The Impact of Sovereign Credit Ratings on Capital Flows and Financial Markets in Africa

A thesis submitted for the Degree of Doctor of Philosophy

By

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DECLARATION

I, Lesley Lucas Ntswane, declare that this thesis is my own work. It is submitted in fulfilment of the requirements for the degree of Doctor of Philosophy at the University of the Witwatersrand, Johannesburg. To the best of my knowledge, this thesis contains no material previously published or written by any other person, for any degree or examination in this or any other university, except where due reference is made in the text of the thesis.

Signature

Date

DEDICATION

To, my wife, Motlapele, my daughters, Monthati, Motheo and Keabetswe, and my mother and brother, Kokoti and Kgomotso: without your love and support, the past four years would have been unbearable. My late grandparents, Motlakadibe and Mpinya, deserve special thanks for all the encouragement and inspiration.

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ABSTRACT

Defined as an opinion by the rating agencies on the ability and willingness of a sovereign government to meet financial commitments in full and at an agreed time, a number of studies argue that sovereign credit ratings are a *de facto* requirement for gaining access to international capital (Cantor & Packer, 1995; Larraín, Reisen & Von Maltzan, 1997; Siddiqi, 2007), While a number of studies such as that by Kaminsky and Schmukler (2002) have tested the short-term announcement impact of the sovereign credit rating adjustments on the bond and equity returns. Kim and Wu (2008) attempted to close this knowledge gap by investigating the impact of S&P issued sovereign credit ratings on emerging economies' financial markets and different types of capital flows. In addition, studies on sovereign credit ratings focus on emerging economies, leaving out a majority of the African countries that are largely classified as developing economies.

Accordingly, the primary aim of the present study is to investigate the relationship between Fitch, Moody's and S&P issued long-term foreign currency sovereign credit ratings and the different types of capital flows in Africa. In addition, the study investigates how the imminent and actual rating migration announcement by Fitch, Moody's and S&P impact the aggregate equity stocks and nominal exchange rate returns in Africa.The study addresses these two questions by using a comprehensive data set of long-term foreign currency sovereign credit ratings issued by Fitch, Moody's and S&P on a cross-section of 28 African countries, between 1994 and 2011. Through a panel data regression framework, the study investigates the long-term influence of long-term foreign currency sovereign credit ratings on the different types of capital flows (foreign direct investment, portfolio equity, portfolio bond and commercial bank and other private institutions) while controlling for economic and country governance factors. The second question of the study is addressed by applying event study analysis, to test the transitory impact of long-term foreign currency sovereign credit ratings daily aggregate equity stock returns and nominal foreign exchange rate.

Overall, the empirical analysis demonstrates that the history of the portfolio equity, FDI and borrowings from commercial banks and other private institutions, represented by the lag of the capital flows, is the most significant variable determinant of these types of flows. For the

borrowings from commercial banks and other private institutions, empirical evidence also suggests that debt rescheduling is a significant determinant for future access to this type of capital. Long-term foreign currency sovereign credit ratings issued by Fitch, Moody's and S&P on the other hand, show a marginal influence on the portfolio equity, FDI and borrowings from commercial banks and other private institution capital flows with the RATING variable reinforcing, as opposed to substituting, for the primary determinants of these types of capital flows. For the public and publicly guaranteed and non-guaranteed portfolio bond flows, where, except for South Africa, many African countries have a limited history of borrowing from the international bond markets, the lag of the dependent variable is insignificant. Empirical evidence further shows that the public and publicly guaranteed and non-guaranteed portfolio bond flows respond differently to the long-term foreign currency sovereign credit ratings issued by the different rating agencies. While S&P issued RATINGS variable is significant for the public and publicly guaranteed portfolio bond net flow rates (PPGBOND) model, when South Africa is excluded from the sample, Fitch issued RATINGS variable is significant for the non-guaranteed portfolio bond net flow rates (PNGBOND).

Interestingly, the empirical evidence show that South Africa's Fitch, Moody's and S&P issued RATINGS have a positive relationship with both portfolio bond and commercial bank and other private institutions net flow rates to countries other than South Africa. In particular, the public and publicly guaranteed portfolio bond (PPGBOND) and commercial bank and other private institutions net flow rates (PPGCOMM) for countries other than South Africa, respond positively to the S&P and Fitch issued South Africa RATING, with own country RATING becoming insignificant when the S&P issued South African RATING is introduced to the model. Similarly both the PPGCOMM and PNGBOND net flow rates to countries other than South Africa, respond positively to the Moody's issued South African RATING.

Event study analysis show that long-term foreign currency sovereign credit ratings upgrade, downgrades eminent rating changes have a short-term announcement impact on both the aggregate equity stock and nominal foreign exchange rate returns in Africa. In particular, the event study results show that there is an incentive for a positive rating announcement for below investment grade ratings while there is no punishment for a negative rating announcement.

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1 INTRODUCTION

The interest in credit rating agencies and the ratings they issue on financial securities and assets, dates back to the credit rating issues on American utility and rail companies (Grier & Katz, 1976; Katz, 1974). While the earlier studies, such as that by Weinstein (1977), Ingram (1983) and Holthausen and Leftwich (1986), focused on the assets or securities issued by corporates, municipalities and utilities, access to the international debt markets by emerging markets, specifically access to the Yankee bond markets through the Brady bonds in the late 1980's, resulted in the increase in the number and interest in sovereigns rating issues (Cantor & Packer, 1995, 1996a).

While the rating agencies explicitly state that the rating issues are an opinion on default risk [1] (Fitch, 2010; Gaillard, 2009), this point has been lost to many of the studies on the ratings, with questions continuously been asked about their ability to predict systemic market risk that leads to economic crises (Kaminsky & Schmukler, 1999; Mora, 2006). Indeed, following a number of financial crises in emerging markets in the 1990's and early 2000's, the credit rating agencies' ability to predict crises and their role prior to, during and after the crises has been of interest to a number of scholars and researchers (Kräussl, 2005; Mora, 2006; Reinhart, 2000). Alsakka and ap Gwilym (2009) for example, argued that the rating agencies exacerbated the capital reversal from the East Asian crisis of 1997 by downgrading countries as they entered the crisis, as opposed to prior to entering the crisis, resulting in the deepening of the crisis across the region and emerging markets. This agrees with the argument by Gelos, Sahay and Sandleris (2003), that sovereign credit ratings were procyclical and may therefore not have an on influence capital flows.This also supports the assertion by Ferri, Liu and Stiglitz (1999) that the rating agencies follow as opposed to leading the market, upgrading sovereign credit ratings during periods of high economic growth and downgrading the ratings during economic turmoil, leading to a boom-bust cycle.

[1]The recent Eurozone debt crises however suggest that sovereign credit ratings may not be the best measure of default risk with Moody A3 rated (investment grade) Greece requiring Euro-zone bail out in May 2010 to prevent debt default bankruptcy and the similarly highly rated (A rated) Ireland following in November 2010.

Credit rating agencies and the ratings that they issue however, remains a key feature in the global financial markets. Indeed, a number of studies have shown that an announcement on the sovereign and corporate credit rating adjustments is accompanied by an adjustment on the cost at which corporates and sovereigns access capital (Hand, Holthausen & Leftwich, 1992; Kaminsky & Schmukler, 2002). In addition, regulatory endorsement, through designations such as the Nationally Recognised Statistical Rating Organisations (NRSRO), make credit ratings a *de facto* requirement when issuing debt on international markets (Partnoy, 1999; S&P, 2011; SEC, 2003). Peter and Grandes (2005), for example, show that in the case for South Africa the sovereign credit rating appeared to be the single most important determinant of the corporate yield spreads, especially for financial services companies, suggesting that corporates can piggyback on the sovereign credit rating to access foreign debt at favourable rates. Studies such as that by Hooper, Hume, and Kim (2008), Li, Jeon, Cho and Chiang (2008) and Reinhart (2002), also show that sovereign credit ratings provide stock and foreign exchange markets with new tradable information, with ratings actions significantly impacting the United State of America's Dollar (USD) denominated stock market returns and volatility, suggesting a direct impact on portfolio equity flows. The study by Brooks, et al. (2004) also show that a sovereign credit rating downgrade announcement has a negative impact on the dollar price of the local currency. This, the authors argue, results in the fall in investor confidence in the value of future local currency denominated cash flows, suggesting an indirect impact on foreign direct investment (FDI), specifically market seeking FDI.

Despite the suggested influence of sovereign credit ratings on access to capital, many of the studies on ratings issued by the three top rating agencies, namely Fitch Ratings (Fitch), Moody's Investors Services (Moody's) and Standard and Poor's Ratings Services (S&P) have focused on their short-term (transitory) impact, as opposed to their long-term structural impact on capital flows. In particular, the studies have sought to investigate the ratings announcement impact on bond yield spreads and equity market returns (Bach, 2008; Cantor & Packer, 1996a; Ferreira & Gama, 2007).

