

**AN EMPIRICAL STUDY OF THE RELATIONSHIP BETWEEN CAPITAL FLIGHT
AND ECONOMIC GROWTH IN SOUTH AFRICA (1970-2010).**

JULIUS K.T NYAMWENA¹

Cell: 0619164885

Email: tinahnyam1@gmail.com or juliusn@uj.ac.za

¹ Julius K.T Nyamwena is a Junior Researcher at the University of Johannesburg Centre for Competition, Regulation and Economic Development

ABSTRACT

Capital flight represents a stumbling block in the mobilization of domestic resources since it intensifies the inadequacy in resources that could have been used productively hence undermining economic growth prospects. It is estimated that Sub-Saharan Africa for the period 1970 to 2010 lost about US\$814 billion as capital flight measured at 2012 prices. This implies that Sub Saharan Africa is losing huge resources that could have been reinvested to stimulate economic growth in the continent. South African alone was estimated to have lost more than US\$38 billion in capital flight during that same period. South Africa ranks among the top five nations in the continent suffering from this economic ill. The purpose of this study was to interrogate the relationship between capital flight and economic growth in South Africa given the large volumes of capital that have fled the country. Economics theory asserts that the availability of capital is a major factor IN increasing productivity. This study uses time-series data for the period 1970 to 2010 and employing the Vector Error Correction Model (VECM) approach to test the relationship. The study adopted the estimates of capital flight by Ndikumana and Boyce (2012). The results of the VECM approach indicates that there is a negative relationship between capital flight and economic growth in South Africa. Thus to address this economic ill the study recommends encouraging people to invest domestically, this can be done through the fostering of investor-friendly policies and guarantying the security of investors' funds. Secondly, illegal financial leakages should be scrutinised and the macroeconomic environment should be stable to build confidence in the domestic economy.

JEL Codes: F38, F62, F63, G28

Keywords: Capital Flight; Economic Growth, South Africa

1. Introduction

Recent studies have shown that capital flight impedes economic development in Sub-Saharan Africa. One particular study is the work of Ndikumana & Boyce (2012) who estimated that Sub-Saharan Africa (SSA) during the period 1970 to 2010 has ceded about \$814 billion as capital flight measured at 2010 prices. This is against the backdrop that SSA during the same period received an estimated \$306 billion as foreign direct investments. Therefore, SSA is losing resources that could have been reinvested to stimulate economic growth in the continent through capital flight. An explanation to this large outflows has been attributed to a huge debt stock that comes with the burden of repayment at a later date and as well as the debt servicing cost.

