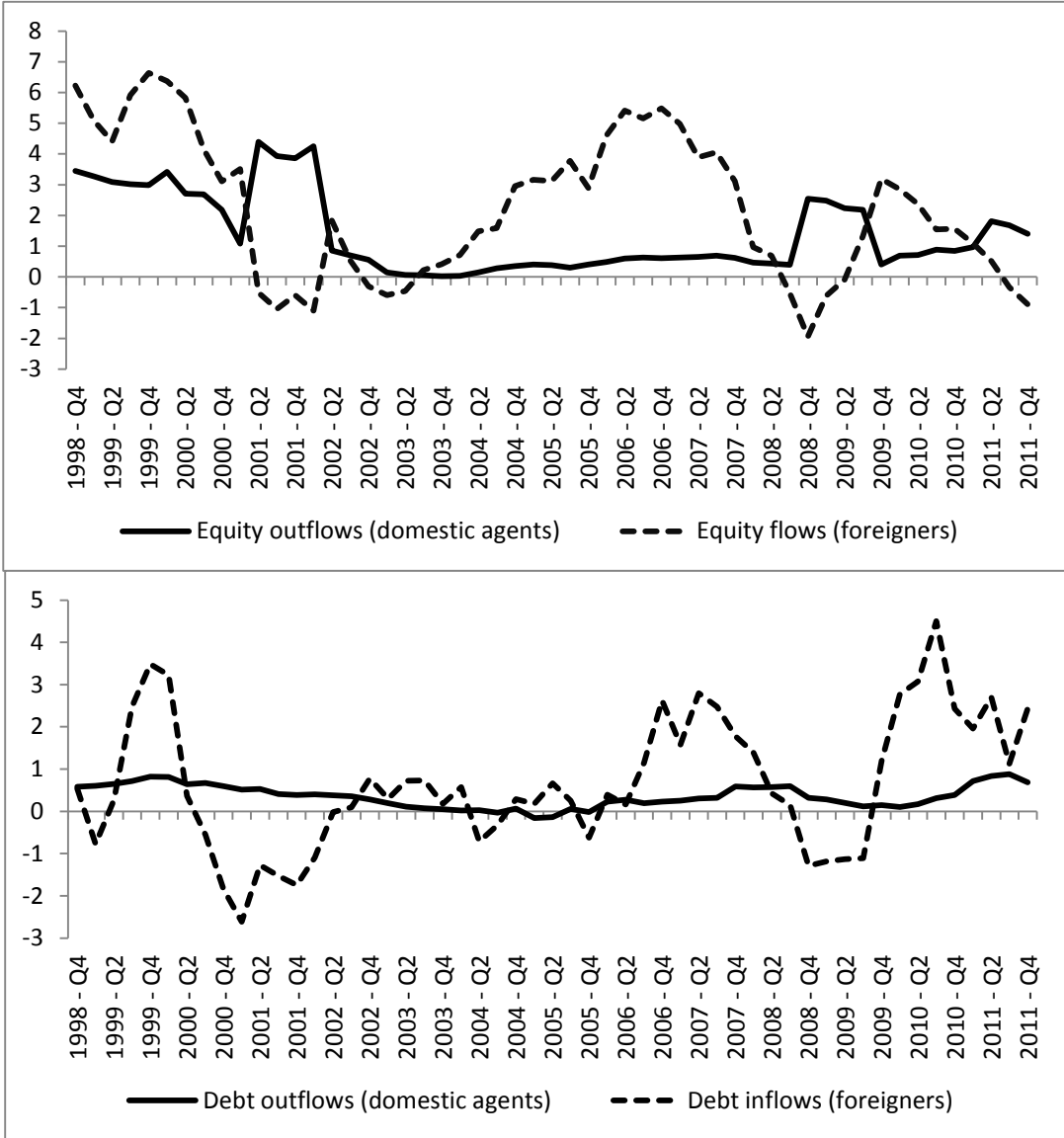
to South Africa. In large part, this entailed a significant increase in aggregate cross-border claims of South African banks in the form of increased loans granted to non-residents and increased holdings of international debt securities (SARB, 2013).