1.1 Purpose of the study

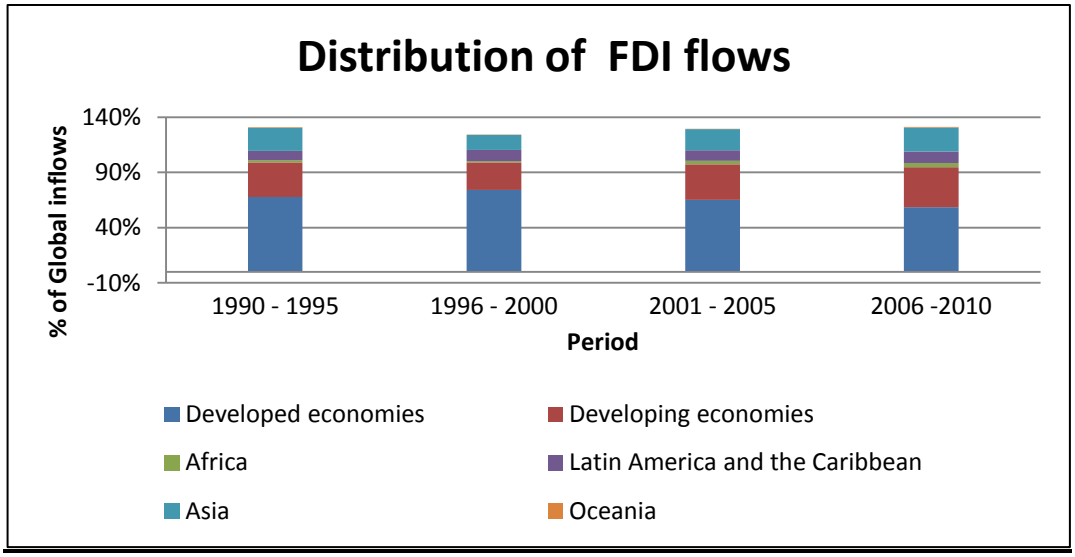
The purpose of the study is to apply regression analysis to test whether the sovereign credit ratings issued by Fitch, Moody's and S&P have a structural long-term influence on capital inflows in Africa. In addition, the study extends previous work by applying event study methodology to investigate the short-term (transitory) sovereign credit rating adjustment impact on aggregate equity stock market and the nominal foreign exchange rate returns in Africa.

1.2 Background and context of the study

Africa's share of capital inflows as a percentage of Gross National Product remains one of the lowest of all the developing regions (Asiedu, 2003; Loots, 1999; Lumbila, 2008; Martin & Rose-Innes, 2004; McDonald, Treichel & Weisfeld, 2006). Indeed, despite the proportion of capital flows to low and middle income countries having increased from approximately 40% in 2007 to just under 50% in 2009, as presented in figure 1, the proportion of FDI inflow to Africa is still low at approximately 3% of global FDI flows in 2009 from 2.8% in 2007 (UNCTAD, 2010).

Africa's share of private capital flows however, has not always been low. Africa's share of developing economies private capital flows in 1976 for example, was approximately 28%, which has since fallen to around 9% in 2007 (IMF, 2011). In addition to that, Osei, Morrissey, and Lensink (2002) show that private capital inflows to most African countries show a greater degree of volatility than those of the Asian and Latin American countries, the cause of which Gabriele, Baratav and Parikh (2000), attribute to socio-political instability.

As a region of largely developing economies, it is generally believed that an inherent regional risk, policy uncertainty and the lack of transparency are some of the factors retarding Africa's access to international private capital (Bhattacharya, Montiel & Sharma, 1997; Easterly & Levine, 1997; van Wyk & Lal, 2008). Gelos and Wei (2000), for example, found that there was clear evidence that international funds invest systematically less in the least transparent countries and that herding among investment funds, tend to be more prevalent in less transparent countries.



Source: UNCTAD, FDI/TNC database 2011

Figure 1: Distribution of global FDI flows.

Sidiqqi (2007) argues that, due to the transparency and discipline required to acquire and maintain a sovereign credit rating, the process may assist in improving capital flows to developing countries, such as those in Africa. The author further argues that sovereign credit ratings provide differentiation where there is information asymmetry among financial market participants. Indeed, Kaminsky, et al. (2004) argue that in addition to local and neighbouring news about international economic agreements, credit rating agency news explain a significant proportion of the capital inflow to emerging countries. Ferreira and Laux (2009) agree, suggesting that sovereign credit ratings not only affect capital inflows to the sovereign government, but also to private firms domiciled within the sovereign country.

It is within this context that the United States (US) Department of State, Bureau of African Affairs and the United Nations Development Program (UNDP) launched programs to assist Africa and other developing economies, to acquire sovereign credit ratings, in order to promote transparency and improve access to global capital markets (S&P, 2003; USDepartmentState, 2002). Not all sovereigns that seek ratings do so to seek immediate access to foreign debt markets however. As suggested by Standard and Poor's (S&P, 2003), in addition to the transparency and the prestige associated with the rating, sovereigns request the ratings to ease access to international capital by their sub-sovereigns (a division or organ of the state) and

corporates domiciled within the sovereign. Chile, for example, requested their first rating from S&P in 1992 and only issued their first sovereign bond ten years later (S&P, 2003). Indeed it has been shown that sovereign credit ratings have an influence not only on the sovereign's cost of capital but also on the cost at which resident corporations access debt through bonds (Peter & Grandes, 2005). This, it is suggested, is through the principle of country ceiling, where the sovereign credit ratings are in most instances the best rating in the country (Borensztein, Cowan & Valenzuela, 2007)[2].

1.1 Significance of the study

As an opinion on a country's willingness and ability to meet financial obligations, sovereign credit ratings encapsulate a number of macroeconomic and governance factors about a country (Bissoondoyal-Bheenick, Brooks & Yip, 2006). Previous studies show that sovereign credit ratings encapsulate macroeconomic fundamentals such as the economic growth, per capita income, inflation, external indebtedness, an indicator for economic development as well as financial default history (Cantor & Packer, 1996a; Mora, 2006; Poon, 2003; Ratha, De & Mohapatra, 2007). In addition, rating agencies suggest that the sovereign credit rating take into account qualitative factors (political and policy development), through input from the respective national authorities or rated entity (Gaillard, 2009).

Given the process and the factors encapsulated in a sovereign credit rating, as well as the suggestion by authors, such as Gelos, et al. (2003) that capital flows are attracted to investment rated sovereigns, it is conceivable that sovereign credit ratings not only bring new, valuable information to financial markets but that they are also a signal of transparency required to improve developing economies' access to capital, as suggested by Saddiqi (Siddiqi, 2007). It is therefore surprising that the focus of many studies on sovereign credit ratings has been on their short-term announcement impact on the cost of capital and not on their long-term structural

[2] Country ceiling doctrine reflects the transfer and convertibility risk, an opinion on the degree of control that is exercised by the sovereign on the entities domiciled in the sovereign with regards to foreign exchange convertibility and transfer (Fitch, 2010)

impact on capital flows (Bach, 2008; Brooks et al., 2004) . While Bevan and Estrin (2004) and Janiki and Wunnava (2004) tried to close this gap, their studies were focused on survey based Institutional Investors' country credit ratings. The twice a year issued Institutional Investors country credit ratings are published by the Economist Magazine and are based on information provided by economists and sovereign risk analysts at leading global banks and securities firms, making it an opinion of the investment community, with direct influence on capital allocation as opposed to the independent ratings issued by the rating agencies. In addition, the Institutional Investors' country credit ratings are issued twice a year at predetermined periods and are not actively monitored, as is the case with the independent rating agency issued ratings (Fitch, 2010; Gaillard, 2009; Moody, 2011).

It was not until the study by Kim and Wu (2008), who investigating the influence of sovereign credit ratings issued by S&P on the development of financial markets and capital inflows in emerging markets, that the impact of the independently issued sovereign credit ratings on capital flows were investigated. Kim and Wu's (2008) study, however, has a number of gaps, including that:

- The study focuses on the sovereign credit ratings issued by one agency as opposed to the three leading agencies namely Fitch, Moody's and S&P. The authors suggest that these were informed by availability of sovereign credit ratings data, which showed that S&P produced more sovereign ratings as well as being more active than other rating agencies. Studies such as that by Gaillard (2009) however, suggest that sovereign credit ratings issued by the different rating agencies have an asymmetric impact on financial markets, suggesting that different agency issued ratings will have asymmetric influence on the different types of capital flows. While, for example, Gaillard (2009) shows that bond yield spreads movements were more significant on sovereign credit rating downgrade announcements by S&P and upgrade announcements by Moody's, Brooks, et al. (2004) found that only Fitch and S&P had a significant downgrade impact on aggregate stock returns. In addition, by 2011 Fitch issued 22 ratings on African countries, as many sovereign credit ratings as those issued by S&P, suggesting that a study focusing on only one of these agencies issued ratings, will leave a gap in the subject of agency ratings on capital flows. The current study closes this gap by investigating the

long-term foreign currency sovereign credit ratings issued by all three leading rating agencies (Fitch, Moody's and S&P);

- Studies on sovereign credit ratings, such as those by Brooks, et al. (2004), Kaminsky and Schmukler (2002) and Kim and Wu (2008), focus on emerging economies and consequently include only three African countries namely Egypt, South Africa and Tunisia. In addition to maintaining investment grade ratings for the most part of the early 2000's as opposed to many other countries in the region that are rated below investment, these countries are also leading recipients of capital in the region. South Africa, in particular, has relatively more developed financial markets compared to many of the economies in the region (Ncube, 2008) and the flows to the country are more skewed towards portfolio flows (Arvanitis, 2005) as opposed to FDI and commercial bank debt flows. South Africa is also a leading investor in the region, making South Africa both the source and recipient of capital flows[3] (UNCTAD, 2010, 2011). Previous studies show asymmetric financial markets reaction to credit ratings adjustment for investment (largely developed economies) and below investment (largely developing economies) rated issues, suggesting that a generalised finding that does not take into account the quality of the rating may be misleading[4]. The current study closes this gap by testing the impact of the quality of the rating (investment or below investment grade) on capital flows. In addition, the study attempts to isolate the influence of South Africa by testing two separate models, one with a full sample that includes South Africa, as well as one that excludes South Africa; and
- Cavallo and Valenzuela (2007) point out that despite the rating agencies attempt to move away from the sovereign ceiling doctrine, sovereign risk transfer to private borrowers remains. This, the authors suggest, is through the sovereigns' power to levy taxes, impose capital controls or even seize the firm's assets when government capacity so necessitates. The authors further posit that the sovereign credit rating impact on private capital flows may be less significant for subsidiaries of multinationals not

