-RESEARCH ARTICLE-

THE RELATIONSHIP BETWEEN SOVEREIGN CREDIT RATINGS AND CAPITAL FLOWS: A CASE OF SOUTH AFRICA

Oliver Takawira*

Department of Finance and Investment
Management (DFIM), College of Business
and Economics (CBE); University of Johannesburg
South Africa
Email: otakawira@uj.ac.za
https://orcid.org/0000-0001-7515-1733

Shanana Desiree Motseta*

MCom Investment Management (2020)- UJ
Senior analyst at Vodacom Pty Ltd, South Africa
Email: dezmotseta@gmail.com
https://orcid.org/0000-0002-7053-7589

─**Abstract**─

The current study analyses the relationship between sovereign credit ratings and capital flow represented by Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI) in South Africa. South Africa has been receiving negative sovereign credit ratings lately. Time series quarterly data from 1994-2017 is collected and analysed using the Auto-Regressive Distributed Lag (ARDL) and the Error Correction Model (ECM). The ratings analysed are from Standard and Poor's rating agency. The results demonstrate that higher ratings are associated with higher financial flows. In other words, when a country is rated high, investors perceive such a country to be a safe heaven and believe that their investments will be safe. The results show that sovereign ratings influence foreign financial flows. These study outcomes imply that authorities need to consider all factors which are targeted by rating agencies and ensure that they perform as expected.

1. INTRODUCTION

Determining the impact of sovereign ratings on financial stability is of particular interest for a vast majority of financial market stakeholders including researchers. "A sovereign credit rating (SCR) is a measurement of a sovereign government's ability to meet its financial debt obligations" (Takawira et al., 2020). Ratings suffer because of opaque methodologies used by rating agencies and failures to predict financial crises like the late 1990 Asian crisis (Takawira et al., 2020).

A study by C. M. Reinhart et al. (2004) also suggests that apart from influencing the domestic economy, sovereign ratings influence the amount of foreign capital inflows that an emerging economy may receive. This, therefore, indicates that sovereign ratings impact the domestic financial development by influencing both, internal and external financial resources. The present study examines how sovereign ratings influence capital flows in South Africa. In this study, both, domestic financial resources and international financial resources are referred to as capital or financial flows.

In 2017, South Africa was relegated to sub-investment grade. Consequently, the cost of debt for both corporations and the government increased as default risk also increased. Consequent to the downgrades, South Africa suffered a few blows in 2017/2018, and the rand to dollar exchange rates depreciated at exponential rates, which also spilled over into the price of crude oil. South Africans experienced more petrol price increases between 2017 and 2019 than decreases and fears over the looming China and USA trade war also translated in investors searching for safer investments and with South Africa's downgrades, safe was, and still is to a certain degree, not a term most investors would associate with the country.

These effects spiralled with the political transition South Africa experienced as a new president was sworn in and hope restored. However, it is undeniable that financial stability in South Africa is still questionable as issues like the debt to GDP ratio, rising rate of unemployment, struggling state-owned companies and an unimpressive economic growth rate remain poorly managed, which has a cumulative impact on sovereign rates and potentially the overall state of South Africa's financial environment.

Figure 1 show the trend of gross domestic savings as a ratio of GDP in South Africa from 2010 to 2021. The figure shows that savings are very low. For the greater part of this period, savings are below 16%. This suggests that the country has relied much on external financial flows to bridge the gap between domestic capital demand and capital supply.
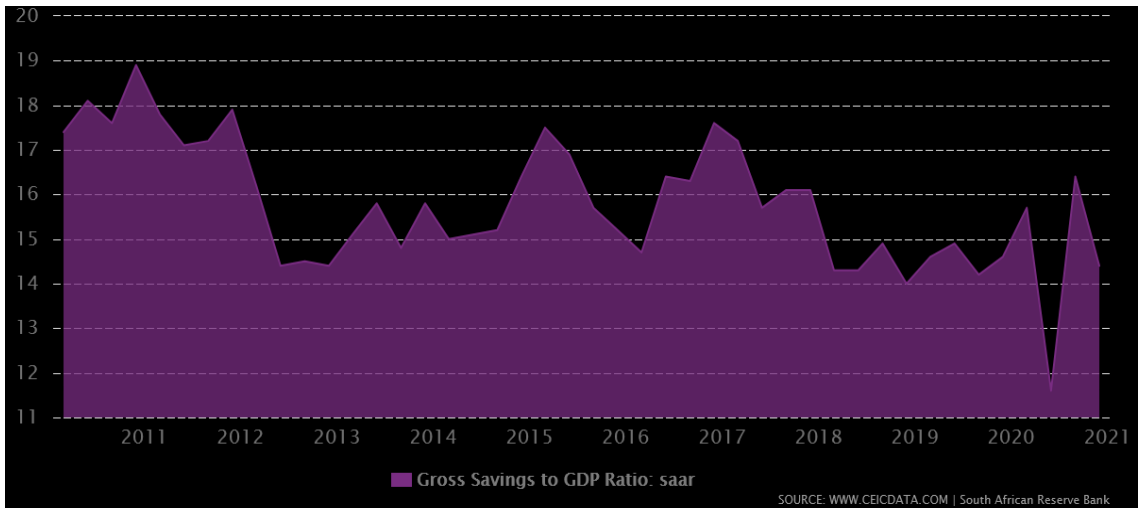
Figure 1: Trend of Domestic Savings in South Africa
Source: Ceicdata (2021)

It is also interesting to note that the flow of FDI to South Africa, even though it is reported to be high from 2006 to 2008, has decreased to early 2000s volume, as illustrated in Figure 2.
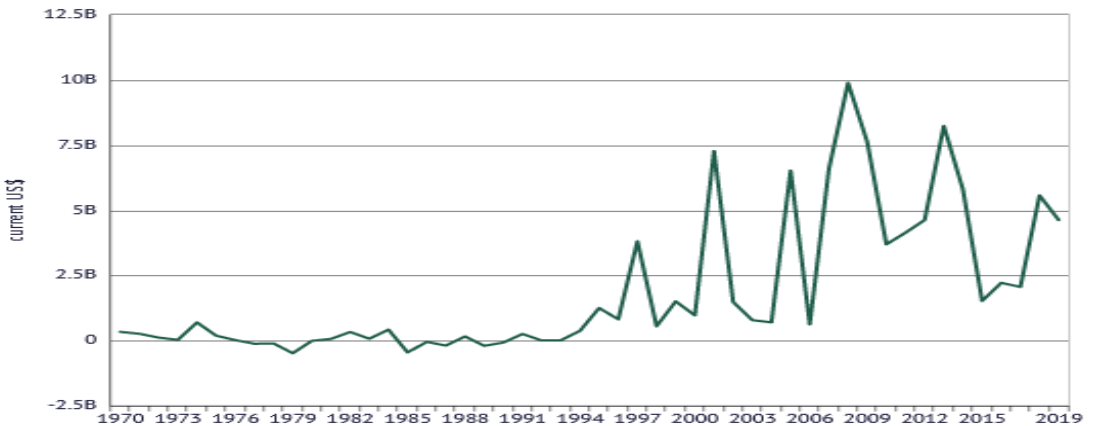

