The Response of Capital Flows to Interest Rate Differentials: The Case of South Africa

Palesa Makhetha-Kosi[1], Syden Mishi[2] and Nomasomi Ngonyama[3]

*[1]University of Fort Hare, Department of Economics, 50 Church Street,
East London, South Africa
[2]University of Fort Hare, Govan Mbeki Research and Development Centre and
Department of Economics, South Africa
[3]University of Fort Hare, Department of Economics, Alice, South Africa*

ABSTRACT Global economic shocks affect different economies at different times, and the policy responses are often different, taking into account each economy's endowments fundamentals. The latest global financial crisis, provide a unique opportunity for testing this assertion empirically. In a Vector Error Correction Modelling (VECM) framework, this study econometrically tests the response of capital flows to interest rates differentials in South Africa over the period 1990-2013, controlling for the effects of financial crisis. The study found that, even though South Africa had positive interest rate differential, this did not translate to proportionately higher capital inflows which can be explained by externalities in human capital formation and risk premium in favour of developed economies. On the other hand, different capital flows respond differently to interest rate differentials.

INTRODUCTION

The last global financial crisis of 2007/2008, which originated in the United States of America, had far reaching effects which varied across economies. Due to such varied effects, policy makers in different economies responded differently, for example, developed economies responded by implementing expansionary monetary policy which lead to interest rates cut towards zero mark (Acharya and Bengui 2016; Yesin 2016). However, for emerging economies, the policy response was more subdued as they were generally less affected by the crisis. As a result, there were pronounced interest rates differentials between developed and less developed countries, which lead to capital inflows surges and currency appreciation episodes in the latter (Acharya and Bengui 2016; Zoega 2016). To avoid erosion of external competitiveness, authorities in emerging markets as Brazil and India, undertook initiatives to reduce capital inflows, with countries like Iceland failing to contain the heightened inflows due to unprecedented high domestic debt levels (Zoega 2016). While the anomaly persists, Arias et al. (2016) came up with a puzzling result which refuted the standard portfolio assumption which posits that

uncovered interest parity met in the long term, at the very least. This is in sharp contrast to the argument in Haynes (1988) based on Canada and US data.

Post global financial crisis, emerging economies have witnessed a slowdown in capital inflows and, in the worst cases, reversal of capital (Zoega 2016). This is a worrying phenomenon given historical perspective which reminds of subsequent costly financial crises (IMF April 2016). Furthermore, the current status quo of emerging markets being heavily integrated into global markets and their increasing share of global output vindicates the cause for concern. This is so, because it implies that unsettling the emerging economies' investment and growth trends can result in more forceful international spillovers compared to the past (IMF April 2016).

This phenomenon has not been closely investigated, especially since the United States Federal reserve's tapering announcements in the second quarter of 2013 which resulted in significant capital inflow reversals from emerging economies. On the other hand, emerging economies, called for international cooperation of monetary policies in order to dampen unpredictable and volatile capital flows, and to mitigate the potential economic distortions they can cause (Rajan 2015). It is at the backdrop of such developments that this study sought to investigate the response of capital flows to interest rates differen-

Address for correspondence:
Mishi Syden
E-mail: smishi@ufh.ac.za

tials in an emerging economy - South Africa. At times, it is felt that monetary policy adjustments can dampen or magnify the volume of capital inflows (Kumar et al. 2014). South Africa went through a major monetary policy shift in 2000/2001 when it adopted inflation targeting monetary policy framework.

Literature further reflects lack of consensus in this regard, for example, on the one hand, Grubel (1968) showed that the level of interest rate differential may not matter for capital flows, with capital able to flow even if the differential is zero or negative. Ocampo and Tovar (1997), Verma and Prakash (2011), Ahmed and Zlate (2013), Dua and Garg (2013), Nier et al. (2014), on the other hand, argued that the causality goes from capital flows to interest rate differentials, with the latter showing persistence in the effect of interest rate differentials on capital flows compared to other determinants, especially during stress periods. In the case of South Africa, Hassan (2015) has argued that interest rate differential only drives inflows of capital when volatility is low.