[4] Refer to Hand, et al. (2002) and Brooks, et al. (2004) for the asymmetric rating impact on investment and below investment grade issues.

domiciled in the rated sovereign as they may have better access to their parent company lineage, suggesting that there may be no impact on bond, commercial banks and other private borrowing where the borrower is a large multinational. This is supported by Cantor and Packer (1989; , 1996b) and Durbin and Ng (2005), who found that some firms yield spreads were lower than similarly rated sovereigns, with investors ignoring the sovereign ceiling doctrine especially for firms with sustainable export earnings as well as those with close relationships with foreign parents or governments. While testing the impact of S&P issued sovereign credit ratings on the different types of capital flows, Kim and Wu (2008) do not separate between public and publicly guaranteed (PPG) and non-guaranteed (PNG) portfolio bond and commercial, bank and other private inflows. The current study closes this gap by separately testing the impact of sovereign credit ratings on public and publicly guaranteed (PPG) and non-guaranteed (PNG) portfolio bonds and commercial, bank and other private inflows.

In addition, the current study closes a number of gaps, by extending previous studies on the short-term impact of sovereign credit ratings on financial markets such as those by Brooks, et al. (2004) and Li, et al. (2008) as follows:

- Many of the African stock exchanges are still in their infancy, with a number of operating stock exchanges increasing from 7 in 1989 to 23 in 2007 (Giovannetti & Velucchi, 2009). Until recently, this has made it difficult for studies to include African countries, other than Egypt, South Africa and Tunisia in the international finance studies (Larraín et al., 1997; Rowland, 2006; Westphalen, 2001). The current study closes this gap by including all the African countries with national equity stock markets; and
- Despite the over 300% increase in daily foreign exchange turnover in 10 years between 1998 and 2007[5], only three studies by Brooks, et al. (2004), Li, et al. (2008) and Hooper, et al. (2008) investigated the impact of sovereign credit ratings on the foreign exchange rate market. The current study closes this gap by investigating the

[5] Daily average foreign exchange turnover in the spot markets in the 10 emerging markets in Asia, Latin America, Central Europe and South Africa rose from 71 billion USD in April 1998 to 337.3 billion USD in April 2007 ((BIS, 2007),

announcement impact of sovereign credit ratings on the nominal foreign exchange returns, in Africa.

1.2 Hypothesis

Özatay, Özmen and Sahinbeyoglu (2009) show that financial markets in countries with low ratings, such as those in Africa, are more affected by downgrades**,** than those with higher sovereign credit ratings. In addition, Cavallo, Kisselev, Perri and Roubini (2004) suggest that due to their ability to predict default risk, a good sovereign credit rating improves capital flows to emerging markets. This, the authors argue, may lead to a boom-bust cycle as excessive capital flows to investment rated sovereigns and result in real exchange rate overshoots. This is followed by countries finding it more costly (with increasing debt service cost) to repay non-contingent debt (debt that will not be affected by future events) increasing the sovereign's probability of default, subsequent downgrade and capital reversal (Cavallo, Kisselev, Perri & Roubini, 2004). These studies, however, like those by Brooks, et al. (2004) and Li, et al. (2008), only test the short-term transitory impact of sovereign credit ratings and do not close the knowledge gaps identified above. In order to close these research gaps, the current study systematically tests three hypotheses:

Hypothesis 1 – Long-term foreign currency sovereign credit ratings do not have a long-term marginal effect on the foreign private capital flows (Commercial bank and other private institutions, FDI and Portfolio bond and equity) in Africa.

The null hypothesis, H_0, to be tested is that long-term foreign currency sovereign credit ratings do not have a statistically significant long-term influence on private capital flows in Africa.

The alternative hypothesis, H_A, to be tested is that long-term foreign currency sovereign credit ratings have a statistically significant long-term influence on private capital flows in Africa.

Hypothesis 2 – Long-term foreign currency sovereign credit ratings do not have a statistically significant announcement impact on the aggregate equity stock returns in Africa

The null hypothesis, H_0, to be tested is that long-term foreign currency sovereign credit rating actions do not have a short-term statistically significant announcement impact on the aggregate equity stock returns in Africa.

The alternative hypothesis, H_A, to be tested is that long-term foreign currency sovereign credit rating actions have a short-term statistically significant announcement impact on the aggregate equity stock returns in Africa.

Hypothesis 3– Long-term foreign currency sovereign credit ratings do not have a statistically significant announcement impact on the nominal foreign exchange rate returns in Africa

The null hypothesis, H_0, to be tested is that long-term foreign currency sovereign credit rating actions do not have a short-term statistically significant announcement impact on the nominal foreign exchange returns in Africa.

The alternative hypothesis, H_A, to be tested is that long-term foreign currency sovereign credit rating actions have a short-term statistically significant announcement impact on the nominal foreign exchange returns in Africa.

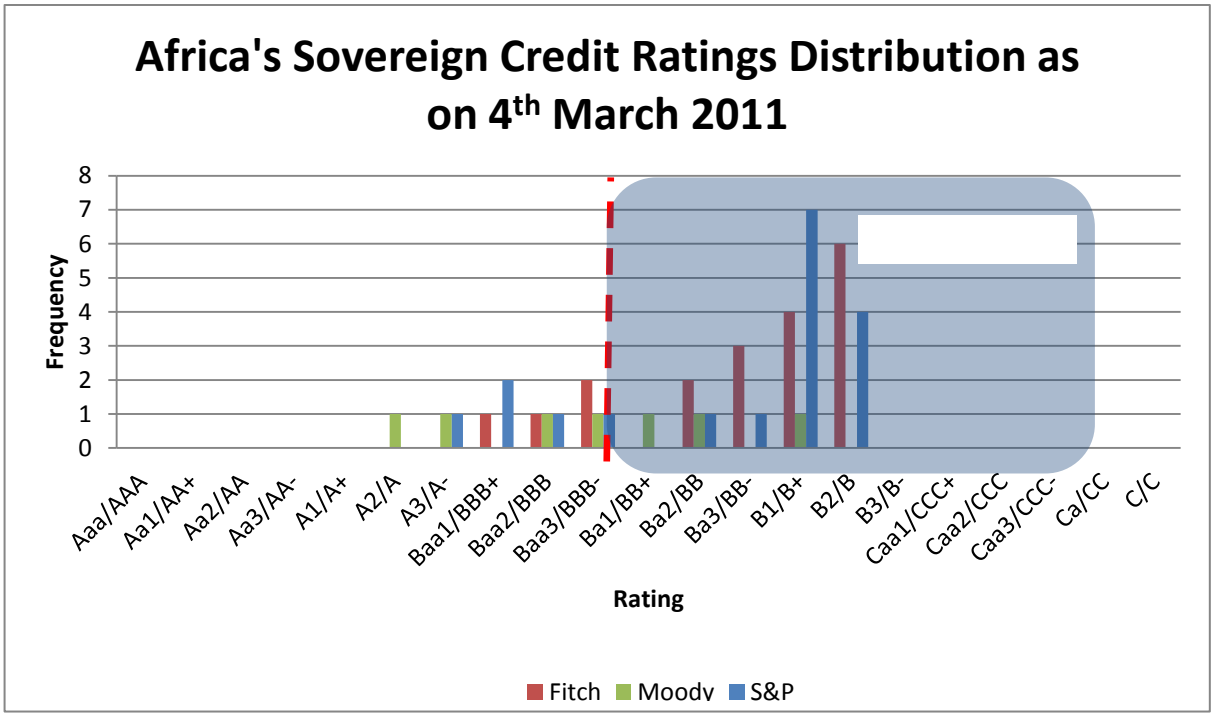
1.3 Structure of the thesis

The study is organised in 5 sections. Section 1 introduced the background and the analytical context of the study, by outlining some of the key issues related to the independent sovereign credit ratings. The gaps in existing literature on sovereign credit ratings were identified. Section 2 provides detailed definitions of sovereign credit ratings, the theoretical framework underlying the issue of a sovereign credit rating as well as the definition of the rating scale. The section further explores related empirical work on the relationship between the sovereign credit ratings and the financial markets and capital flows. Section 3 defines the analytical framework for the impact of long-term foreign currency sovereign credit ratings on capital flows and financial markets as well as the relevant modelling issues related to the empirical analysis. Empirical analysis results of the study are documented in section 4 and section 5 summarises the key findings of the study, major contributions and suggestions for future research.

2 RELATED WORK REVIEW: THEORY AND EMPIRICAL LITERATURE

While the history of the sovereign credit ratings goes back to the 1940's, when Moody's issued the USA a long-term local and foreign currency rating, Moody's had been rating specific government bond issues since 1919 (Cantor & Packer, 1996a; Gaillard, 2009). Sovereign credit rating issues increased in the late 1980's and early 1990's, as more emerging economies sought to issue debt on the international markets, following the establishment of the Brady bonds to convert bank loans of mostly Latin American countries in 1989 (Cantor & Packer, 1995). This, according to Cantor and Packer (1995), resulted in the assigned median rating in the 1990's to be the lowest possible investment grade, BBB-/Baa3, as opposed to the AAA/Aaa before 1985 when the ratings were largely assigned to developed economies.