Figure 2: FDI inflow into South Africa
Source: World Bank (2021)

It is also important to note that the period in which South Africa has witnessed a decrease in FDI inflow is mirrored with the country being downgraded by all rating agencies as illustrated in Figure 3. Figure 3 shows that as from 2014, the country has been receiving negative downgrades.
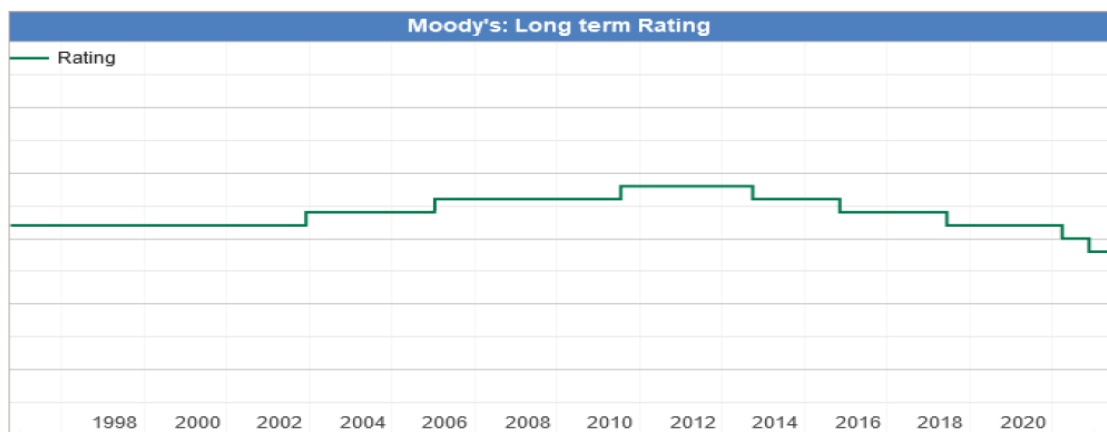
Figure 3: Overview of Moody's Long-term Rating (South Africa)
Source: Countryeconomy.com (2021)

Takawira et al. (2021) indicates that South Africa has faced many downgrades and negative outlooks on the sovereign debt recently. Sovereign ratings filter directly to corporates rating and therefore raise their cost of borrowing (Takawira et al., 2021). Downgrades and low sovereign credit rating are to blame for financial instability since these ratings play a critical role in the decisions as to where and when to invest as well as determining the interest rate that is expected by investors for sovereign debt (Takawira et al., 2021).

Studies such as Cai et al. (2016); Bayar et al. (2014); Emara et al. (2018) and Mutize and Mugobo (2018) show that investors may not be interested in investing in a country where raising capital is likely to be expensive. They implied in a way that sovereign credit ratings could reduce the amount of funds a country might obtain as some type of capital flows, such as Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI).

The discussion in this section paints a picture that sovereign credit ratings affect corporations and the governments accessibility to finance, respectively. In view of this, the analysis aims to identify the impact of sovereign ratings on capital flows in South Africa, where capital flows are measured by FDI and FPI.

This study focuses on analysing the relationship between sovereign ratings and South Africa's capital flows. The role of external financial flows is taken into account given the deficit between domestic capital supply and demand. The specific objectives of the research therefore are to econometrically test how sovereign ratings affect capital flows into South Africa and suggest possible policy implications on the basis of the findings of the study. The study aims to determine if sovereign credit ratings do have an impact on capital flows?

The rest of the paper is structured as follows: Following the introduction, section 2 focuses on reviewing literature and available studies on the link between sovereign credit ratings and foreign capital inflows. The section also reviews literature on the available studies which have examined the variables of interest. The third section presents and discusses the methodology and data used to attain the study's objectives. The fourth section discusses empirical findings and lastly, section 5 concludes the study.

2.   LITERATURE REVIEW

This section presents the literature on the link between capital flows and sovereign rates. In discussing about these theories, the focus will be on the determinants of capital flows, and how sovereign credit rate changes may influence that amount of capital a country may receive.

2.1   Theoretical Literature

The better the rating, the more likely a state can keep up with its debt repayments and vice versa. These ratings also offer an indication of the level of risk associated with the government bond investments for investors as credit ratings have had a stronger effect on fixed income markets on securities such as bonds (Charlin et al., 2017).

Moody's, Fitch and Standard & Poor are currently the biggest credit rating firms that issue these ratings to different states. Since the recognition of rating firms in the mid 1970's by the Securities and Exchange Commissions, rating agencies have evolved and have, over the years, found themselves under scrutiny for the information they provide together with how they derive this information. Needless to say, they still largely depend upon multiple market participants for information of different governments.

2.2   Institutional FDI Fitness theory

The first theory which explains the determinants of FDI is the Institutional FDI Fitness theory. The theory is proposed by Wilhelms et al. (1998). The term FDI fitness emphasises the ability of a country to attract, assimilate and hold foreign direct investment. The ability of the country to satisfy the expectations of the potential investors gives the country an edge in accessing FDI inflows. The theory tries to explain why foreign direct investment can prefer one country over another. The roles of the government and other market participants are identified as the major factors determining the volume of FDI into a country. With regards to the role of the government, Makoni (2015), highlight that the ability of the government to manage the economy and reduce or mitigate any risk plays a central role in attracting FDI into the country. Makoni (2015) shows that there is no investor who will be interested in investing in a country where there is a huge risk of locking his or her investment.

Canuto et al. (2012), shows that sovereign risk is under the control of the government, given that the variables which are usually analysed when rating a country are under the

control of the government. The authors also show that sovereign risk is different from country risk which is a broad term. Sovereign risk may also contribute towards country risk. When a country is viewed as riskier, investors will not be willing to invest in such a country.