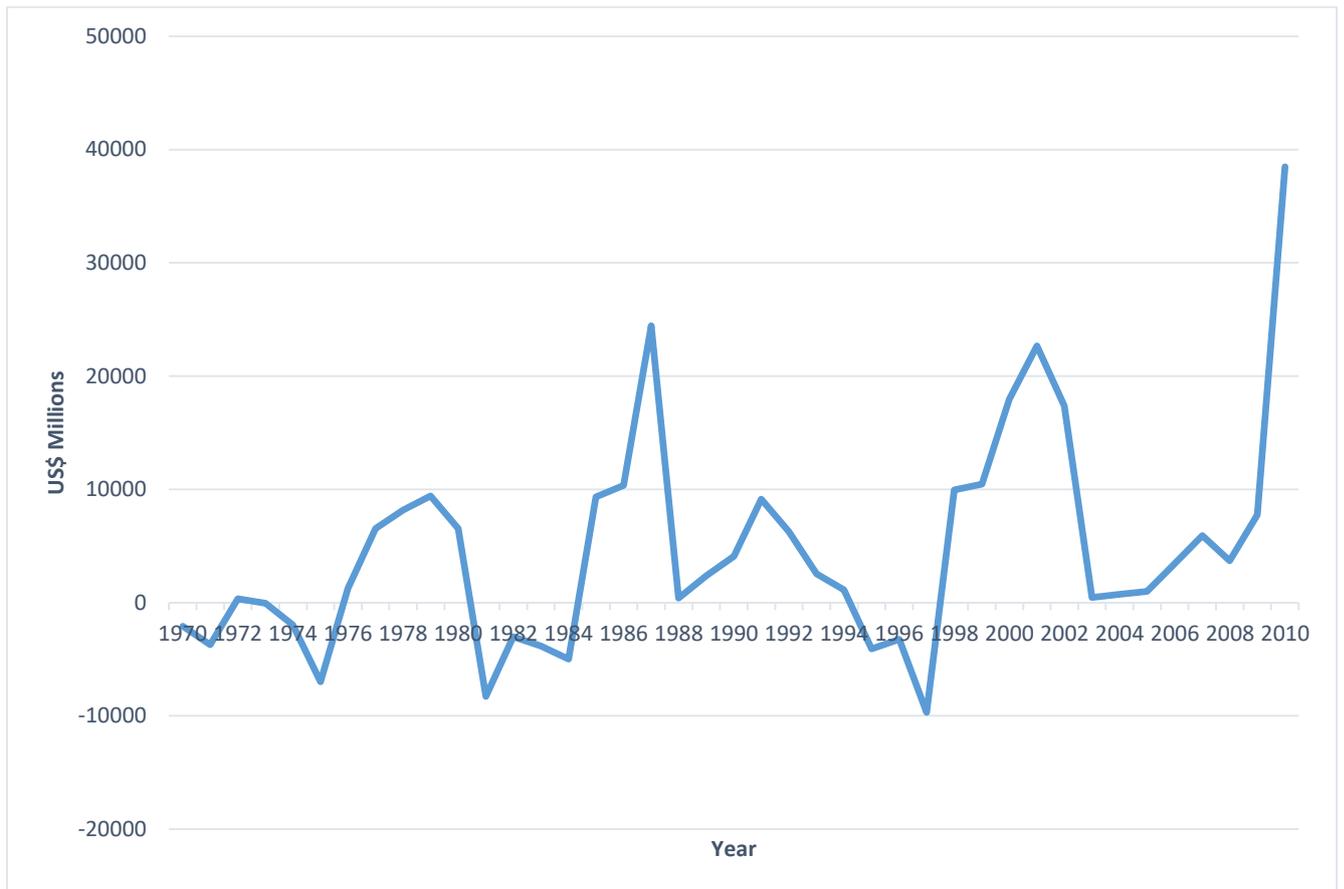
According to Ndiaye (2011) capital flight is promulgated from both the private and public authorities. He identifies that the private agents are likely to engage in capital flight when there is an unstable political environment, macroeconomic uncertainty, rudimentary financial system and when the opportunity cost to not invest abroad is higher. These factors have the implications of reducing the number of private investments and a fall in private investors tend to be associated with a reduction in economic growth. Thus capital flight reduces the savings base in a country that represents a potential investment by shifting it abroad. Ndiaye (2014) posits, that the action of public authorities can fuel capital flight through poor governance and weak institutions. Public authorities in some instance abuse their positions to accumulate wealth via corrupt tendencies by investing this wealth abroad (Ndikumana & Boyce, 2001). This deprives the economy of further public investment caused by the deviation of public resources for personal use leading to adverse effects on economic growth (Ndiaye 2014).

This paper's primary objective is to econometrically analyse the relationship between capital flight and economic growth in South Africa. According to Olugbenga & Alamu (2013), South Africa ranks among the top five countries suffering from capital flight. The list is led by Nigeria followed by Egypt, Algeria, Morocco, and South Africa. Thus this paper seeks to determine the relationship between capital flight and South Africa economic growth.

1.1 South Africa and Capital flight

This section provides a historical perspective on the trend in capital flight between 1970 and 2010. The figure below shows the amount of capital flight in US dollars that has left South Africa during this period 1970-2010.

Figure 1: Capital Flight Trend from 1970 to 2010



SOURCE: Authors illustration using Boyce and Ndikumana 2012 capital flight estimates

In the early year's capital flight from South Africa was relatively oscillating below zero, a negative value in capital flight indicates that received more funds from the rest of the world than it would have transferred. Thus, during the 1970 to 1976 South Africa was receiving large inflows of capital. However, as from 1976 to 1980 the trend rises depicting the scenario where the capital flight was positive implying that some capital had left South Africa. To be precise on average South Africa lost more than 6 billion dollars at 2010 constant prices in the form of capital flight. The graph also shows another peak of sustained capital flight from the year 1984 to 1988. During this period the year 1987 recorded the capital flight of an estimated 24 billion that was transferred abroad. A possible explanation of this can be attributed to the fact that during this time South Africa was under apartheid and as mentioned politically unstable environments motivate the practice of capital flight.