The first African sovereign credit rating was issued in September 1994 when Fitch issued the long-term sovereign credit rating to South Africa. Sovereign credit rating issues on African countries accelerated in the 2000's, from 7 in 2001 to 22 by 2010, following the US Department of State, Bureau of African Affairs and UNDP initiatives (Fitch, 2007; Gaillard, 2009; S&P, 2003). Between 1994 and 2011, 28 sovereign credit ratings were issued on African countries by at least one of the three leading rating agencies (Fitch, Moody's and S&P), a majority of which are below investment grade as shown in figure 2.



Source: (Fitch 2011; Moody's 2011; S&P 2011)

Figure 2: Africa's Sovereign Credit Ratings Distribution as on 4th March 2011

2.1 Defining sovereign credit ratings

A sovereign credit rating is an opinion by the rating agency, on the ability and willingness of a sovereign government to meet financial commitments in full and at an agreed time (Hooper et al., 2008; Ratha et al., 2007; Reisen & von Maltzan, 1998). It is within this context that Gaillard (2009) cautions against the incorrect assumption that sovereign credit ratings are an all-encompassing opinion on the nation's credit rating. However, while agreeing that a sovereign credit rating is not an all-encompassing opinion on the nation's credit rating, Cantor and Packer (1996a), Kaminsky and Schmukler (2002) and Brooks, et al. (2004) point out that an entity domiciled within the sovereign is more likely to be rated equal to or below the sovereign, making the sovereign rating the "best" credit risk in a country, as also illustrated by Arteta and Hale (2007) and Borensztein, Cowan and Valenzuela (2008).

Sovereign credit ratings are issued on request by the rated sovereign government who also pay for the rating issue. In some instances, such as that of US Department of State, Bureau of African Affairs and UNDP initiatives , the rating issue is funded through a sponsor (Fitch, 2007; Gaillard, 2009; S&P, 2003). It remains incumbent however, irrespective of the rating issue funder, upon the rated sovereign to be open and transparent about the information and data upon which the rating will be based (Fitch, 2007). Haque, et al. (1989), Lehmann, (2004) and Saddiqi (2007), for example, argue that, due to the benefits derived from the transparency and disciplining effect involved in the process of issuing and maintaining a sovereign credit rating, it is beneficial for the rated sovereign to be transparent about the information and data upon which the rating is to be determined.

It is, however, the commercial aspect of the rating process, among other factors, that has been a source of concern for a number of observers. Several studies, for example, have argued that due to the business benefit to the agencies attached to the rating issue, some sovereigns (and debt issuers) may shop around for a favourable rating in order to reduce their cost of capital (Benmelech & Dlugosz, 2009). Benmelech and Dlugosz (2009) however found that this was rare for municipal, corporate and sovereign ratings as opposed to securitisation issues. The strongest criticism against sovereign credit ratings however, comes from the suggestion that their influence flows from their regulatory endorsement, as opposed to their informational value (Partnoy, 1999). Some investors, for example, do not invest in unrated assets, making the rating a *de facto* requirement for accessing capital (Cantor & Packer, 1996a; Chue & Cook, 2008; Rigobon, 2001). In addition, recommendations on banking laws and regulations, such as Basel II, recommended that a rating issue be an integral part of banks' capital requirement determination process (Al-Sakka & ap Gwilym, 2009; Ferreira & Gama, 2007; Lehmann, 2004; Mora, 2006)[6].

Three international rating agencies in particular, namely Fitch, Moody's and S&P, dominate the sovereign credit rating market (S&P, 2011; SEC, 2003). As in 2012, Fitch, Moody's and S&P accounted for approximately 90% of the global sovereign credit rating market, with S&P issuing

[6] Additional due diligence requirements have since been introduced to accompany the use of external ratings under the new securitisation framework (BIS (2010)). The Basel Committee's response to the financial crisis: report to the G20, last, from www.bis.org.

126 sovereign credit ratings, followed by Moody's with 113 and Fitch with 100 (Fitch, 2010; Moody, 2011; S&P, 2011). Indeed, until 2003, the three agencies were the only rating agencies endorsed by the Nationally Recognized Statistical Rating Organizations (NRSRO), making their rating issues the *de facto* ratings for accessing in particular the US financial capital markets (S&P, 2011; SEC, 2003)[7].

A number of studies have argued that the regulatory endorsement, combined with the agencies commercial interest as well as their failure to predict structural changes, has resulted in their rating opinions' failure to anticipate a number of emerging market crises in the 1990's and 2000's. Reinhart (2000), for example, argues that while they have been able to predict sovereign defaults, sovereign credit ratings have systematically failed to predict currency crises, and tend to lag these crises with downgrades. This is supported by Mora (2006), who showed through regression analysis that assigned ratings exceeded predicted ratings before the Asian crisis of 1997 and mostly matched the predicted ratings only during the crisis period. In addition, Claessens and Embrechts (2003) found that while internal and external ratings are driven by similar factors, both underestimate event risks with external ratings (those issued by the rating agencies) slower to respond to a financial crisis. Hooper, et al. (2008) further argue that the subsequent downgrades during the crisis were a clear case of overreaction and contributed to the intensity of the crisis by the rating agencies.

2.1.1 *Measuring the sovereign credit ratings*

In broad terms, there are two categories of ratings (investment grade and non-investment grade), separated according to the type of financial obligation (foreign or local currency) and the time to maturity (short and long-term) of the obligation[8]. Fitch, Moody's and S&P apply an ordinal scale in assigning sovereign credit ratings, with each symbol in one agency having an

[7] In the US the Securities and Exchange Commission (SEC) permits investment banks and broker-dealers to use the NRSRO credit rating agency (CRA) for certain regulatory purposes such as the net capital requirements. Similarly, in terms of the previous Basel Committee on Banking Supervision (Basel II agreement), banking regulators could allow banks to use credit ratings from certain approved rating agencies or "External Credit Assessment Institutions" when calculating their net capital reserve requirements (Basel II, SEC 2003, 2011).,

[8] Long-term ratings are those that have more than 13 months to maturity, while short-term rated securities are those that will mature within 13 months.

equivalent in the other agencies (Fitch, 2007; Gaillard, 2009), allowing for a comparison across the ratings issued by the different agencies.

Fitch and S&P use similar ordinal scales for the long-term ratings, ranging from **AAA,** denoting the lowest expectation of credit or default risk, to **D** where an entity has defaulted. A plus (+) or minus (-) modifier may be appended to the long-term rating category between **AAA** to **CCC**, to indicate their relative status within the category (Fitch, 2007; Gaillard, 2009). For the short-term rating however, the two rating agencies used a different ordinal scale. Fitch short-term ratings begin with **F1** for the highest credit quality, to **D** for an entity that has defaulted on short-term financial obligations with the plus (+) or minus (-) modifiers appended to categories rated **F1** to indicate their relative status within the category (Fitch, 2007). S&P short-term ratings, on the other hand, start from the highest **A1** for financial obligors with the highest capacity to meet short-term financial commitments to **D** for short-term obligations in default (Gaillard, 2009).

The highest long-term rating by Moody's is Aaa for obligations judged to be of minimal credit risk, to **C** for the lowest rated credit class, with little prospect for recovery of the principal or interest. Long-term ratings are further enhanced through appended modifiers 1, 2, and 3 for ratings between **Aa** through to **Caa** to indicate relative ranking within each category (Moody 2011). Moody's short-term ratings range from **P-1** (Prime-1) for issuer with superior ability to repay short-term debt obligations to **NP** (Not Prime) for issuers with a high risk of defaulting on short-term debt obligations (Gaillard, 2009). Table 1 summarise the long and short-term rating categories for Fitch, Moody's and S&P.

Table 1: Agency sovereign credit rating scales

<table>
<tr><th></th><th colspan="2">Moody's</th><th colspan="2">S&P</th><th colspan="2">Fitch</th></tr>
<tr><td></td><td>Long Term</td><td>Short Term</td><td>Long Term</td><td>Short Term</td><td>Long Term</td><td>Short Term</td></tr>
<tr><td rowspan="8">Investment Grade</td><td>Aaa</td><td rowspan="4">P-1</td><td>AAA</td><td>A1+</td><td>AAA</td><td>F1+</td></tr>
<tr><td>Aa1</td><td>AA+</td><td rowspan="3">A-1</td><td>AA+</td><td rowspan="3">F1</td></tr>
<tr><td>Aa2</td><td>AA</td><td>AA</td></tr>
<tr><td>Aa3</td><td>AA-</td><td>AA-</td></tr>
<tr><td>A1</td><td>A+</td><td rowspan="3">A-2</td><td>A+</td><td rowspan="3">F2</td></tr>
<tr><td>A2</td><td rowspan="2">P-2</td><td>A</td><td>A</td></tr>
<tr><td>A3</td><td>A-</td><td>A-</td></tr>
</table>

	Moody's		S&P		Fitch	
	Baa1		BBB+	A-3	BBB+	F3
	Baa2	P-3	BBB		BBB	
	Baa3		BBB-		BBB-	
Speculative Grade	Ba1	Not Prime	BB+	B-1	BB+	B
	Ba2		BB		BB	
	Ba3		BB-		BB-	
	B1		B+		B+	
	B2		B		B	
	B3		B-		B-	
	Caa1		CCC+	B-3	CCC+	C
	Caa2		CCC		CCC	
	Caa3		CCC-		CCC-	
	Ca		CC		CC	
	C		C		C	
			D	D	D	D

Source: (Fitch 2007; Moody's 2007; S&P 2007)

2.1.2 *Determinants of sovereign credit ratings*

Using regression analysis, Cantor and Packer (1996a), showed that sovereign credit ratings encapsulate a number of macroeconomic indicators namely per capita income, inflation, external indebtedness, growth (GDP growth), an indicator for economic development (proxied by the IMF classification of an economy as either industrialised or not industrialised), and an indicator for default history. Cantor and Packer (1996a) further show that these observable macroeconomic indicators explain 90% of S&P and Moody's issued sovereign credit ratings.