2.3   Portfolio equilibrium approach of capital flows

The portfolio equilibrium approach was developed by Williams (1970) and the theory seeks to explain international capital movements. This theory is regarded as more suitable for estimation of portfolio flows because it identifies the two most critical factors such as market return and risks associated with the investments (Lozovyi et al., 2007). Mutize and Mugobo (2018) highlight that global investor allocate their investments by looking at the risk in a country that could affect their investments, such as sovereign credit ratings and exchange rate volatility. Sehgal, et al. (2018) stress on the fact that sovereign credit ratings are one of the types of risk that plays a crucial part in influencing the decisions of countries and international investors by providing reliable information that relates to the risk associated with the country (default risk). C. Reinhart et al. (2003) highlight that sovereign risk is highly crucial for assessing cross-border external capital. Das et al. (2010) claim that "countries usually lose all access to private capital markets when sovereign ratings fall below a critical threshold. In contrast, countries with very high ratings tend to have continuous access to capital." The portfolio equilibrium approach caters to the factor of risk.

2.4   Liquidity and economic runs theory

The liquidity and economic runs theory suggests that investors tend to move their investment from one nation to another if the original country shows signs of unhealthy economic fundamentals, or if they anticipate that the economic fundamentals might worsen (Devenow et al., 1996). A healthy economy is associated with less risk and high returns and therefore investors prefer healthy economies as their investment destinations. Mutize and Gossel (2018) indicate that any deterioration in the economic fundamentals may result in investment withdrawals, and if there is major spill-over that may cause capital flights. Basic quantitative and qualitative information are aspects of economic fundamentals used for the subsequent financial valuation of companies, securities, assets or currencies, and signifies the economic or financial health of an institution. Investors and analysts apply these fundamentals in asset examination developing estimates to verify if investments are worthwhile. Normally, investors evaluate economic fundamentals of a country relative to riskiness. Scholars such as Mutize and Mugobo (2018), Afonso et al. (2012), and Emara et al. (2018) indicate that sovereign credit rating by credit rating firms is one of the economic fundamentals that is considered by global investors when they determine whether an investment destination is a good one.

2.5   Theory of asymmetric information

The theory of asymmetric information was developed by Akerlof (1978). Asymmetric information refers to the disproportionate understanding of a transaction between the parties, with one party having access to more information than the other. That generates a transaction imbalance. The problem with information asymmetry wherein one party has more information than another, is that it happens before the parties participate in the investment operation. For instance, if the receipt country of capital flows has more information than the foreign investors of capital flows, they only disclose this while concluding the agreement.

Sovereign ratings have a crucial part in reducing the asymmetric information between the receipt country of capital and foreign investors by providing the essential information needed by foreign investors when they make investment decisions. Kaminsky et al. (2002) focus on the important role played by credit ratings in reducing asymmetric information between foreign investors and a receipt country. This is because they reveal information, more particularly about non-transparent economies, that is important when investors make investment decisions. Sovereign credit ratings provide cheaper information (in the financial sector) needed by foreign investors when they plan their investments. There are several past studies which support this theory. These studies include Mutize and Mugobo (2018), Afonso et al. (2012), Alsakka et al. (2012) Baresa et al. (2012).

2.6   Empirical Literature

2.6.1   Cross Country Studies

Studies conducted to examine the relationship between sovereign ratings and financial growth as well as international capital flows include cross-country studies (Baresa et al., 2012; Emara et al., 2018; Gourio, 2015; Hooper et al., 2008; Jevcak et al., 2010; Kim et al., 2008; Körner et al., 2015; Mutize & Mugobo, 2018; Violante, 2016). On the other hand, there are studies which have been carried out utilising time series techniques (Al-Smadi, 2018; Cooke et al., 2015; Kilic et al., 2014). These studies are carried out in different regions and different countries with varying results.

The review will start with looking at cross-country studies. Of the available studies, Emara et al. (2018) analyses the effects of sovereign ratings on capital inflows in emerging markets. The author utilises the Arellano-Bover system GMM for 23 countries. The empirical results reveal that sovereign credit ratings play an important role in determining the amount of capital a country receives. The results also reveal that foreign capital flows are crucial for the development of developing economies. This suggests that any factor which may inhibit this important resource does affect the growth of these countries.

Utilising the same econometric method, Violante (2016) examines the relationship between sovereign credit rating and capital flows for emerging economies, specifically focusing on foreign direct investments before and after the 2008 financial crisis. The author divided the data into two samples. The first sample was for the period from 1994 to 2006. The second sample was from 2007 to 2015. The empirical results are found to be consistent with Emara et al. (2018). It is found that sovereign credit ratings have a significant effect on capital flows. However, the empirical results also reveal that bond investors lost confidence in sovereign credit ratings. This was due to bond yields not responding to sovereign credit ratings after the crisis.

In another study, Tembe et al. (2012) carries out a comparative study between China and Mozambique. The author focuses on analysing factors that determine foreign direct investment in developing countries. The study finds that there are a variety of macroeconomic variables that influence capital flows. These variables include corruption, infrastructure, taxes and government policy. The findings of this study are found to be consistent with the FDI fitness theory which emphasises the role of the state in determining capital flows to a country. Moreover, the study notes that variables which are usually used in determining whether a country should be downgraded or not are found to be contributing factors to capital flows to a country. The authors also point out that there are differences in countries where attracting capital flows in concerned.

Cai et al. (2016) conduct another cross-country level study and find that sovereign ratings are a particularly important determinant of capital flows to the countries which are considered in the study. This is more applicable to FDI mostly. However, the authors note that the effect of sovereign ratings is not the same. The effect is found to be more pronounced in developing countries as compared to developed countries. It is also observed that the attitude of investors when it comes to risk is not the same. This explains why some investors can still invest in countries which are downgraded.

In a study which is slightly different to the previous one, Mutize and Gossel (2018) examine the effect of currency ratings on long-term bonds and stock market for 19 countries utilising Granger causality tests. The results reveal that both, the bonds and stocks react negatively to sovereign rating downgrades. The results suggest that sovereign credit ratings have a negative impact on both markets. This becomes important in the South African context where the two markets are largely dominated by foreign buyers. Therefore, any factor which affects the actions of foreign investors will have a significant impact on the ability of the two markets to attract foreign capital.