Figure 5: Capital flows by asset class and agent flow



It is interesting to note that the increase in portfolio inflows by foreigners during the recent surge episodes is lower than the levels achieved during the mid-1990s to early 2000s. In addition, the portfolio outflows by domestic agents were also much lower than the levels achieved during the mid-1990s to early-2000s. During the recent financial crisis, sharp increases in portfolio outflows by foreigners were also accompanied by large increases in portfolio outflows by domestic agents.¹⁶

Figure 6: Equity and debt flows



Decomposing portfolio flows into its different components show that foreigners have been attracted to South African equities. However, during the financial crisis, there

¹⁶ the spike in 2000 since it involved a reclassification of assets rather than an increase in capital flows as pointed out earlier.

was a sell-off of South African equities by foreigners as well as a rise in domestic agents' purchases of foreign equities. So in essence, the sharp rise in portfolio outflows by both domestic agents and foreign agents during the financial crisis was essentially due to equity outflows. Since the end of 2009, equity inflows by foreigners have declined and turned negative in 2011 while debt inflows have declined but remained positive. Foreigners reduced their debt inflows during the financial crisis.

5 Capital flow reversals

A key question on capital inflows is the extent to which these flows are reversible, thus posing potential macroeconomic challenges. In this regard, a decline in capital inflows could be just as bad or even worse than a net capital outflow (Willet and Sula, 2009, p301). The argument here is that a large decline in inflows, say from 6 per cent to 1 per cent of GDP, could pose a larger financing problem than a smaller capital flow reversal, say from a 1 per cent inflow to a 1 per cent outflow.

Capital flow reversals can be proxied by the change in capital flows as a ratio of GDP as follows:

$$CFR_{it} = \frac{C_{i,t-1} - C_{i,t}}{GDP_{t-1}} \dots\dots\dots(5)$$

where C_{it} , GDP_t , CFR_{it} represent the net capital flow, gross domestic product, capital flow reversal respectively, i is the capital flow component and t is the time period. Larger positive values for CFR_{it} imply a larger reversal in flows for component i .

Is there a relation between capital inflows and the possibility of capital flow reversals? More specifically, are capital flow reversals related to the preceding cumulative inflows? The relationship between capital flow reversals and accumulated inflows can be estimated as follows:

$$CFR_{it} = c + \alpha C_{it} + \sum_{a=1}^5 \beta_a X_a + \varepsilon_{it} \dots\dots\dots(6)$$

where c is a constant term, C_{it} captures the capital inflows in the preceding year (four quarters) for component i in time period t , ε_{it} an error term and X_{it} represent five control variables (VIX index, commodity prices, interest rate differentials, current account balance, financial depth) which could have a bearing on the magnitude of capital flow reversals.¹⁷

The estimations are done for the two sub-periods, 1995q2 to 2004q2 and 2004q3 to 2011q4.¹⁸ The first sub-period incorporates the liberalisation of capital controls while the second sub-period covers the surge in capital flows which began in 2004Q3. This division allows for a comparison of capital flows across what could be considered a "normal" period (1995Q2 to 2004Q2) and an abnormal ("surge") period (2004Q3 to 2011Q4).

The results are presented in the annex (tables A1, A2, A3). The coefficient for accumulated inflows (α) is positive and significant implying that accumulated inflows have a bearing on capital flow reversals for the different capital flow components. By comparing the significance and size of the coefficient (α) on accumulated capital flows, a reversability ranking across the different capital flow components could be established (Sula and Willet, 2009).