The fall of apartheid in South Africa in 1994 and the ushering in of a new democratically elected leadership saw the level of capital flight, dropping into the negative regions. Thus confirming that indeed stable political environments are investor-friendly. However, since the year 1998 capital flight has been in the positive region. In particular, in the year 2000 more than 22 billion

dollars were transferred abroad. Another notable feature of the graph suggests that as from 2008 capital flight has been on an upward trend. As at the year 2010, South Africa was estimated to have lost more than 38 billion dollars which is a large volume of capital.

The purpose of this study is to ascertain the relationship between capital flight and economic development in South Africa given the large volumes of capital that have fled the country. The South African literature on a capital flight has largely been dominated by studies that focus mainly on the causes and explanations of this phenomenon (Mohamed & Finnoff, 2005, Fedderke & Liu, 2002, Wood & Moll, 1994, Smit & Mocke, 1991, Zavareh, 1991). This paper contributes to providing empirical econometric evidence on the relationship between capital flight and economic growth in South Africa.

The remainder of the paper is structured as follows, section two provides a literature review on the area under study while section three indicated the research method and model adopted for the study. Section four presents the empirical results and discussion.

2. Literature Review

The traditional neoclassical growth that was initially instigated by Harrod–Domar and Solow models gives prominences to three key factors that are critical in stimulating economic growth. These three are namely labour, capital, and technological progress. Improvements in labour may be a result of changes in the quantity and quality of the labour force while increases in capital are represented through changes in the savings and investments (Solow, 1956).

Beja (2005) postulates that capital flight is usually unobservable and it is unclear why people engage in it. He defines capital flight “as the net unrecorded capital outflows from a capital scarce developing country”. The unrecorded capital outflow emanates from the difference between recorded sources and recorded uses of funds.

Ndikumana & Boyce (2012) indicate that capital flight is a serious development challenge not only in Africa but all over the world. A United Nations Development Programme (UNDP) 2011 report exposit that in areas where capital flight occurs it poses a key stumbling block in the mobilization of domestic resources. This is because capital flight intensifies the inadequacy in resources that could have been used productively hence undermining economic growth prospects. The following channels show how capital flight can influence economic development. Namely capital flight affects economic growth through the investment channel,

eroding the tax base, difficulties in the balance of payments, financial system and corruption (Ndiaye 2014).

The transferring of capital abroad slows down the rate of capital accumulation since residents prefer to send their savings away. If unabated this will lead to a reduction in the domestic savings which are key in financing new and old investments. Ndikumana and Boyce (2009 & 2012) underscore that capital flight drains valuable national resources and in turn lowers the domestic investment within the country. This reduction in domestic investments will negatively affect the rate of economic growth since investments in economic theory has a positive relationship with economic growth (Ndiaye, 2011). Therefore, capital flight represents a serious development challenge since it curtails the mobilization of resources which are critical for long-run economic growth.

The adverse effect of capital flight on economic growth is well documented in the literature. This is attested by the vast number of studies that have been done on the area both in the 20th century and 21st century. This study discusses some of these studies but it is important to note these studies are not an exhaustive list of all the studies.

Beja *et al.* (2005) in their study of capital flight from Thailand explore the link between capital flight and economic growth for the period 1980 to 2000. Basing their analysis on what economic theory suggest that economic growth, high rates of return to capital making capital holders not to pull away from their funds abroad. Using trend analysis to test this relationship between these variables over 20 years. Real gross domestic product (RGDP) was used as a measure of economic growth while the capital flight was measured using the share of capital flight (measured using the residual method) to RGDP. Their analysis confirms that economic growth and capital flight are inversely related hence supports the assertions from theory. However, it is inconclusive to base the results merely on a trend of 20 years, thus there is a need for the use of robust econometric techniques to dissect this link between economic growth and capital flight. While it is not the only study using the trajectory analysis of capital flight and economic growth, a study by Almounsor (2005) concludes that there is a negative relationship between capital flight and economic development in the Middle East North Africa (MENA) region.