Since the end of apartheid and the start of financial liberalization in 1995, South Africa has experienced large amount of capital inflows which has created cause for concern among policy makers and economists. This is so because large inflows increase the potential for financial risk and instability in an economy (Mohamed 2010). Emerging economies are argued to be relying heavily on capital inflows due to low savings base (Gordan 2011; South African Reserve Bank (SARB) 2013). However, it should also be noted that, significant capital flow swings have serious macroeconomic implications (Arias et al. 2016; Zoeg 2016; SARB 2013).

On the other hand, Murshid et al. (2001) huge inflows of capital can lead to any challenges including inflation, currency appreciation, lower savings among many other ills. Contrary to Angmortey and Tandoh-Offin (2014), it appears that capital inflows crowd out domestic savings in emerging economies. Furthermore, South Africa is one of the emerging economies that managed to withstand the crisis hence became attractive to international investors seeking refuge from advanced economies (Gordan 2011; Acharya and Bengui 2016). Hitherto et al. (2000) argued that indeed interest rate differentials are key determinant of capital flows.

Capital flows can be classified into three groups, foreign direct investments (FDI), foreign portfolio investments (FPI) and other foreign investments (OFI) (Wesso 2001; SARB 2016). FDI entails such investment into a firm to which foreign investors have, a tenth, at minimum, of voting rights, while FPI accounts for the holding of bonds and equity across borders. OFI on the other hand is composed of loans and deposits between banks, companies and governments across the international boarders (Wesso 2001). For all the three capitals, there is outflow and inflow into the domestic economy, with net flows reflecting the balance between the two flows. This study is more interested in 'hot capital' portfolio investment and other capital investment and not on FDI which is considered more permanent (Sarno and Taylor 1999; Griffith-Jones and Gallagher 2011).

IMF (2008) stated that there has been a significant increase of private capital flows into Sub-Saharan Africa (SSA) since early 2000s. The trend is attributable to high global liquidity and the greater investors' appetite for high yields in SSA (South African National Treasury 2010).

According to Aron et al. (2010), since 1994 foreign direct investment has been increasing; however, the increase has been lower than that of portfolio investment (World Bank 2009). Aron et al. (2010) argued that the high volume of inflows is as a result of well-developed domestic capital markets since mid-1990s, a period that also coincided with liberalisation of capital accounts. The trend is much clear on portfolio equity, which has proved to be greatest source of external finance (SARB 2013). As compared to middle-income economies the equity market in South Africa is larger and also liquid, essentially when the volume of trading is considered. The increase in portfolio investment is thus a result of market liquidity.

From the period 1990-1994 both the foreign portfolio and other foreign investments have been low; the net was near zero. From 1996-2012 foreign portfolio investment increased above other foreign investments. The increase in foreign portfolio investment since 1994 reflects the significance and growth of capital markets in South Africa (Aron et al. 2010).

From around 2006 there was a sharp increase of foreign portfolio investments flowing into South Africa as depicted by a higher positive net flow. At the same time, other foreign invest-

ments were also increasing although not as much as the foreign portfolio. The IMF (2008) observed this surge in private capital inflows as owing to the abundance in global liquidity during the period 200-2007, as well as the desire for higher yields in SSA. The global financial crisis had a negative impact only to foreign portfolio investment to South Africa. As a result a decline in foreign portfolio investment is registered during 2008/2009 as was with many other emerging economies (Fratzscher 2011).

Since 2005 there has been an increase in flows of other foreign investment South African Reserve bank (2013). While foreign portfolio investment increased sharply between the periods of 2010-2012, the increase was due to positive growth prospects, favourable sovereign ratings, more openness and development and sophistication of local financial markets (National Treasury 2010). The traditional theory of interest rates links interest rates to exchange rate and the flow of capital, hence development of financial markets matters.

Given a country's capital offer curve, capital-flow-indifference and an international interest rate line, as demonstrated in Hayek (1941), Leontief (1958) and Miller (1968), the link between interest rates and capital flows arise as international rates of interest becomes higher (making the international interest rate line steeper); the optimal condition will be for that particular country to supply capital. Lower world interest rates make the particular country an optimal demander for capital. This implies that capital will flow from a country of lower interest rate to the one with higher interest rate, and not always to a country with higher marginal productivity of capital. On the other hand, Bems et al. (2016) acknowledged the role of interest rate differentials as a push factor for capital inflow reversal; however, the analysis showed that this is mitigated in an economy with greater exchange flexibility. Furthermore, the portfolio allocation theory asserts that capital flows are driven fundamentally by rates of return and risk factors (Devereux and Saito 2006).