Subsequent studies have confirmed the findings by Cantor and Packer (1996a) with Bissoondoyal-Bheenick, et al. (2006) showing through ordered probit and case-based reasoning, that, in addition to a proxy for technological development, specifically mobile phone use, GDP growth and inflation rate explain the sovereign credit ratings. Mellios and Paget-Blanc (2006), on the other hand, show through principal components analysis that the most significant variables in assigning a sovereign credit rating are per capita income, government income, real exchange rate (RER) stability, inflation rate and the sovereign default history .

In addition, while agreeing that a sovereign credit rating encapsulate quantitative (financial and economic) factors, the agencies also point out that the agency's own judgement as well as qualitative (political and policy development) factors that may not be publicly observable, are taken into account when issuing a rating (Gaillard, 2009). Moody's (2006) further argue that, due to their forward looking nature, a sovereign credit rating analysis requires forward looking evaluation of risk of default over a medium to long-term horizon, necessitating medium to long-term projections. This, Moody's points out, involves a construction of a range of scenarios to stress test the vulnerability of the rated sovereign to internal and external economic, political and financial shocks. This supports the findings by Cantor and Packer (1996a), that at least 10% of the sovereign credit rating could not be explained by the macroeconomic factors, showing through regression analysis that quantitative models performed poorly in predicting small differences in the sovereign credit ratings, suggesting a greater qualitative review and agency intervention in the determination of a sovereign credit rating.

2.1.3 *Sovereign credit rating actions*

According to the rating agencies (Fitch, 2007; Gaillard, 2009; Moody, 2011), announcements on a sovereign credit rating outlook, watchlisting, affirmation and movement across the different notches constitute a credit rating action. Rating agencies, for example, make announcements on the actual rating between the different notches (A and A-) as well as the potential future direction of rating (stable, positive or negative outlook or watchlist)(Fitch, 2007; Gaillard, 2009; Moody, 2011). In the case of Moody's, for example, a rating outlook is an opinion on the likely direction of a rating in the following 18 to 24 months, while the watchlist is a formal active rating review on the direction of the rating in the following 3 to 6 months (Moody, 2011). This supports the findings by Hamilton and Cantor (2004), that in addition to the actual rating migration between the different notches, outlooks and watchlists were a good predictor of the possible rating migration and therefore , bring equally critical information to the international financial market[9].

[9] Fitch (2010) refers to a rating action as a rating upgrade, downgrade, affirmation, confirmation, watch-listing, or a change in the rating outlook.

Rating migration between the different notches, outlooks and watchlists are not regularly paced, but are brought on by changes in the underlying economic, financial and policy conditions that they encapsulate, suggesting an active monitoring process (Bissoondoyal-Bheenick et al., 2006; Cantor & Packer, 1995; Fitch, 2007). Ratha, De and Mohapatra (2007), for example, further showed that the rating changes by the different agencies also follow a similar direction and magnitude, suggesting a level of herding in the rating movements. This supports the argument by Sy (2002) that a rating event may also be brought on by a need to self-correct in cases where there may be rating splits (a difference in the rating on the same sovereign by the different rating agencies).

While the rating agencies argue that a sovereign credit rating is a forward looking opinion on the potential default on financial obligation, a number of studies have also suggested an upward bias by the rating agencies, resulting in sovereign credit rating actions that lag as opposed to leading the financial markets. Mora (2006), for example, found through regression analysis, that the agency assigned ratings exceeded the model predicted ratings, before the Asian crisis of 1997, with the agency assigned rating downgrades following the financial crisis, self-correcting to match the model predicted ratings. This supports the findings by Larraín, Reisen and Von Maltzan (1997) that, prior to the Mexican Peso devaluation in 1994, S&P rated the Mexican debt favourably two days prior to the Peso devaluation at one step below investment grade with a positive outlook[10]. Indeed Mora (2006) also noted that Russia defaulted on its financial obligations during the year that the sovereign debt was rated investment grade. In addition, Block and Vaaler (2004) found that the rating actions responded to political cycles, with adverse movement in the sovereign credit ratings immediately prior to an election and only normalising once the election results have been universally accepted.

[10] The recent Eurozone,debt crisis however suggest that sovereign credit ratings may not be the best measure of country risk with first Greece requiring Euro-zone bail out in May 2010 to prevent debt default bankruptcy, while rated A3 (investment grade) by Moody, followed by the equally highly rated (A rated) Ireland in November 2010.

2.2 The significance of the sovereign credit ratings

Given their regulatory endorsement, with investors such as mutual and pension funds investing only in rated securities as opposed to similar unrated securities, it is conceivable that credit ratings will have an influence on both the access and conditions at which capital is accessed (Cantor & Packer, 1996a; Kaminsky & Schmukler, 2002; Rigobon, 2001). Cantor and Packer (1996a), for example, showed through regression analysis, that 92% of sovereign bond yield spread variances were explained by an announcement on a sovereign credit rating adjustment (rating event) . In addition, the authors showed that, while the marginal impact of the sovereign credit ratings declined to 91.4%, their explanatory power remained at 1% significant level when their regression model was controlled for macroeconomic factors, suggesting a robust relationship between sovereign credit ratings and bond yield spreads.

While the findings by Cantor and Packer (1996a) supports the assertion by Reinhart (2000) that sovereign credit ratings have done well to predict sovereign defaults, this contradicts the argument by Partnoy (1999) that markets, through the sovereign bond yield spreads, are a better indicator of the country risk. Indeed, a number of studies such as that by Larrain et al. (1997), support the assertion that sovereign credit ratings do bring new information to the financial market. In the short-term at least, the studies demonstrate that sovereign credit ratings have a significant announcement impact on sovereign yield spreads. In particular, Larrain, et al.(1997) argue that the rating adjustments were anticipated as opposed to lagging the financial market, reflected by the yield spreads rising days prior to the negative outlook announcement and declining before a positive outlook announcement. Concurring with Larrain, et al.(1997), Norden and Weber (2004) showed that corporate stock and credit swap markets anticipate both the downgrades and negative outlook announcements, with S&P and Moody outlooks exhibiting a bigger impact than the actual downgrade. Larrain, et al.(1997), however, also show that the yield spreads reverse once the announcement has been confirmed, suggesting a transitory as opposed to a long-term structural impact. In addition, the authors show that the causality between sovereign credit ratings and yield spreads was both ways, with the sovereign credit rating adjustment also following yield spread adjustments.

2.2.1 *Sovereign credit rating and financial markets*

Despite the criticism and calls for more transparency in the rating process (EU, 2011; Fang, Lai & Miller, 2009)**,** a number of studies have shown that sovereign credit rating adjustments bring new information to the financial markets. Brooks, et al. (2004), for example, show that the sovereign credit rating adjustments have a cross asset impact in addition to influencing the rated bond issues. The authors show that sovereign credit rating downgrade announcements have a negative impact on aggregate equity stock returns as well as on the dollar value of the domestic currency (exchange rate). The cross asset impact of the sovereign credit rating adjustments was confirmed by Ferreira and Gama (2007) who also show across border contagion of the sovereign credit rating adjustment. The authors show that the sovereign credit rating for downgrade adjustment announcements have a significant negative spill-over effect, with the geographic proximity and emerging market status of the affected neighbouring country amplifying the impact. In addition, the impact extended to industry level, with the traded goods and small industry effect more pronounced (Ferreira & Gama, 2007).

Cavallo and Valenzuela (2007) concur, showing that in addition to firm-specific variables, debt issue characteristics and macroeconomic conditions, sovereign risk and global factors account for the variances in corporate bond spreads. The authors posit that the transfer of risk from a sovereign credit rating to the private borrowers will remain as the sovereign government has the power to levy taxes, impose capital controls or even seize the firm's assets when government capacity so necessitates. Indeed, Borensztein, et al. (2007) point out that while agencies are gradually moving away from sovereign ceiling doctrine, it appears that sovereign ratings remain a significant determinant of the ratings assigned to corporates domiciled in the sovereign, even after controlling for macroeconomic factors as well as corporate performance indicators.

Cavallo and Valenzuela (2007) however, caution that transmission of risk from a sovereign to private borrowers was not universal, with the transmission from the sovereign to the private borrowers less significant for subsidiaries of multinational companies. This is supported by Cantor and Packer (1996b) and Durbin and Ng (2005), who found that some private corporate borrowers were rated more favourably than their sovereigns and that in some instances,

corporate yield spreads were lower than similarly rated sovereigns. Durbin and Ng (2005) argue that investors tended to ignore the sovereign ceiling doctrine especially for firms with sustainable export earnings as well as those with close relationships with foreign parents or governments. In the case of South Africa, for example, Peter and Grandes (2005) found that for local currency ratings, the sovereign ceiling doctrine did not apply to multinationals and where the doctrine is applied, it is more pronounced for financial services firm spreads.