Körner et al. (2015) study the effect of sovereign ratings on Portfolio Investment (PI) for 119 countries. The authors utilise the fixed effects model in their analysis, analysing the effects of sovereign ratings on investors choosing to invest in the domestic economy as well as in other countries. The results reveal that sovereign credit downgrades have a significant effect at both the home bias as well as the willingness to invest in other

countries. These results are found to be applicable to FPI. The results thus suggest that sovereign credit ratings do not affect developing countries which are at the receiving end only. It also affects investors in the country of origin.

Ivanovic, Baresa et al. (2012) evaluate "shadow" sovereign credit ratings using 81 countries as a sample, from these 50 are set aside to approximate the model while for ratings were estimated for the remaining 31 countries that do not have ratings. The findings reveal that credit ratings represent the creditworthiness of companies or governments. They are crucial measures in attracting foreign capital. The study further indicates that countries that do not have credit rating and countries that have negative credit rating face difficulties in attracting capital flows compared to countries with low credit ratings.

Baum et al, (2013) examine the effect of sovereign ratings on yields for four countries (Spanish, French, Italian, and German). The GARCH model is utilised as the estimation technique. The empirical results reveal that when a downgrade is announced, it has negative effects on yields. It is also observed that such announcements somehow contribute to crisis in the Euro region. This therefore implies that whenever a downgrade is announced, it will have an influence on investor willingness to put money in a country where yields are likely to be affected negatively. This suggests that sovereign ratings may therefore reduce capital to countries which are downgraded.

2.6.2 Country Specific Studies

Of the country specific studies, Bayar et al. (2014) examines the effects of sovereign credit ratings on foreign direct investment inflows in Turkey from January 1995 to July 2013. The authors use a VAR based technique model. The findings from the study show that FDI is positively influenced by sovereign credit ratings. The study also employs the Granger causality tests to analyse the causal relationship between sovereign ratings and FDI. The empirical results reveal "a two-way causality link between sovereign credit ratings by S&P and Fitch and foreign direct investment inflows and a one-way causality between sovereign credit ratings by Moody's and foreign direct investment inflows" (Bayar et al., 2014).

In another study, Al-Smadi (2018) investigates into the determinants of foreign portfolio investment in Jordan for the period from 2000 to 2016. The findings of the study show that riskiness of the country is an important determinant of portfolio investment. The results imply therefore that whenever a country is regarded as too risky, the investors will not be willing to put their resources there. This is also found to be consistent with Fiess (2003) and Hashimoto et al. (2012) and Asaad Mohammed Ali et al. (2020) who show that country risk acts as another impediment when it comes to determining the volume of capital flowing into a country.

2.6.3   Empirical Literature on South Africa

There are several studies in South Africa which have been carried out to examine the effect of sovereign credit rating on the economy. These studies include Mutize and Mugobo (2018), Wortmann (2010), Ntsalaze et al. (2017), Naeem (2012) and De Haan et al. (2017) and Venkatraman (2015). These studies utilise different models and the results obtained are varied. However, the majority of these studies have largely focused on analysing the effect of sovereign credit rating on the country's capital inflows and outflows.

Starting with the work done by Mutize and Mugobo (2018), the authors examined how a sovereign rating downgrade affects foreign direct investment in South Africa between 2004 and 2014 utilising an event study. The empirical results reveal that the impact of the downgrades from the three major rating agencies in South Africa does not have the same effect on capital inflows into the country. The effect of a Moody's downgrade is found to be more pronounced as compared to what is experienced from other rating agencies. However, this was found to be contrary to the finding of Wortmann (2010), who establishes that a sovereign rating by S&P affected foreign portfolio inflows into South Africa. This is found to be consistent with Bayar et al. (2014) who further show that Moody's have the second largest effect followed by Fitch.

In another study, Ntsalaze et al. (2017) study the impact of sovereign credit ratings on legal entities in South Africa, with a particular emphasis on the extent to which the sovereign credit rating reduces the amount of capital inflows into the country. The authors focus on credit allocated to legal entities operating in the domestic economy. The findings reveal that a negative rating limits the amount of capital which the firm could attract. These results are found to be consistent with Naeem (2012) and De Haan et al. (2017). These authors argue that sovereign credit rating influences private firms' access to external credit.

Ntswane (2014) conduct a study into the link between rating agencies long-term foreign sovereign ratings and the various forms of capital flows to Africa. The study utilises a comprehensive data set for 28 African countries for the period from 1994 to 2011. The study employs both a panel regression model and event study. The empirical results reveal that changes in sovereign ratings have an influence on FDI, FPI and bank credit. The event studies result also demonstrate that rating announcements influence the stock market.

Venkatraman (2015) employing an event study for 364 sovereign credit rating announcements for the period 1 January 2005 to 31 December 2013, also examines the extent to which the Johannesburg Securities Exchange share prices react to credit rating notices. The empirical results reveal that the JSE share prices are not responsive to new information related to sovereign credit rating announcements. The author divides the findings of the study into two major sets. The first set indicates that in the long run

abnormal returns are responsive to sovereign credit rating. The second set shows that sovereign credit rating by Moody's and Standard & Poor has a significant effect as there is evidence of abnormal returns.

The review of the studies carried out in SA shows that the available studies have largely been carried out utilising event studies. The present study contributes by utilising econometric analysis, specifically the cointegration tests which look at both the long-run and short-run relationships between the variables of interest.

3. RESEARCH METHODOLOGY

The study applied a quantitative approach in analysing South Africa's quarterly time series data from 1994 to 2017. Data was collected from the World Bank, the South African Reserve Bank and Quantec Easy data.