Study Objective

The main objective of this study is to econometrically establish the response of capital flows to interest rates differentials in South Africa, controlling for the effects of financial crises.

The study is organised as follows: following this introductory section, is the methodology, outlining the model specification and data analysis techniques. The third section presents the results from the econometric analysis and discussion of the results. Conclusions and recommendations follow as fourth and fifth sections respectively.

METHODOLOGY

The study sought to find out whether capital flows in their disaggregated nature respond to interest rate differentials, and if they do, to what extent is that response. In this regard, the direction and magnitude of the response need to be captured. Further, it is of interest to capture the effect of economic shocks like the global financial crisis. Regression analysis is best suited at providing the answers to the posed questions. In that regard the study specifies the model as follows, motivated by the work of Kumar et al. (2014):

$$FI_t = \beta_0 + \beta_1(i_{SA} - i_{US}) + \beta_2 GDP_t + \beta_3 ALSi_t + \beta_4 Inf_t + \epsilon_t$$
$$\ldots (1)$$

where
FI = Financial inflows to South Africa
i= short term interest rate, with subscript represented country
GDP= gross domestic product
$ALSi$= stock market index
Inf= inflation rate (CPI growth rate)

The econometric model is estimated in log-linear of the form:

$$logFI_t = \beta_0 + \beta_1 log(i_{SA} - i_{US}) + \beta_2 log\,GDP_{SA} + \beta_3 log\,ALSI_t + \beta_4 Inf_t + \epsilon_t \qquad \ldots \quad (2)$$

A Priori expectation
$\beta_1 > 0 \; ; \; \beta_2 > 0 \; ; \; \beta_3 > 0 \; ; \; \beta_4 < 0$

Data Period and Data Sources

To establish the responsiveness of capital flows to interest rates differentials, a time series analysis was carried out on quarterly data from 1990Q1 – 2012Q4. Data for all variables has been sourced from the South African reserve bank. Table 1 presents the empirical definition of each variable and cites examples of application in literature.

The variables, though informed by literature, as cited in Table 1, are very much applicable to South Africa; hence the measurements adopted are the ones that speak to the South African economy.

Estimation Techniques

Given the time series nature of the data and that it is of financial variables, stationarity tests were conducted to ensure meaningful results are obtained for necessary and sound inferences. The presents of unit root in a series makes the results spurious and any inferences made from such results will be misleading.

The study employed Augmented Dickey-Fuller and Phillips-Perron tests, and established stationarity (order of integration), to be I (1). Phillips-Perron is more powerful as it can add lagged terms to correct for higher order serial correlation and takes into account structural breaks existing in the data (Ntshangase et al. 2016). Furthermore, given the nature of the variables in the model, a multivariate system is a possibility to the extent that one cannot pin down the dependant variable and a group of explanatories. In this regard, VECM estimations were feasible (Kapingura et al. 2014; Ntshangase et al. 2016).

Eight variants of the stated model were estimated with capital flows as dependent variable (exchanging foreign portfolio investment and other foreign investment): dependent variable measured as volume of flows; the net inflows of both the dependent variables considered; pre-crisis period and using a crisis dummy. The esti-mated results and their interpretation are presented in next section and a full discussion is provided.

RESULTS AND DISCUSSION

Descriptive Statistics

Descriptive statistical analysis was done to summarise the data. Table 2 presents the statistics of all the variables in the model. In line with the discussion above in relation to the dominance of foreign portfolio investment, on average foreign portfolio were over double the value of other foreign investment. Inflation, as proxied by CPI, was on average at the upper bound of the target range of six percent (South Africa adopted an inflation targeting monetary framework in 2000, with a target band set at 3% - 6%). Stock market development and economic environment are both positive, while, on average, South African interest rates were 7 percent higher than in the United States over the study period. Given that the Skewness results fall within -1 and 1, the series are symmetry, normal distribution is underlying the distribution that is more peaked (as read from the Kurtosis statistics of greater than one).