Cervena (2006) investigated the relationship between capital flight and economic growth in several countries from East European Africa, Latin America, and Asia. The General least-squares method was used to estimate this relationship. The findings of the study confirmed

that capital flight had a significant and negative impact on the economic growth of selected countries.

In 2007 Beja (2007) examines the relationship between capital flight and economic performance in the Philippines. The estimation technique was based on the Incremental Capital Output Ratio (ICOR) computations and capital flight was measured using the residual method using annual time series data from 1970 to 1999. Beja (2007) findings indicate that capital flight in the Philippines resulted in sluggish economic growth because of its negative effect on the mobilisation of resources in the country that weakens economic growth. The study reinforces the need to speed up the implementation of policies that address the issue of capital flight.

Forgha (2008) employing the Two-stage least-squares method in his study on the effect of capital flight and economic growth in Cameroon for the period 1970 -2005. The residual method was used to estimate capital flight. The study found that capital flight from Cameroon has a significant negative effect on the country's economic growth. The findings are in line with the expectations from the theory that it lowers economic performance.

A study by Lan (2009) on selected countries in the Association of Southeast Asian Nations (ASEAN) examines the relationship between capital flight and economic growth using the Autoregressive distributed lag bounds test approach to cointegration. Time series data for the period 1972 to 2005 was used while the residual method was used to measure capital flight. The study reveals that capital flight does have a significant and negative effect on economic growth in selected countries of the ASEAN.

In Nigeria, several studies have been carried out on the relationship between economic growth and capital flight. Bakare (2011) using the autoregressive vector model examines the aforementioned relationship for the period 1988-2010. The gross domestic product was used as an indicator of growth and capital flight was measured using the residual method. The research findings indicate that capital flight has a negative relationship with economic growth in Nigeria. Another study Nigeria by Oke & Kolapo (2012) investigated the relationship between economic growth and capital flight determinants using the Johansen cointegration test on data for the period 1985 to 2010. The estimated values of capital flight were based on the residual method and capital flight was expressed as a ratio of GDP. Their results suggested that in Nigeria inflation and exchange rates are the prime motivators of capital flight. They concluded that they had a negative relationship with the economic growth rate.

In contrary to the above studies, in another study in Nigeria by Saheed & Ayodeji (2012) using the ordinary least squares method found a positive relationship between capital flight and Nigerian economic growth. Similarly, Adesoye *et al.* (2012), also came to the same results that capital flight exerts a positive influence on economic growth. However, this defies theory expectations that capital flight can have a positive impact on national economic growth.

Olugbenga & Alamu (2013) also in Nigeria carried out a study on whether capital flight has an impact on economic growth for the period 1981 to 2010. Using the residual method to estimate the amount of capital flight that has left Nigeria and GDP they employed the Johansen cointegration test. Their findings confirm that there is cointegration among the variables in the long run and that capital flight has a negative effect on economic growth. However, Olugbenga & Alamu findings further state that this is only in the short run because they discovered also that capital flight does also have a positive impact on economic growth in the long run. They attributed this positive impact basing on the importation of capital goods which is an outflow in the first place but has the effect of stimulating growth in the economy when it starts to be productive.

A cross-study on African countries in the Franc zone by Ndiaye (2014) examined the effect of capital flight on economic growth for the period 1970 to 2010. In this study, Ndiaye used GDP per capita as a measure of the growth rate and the ratio of real capital flight to GDP to represent the capital that had left these countries. The estimates of capital flight were derived from the adjusted World Bank Method and Morgan Guaranty Method. The General Method of Moments (GMM) was used to determine the effect of capital flight on economic growth. His findings showed that capital flight significantly reduces the rate of economic growth in the Franc Zone. Thus the result was in line with the theoretical explanations and consistent with other empirical studies that have found similar results (Cervena 2006, Forga 2008, Gusarova 2009).