3.1 Model specification

The study is based on the Fernandez-Arias and Montiel model, which emphasises the role of both, pull and push factors. Fernandez-Arias (1996) put the model forward which assumes that capital flows through transactions in *n* types of assets. The model assumes that the flow of capital to developing countries is a function of domestic economic climate, country creditworthiness and capital exporting country financial conditions which are relevant for investment in the developing country. The model is specified as:

$$D_s(d,F)C_s(c,S_{-1}+F) = W_s(w,S_{-1}+F) \dots\dots\dots\dots\dots\dots\dots 1$$

where W_s is the opportunity cost of funds of type *s* in the world economy which is assumed to depend on the stock of liabilities S to reflect the portfolio diversification considerations of external creditors. The factors *d, c* and *w* are shift factors which are associated with domestic economic climate, country creditworthiness, and any creditor-country financial conditions such as financial returns and capital market regulations. In line with Fernandez-Arias and Montiel (1996) it is assumed that D_s, C_s and W_s increase in the shift parameters. Thus, equation 3.39 defines the equilibrium value of F implicitly. Explicitly, it will be given by:

$$F = F(d,c,w,S_{-1}) \dots\dots\dots\dots\dots\dots\dots\dots 2$$

Therefore, the changes in capital flows will be determined by the combination of changes in *d, c* or *w* given the values of S_{-1}. Thus, the model suggests that changes in domestic factors which will operate at both, the project and country level as well as factors which relate to the external environment. These factors therefore determine the amount of capital the country is likely to receive. Based on this theoretical model, the empirical model to be utilised is the same as Kim and Wu (2008). The model is estimated as follows:

$$CAPFLOW_t = \beta + \beta_1 CAPFLOW_{t-1} + \beta_2 SCR_t + \beta_3 X_t + u_t \dots\dots\dots\dots\dots\dots\dots 3$$

Where CAPFLOW represents capital flows, SCR is Sovereign credit rating and X capturing control variables which in this case, includes GDP, financial sector development, interest rate and inflation.

3.1.1 Definition of Variables and Apriori Expectations

The study utilized two measures; Foreign Direct Investment (FDI) was used as the first measure. This again is in line with Kim et al. (2008). In this regard, it is measured by net inflows of foreign direct investment as a percentage of GDP. The second measure of financial flows is Foreign Portfolio Investment (FPI). This represents the net inflow of portfolio investment into South Africa. In terms of Sovereign credit ratings, the study utilised sovereign credit ratings by Standard and Poors (S&P). These ratings include long-term ratings as well as their outlook for a period of six months. The long-term rating rank begins at AAA which represents the top credit quality, and goes down to the least quality represented by D/SD. In this case, D/SD stands for default/selective default. The rating BBB- are considered to be investment grade rating, whilst BB+ are considered to be speculative. Kim et al. (2008) show that short-term ratings can be anything from A-1 to D/SD. Also, the investment grade is A-3 and above. Furthermore, the ratings are attached with rating outlooks which varies "Credit Watch-Positive" to "Credit Watch-Negative". Kim and Wu further show that rating announcements are done where the economic and financial conditions within a country adjust adequately. Such changes should be in a position to warranty the credit quality of sovereigns.

The study follows the work of Kim et al. (2008) as well as Gande et al. (2005) where S&P ratings were sequentially converted into time series data. As per Kim et al. (2008) and Gande et al. (2005), numerical values were assigned for every grade ranking, scaling from 0 for default to 20 for AAA for the ratings that span over the long term. The long-term ratings have also been modified to integrate the outlook for each ranking. For example, where a rating specific to a period is AA (18), with a corresponding positive outlook of (0.25), the total long-term rating was captured as 18.25. A positive relationship between capital inflow and sovereign rating is expected. A higher rating shows that economic fundamentals within a country are on a positive trajectory. This will therefore instil confidence in foreign investors who will view the country as a safe haven for their investment. As their investments into the country brings financial resources, they ultimately improve the financial conditions within the country.

In terms of control variables, the study utilised the domestic credit to GDP (DCP), domestic investment, measured by Gross Fixed Capital Formation (GFCF), Repo rate, representing interest rate, and CPI as a measure of macroeconomic stability. A positive relationship between the different forms of capital inflows and GDP and GFCF is expected. On the other hand, a negative relationship between capital flows and inflation is expected. Inflation signifies unstable macroeconomic variables. Investors will not be

willing to invest in a country where there is a lot of uncertainty regarding their investment. The sign of interest rate is ambiguous. Higher interest rates may result in higher foreign savings, as investors try to take advantage of the higher returns.

3.1.2 Estimation Techniques

Stationary tests were conducted to ensure that the results which are obtained are robust. To test for stationarity for the times series data, the study employed formal and informal tests. Informal tests in this case involved the use of graphical tests. Phillips-Perron (PP) and Augmented Dickey Fuller (ADF) are the two formal tests that were used to formally test for stationarity and then retest using the Phillips-Perron test.

3.2 The Autoregressive Distributive Lag (ARDL)

The study utilised the ARDL model to co-integration in establishing the impact of sovereign credit ratings on financial conditions in South Africa.

The technique requires the estimation of an error correction model of the form:

$$\Delta CAPFLOW_t = \beta + \sum_{i=1}^{p} \beta_1 CAPFLOW_{t-1} + \sum_{i=1}^{p} \vartheta_i \, SCR_t + \theta_3 X_t + \vartheta_2 t + u_t \dots\dots 4$$

Model 4 captures how the lagged dependent variable, explanatory variables and their lagged components affect capital flows in a single model.

After establishing cointegration, the Error Correction Model (ECM) was carried out so as to analyse what happens in the short run. The ECM model will be used to describe all the dynamics of disequilibrium of variables in the short run. The ARDL model can also be used to drive the ECM through the application of a simple linear transformation that integrates long run equilibrium and short run adjustments without losing long run information.

Several diagnostic tests were also carried out to examine the adequacy of the model. These tests include normality, homoscedasticity, autocorrelation and stability tests.

4. PRESENTATION OF EMPIRICAL RESULTS

The study seeks to examine the effect of sovereign ratings on capital flow. In this regard, capital flow is measured by financial flows, represented by FDI and FPI.

4.1 Descriptive Statistics

Descriptive statistics for the variables utilised were established and outlined in Table 1 below:

The variables presented in Table 1 convey that the mean values for the financial variables are within the same range. Although not the focus of the study, the extent at which the financial sector evolves does determine the growth rate. This can also be inferred on the basis of the descriptive statistics. It is also interesting to note that all the variables utilised in the study are normally distributed as shown by the Jarque-Bera statistic and its associated probabilities. However, no conclusion can be reached looking at this information, as it is univariate in nature.

Stationary tests are conducted to ensure that the results which are obtained are robust. Phillips-Perron (PP) and Augmented Dickey Fuller (ADF) are the two formal tests that were used to formally test. Formal tests were therefore conducted, and results set out in Table 2 and 3. The results in Table 2 shows that at level series, there are few variables, which are stationary, even though not under all the assumptions. These variables are SCR and CPI.