Foreign direct investment is usually considered to be more stable since it is highly illiquid and influenced more by long-term profitability considerations. Portfolio flows on the other hand, are regarded as being highly volatile ("hot money") and hence subject to sudden reversals during times of crises. In part this is due to investors displaying "herding behaviour" as a result of asymmetry of information (Calvo and Mendoza, 2000) or utilising similar criteria in their trading decisions (Haley, 2001). However, the results in this paper show that portfolio flows, have in general, not necessarily been much "hotter" than the other components of capital flows during

¹⁷ The VIX index is the Chicago Board Options Exchange (CBOE) Volatility Index which measures market risk and captures the expected volatility in the Standard and Poor's 500 index options. Commodity prices is an index of South African commodity prices. Interest rate differential is the difference between South Africa's 3 month treasury bill rate and US rate. Financial depth is measured as the market capitalisation of the JSE as a ratio of GDP.

normal times. Contrary to the international empirical evidence, FDI reversals have tended to exceed those for portfolio reversals and "other investment" reversals during normal times. In fact, portfolio reversals have been similar to that of "other investment" reversals.

During the surge episode (2004q2 to 2011q4), capital flow reversals for portfolio flows have exceeded those of FDI and other investment flows. Thus, the evidence suggests that surge episodes in South Africa are characterised by large portfolio inflows driven by short-run profit motives.

The size of the coefficient (α) on accumulated capital flows also provides an indication of the magnitude of outflows for the different components. In this regard, it is noteworthy that approximately 50 per cent of portfolio inflows leave the country after one year. The outflows are very similar during normal times and surge periods. Approximately 45 per cent of "other investment" inflows leave the country after one year. However, the results for FDI inflows are somewhat different with approximately 80 per cent (33 per cent) of inflows being expatriated during normal times (surge periods) after one year.

6 Some policy implications and conclusions

This study has identified capital flow episodes for South Africa. The results indicate that for most of the period since the advent to democracy and the liberalisation of the capital account, South Africa has been the recipient of net capital inflows. In keeping with the international empirical evidence, South Africa's gross capital flows have, since 1995, increased in size and volatility relative to net capital flows. This in effect implies that the understanding of the dynamics of capital flows could be significantly enhanced through an analysis of gross rather than net capital flows.

The evidence shows that domestic and foreign investor behaviour have an asymmetric effect on capital flows. For example, during the great recession foreigners reduced their net capital inflows to South Africa while domestic agents

¹⁸ A dummy variable is included in the estimation to account for the de Beers transaction in 2001 and the Rembro disinvestment from British American Tobacco in 2008 since both these transactions did

also reduced their holdings of foreign assets and in so doing offset the behaviour of foreign agents. This, in effect, suggests that policy directed at minimising the adverse effects from capital flows should separately target the behaviour of domestic and foreign investors. In this regard, capital controls in the form of macro-prudential rules which encourage equity and investment inflows may be more desirable than inflows into short-term debt (Broner et al, 2013). On the other hand, the accumulation of reserves could also help with the mitigation of shocks when they occur.

This study has not analysed the macro-economic impacts of capital inflows to South Africa. South Africa has been subjected to an on-going surge episode since 2004 which has helped to fund the widening current account deficit. However, indications are that capital flows into South Africa may have at times triggered a larger exchange rate impact than has been the case in other EMEs (IMF, 2011). In addition, while inflows have contributed to the rise in equity prices, the impact on asset price movements and credit developments have been limited (IMF, *ibid*). Further detailed analysis directed at unpacking the links and potential impacts between capital flows and macro-economic developments will be of significant benefit to policy formulation. The delineation of capital flow episodes as undertaken in this paper could be very useful in this regard.

Recently there have been rising concerns about the potential economic impact of declining capital flows to EMEs. These mainly relate to the impact of the normalisation of the global interest rate environment and changing investor perceptions about domestic economic prospects on capital flows to EMEs like South Africa. Some recent macro-economic simulations indicate that a halving of capital inflows will have a significant impact on the exchange rate, inflation and growth outcomes in South Africa (BER, 2013).¹⁹ However, these simulations do not distinguish between the different types of flows. Research however, indicates that the economic impacts may vary by type of flow (Sula and Willet, 2009). This is an issue that warrants further research in the South African case.

not entail cross border capital flows as mentioned earlier.

¹⁹ The net impact depends on the monetary policy response accompanying the decline in capital inflows.