In addition to the asymmetric impact on private corporate borrowers, the impact of the sovereign credit ratings adjustment has been shown to be dependent not only on the type of the rating action (downgrade or upgrade), but also on the rating agency. A number of studies, for example, have shown that the rating adjustment impact was significant for downgrades and not for the rating upgrades (Brooks et al., 2004; Cantor & Packer, 1996a; Gaillard, 2009). Indeed, while Cantor and Packer (1996a) found that the sovereign credit rating upgrade and downgrade adjustments have an impact on the sovereign bond yields, the study found that the sovereign credit rating announcements were more pronounced for below investment grade ratings. Reisen and von Maltzan (1998) further show that the sovereign credit rating adjustments impact was significant only when a country was put on review for possible downgrade. This agrees with the findings by Ferreira and Gama (2007), who found that there was a negative stock market return spreads (the return differential vis-a-vis the US NY stock exchange) to a sovereign credit ratings downgrade but no significant reaction to upgrades. This is in line with the findings by Brooks, et al. (2004) and Hooper, et al. (2008) that the rating adjustment impact was dependent on the type of the economy, with the adjustment impact more pronounced for emerging markets economies whose credit ratings are usually of lower credit quality .

Brooks, et al. (2004) further show that only sovereign credit ratings issued by Fitch and S&P had a significant downgrade impact on aggregate stock returns as compared to those issued by Moody's and Thomson. Gaillard (2009) concurs, showing that for sovereign bonds, the rating downgrade adjustment by S&P and upgrade adjustments by Moody's have the most significant impact on yield spread movements. In addition, Gaillard (2009) shows that Moody's issued sovereign credit ratings disagree more with the market than Fitch and S&P. This is contrary to

the findings by Ratha, et al. (2007) who showed that there was a high correlation between sovereign ratings issued by different agencies, with bivariate correlation co-efficiencies ranging between 0.97 and 0.99 for Fitch, Moody and S&P in 2006. The authors argue that the differences in the ratings were found to be arising from the timing of the rating as opposed to the interpretation or biases by the rating agencies. While Cantor and Packer (1996a) confirm the consistency on assigned Moody and S&P ratings, they found that agencies differed more frequently on below investment sovereign bonds ratings than they do on corporate bonds. This, the authors suggest, was brought about by difficulties in assessing political and economic conditions for developing economies. The rating agencies (Moody, 2007; S&P, 2007) however suggest that the rating splits may be due to the analysts' experience and judgement and not on any biases by the agencies, suggesting that the asymmetric reaction to the rating adjustments by the different rating agencies may be due to the market confidence in the respective agency capability.

2.2.2 *Sovereign credit ratings impact on capital flows*

According to Kaminsky and Schmukler (2002) and Özatay, et al. (2009), sovereign credit ratings address the information asymmetry by bringing new information, especially for non-transparent economies, improving their ability to attract private capital flows. While Cavallo, et al. (2004) agree, they also caution that an investment grade sovereign credit rating issue on an emerging market economy, attracts excessive inflows that they fail to handle, leading to real exchange rate overshoots (devaluation in excess of the long run equilibrium level) and potential currency crises. In line with Cavallo, et al. (2004), Larrain, et al. (1997) suggests that emerging market sovereign credit rating downgrades have the potential to dampen excessive private portfolio capital flows, with cautious investors reducing their exposure to emerging markets following a downgrade.

In contrast to Cavallo, et al. (2004), and Larrain, et al. (1997) however, Gelos, Sahay, and Sandleris (2003) could not detect significant punishment of defaulters by the credit markets. This is supported by Reinhart and Rogoff (2008) who argue that serial default is nearly universal as countries struggle to transform from emerging to advanced economies. Reinhart

and Rogoff (2008) also show that crises frequently emanate from financial centres with transmission through interest rates and commodity prices, suggesting that in the absence of a conducive global environment, private capital flows will dry up irrespective of the prevailing domestic environment or sovereign credit rating. This is supported by Kasekende, et al. (2009), who posit that the minimal financial impact experienced by Africa during the 2008 global economic and financial crisis, was due largely to the declining demand and falling commodity prices as opposed to financial contagion.

While not disagreeing with Gerlos, et al. (2003) and Reinhart and Rogoff (2008) on the importance of the global environment on investment flows, Reinhart, Rogoff and Savastano (2003) argue that countries whose Institutional Investor country credit Index was very low, had a high probability of default and were least likely to access the international private capital markets while their country credit Index was very low. The authors show a history of default reduces the debt to Gross National Product (GNP) threshold of debt intolerant countries (countries that have no capacity to carry debt and continue to meet financial obligations) to as low as 15%, suggesting a correlation between debt capacity as reflected in the country credit Index and access to capital.

The findings by Reinhart, et al. (2003), are supported by Kaminsky, et al. (2004), who show from a sample of 104 countries, that the largest decline in net capital inflows as a proportion of GDP, was correlated to the decline in Institutional Investor country ratings for the middle-income countries. Indeed, Hernandez, Mellado and Valdés (2001) earlier found that one of the factors that negatively impacted on portfolio flows to developing economies between the 1970's and 1990's was the country's indebtedness and creditworthiness, as represented by their country credit ratings. This is further supported by Janicki and Wunnava (2004), who show that the the Institutional Investor's country credit rating was a significant determinant of FDI inflows to emerging central and eastern European countries. In addition, Bevan and Estrin (2004) also show that that there is a two way causality between the Institutional Investor's country credit rating and FDI inflows, with FDI enhancing International Investor country's credit rating with a lag, leading to increased future FDI inflows that created a self-reinforcing cycle.

While the studies, such as those by Reinhart, et al. (2003), Kaminsky, et al. (2004), Bevan and Estrin (2004) and Janicki and Wunnava (2004) demonstrate the effect of a country rating on capital flows, these studies do not address the question of rating agency issued sovereign credit ratings on capital flows. The studies are based on the Institutional Investor country ratings that, unlike the rating agency issued sovereign credit ratings, are based on a survey input from the investment community such as senior economists, sovereign risk analysts at leading banks, money management and securities firms [11]. In addition, the Institutional Investor country ratings are issued periodically in March and September of each year, as opposed to the continuously monitored sovereign credit rating issues by Fitch, Moody's and S&P (Fitch, 2010; Gaillard, 2009; Institutional-Investor, 2013; Moody, 2011).

On the other hand, studies such as those by Kaminsky and Schmukler (2002), Cavallo, et al. (2004) and Larrain, et al. (1997), while investigating the Fitch, Moody's and S&P sovereign credit ratings, only analyse their short-term adjustment impact on financial market performance, as opposed to their long-term structural impact on capital flows. Indeed, while confirming a highly significant short-run negative rating adjustment announcement impact on emerging-market sovereign bond yields, Larrain, et al. (1997) caution against overestimating the long-run impact of the sovereign credit ratings, leaving a knowledge gap in the effect of independent sovereign credit ratings on capital flows. Kim and Wu (2008) attempt to close this gap by investigating the long-term effect of S&P issued ratings on financial sector development and capital flows, on 51 emerging market countries. The authors investigate the effect of both the long-term and short-team foreign and local currency sovereign credit ratings on the different types of capital flows (FDI, Portfolio Bond, Portfolio Equity, Portfolio investment, excluding liabilities constituting foreign authorities' reserves, total assets minus total liabilities of BIS reporting banks against individual countries and total loans minus total deposits from BIS reporting banks against individual countries) for the period between 1995 and 2003.

[11] See (2004) and Janiki and Wunnava (2004) for studies on the impact of Institutional Investor country risk rating FDI inflows in the central and Eastern Europe transition economies

The key findings from Kim and Wu (2008) are that S&P issued long-term foreign currency sovereign credit ratings improved the financial intermediary markets. The study also demonstrated a positive correlation between the S&P issued long-term foreign currency sovereign credit ratings and capital flows, suggesting that the impact on capital flows is transmitted through the financial intermediary markets. Kim and Wu (2008), however, found that the effect of S&P issued long-term foreign currency sovereign credit ratings was not significant for all types of capital flows, with the statistically significant effect only on the bank flow variables (total assets minus total liabilities of BIS reporting banks against individual countries and total loans minus total deposits from BIS reporting banks against individual countries) but not for the portfolio bond, portfolio equity and the ratio of FDI to GDP. While the authors find that the long-term local currency sovereign credit ratings do improve the local market development, the study concludes that the long-term local currency sovereign credit ratings and both the local and foreign currency short-term sovereign credit ratings do not improve the international capital inflows with the short-term sovereign credit ratings retarding capital flows.

2.3 Conclusions

This chapter introduced sovereign credit ratings, defining factors that inform the sovereign credit rating as well as the impact sovereign credit ratings have on financial markets. Empirical evidence show that a number of macroeconomic factors identified by Cantor and Packer (1996a) and confirmed by Bissoondoyal-Bheenick, et al.(2006), determine the sovereign credit rating. In addition, the rating agencies suggest that the agency's own insights are critical in the determination of new rating issues as well as in the adjustment of existing ratings (Fitch, 2007; Moody, 2011; S&P, 2007). This is supported by Cantor and Packer (1996a), who show that, on average, the publicly available macroeconomic indicators explain 92.4% of the variability in the average sovereign credit ratings (90.5% of Moody issued ratings and 92.6% of S&P issued ratings), suggesting that the remaining unexplained variability was brought on by the rating agency insights.