Inferential Analysis

Considering the volume of capital inflows (model 1 and 2), the effect of interest rate differential, the key explanatory variable, is significant, however negative. This implies that as the interest rate differential increases, the volume of

Table 1: Variable definition and use in literature

Variable	Definition	Application in lit.
Financial inflows	There are different forms of financial flows foreign direct investment, foreign portfolio investment and other investments (bank loans).	Kumar et al. (2014); Fedderke and Liu (2002); Fedderke (2002)
Interest rate differentials	The US TB rate is considered the foreign rate. while South African TB is taken as domestic	Kumar et al. (2014); Fedderke and Liu (2002); Pastor 1990
GDP	To capture economic growth, the macroeconomic environment	Industrial production index in Kumar et al. (2014)
Stock market index	All share index to reflect stock market development	Kumar et al. (2014)
Inflation	Measure economic stability. High rate of inflation erodes value of money.	Kumar et al. (2014); Lensink et al. (2000)

Source: Authors

Table 2: Descriptive statistics of used variables- 1990-2012

Statistic	FPI (Rmil)	IDF (%)	ALSI(x)	CPI	GDP(Rmil)	OFI(Rmil)
Mean	540167.8	7.160848	15582.09	6.426316	372818.2	208358.6
Median	320168.0	6.852250	10131.72	6.250000	357616.0	178302.0
Maximum	1543214.	15.45817	38170.38	13.40000	503466.0	414940.0
Minimum	67333.00	2.179867	4846.465	0.400000	261765.0	72909.00
Std. Dev.	435457.8	2.701443	10219.82	2.816256	70432.96	97635.84
Skewness	0.839654	0.450647	0.667811	0.116804	0.244707	0.549659
Kurtosis	2.514144	3.038561	1.870182	2.749773	1.655896	2.214129
Observations	76	76	76	76	76	76

Source: Authors

capital flows to South Africa declines. This is however counter-intuitive as the opposite is expected. It is, however, imperative to note that capital flows are attracted by many factors other than the interest rates; the overall return is the key which takes into account risk and prospects (Grenville 2008). Other factors such as domestic developments, for example, all-encompassing policies and vibrant economic performance (proxy for accountable use of funds) play a significant role (Reinhart 2005).

Of importance to note is that South Africa has been competing with other emerging economies for the same investments, especially the Asian and Latin American countries which have over high yields as well as positive prospects due to sustained positive economic growth trends (Reinhart 2005). This can be construed in line with Robert Lucas' puzzle, positing that capital does not necessarily flow from richer to poorer countries. This can only be explained by key underlying economic forces, which include spill over effects of human capital formation attracting more investment to already capital rich countries. In the same vein, Business Tech (16 August 2015) reported that South Africa is ranked the 11th of most risk countries, and is in the league of Russia, Brazil and Turkey (where Venezuela, Greece and Ukraine takes the top three spots in that order), owing mainly to its domestic spending policies. The rank is based on the credit default swap spreads data from Bank of America.

Kawai and Lamberte (2010), invoking Grubel (1968), argued for the Wicksellian 'natural' rate of interest in explaining the positive interest rate differential in emerging and developing economies against the impossibility trinity. Even though such interest rate exists, the authors argued that it does not necessarily translate to positive capital inflows. Considering it a structural issue than cyclical one, Kawai and Lam-

berte (2010) highlighted that poor policies and inefficiencies are key explanations to such paradox of Robert Lucas. To further complicate the paradox, Hassan (2015) concluded that interest rate differential drives inflows of capital only when volatility is low. Such conditional factors need to be taken into account for the purpose of understanding the role of macroeconomic environment on the relationship and/ or influence of interest rate differential on capital flows.

Key macroeconomic indicators have been controlled in this estimation. Higher inflation, indicating greater uncertainty in the local market, leads to capital flight as there is a negative relationship with capital flows, with foreign portfolio investment of more high flight risk (model 1). This corroborates the findings of Dooley (1988), Ayadi (2008) and Daves (2008). Such fear of risk has exacerbated the outflows even if interest rate differentials are high, as discussed above. Every investor is willing to come where there is more certainty and, as shown by the positive effect of economic performance, economic growth indicates hope for more returns and capital flows (other foreign investments) increase (model 2). Overall, the effect of interest rate differentials is more on other investment than on portfolio investment at levels (coefficients on model 1 compared to model 2).