The nature of flows was much more diverse in the pre-crisis period but, more recently, portfolio investments have dominated inward capital flows to South Africa. The results in this study indicate that around 50 per cent of portfolio inflows leave the country after one year. In addition, there has been a significant increase in the volatility of portfolio of inflows since the outbreak of the financial crisis. This issue is of particular relevance given that the recent portfolio inflows have been underpinned by non-resident participation in the longer end of the maturity spectrum in South Africa's bond market. This has, in effect, led to a decline in long-term bond yields and a reduction in the cost of financing for government. The recent downgrades in South Africa's sovereign ratings, investors reaching their exposure limits in South African bonds as well as deteriorating inflation outcomes could have adverse implications for bond inflows into South Africa. The potential macroeconomic implications of a decline in bond flows are of immense relevance to economic policy in South Africa.

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Annex

Table A1: Capital flow reversals (dependent variable: FDI reversals)

1995Q2-2004q2						
constant	-0.17	-5.92	-12.94*	12.61*	-14.04*	-12.84*
	(0.19)	(3.71)	(7.22)	(7.47)	(8.35)	(7.24)
accum	0.61	0.79*	0.80*	0.80*	0.79*	0.78*
	(0.45)	(0.50)	(0.46)	(0.46)	(0.46)	(0.47)
dummy	-4.09	-4.82	-4.72	-4.71	-4.46	-4.22
	(2.93)	(2.97)	(2.92)	(2.94)	(3.12)	(3.17)
findepth		0.88	1.50*	1.48*	1.44*	1.30*
		(0.55)	(0.82)	(0.82)	(0.82)	(0.72)
vix			0.14	0.14	0.15	0.15
			(0.08)	(0.08)	(0.10)	(0.10)
interestrates				-0.02	-0.09	-0.10
				(0.21)	(-0.18)	(0.19)
commod					0.02	0.02
					(0.03)	(0.03)
CAB						-0.19
						(0.24)
R2	0.31	0.40	0.50	0.50	0.51	0.51
Adj R2	0.27	0.34	0.44	0.43	0.41	0.41
2004q3 to 2011q4						
constant	-0.22**	-2.03**	-1.86*	-1.51*	-0.96	-1.00
	(0.11)	(0.88)	(0.95)	(1.74)	(4.85)	(5.28)
accum	0.29***	0.33***	0.34***	0.33***	0.34***	0.33**
	(0.08)	(0.07)*	(0.08)	(0.08)*	(0.09)	(0.09)
dummy	-0.74*	-0.81**	-0.76**	-0.74**	-0.82*	-0.84*
	(0.39)	(0.38)*	(0.32)	(0.30)	(0.45)	(0.47)
findepth		0.19	0.18**	0.17*	0.15*	0.17
		(0.09)	(0.09)	(0.11)	(0.14)	(0.17)
vix			-0.004	-0.006	-0.004	-0.001
			(0.01)	(0.01)	(0.01)	(0.01)
interestrates				-0.02	-0.08	-0.05
				(0.09)	(0.30)	(0.33)
commod					-0.001	-0.001
					(0.01)	(0.01)
CAB						0.02
						(0.06)
R2	0.23	0.29	0.29	0.29	0.29	0.29
Adj R2	0.18	0.20	0.17	0.14	0.10	0.07

Notes: Robust standard errors corrected for heteroskedasticity and autocorrelation in brackets

Table A2: Capital flow reversals (dependent variable: Portfolio reversals)