Obidike *et al.* (2015) investigated the impact of capital flight on economic development in Nigeria. Using time-series data for the period 1981 to 2011, capital flight was measured as the summation of net inflows in foreign direct investments, current account balance, increase in external debt and foreign reserves. They employed the Autoregressive distributed lag (ARDL) model since they posit that investor's expectations are derived on the previous performance of the economy. Their results indicate that capital flight on Nigeria has a significant negative effect on economic development. These results are also in line with other empirical studies that have found similar results.

3. Research Method

3.1 Model Specification

This study uses annual time-series data from the year 1970 to 2010 to establish the relationship between capital flight and economic growth in Zimbabwe. Data on capital flight estimates were sourced from the Political Economy Research Institute (PERI) website that was calculated by Ndikumana and Boyce (2012) while the remaining variables were all collected from the World Bank data source. The reason for this was that capital flight was measured in (US\$) dollars thus all the variables were obtained from where there are all expressed in the same currency.

Therefore, the model was specified as follows;

$$RGDPC_t = \beta_1 + \beta_2 REER + \beta_3 GFCP_t + \beta_4 INF_t + \beta_5 KF_t + \mu_t$$

Where:

RGDPC refers to the real GDP per capita in year t and $RGDPC_{t-1}$ is the real GDP per capita in the previous year.

REER refer to the real effective exchange rate

GFCP refer to gross fixed capital formation

INF refers to the inflation rate

KF: refer to capital flight as a share of GDP

The variables REER, GFCP, and INF entered this equation as a control variable. This was guided by other empirical studies, in particular, the work of Ndiaye (2014). Control variables are important in that they make the estimated model better by capturing other elements that are not attributed to the two variables under inspection.

Definition and Justification of Variables

Real Gross Domestic Product per Capita (RGDPC):

This variable enters a measure of economic growth. The preferred measure adopted in this study is the real GDP per capita in annual percentage. This conforms with other empirical studies that have used it to represent economic growth (Ndiaye 2014, Obidike *et al.* (2015).

Capital Flight (KF):

This study in line with the work of Boyce and Ndikumana (2012) defines capital flight as unrecorded capital outflows in a country to the rest of the world. The expected prior is that capital flight has a negative influence in economic growth. The new estimates of capital flight

based on the residual method by Ndikumana and Boyce were used in this study. This variable was expressed as a ratio of GDP.

Gross Capital formation (GFCP):

This variable enters the model as a proxy for investment which is a key determinant of economic growth. The expected priori is that it has a positive effect on the economic growth rate.

Inflation rate (INF)

Similarly, to gross capital formation inflation comes in as a control variable and the prior expectation is that it has a negative effect on economic growth.

Real effective exchange rate (REER)

This variable also entered the specified model as a control variable and it is expected that it has a positive relationship with economic growth.

3.2 Method of Estimation

To investigate the relationship between capital flight and economic growth in South Africa the study employed the Vector Error Correction Model (VECM). Before an estimation was done all the variables were tested for the presence unit root. This test checks whether the mean and variance of the variables under study are constant over time. The presence of unit root has the consequences of generating spurious regressions. This will make the results less reliable and biased. To test for a unit, root the Augmented Dickey-Fuller test was used, the decision rule is that the variable is stationary if the calculated statistic value is greater than the critical value in absolute terms.

After determining stationarity, the subsequent test was the cointegration test which measures the long-term relationship between the variables, whose existence guarantees that the variables demonstrate no inherent tendency to drift apart. Johansen Cointegration tests (Johansen1988; Johansen and Juselius, 1990) were used to tests for cointegration.

3.2.1 Vector Error Correction Model (VECM)

Henry (2010) states that once cointegration has been determined, then the most appropriate specification to determine the relationship of the variables is the VECM approach. This approach, unlike the Granger causality test, can establish the direction of causality.

4. Empirical Results and Discussion

4.1 Unit Root tests

The table below shows the Unit root test using the formal tests known as the Augmented Dickey-Fuller.