The variables were tested for stationarity at first difference. The results show in Table 3 that all the series are stationary. This, therefore, confirms that differencing the series once is what was required to ensure that the data is stationary. It is also crucial to note that the series are found to be integrated of different orders. Thus there is a case of an I(0) and I(1). This means the ARDL model to cointegration is the best test to use as it is compatible with data of that nature. The next section first determines the lag length, which was used in the study. This is followed by the ARDL models.

4.2 Lag length Selection (Financial Flows Model)

The stationarity of the variables was checked using Augmented Dicker Fuller and Phillips-Perron. The next step was to choose the lag length. This was carried out empirically and the results have been demonstrated in Figure 4.

The results in Figure 4 show that the appropriate model chosen based on the Akaike information criterion is ARDL (2, 2, 2, 2, 2, 2). Again, as indicated under the financial sector development model, choosing the appropriate lag length is of importance as that determines the fitness of the model.

Once again, the results show that there is evidence of cointegration given an F-statistic of 24.33. This is bigger than the upper bound. This shows that capital flows, as measured by FDI, sovereign ratings, financial sector development measured by DCP, economic growth measured by GDP, domestic investment, measured by GFCF, inflation, and repo rate have a long-term relationship. These results indicate that changes to the sovereign ratings influence the amount of FDI, which South Africa at a point in time receives. Having established cointegration, the next step was to check the relationship amongst the variables in the long-run. The results are presented in Table 5.

Table 1: Descriptive Statistics

	LDCP	LFDI	LFPI	LGDP	LGFCF	SCR	REPO	CPI
Mean	14.0406	13.1548	13.3182	14.6932	12.9473	7.4832	9.5508	6.0349
Median	14.2741	13.5215	13.4817	14.7544	13.1035	8.0839	7.7500	5.6268
Maximum	15.1694	14.5047	15.0959	14.9627	13.3607	8.6187	19.3200	11.5364
Minimum	12.5022	10.7078	11.1174	14.3176	12.2900	6.1958	5.0000	1.3854
Std. Dev.	0.8495	1.2237	1.2070	0.2211	0.3735	0.9437	4.0920	2.1387
Skewness	-0.3127	-0.7479	-0.1499	-0.2790	-0.3250	-0.3659	0.8164	0.4795
Kurtosis	1.7154	2.3250	1.8817	1.5800	1.4497	1.3416	2.5755	3.4665
Jarque-Bera	2.2113	2.8054	1.3963	2.5216	3.0614	3.2857	3.0833	1.2322
Probability	0.3310	0.2459	0.4975	0.2834	0.2164	0.1934	0.2140	0.5400
Sum	365.0552	328.8687	332.9543	382.0243	336.6297	179.5960	248.3200	156.9082
Sum Sq. Dev.	18.0406	35.9405	34.9630	1.2217	3.4871	20.4852	418.6154	114.3515
Observations	92	92	92	92	92	92	92	92

Source: Authors using Eviews 11

4.3   Formal Stationarity Tests

Table 2: Stationarity Tests (Level Series)

	Augmented Dickey Fuller			Philip Peron		
Variable	None	Constant	Constant and Trend	None	Constant	Constant and Trend
DCP	1.9660	-1.6955	-0.9267	5.7956	-2.4495	-0.7082
FDI	1.8684	-5.6348	-5.9505	2.6290	-2.0344	-1.6078
FPI	5.430	-1.6281	-3.2621	5.4300	-1.6177	-2.5400
SCR	-1.2272	-0.3630	-2.4478	-2.3353**	-0.3507	-1.5400
GDP	1.9392	-2.2977	0.4685	5.6346	-1.9367	0.0895
GFCF	1.3620	-1.2857	-1.3091	2.5501	-1.6755	-0.9937
REPO	-1.7884	-1.5946	-2.9441	-1.0850	-1.5163	-3.0778
CPI	-1.2089	-3.7847	-4.1789	-1.2844	-2.7830*	-2.9723

Source: Authors using Eviews 11

Table 3: Stationarity Tests (First Difference Series)

|	Augmented Dickey Fuller			Philip Peron		
Variable	None	Constant	Constant and Trend	None	Constant	Constant and Trend
DCP	-2.4859*	-2.6668*	-3.1533**	-2.4859*	-2.6115*	-3.1471**
FDI	-2.6604**	-3.1082**	-4.4695***	-4.1522***	-5.3250***	-5.9504***
FPI	-2.2791**	-3.7354**	-3.8804**	-2.1969**	-3.6864**	-3.8367**
SCR	-2.4159**	-2.6831*	-2.6764*	-2.4334**	-2.7402*	-2.7372*
GDP	-3.5698**	-3.5672**	-3.0954**	-3.4461**	-3.5131**	-3.0704**
GFCF	-2.5918**	-2.9695**	-3.1046**	-2.5918*	-2.9695*	-3.1046**
REPO	-3.7441***	-3.9956***	-4.1258***	-6.5281***	-6.5394***	-6.4462***
CPI	-5.1913***	-5.2598**	-5.0950**	-6.4211**	-6.9483**	-6.7212**