While the rating agencies make it clear that the issued sovereign credit ratings are an opinion on the sovereign's ability and willingness to meet its financial obligations, the interest in the ratings and the rating agencies has focused on their role on financial crises. In some instances, it has also been suggested that the rating agencies have an upward bias, issuing ratings above the sovereign's ability to meet financial obligations, leading to default risk and financial crises (Mora, 2006; Sy, 2004). In particular it is posited that sovereign credit rating issues lagged emerging market financial crises in the 1990's, reacting instead to the crisis through a downward adjustment (Gelos et al., 2003; Kaminsky & Reinhart, 2002; Reinhart, 2000). This, it is suggested, exacerbated the crises, with the capital flow reversals following the downgrades.

Empirical evidence however, suggests that sovereign credit ratings do bring new independent information to financial markets. A number of studies, for example, argue that sovereign credit ratings fill the information asymmetry that is characteristic of the developing economies, in addition to potentially providing differentiation between these economies (Ratha et al., 2007; Siddiqi, 2007). This concurs with studies such as those by Kaminsky and Schmukler (2002), Cavallo, et al. (2004) and Larrain, et al. (1997), that suggest a strong relationship between Fitch, Moody's and S&P sovereign credit ratings and access to foreign capital at favourable conditions. These studies, focused on the short-term rating transition impact on financial markets performance, show a rating transition announcement impact on the bond yield spreads and equity stock returns (Ferreira & Gama, 2007; Hooper et al., 2008; Rowland, 2006). Empirical evidence from these studies shows that it is the insights of the rating agencies as well as the interpretation and projection of the future outlook on the publicly available macroeconomic indicators that bring new information to the financial markets. As shown by Cantor and Packer (1996a), while the macroeconomic indicators explain 85.6% of the variance in the sovereign yield spread, the sovereign credit ratings explain 91.9% of these variances, indicating a market information value flow from the sovereign credit ratings. Indeed, while subsequent studies show mixed reaction to the sovereign credit rating downgrade and upgrade adjustments, the studies agree with Cantor and Packer (1996a)'s study that sovereign credit rating adjustments do bring new information to the financial market. Reisen and von Maltzan (1998), for example, show that sovereign bond yield spreads reacted to negative (downgrade) sovereign credit rating adjustments but not to the positive (upgrade) adjustments. This is

confirmed by Brooks, et al. (2004) who showed that sovereign credit rating downgrades, specifically those by Fitch and S&P, resulted in the negative aggregate stock market and foreign exchange rate returns. Reisen and von Maltzan (1998) however, while not finding any evidence of positive rating announcement impact on yield spreads, show a positive rating adjustments bond yield spread and stock market returns volatility.

Empirical evidence also shows an asymmetric impact of sovereign credit ratings on financial markets, based on the type of economy (developed and developing economy). Ferreira and Gama (2007) and Kaminsky and Schmulker (2002), for example, show that the rating adjustments impact is more pronounced for emerging markets as opposed to developed economies. This supports the findings by Reisen and Von Maltzan (1998) and earlier findings by Cantor and Packer (1996a) who showed that the sovereign credit rating adjustment impact was specifically pronounced for below investment rated sovereigns that are predominantly developing economies. In addition, Ferreira and Gama (2007) and Kaminsky and Schmulker (2002) show that the sovereign credit rating adjustment impact on emerging markets bond yields and equity stocks has a spill over impact on neighbouring countries, with Kaminsky and Schmulker (2002) showing that this is more pronounced during a financial crisis. Indeed Kaminsky and Schmulker (2002) argue that there is herding mentality by market participants in emerging markets, which is reflected during rating adjustment.

Literature on sovereign credit ratings further suggests a relationship between the rating adjustment and access to capital. Cavallo, et al. (2004), for example, suggest that higher sovereign credit rating improves capital flows to emerging markets, with an investment rated sovereign issue leading to a higher capital inflow. This is in line with the argument by Kaminsky and Schmukler (2002) and Özatay, et al. (2009) that sovereign credit ratings address the information asymmetry on emerging economies by bringing new information, especially for non-transparent economies, improving their ability to attract private capital flows. Kim and Wu (2008) go on to test this conjecture, showing that long-term foreign currency sovereign credit ratings issued by S&P not only improved the financial development of emerging markets, but that they also have a positive relationship with the different types of capital flows to emerging

economies. This supports the earlier findings by Bevan and Estrin (2004) and Janicki and Wunnava (2004), who showed that a different type of country rating (International Investor issued country rating), explained the differences in FDI flows to emerging central and east European countries. Indeed, Partnoy (1999) argues that due to their regulatory endorsement, rating agencies have the power to influence access to capital flows. This concurs with the argument by Cantor and Packer (1995) that, since the establishment of the Brady bonds in the late 1980's, sovereigns credit ratings have become a *de facto* requirement for emerging economies to access international debt markets with investors such as the mutual and pension funds investing only in rated securities as opposed to similar unrated securities (Cantor & Packer, 1996a; Kaminsky & Schmukler, 2002; Rigobon, 2001).

3 ANALYSIS OF SOVEREIGN CREDIT RATINGS IMPACT– EMPIRICAL FRAMEWORK

This chapter defines the analytical framework for the impact of long-term foreign currency sovereign credit ratings on capital flows and financial markets in Africa. First, the chapter defines the analytical framework for the long-term structural relationship between the long-term foreign currency sovereign credit ratings issued by Fitch, Moody's and S&P and the different types of capital flows namely, foreign direct investment (FDI), portfolio equity (EQUITY), portfolio bond (Bond) and commercial borrowing from private banks and other private institutions (COMMERCIAL). The chapter proceeds to define the short-term, transitory rating adjustment impact on the aggregate equity stock and nominal foreign exchange rate returns.

The analytical framework does not attempt to derive new fundamental models from the first principles, but is based on widely used frameworks with adaptations to reflect the inclusion of the proposed additional variables as well as the empirical analysis techniques employed. Two quantitative techniques, widely used in economic and financial research, are used to test the impact of the long-term foreign currency sovereign credit ratings on financial markets and capital inflows in Africa, namely the event study technique and regression analysis.

3.1 A framework for empirical measurement of the long-term structural effect on capital flows

In empirical research in particular, a theory is tested in order to confirm or support a prevailing theory or null hypothesis before a regression model is accepted as the best estimate of the true value of the dependent variable (Brooks 2008). The burden of proof is normally on proving an alternative theory or the alternative hypothesis, by testing the existence of a significant relationship between two or more variables (Albright, Winston & Zappe, 1998). According to Koop (2008), for the prevailing theory or null hypothesis to be rejected (and for the alternative theory to be accepted) a statistical significance of the estimated marginal effect of the

independent variable(s) on the dependent variable must be estimated. This statistical significance is based on the level of confidence that the estimated values of the regression model are closer to the true value of the estimated variables (Koop, 2008). The confidence level, a reflection of the estimation error (*or point estimate*) of a regression model, is presented as a range of values, that represent the confidence level of estimation (90%, 95% or 99%), with the higher value indicating a higher accuracy of the estimated value.

For the current study, regression analysis is applied to test the null hypothesis that long-term foreign currency sovereign credit ratings do not have a statistically significant long-term influence on private capital flows in Africa. This involves an estimation of the marginal influence of the sovereign credit ratings (the independent variable) on the different types of capital flows (dependent variable), while controlling for variables previously proved to have an effect on the different types of capital flows. According to literature , a number of specific macroeconomic variables and country risk factors that are observable by investors at the time of making an investment, explain the differences in capital flows to emerging economies (Hernandez, Mellado & Valdés, 2001). These macroeconomic variables and country risk factors form the basis for the empirical analysis of the long-term structural relationship between the long-term foreign currency sovereign credit ratings and the different types of capital flows, as described below.

a. ***Recipient country market size***

Empirically there is agreement that a large market size implies increased demand for goods and services, and is one of the key pull factors of capital flows, in particular market seeking FDI inflows (Bhattacharya et al., 1997; Loots, 2005; Malefane, 2007). Mhlanga, Blalock, & Christy (2010), for example, found that the host country market size has a positive impact on FDI flows to SADC countries irrespective of the source, sector or type of investment. This agrees with an earlier study by Malefane (2007), who found through co-integration analysis, that export seeking FDI flows to Lesotho, were targeting the larger South Africa's GDP, as opposed to the smaller local GDP.

b. ***Trade openness***

As demonstrated by Janicki and Wunnava (2004) and Bevan and Estrin (2004), openness, as presented by external trade in goods and services , is one of the key determinants of FDI flows from the European Union member states to the emerging central and east European countries. As demonstrated by Janicki and Wunnava (2004) and Malefane (2007), the ease and ability to access a larger external market is critical for attracting export seeking FDI to smaller developing economies, where the domestic demand for goods and services may not justify market seeking FDI.

c. ***Sovereign indebtedness***

According to Hernandez, et al. (2001), one of the factors that negatively impacted on portfolio flows to developing economies between the 1970's and 1990's was the country's indebtedness and creditworthiness. This was confirmed by Gelos, et al.(2003), who found that in addition to the government debt levels, the ability to service the debt represented by the country's liquidity was a key determinant of government ability to access international bond and bank loan markets. Reinhart and Rogoff (2004) concur, arguing that the lack of capital flows from developed countries to poor countries is related to, among other factors, risk that the sovereign will default on its financial obligations.

d. ***Monitory policy stability***

Monetary policy instability as represented by inflation rate, negatively impact capital flows to developing countries, as investors lose confidence in the value of the returns to be derived from the weakened and often volatile local currency (Asiedu & Lien, 2004). In particular, in an unstable monetary policy environment, foreign investors are particularly concerned with the erosion of local currency denominated returns in an environment of high inflation rates (Bevan & Estrin, 2004).