Table 1: Augmented Dickey-Fuller Unit Root Test

Variable	T-statistics	Critical values			Decision
RGDPC	-4.3054	***	**	*	I(0)
		-3.6056	-2.9369	-2.6069	
KF	-4.3662	-3.6104	-2.9390	-2.6079	I(0)
GFCP	-4.4740	-3.6105	-2.9390	-2.6079	I(0)
INF	-5.5314	-3.6156	-2.9411	-2.6091	I (1)
REER	-5.0743	-3.6156	-2.9411	-2.6091	I(1)

Where *** is 1% level of significance, ** 5% level of significance and * 10% level of significance

Source: Authors Eviews Output

Table 1 shows the results of the formal test which indicate that three variables RGDPC (economic growth), capital flight (KF) and gross fixed capital formation (GFCP) were stationary at levels I (0) while inflation rate (INF) and the real effective exchange rate (REER) were stationary at first difference I (1). Thus from the results, we have a mixture of I (0) and I (1) variables we may proceed to test for cointegration. Before carrying out the cointegration test it is critical to determine the number of lags. The Lag order statistics are shown in table 2 below.

Table 2 Determination of Lags

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-438.442	NA	152503.1	23.2864	23.4588	23.3477
1	-384.8989	92.9952	21270.9*	21.3105*	22.1724*	21.6171*
2	-374.7370	15.5103	29818.90	21.6177	23.1691	22.1697
3	-358.4772	2103945	31809.19	21.6040	23.8450	22.4014

Source: Authors Eviews Output

*indicates lag order selected by the criterion

LR: Sequential modified LR test statistics (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

The table indicates that lag order is one based on all of the tests hence moving forward all the tests were done with lag order specified as (1).

4.1 Cointegration test

The Johansen Juselius cointegration test was used because according to Pradhan (2011) it is more advanced and powerful than the other tests. The test is based on two hypotheses, the null hypothesis which says there is no cointegration against the alternative which states that there is cointegration. The following Table 3 presented the cointegration results.

Table 3: Cointegration Test

Johansen Cointegrating Test

Test	Hypothesized No of CEs	Eigenvalue	Trace/Max Eigen	5% Critical value	Probability
Trace test	None*	0.622475	9231961	69.81889	0.0003
	At most 1	0.5000586	54.32899	47.85613	0.0109
	At most 2	0.36958	27.25055	29.79707	0.0956
Max eigen value	None*	0.62247	37.99061	33.8768	0.0152
	At most 1	0.50058	27.07845	27.5843	0.0579
	At most 2	0.36958	17.99171	21.13162	0.1302

Source: Authors Eviews Output

Trace test indicates 2 cointegrating equations at the 5% level

Max-Eigen test indicates 1 cointegrating equation test at the 5% level

- Denotes rejection of the hypothesis at the 5% level.

Trace test and Max-Eigen test indicated conflicting results at 5% level of significance. The Trace test suggests that there two cointegrating equations while the Max-Eigen test indicates one cointegration equations. However, in cases of a multivariate framework, it has been seen that Max- Eigen test has greater power. Hence, in a multivariate structure, it is better to follow

Max - Eigenvalue statistic (Eviews.com). Therefore, this paper adopted the results of the Max-Eigen test which indicates one cointegration equation.

The table below shows the normalised cointegrating coefficients results of one cointegrating equation.

Table 4: Normalised Cointegration Results

Normalized cointegrating coefficients (standard error in parentheses)				
RGDPC	INF	GFCP	REER	KF
1.000000	1.249344	0.7539	-0.034198	0.001797
	(0.24421)	(0.15954)	(0.02411)	(0.10785)

Source: Authors Eviews Output

The normalised cointegration based on the table is as follows

$$RGDPC - \beta_0 + 1.249INF + 0.7539GFCP - 0.034198 REER + 0.001797KF = 0 \quad (1)$$

Reversing the signs of the estimated coefficients in equation 1 results in

$$RGDPC = \beta_0 - 1.249INF - 0.7539GFCP + 0.034198REER - 0.001797KF = 0 \quad (2)$$

The second equation represents the estimated equation. The results of the long-run relationship indicate that capital flight has a negative relationship with economic growth in South Africa. This result is in line with the priori expectation that capital has a negative relationship with economic growth. A one percent increase in capital flight leads to a 0.001797% decrease in economic growth. The findings of this study are in line with other studies such as Obidike et al. (2015), Ndiaye (2014) and Cervena (2006) that also found a negative relationship between capital flight and economic growth

The findings indicated also that gross fixed capital formation and inflation have a negative relationship with South Africa's economic growth measured as real GDP per capita. The exchange rate measured as real effective exchange rate (REER) has a positive relationship with economic growth in South Africa. Gross fixed capital formation priori expectation was that it positively influences economic growth making the outcome of negative relationship rather surprising. However, other studies have come up with similar results, Pavelescu (2008) found out that in Germany and Portugal during the period 2000 to 2006 gross capital formation had a negative effect on the economies of both countries.