Source: Authors using Eviews 11
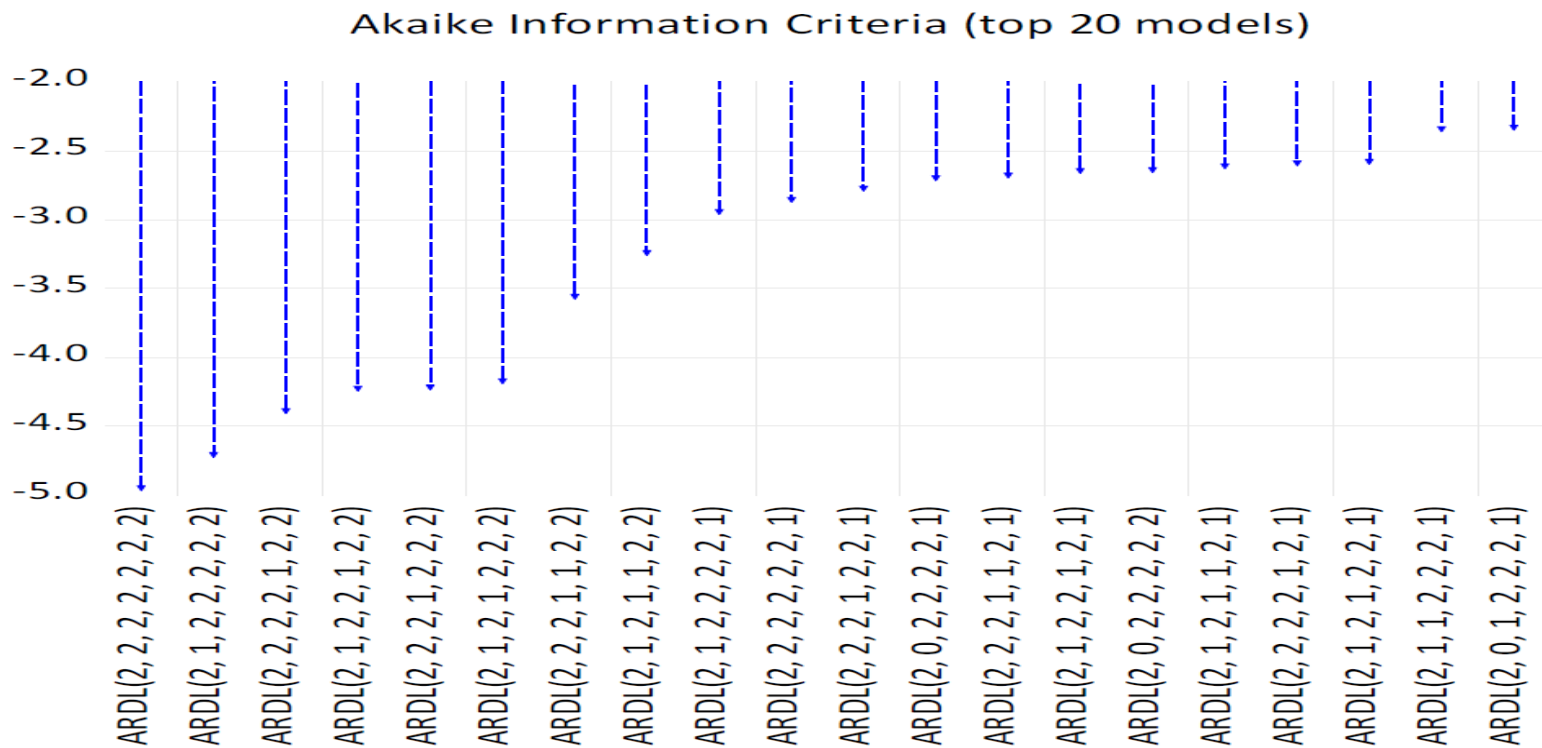
Figure 4: Lag length Selection: FDI Model
Source: Authors using Eviews 11

4.4 Long-run Model (Financial flows Model)

The long-run model presented in Table 5 shows that SCR, LDCP, LGDP and LGFCF are positively related with the measure of foreign financial flows, which is FDI in this case. On the other hand, CPI and Repo are found to be negatively related with FDI. These results are discussed in full below.

4.5 Long-run Model (Financial Flows Model)

The Bounds test was estimated, and the results are presented in Table 4.

Table 4: Long-Run Model (Financial Flows Model)

F-Bounds Test		Null Hypothesis: No Levels relationship		
Test Statistic	Value	Significance	Integrated at Order Zero I(0)	Integrated at Order One I(1)
		Asymptotic: n=1000		
F-statistic	24.3320	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99
Actual Sample Size	22	**Finite Sample: n=35**		
		10%	2.254	3.388
		5%	2.685	3.96
		1%	3.713	5.326
		Finite Sample: n=30		
		10%	2.334	3.515
		5%	2.794	4.148
		1%	3.976	5.691

*** = 0.01 level of significance, ** = 0.05 level of significance, * = 0.1 level of significance
Source: Authors using Eviews 11

Table 5: Long-run Model (Financial flows Model)

Dependent variable: FDI				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
SCR	0.1658	0.0420	3.9504	0.0578
LDCP	7.4758	0.3587	20.8426	0.0305
LGDP	21.8472	1.8950	11.5287	0.0551
LGFCF	2.1011	0.3076	6.8316	0.0925
CPI	-0.2133	0.0086	-24.8210	0.0256
REPO	-0.1946	0.0066	-29.3113	0.0217
C	257.8632	20.1115	12.8217	0.0496

*** = 0.01 level of significance, ** = 0.05 level of significance, * = 0.1 level of significance
Source: Authors using Eviews 11

The positive relationship between SCR and FDI is in line with theory and the *apriori* expectations that is there is a theoretically expected relationship. This result is also consistent with a few empirical studies such as Kim et al. (2008), Konopczak et al. (2017), Swamy et al. (2018). Konopczak et al. (2017) indicates that the relationship between capital flows and sovereign rating can be explained in two ways. The authors show that "in one way, the increasing demand for a country's debt securities decreases bond-yields. On the other hand, the over-reliance on external financing and the increased vulnerability to sudden stops of capital inflows increases the sovereign bond yields." Swamy et al. (2018) also show that when a country is rated positively, it has great chances of attracting foreign financial flows, as investors are confident that their investment is safe. Kim et al. (2008) who demonstrate that cross-border bank flows, portfolio inflows and FDI inflows increased into a country following a positive rating, also support this result. An FPI model was also estimated. The results are found to be consistent with the FDI model. This result is found to be in line with the financial sector development model. These results therefore suggest that sovereign ratings significantly affect financial conditions in South Africa.

Concerning the control variables, the results show that financial sector development is a highly important factor in determining the volume of financial flows into the country. This confirms the apriori expectation and Alfaro et al. (2004). Alfaro et al. (2004) shows that countries with thoroughly developed financial systems are likely to benefit more through foreign direct investment as a developed financial system lowers the costs of raising financial resources. The statistical results also show that growth prospects are also a vital determinant of financial flows into the country. This result is found to be consistent with Charkrabarti (2001) and Jordaan (2004). These authors argue that foreign finance flows to countries where there are growth opportunities. That enhances the company's ability to achieve a higher return on its investment. It is also critical to note that the measure of investment is positively related with financial flows into the country. This suggests that financial flows are likely to come into a country where the investment climate is thriving.

Consistent with the previous model, CPI and interest rate variable are found to be negatively related to financial flows into South Africa. Buckley et al. (2007) shows that inflation is usually used to measure the stability of a country. Where there is instability, investors may not be willing to come and inject their funds as there are high chances that the investment may lose value. On the other hand, high levels of inflation may indicate difficulties in terms of borrowing finances in the domestic market.