The effect of interest rate differential on net capital flows is positive and significant in most of the cases (model 3, 4, 5, 6 and 7), corroborating the theory that capital follows where there are high returns. As positive net flows are experienced when interest rate differentials are high, this explains the currency appreciation among emerging markets, South Africa included, as investors sought safe havens (Acharya and Bengui 2016; Zoega 2016). Model 3 and 4 show a positive coefficient of interest rate differentials,

vindicating the above argument. The phenomenon is two-fold: firstly, interest rates among emerging economies were attractive (positive interest rate differential) and the financial crisis was wreaking havoc in developed economies, where it originated.

On the other hand, the resilience of the South African stock market attracted more investors, as depicted in the positive coefficient on stock market development. Furthermore, high uncertainty (proxied by inflation) reduces other foreign investments, so does economic growth. When the economy is doing well, firms can generate good profits and retain most for business expansion, thereby, reducing borrowings, especially from foreign banks.

Of significance during the period under study is the 2008/2009 global financial crisis. The study also estimated pre-crisis period model versus a post crisis one. There is a positive effect of interest rates differential on foreign capital flows during the pre-crisis period (model 5 and 6); the effect is, however, weaker for net foreign portfolio investment (model 5). On the other hand, when crisis dummy was added to the full sample (model 6 and 7), the effect of interest rates differential on both other investment and portfolio investment becomes weak out of the crisis (IDF coefficient of model 7 and 8).

However, when IDF is interacted with the crisis dummy to capture the effect of interest rate differential, specifically in the crisis period, the results are strong and statistically significant. There is a negative effect on net portfolio investment, while a positive effect is observed on other investments. During the crisis period (in South Africa the crisis was at peak during 2008/2009), hot capital escaped, to other regions that were not in severe crisis the US and other industrialised economies that were recovering (Griffith-Jones and Gallagher 2011). The resilience of other foreign investments could be explained by contractual obligations that existed in line with the conclusion in Sarno and Taylor (1999) that commercial bank credit appeared more permanent than equity and bond flows. Similar conclusion has also been reached in Verma and Prakash (2011). In related study, Griffith-Jones and Gallagher (2011) indicated that this phenomenon known as 'carry trade' happens mainly with short term capital and has been influence by interest rate differentials. Brazil and South Korea are highlighted as examples of economies

which suffered from currency appreciation resulting from such 'carry trade'. If it were portfolio investment, then contractual obligations could be relating to margin sales in the bond market. However, the higher interest rate differential could not counter the possible default risk due to the financial crisis, hence portfolio investment inflows dwindled.

According to the South African Reserve bank (2013), loans and foreign deposits in the local banking sector were attracted by the positive interest differential during the financial crisis period. Besides, South African banks showed much resilience to the financial crisis and became more attractive to many international depositors. Furthermore, Ahmed and Zlate (2013) explained the negative effect of financial crisis (risky scenario) on the relationship between interest rate differential and net portfolio investment (crisis*idf coefficient in model 7). On this note, Griffith-Jones and Gallagher (2011) raised concerns with the immediate reversal of capital flows soon after financial crisis exposing emerging economies to worst growth outcomes- a result which economists agree could be avoided by capital controls (IMF 2010; Ostry et al. 2010). However, it is imperative to note that the capital inflows are need for an economy desperate for long-term financing on development of infrastructure like South Africa (Azis and Yarcia 2015).