The results for inflation and the real effective exchange rate are in line with the priori expectation of a negative and positive relationship respectively.

4.2 Vector Error Correction model results

The outcome of the VECM captures both the long run and short-run relationship of the estimated relationship. The table below gives the outcome of the estimated VECM model.

Table 5: VECM Result

Variable	Coefficients	Standard Errors
D(RGDPC(-1))	-0.4242	0.14384
D(KF(-1))	-0.018408	0.04151
D(INF(-1))	-0.078174	0.15933
D(REER(-1))	-0.053145	0.03324
D(GFCP(-1))	0.183024	(0.05714)
CointEq 1 (ECT)	-0.305175	

Source: Authors Eviews Output

Table 4 also indicates the short-run adjustment coefficients. In this study, the error correction term (ECT) was -0.305175, which measures the speed of adjustment from the long-run disequilibrium. The econometric theory states that it should be negative to ensure equilibrium is attained. The ECT denotes the short-run adjustments towards equilibrium. The VECM results indicated that the speed of adjustment was 30.5175%, which imply that if the model is in disequilibrium in the previous year 30.5175% is corrected within one year

4.3 Conclusion and Policy Recommendations

The primary objective of this study was to determine the relationship between capital flight and economic growth in South Africa. In light of the huge volumes that have left the country during this period 1970 to 2010. The study of capital flight is important due to the huge social cost that it is associated with. The transferring of resources that could have been used productively undermines economic growth prospects. A Vector Error Correction Model approach was used to determine the relationship between capital flight and economic growth.

The result of the VECM approach suggested that capital flight has a negative relationship with economic growth in South Africa. These findings are in line with theoretical expectations which

stipulates that capital flight has a negative relationship with growth in the economy. Furthermore, the findings suggest that a percent increase in capital flight leads to a 0.001797% decrease in economic growth. In addition, the findings of this study are in line with other empirical studies such as Obidike et al. (2015), Ndiaye (2014) and Cervena (2006) that also got the same results. From the results obtained the error correction term specifies that roughly 30.5175% of the disequilibrium in the previous year is corrected within one year. The ECT denotes the short-run adjustments towards equilibrium. Therefore, this study managed to determine both the long run and short-run relationship between capital flight and economic growth and as well found that capital flight has a negative influence on economic growth in South Africa.

Capital flight reduces the savings base in a country that represents potential investment, shifting capital abroad translates to a loss in income, jobs and hence lower tax revenues. Therefore, to curb this economic ill it is imperative that capital flight should be discouraged by encouraging people to invest domestically, this can be done through the fostering of investor-friendly policies and guarantying the security of investors' funds. This is in line with the strategies identified by Boyce & Ndikumana (2014) to address capital flight through fostering domestic biased investments. They suggest that the development of domestic investment opportunities can help keep capital that otherwise would be shifted abroad legally or illegally as capital flight. In addition, the duo believes that this would also aid in attracting capital from abroad and take advantage of the remittances from the African diaspora.

Obidike *et al.* (2015) suggested that a stable macroeconomic environment reduces uncertainties in the economy. Secondly, the government should step up its efforts in controlling financial leakages especially via illegal channels and shady deals. Therefore, there is a need for some financial control to help reduce the amount of capital that goes offshore either unaccounted for or legally.

Lastly, the study recommends that although South Africa depends on the foreign inflows to augment the supply of capital given the low saving culture in the country. The government should take steps that ensure that same inflows do not culminate in possible leakages leading to capital flight. Thus while the country needs capital inflows the same inflows should not be lost as capital flight. Therefore, proper oversight of all capital flows should be implemented. Boyce and Ndikumana (2014) capital.

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