1995Q2-2004q2						
constant	-0.70*	2.54	4.43	4.38	0.68	-1.52
	(0.38)	(2.26)	(5.73)	(5.65)	(7.04)	(6.03)
accum	0.36**	0.43**	0.44**	0.44**	0.50*	0.52*
	(0.15)	(0.17)	(0.19)	(0.20)*	(0.19)	(0.20)
dummy	2.69*	2.94*	3.01*	3.01*	3.81*	3.62*
	(1.57)	(1.56)	(1.64)	(3.01)	(1.65)	(1.57)
findepth		-0.52	-0.70	-0.70	-0.81	-0.58
		(0.35)	(0.66)	(0.65)	(0.64)	(0.50)
vix			-0.03	-0.04	0.007	0.01
			(0.08)	(0.09)	(0.09)	(0.09)
interestrates				0.004	-0.16	-0.15
				(0.18)	(0.19)	(0.18)
commod					0.07	0.08***
					(0.03)	(0.03)
CAB						0.37
						(0.32)
R2	0.21	0.25	0.26	0.26	0.31	0.35
Adj R2	0.16	0.19	0.17	0.15	0.18	0.19
2004q3 to 2011q4						
constant	-0.89*	4.52**	3.29	4.28	10.83	9.23
	(0.45)	(2.13)	(2.7)	(4.7)	(9.30)	(10.06)
accum	0.32**	0.51**	0.52**	0.52**	0.53**	0.56**
	(0.14)	(0.20)	(0.21)*	(0.22)	(0.22)	(0.24)
dummy	1.73	2.89*	2.53*	2.61*	1.95	1.99
	(1.23)	(1.52)*	(1.51)	(1.53)	(1.45)	(1.44)
findepth		-0.64**	-0.57*	-0.60*	-0.72*	-0.66
		(0.27)	(0.30)*	(0.35)	(0.42)	(0.44)
vix			0.02	0.02	0.03	0.05
			(0.03)	(0.04)	(0.03)	(0.05)
interestrates				-0.07	-0.48	-0.35
				(0.18)	(0.50)	(0.55)
commod					-0.01	-0.01
					(0.01)	(0.01)
CAB						0.15
						(0.15)
R2	0.16	0.31	0.32	0.33	0.35	0.37
Adj R2	0.11	0.23	0.22	0.19	0.18	0.17

Notes: Robust standard errors corrected for heteroskedasticity and autocorrelation in brackets

Table A3: Capital flow reversals (dependent variable: “other” investment reversals)

1995Q2-2004q2						
constant	0.25 (0.16)	2.32 (1.48)	5.2*** (1.83)	2.34 (2.69)	5.77** (2.57)	5.87* (3.08)
accum	0.38*** (0.08)	0.44*** (0.07)	0.40*** (0.06)	0.43*** (0.06)	0.43*** (0.07)*	0.43*** (0.08)
dummy	0.49* (0.23)	0.50* (0.28)	0.34 (0.39)	0.29 (0.39)	-0.11 (0.50)	-0.08 (0.58)
findepth		-0.32 (0.22)	-0.55** (0.21)	-0.43* (0.22)	-0.38* (0.22)	-0.40 (0.27)
vix			-0.06* (0.03)	-0.06* (0.03)	-0.10*** (0.03)***	0.10*** (0.03)
interestrate				0.2 (0.15)	0.36*** (0.11)***	0.36*** (0.12)*
commod					-0.06*** (0.02)***	-0.06** (0.02)*
CAB						-0.01 (0.21)
R2	0.24	0.27	0.32	0.34	0.41	0.41
Adj R2	0.20	0.21	0.24	0.24	0.29	0.26
2004Q3-2011q4						
constant	-0.29* (0.17)	-1.17 (1.58)	0.24 (1.60)	1.98 (2.99)	0.03 (7.14)	-2.07 (6.84)
accum	0.34** (0.12)	0.36** (0.14)	0.42*** (0.14)	0.45*** (0.13)	0.44*** (0.14)	0.67*** (0.16)
dummy	-1.03 (0.54)	-1.06* (0.55)	-0.67 (0.55)	-0.63 (0.59)	-0.43 (0.88)	-1.15 (0.79)
findepth		0.09 (0.16)	0.01 (0.15)	-0.02 (0.18)	0.005 (0.23)	0.19 (0.25)
vix			-0.04** (0.02)	-0.05* (0.02)	-0.06** (0.03)	-0.03 (0.02)
interestrate				-0.13 (0.16)	-0.007 (0.42)	0.15 (0.39)
commod					0.003 (0.01)	0.004 (0.01)
CAB						0.33** (0.15)
R2	0.19	0.19	0.23	0.24	0.25	0.34
Adj R2	0.13	0.10	0.10	0.09	0.06	0.13

Notes: Robust standard errors corrected for heteroskedasticity and autocorrelation in brackets