During the crisis period, from the second quarter of 2008 to the third quarter of 2009, other investments flowed heavily into South Africa as the interest rate differential was widening. Other foreign investors (ofi) proved to weigh interest rate more than the risk in decision making, as compared to foreign portfolio investment during the crisis period, see model 7 and 8 in Table 3. The results are consistent with Fratzcher's (2011) finding that the global financial crisis had a negative impact only on foreign portfolio investment to South Africa and, as a result, there was a decrease in foreign portfolio investment in 2008/2009 as with many other emerging economies. Further, Griffith-Jones and Gallagher (2011) noted the differences in response to interest rate differentials by different capital flows. On the other hand, the effect of inflation, stock market development and economic performance remained the same as discussed above, even when crisis dummy was included. On the other hand, European Central Bank (2016) attributed capital reversals to growth differentials post global fi-

Table 3: VECM estimation results

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. variable	FPI	OFI	Nfpi	nofi	nfpi- Pre-crisis	nofi- Pre-crisis	nfpi- crisis dum	nofi- crisis dum
Ind. Variables logASI				271327.3 (45637.6) [5.94526]	201846.7 (27112.0) [7.44492]		98243.64 (19135.6) [5.13408]	
logCPI	-0.416308 (0.16694) [-2.49369]	0.107137 (0.14421) [0.74290]	13614.87 (7533.03) [1.80736]	-65051.45 (8922.33) [-7.29086]	-9394.089 (1484.43) [-6.32842]	3783.797 (829.918) [4.55924]	-3568.382 (1011.86) [-3.52656]	1677.767 (628.432) [2.66977]
logIDF	-0.977201 (0.27324) [-3.57632]	-1.214209 (0.25955) [4.67814]	34509.79 (12240.2) [2.81938]	27231.73 (15137.5) [1.79895]	2450.000 (1528.96) [1.60239]	13558.15 (5174.62) [2.62012]	-658.9460 (6614.66) [-0.09962]	6415.713 (4212.22) [1.52312]
logGDP		1.368916 (0.47444) [2.88531]	34445.28 (21028.6) [1.63802]	-901335.8 (156044) [-5.77617]	-667389.4 (90338.6) [-7.38764]	49969.27 (14712.4) [3.39639]	-326710.6 (66399.0) [-4.92041]	30883.02 (8132.42) [3.79752]
CRISIS(-1)* LOG(IDF(-1))	-	-	-	-	-	-		
EC	-0.156749 (0.04542) [-3.45116]	-0.112055 (0.03529) [-3.17544]	-0.355440 (0.18464) [-1.92502]	-0.152661 (0.05512) [-2.76964]	-0.133385 (0.10338) [-1.29020]	-0.891343 (0.19669) [-4.53182]	-0.690236 (0.14134) [-4.88335]	-0.980310 (0.16734) [-5.85836]
R-squared	0.32181	0.185777	0.460608	0.426897	0.266239	0.674234	0.581257	0.610257
Adj. R-squared	0.17238	0.085565	0.341759	0.366114	0.159232	**0.570942**	**0.529719**	**0.555450**

Source: Authors

nancial crisis other than mere interest rate differential.

The results presented above revealed that the two types of capital flows considered in this study do not necessarily experience the same effect, or, to put it differently, they respond to same factors differently. As a result, when policies are formulated capital flows should not be bundled, but an understanding of each type of flow and its behaviour will be critical for effective policy. The same observation has been made by Davis (2016) in which case the current account balance is a key factor.

The results observed, mainly during the financial crisis, with differences in sensitivity of capital flow types to interested rates, differential are also revealed in variance decomposition results. Variations in other capital inflows are explained up to 42 percent by IDF in the 10th quarter two and half years, while only half of that is explained for portfolio investment. This is shown in the variance decomposition results presented in Table 4. As much as both capital flows react to interest rate differentials, the speed at which that happens varies (Griffith-Jones and Gallagher 2011), although both react to about 7 percent in the first year, other foreign investments double in the first quarter of second year,

while portfolio investment is still just under 10 percent.

Another unique differentiation is that foreign portfolio investment is stickier (European Central Bank 2016), as it explains its variation of up to 65 percent in more than two years (that means other factors only explain up to 35 percent), while other foreign investments have other variables explaining up to 45 percent of its variation in the same period. This implies that other foreign investments are more responsive to the condition of the economy than portfolio investment (Davis 2016). Foreign portfolio investment is reactive to factors that vary mainly in the short term (like interest rates), compared to portfolio investment that reacts more to long term factors like economic growth (up to 8 percent) and stock market development (up to 5 percent) over two-and-half years (this is in comparison to about 1 percent apiece for other investments) (Griffith-Jones and Gallagher 2011).