4.6   Error Correction Model (Financial Flows Model)

The ECM Model was also estimated for the financial flows model. The results are presented on Table 6.

Table 6: Error Correction Model (Financial Flows Model)

Dependent variable: FDI				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D (LFDI (-1))	1.6628	0.0564	29.4592	0.0216
D(SCR)	2.0069	0.0591	3.9591	0.0187
D(LDCP)	17.6771	0.4662	37.9209	0.0168
D(LGDP)	46.2610	1.1529	40.1247	0.0159
D(LGFCF)	1.1932	0.1674	7.1300	0.0887
D(CPI)	-0.4976	0.0119	-41.9857	0.0152
D(REPO)	0.1722	0.0059	29.3064	0.0217
CointEq(-1)**	-0.6161	0.1916	-3.2156	0.0161
R-squared	0.9992	Mean dependent var		0.1618
Adjusted R-squared	0.9979	S.D. dependent var		0.2814
S.E. of regression	0.0130	Akaike info criterion		-5.5836

*** = 0.01 level of significance, ** = 0.05 level of significance, * = 0.1 level of significance
Source: Authors using Eviews 11

The ECM results again show that to a greater extent the findings align with the long-run model. Furthermore, it is important to note that the ECM term is negative. It is also significant at 0.05 level. This shows again that if the two variables move apart in the short-run, they will converge to their long-run equilibrium. Also, about 62% of this is corrected within a year. This is higher as compared to financial sector development showing the volatility of financial flows. There is no two-way relationship between SCR and capital flows. The effect runs from SCR to capital flows. Therefore, Granger causality tests are not relevant.

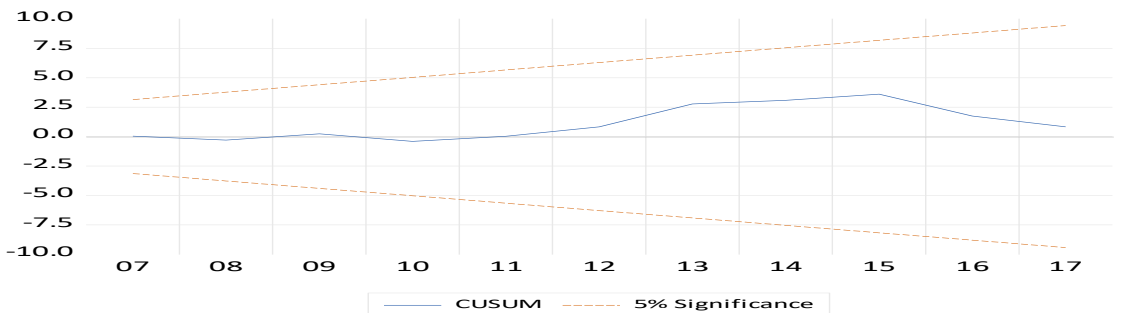## 4.7 Stability test (Financial Flows Model)

Figure 5: Stability test (Financial Flows Model)
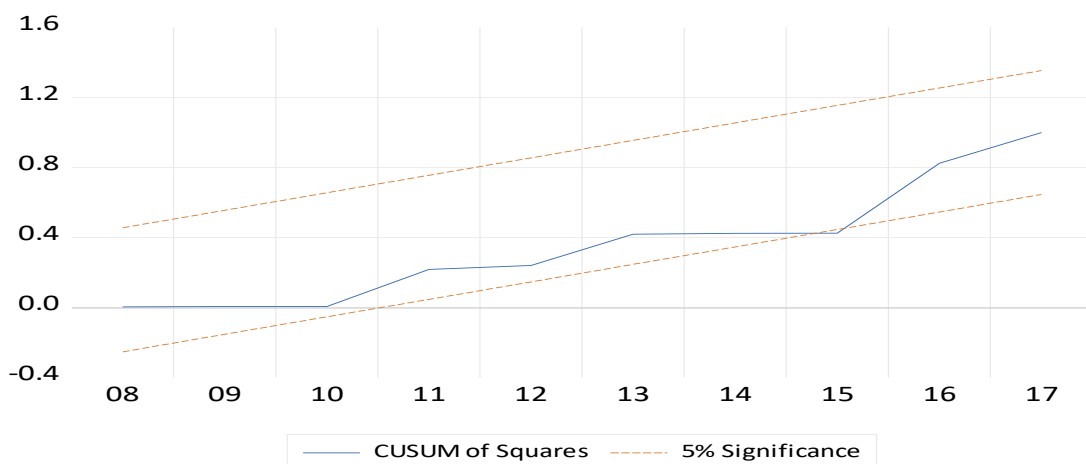**Source:** Authors using Eviews 11

Figure 6: Stability test -CUSUM SQUARE (Financial Flows Model)
Source: Authors using Eviews 11

Stability tests were also performed. The results are reported in Figure 5 and 6. The results indicate that both the CUSUM and CUSUM Squares are stable. Therefore, this confirms that the model estimated is correctly specified.

5. CONCLUSION

The present study seeks to examine the effect of sovereign credit rating on capital inflows in South Africa utilising the ARDL model. The empirical results demonstrate that higher ratings are associated with higher financial flows. In other words, when a country is rated high, investors perceive such a country to be a safe haven i.e. their investments will be safe. These results corroborate findings by previous studies on the subject, such as Kim et al. (2008).

The empirical results also show that growth prospects, financial sector development and macroeconomic stability as measured by inflation are other important determinants of financial flows to South Africa. Thus, the study shows that instability in macroeconomic variables may be detrimental to the possibility of the country attracting foreign financial flows. These also have a bearing on the rating, which are done by the likes of Moody's, S&P and Fitch as they are centred on the same macroeconomic variables.

The findings from the study show that sovereign ratings have serious consequences on the financial conditions of the country as it impacts those variables which play a role in mobilising financial resources. This becomes important given the mismatch for both domestic capital supply and capital demand. Thus, South African authorities need to consider the implications of a downward rating by rating agencies. This indicates that

there will be serious consequences when it comes to access to capital for development in the domestic economy as well as externally on the part of the state.

This is important considering that the country still has enduring issues in terms of poverty and economic inequality. Access to financial resources by firms has played a role in reducing some of these social ills. Therefore, a reduction in foreign financial flows will have potentially serious implications for the growth and development of the country.

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