CONCLUSION

Global financial crisis received diverse responses from policy makers around the globe, one such action being changes in interest rates that resulted in new interest rate differentials,

Table 4: Variance decomposition

Period	S.E.	LOG(OFI)	LOG(ALSI)	LOG(CPI)	LOG(IDF)	LOG(GDP)
1	0.102345	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.128843	98.94061	0.001051	0.706668	0.351670	4.74E-06
3	0.148954	95.99027	0.015701	1.303272	2.426360	0.264399
4	0.169215	91.04068	0.013555	1.661327	6.888317	0.396121
5	0.191100	84.86943	0.087897	1.560435	13.03573	0.446508
6	0.215137	78.15346	0.283779	1.270662	19.81827	0.473830
7	0.240902	71.46186	0.514325	1.013590	26.47089	0.539339
8	0.267789	65.23447	0.691431	0.832782	32.58088	0.660437
9	0.295232	59.74632	0.798980	0.703958	37.93918	0.811560
10	0.322759	55.11406	0.862527	0.608240	42.46348	0.951692
Period	S.E.	LOG(FPI)	LOG(ALSI)	LOG(CPI)	LOG(IDF)	LOG(GDP)
1	0.094218	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.114124	97.91612	0.314075	0.094949	1.468846	0.206009
3	0.131821	89.51016	2.544407	0.164604	4.013842	3.766983
4	0.152796	82.13530	4.603667	0.424533	6.937887	5.898614
5	0.172926	77.76497	5.490049	0.476289	9.701472	6.567215
6	0.191558	75.08759	5.543416	0.388699	12.23749	6.742808
7	0.209092	72.73528	5.285948	0.406865	14.67188	6.900024
8	0.226076	70.17690	5.014318	0.551703	17.03199	7.225088
9	0.242868	67.52848	4.829624	0.716015	19.24103	7.684851
10	0.259481	65.07563	4.732129	0.835720	21.20561	8.150914

Source: Authors

especially between developed and emerging economies. This paper set out to investigate the response of capital flows, as represented by portfolio investment and other foreign investment, to interest rate differentials for the South African economy between 1990 and 2013 controlling for the global financial crisis. After the application of econometric techniques on the time series data, the results show that capital flows are sensitive to interest rates and risk, with portfolio investments more responsive to the latter and other financial flows to the former. Some results are contrary to theory; however, the paradox can be explained by factors like human capital formation externalities and risk profiles of the respective economies.

RECOMMENDATIONS

Given the above results and discussion, the study provides recommendations to policy makers and future researchers. In terms of policy, it is important to ensure that the macroeconomic policies are transparent, for example, the bailing out of parastatals should be transparent and should be done within clearly stipulated time frames. Having a framework to review the bail-out programme with key decision points of whether to continue or stop the bail-out helps to give investors much confidence.

The South African financial system regulatory framework is sound and yielding the desired results, given the resilience to financial shocks during the global financial crisis, the authorities should continue implementing the Basel recommendations. There is always a call from market stakeholders like the manufacturing cycle for the South African Reserve Bank to act on the exchange rate, however, this study recommends that exchange rate determination be left to the market forces. However, the economy can benefit from capital flows control as long as it is underpinned by clear macro prudential policies. South Africa needs to invest heavily in human capital formation which will assure investors of good use of funds and, therefore, potentially low risk. Externalities to human capital formation have become a key distinguishing factor to where capital flows, regardless of interest rate differential.

Although there is little that any economy could do to prevent a financial crisis, there is room to mitigate the effects by building resilient institutions. The work of the South African banking sector is highly commendable in this regard and this study recommends continued close supervision of the sector, restricting investment in toxic assets as well as much foreign exposure. This will make the sector more attractive to international depositors bringing in more other foreign investment. For portfolio investment, the best approach could be to reduce other uncertainties and risks (example, political) to dilute the overall risk of investing in the economy; this can only aid to reduce capital flight rather than stopping it.

South Africa needs to work on its current account balance, to improve it to positive, as the deficit puts it in a position to try to follow US Fed rate changes and lose out on the interest rate differential dividend. Domestic savings need to be encouraged, especially by regulation of interest rate spread which is exceedingly high in South Africa compared to the rest of the world.

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