e. ***Infrastructure development***

One of the key considerations for manufacturing investment in developing economies is the potential cost advantage of the host economy. Good infrastructure, as shown by Morisset

(1999) and Asiedu (2003), is expected not only to improve productivity but to also reduce the cost of doing business. In addition, Kim and Wu (2008) found that investors were also more likely to invest in economies that invested in future production capacity, as represented by investment in productive capacity.

f. ***Quality of the host country's institutions***

Investor surveys suggest that in addition to favourable macroeconomic factors, a conducive investment climate is required to encourage capital flows to developing economies (Asiedu & Lien, 2004). Jenkins and Thomas (2000), for example, show that in addition to an unstable macroeconomic environment, investors identified regulatory uncertainty as a key factor in discouraging capital flows to Southern Africa. An empirical analysis by Asiedu (2003) confirms this observation, with the results of a regression analysis on the determinants of FDI to Africa, showing that macroeconomic stability, efficient institutions, political stability and a good regulatory framework explain the differences in FDI flows.

g. ***Financial intermediary development***

A level of development of financial intermediaries is necessary to facilitate the absorption of the capital inflows to an economy (Portes & Rey, 2005). As demonstrated by Ndikumana (2000), for example, higher financial intermediary development leads to increased future levels of investment and capital accumulation. This supports an earlier study by Lensink and White (1998) who found that an indicator for financial development represented by the ratio of broad money to GDP , was one of the significant independent variables in a regression model of the determinants of capital flows to developing economies.

h. ***International environment***

As suggested by Taylor and Sarno (1997), and supported by Manasse, Roubini and Schimmelpfennig (2003), Dailami, Masson and Padou (2005) and Cuadra and Sapriza (2008) external factors, such as the investor country economic environment have an effect on capital flows to emerging economies. The studies in particular show that capital flows to vulnerable economies, with low country ratings in Latin America, East Asian and Eastern Europe, were

more sensitive to US interest rates movements than those with investment grade country ratings.

3.1.1 *Specification of the long-term structural capital flow equation*

Based on empirical analysis and in line with the reduced form equation specified by Edwards (1984), the long-term relationship between capital flows and long-term foreign currency sovereign credit ratings can be modelled as follows:

$$CAPFLOW_{it} = \alpha + \beta_{t-1} CAPFLOW_{it-1} + \beta^{i} R_{i,t} + \beta^{RSA} R_{RSA,t} + \sum_{k=1}^{p} \gamma_{t-1} ECONOTRS_{i,t} + k{=}1p\delta t{-}1WBGOVMi,t{+}\varepsilon \quad (1)$$

Where:

- $\boldsymbol{CAPFLOW_{it}}$, represents alternatively the different types of foreign capital flows namely FDI, portfolio bond, portfolio equity or commercial bank and other private institutions measured as the ratio of the annual net capital inflows to GDP;
- $\boldsymbol{CAPFLOW_{it-1}}$ represents alternatively a single period lag of the different types of foreign capital flows namely FDI, portfolio bond, portfolio equity or commercial bank and other private institutions measured as the ratio of the annual net capital inflows to GDP;
- $\boldsymbol{R_{i,t}}$, **and** $\boldsymbol{R_{RSA,t}}$ represent the average annual sovereign credit rating of country ***i*** at time ***t***, and the average annual sovereign credit rating of South Africa at time ***t*** respectively;
- $\boldsymbol{ECONOTRS_{i,t}}$ represent the annual national macroeconomic control variables discussed in *a* to *h* above; and

  $\boldsymbol{WBGOVM_{i,t}}$ represent the indicators of quality of country governance (voice and accountability, political stability, government effectiveness , regulatory quality and the rule of law)[12]

[12] See Kaufmann et al. (2005). for the description of the details of the construction of indicators of quality of country governance

a. *Data descriptions and modelling issues*

The data set for the current study covers 28 countries for which long-term foreign currency sovereign credit ratings were issued by either one of Fitch, Moody's or S&P for the period between1994 and 2011. The period coincides with the year in which the first long-term foreign currency sovereign credit rating was issued for an African country, when South Africa was issued a BB long-term foreign currency sovereign credit rating by Fitch on the 22nd of September 1994.

i. Foreign capital flows

The current study takes into account the different types of foreign capital flows as identified by Sula and Willett (2009) and Williamson (2005) . These include net flows of foreign direct investment (FDI), portfolio equity (EQUITY), portfolio bond (BOND) and commercial banks and other private institutions (COMMERCIAL). Net flows from portfolio bond and commercial banks and other private institutions are further divided into those that are public and publicly guaranteed (PPG) and those that are nonguaranteed (PNG), to distinguish between the underlying security provided by the borrower. In order to ensure consistency of measurement and source, all the capital flows were sourced from the World Bank's World Development Indicators databases. This also ensured the consistency of definition as described below:

- Foreign direct investment (FDI) - are the net inflows of investment to acquire a lasting management interest, described as 10 per cent or more of voting stock, in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments;
- Portfolio equity (EQUITY), net inflows (BoP, current US$) - are the net inflows from equity securities other than those recorded as FDI and includes shares, stocks, depository receipts, and direct purchases of shares in local stock markets by foreign investors;
- Public and Publicly Guaranteed bonds (PPGBOND) (NFL, current US$) – are public and publicly guaranteed debt from bonds that are either publicly issued or privately placed

and the net flow received by the borrower during the year constitutes disbursements minus principal repayments;

- Public and Publicly Guaranteed commercial banks and other creditors (PPGCOMMERCIAL) (NFL, current US$) – are public and publicly guaranteed long-term commercial bank loans from private banks and other private financial institutions received by the borrower during the year, constituting disbursements minus principal repayments.
- PNG or Nonguaranteed (PNGBOND) bonds (NFL, current US$) – are nonguaranteed long-term debt from bonds that are privately placed and the net flow received by the borrower during the year, constituting disbursements minus principal repayments
- PNG or Nonguaranteed (PNGCOMMERCIAL) commercial banks and other creditors (NFL, current US$) – are nonguaranteed long-term commercial bank loans from private banks and other private financial institutions received by the borrower during the year, constituting disbursements minus principal repayments

Each one of the capital flows were converted to net inflow rates as a ratio of GDP in current US dollars.

ii. Annual average sovereign credit ratings

The current study considers all long-term foreign currency sovereign credit ratings issued by Fitch, Moody's and Standard and Poor's (S&P) on African countries between 1994 and 2011, a total of 28 countries, 5 of which are rated by all 3 rating agencies, 16 of which are rated by 2 and 7 by one rating agency (See Appendix A for the list of the countries). For each one of the long-term foreign currency sovereign credit ratings, the study identified rating events that constitute an announcement on the changes in the rating status by the rating agencies on long-term foreign currency sovereign credit ratings as well as the annual average sovereign credit rating for each country. Each rating was sourced from the respective rating agencies to ensure consistency of measurement and the timing of rating changes (Fitch, 2011; Moody, 2011; S&P, 2011).

Sovereign credit ratings by Fitch, Moody's and S&P are presented in ordinal scale and a transformation to a numerical scale was required in order to carry out regression model

estimation. Borrowing from Cantor and Packer (1996a) and Grande and Parsley (2005), the data is linearly transformed to time series data as presented in Table 2

Table 2: Linear transformation of the foreign currency sovereign credit ratings.

	Moody's	S&P	Fitch	Conversion
Investment Grade	Aaa	AAA	AAA	20
	Aa1	AA+	AA+	19
	Aa2	AA	AA	18
	Aa3	AA-	AA-	17
	A1	A+	A+	16
	A2	A	A	15
	A3	A-	A-	14
	Baa1	BBB+	BBB+	13
	Baa2	BBB	BBB	12
	Baa3	BBB-	BBB-	11
Speculative Grade	Ba1	BB+	BB+	10
	Ba2	BB	BB	9
	Ba3	BB-	BB-	8
	B1	B+	B+	7
	B2	B	B	6
	B3	B-	B-	5
	Caa1	CCC+	CCC+	4
	Caa2	CCC	CCC	3
	Caa3	CCC-	CCC-	2
	Ca	CC	CC	1
	C	C	C	0
		D	D	0
Outlook	**Positive**	**Positive**	**Positive**	**0.25**
	Stable	**Stable**	**Stable**	**0**
	Negative	**Negative**	**Negative**	**-0.25**
Credit Watch	**Positive**	**Positive**	**Positive**	**0.5**
	Negative	**Negative**	**Negative**	**-0.5**

The transformation of each rating to a numerical annual average rating that could be used for statistical analyses followed a four step approach as follows:

- First a numerical value was attached for each rating - from 20, for the highest long-term foreign currency ratings AAA for Fitch and S&P and Aaa for Moody's to 0, for a default rating C or D;
- Each rating is adjusted for the outlook and Watchlisting, such that each rating is the sum of the actual rating and the rating outlook or watchlisting. For example where the rating is S&P B- with a positive outlook the numeric rating will be 5.25 (5 for the B- plus 0.25 for the positive outlook);
- The third step involves determining the daily rating by assigning the rating for each day from the day of the rating announcement to the date of the next rating announcement – for example where Moody's announced a Baa1 rating with stable outlook on the 2nd of January that was followed by a Baa1 rating with a negative outlook on the 23rd of May the daily ratings will be assigned as follows:
    - A daily Moody's numeric ratings of 13 is assigned between the 2nd of January and the 22nd of May followed by a daily rating of 12.75 from the 23rd of May onward; and
- Lastly the average annual rating is determined through a weighted average number of days for each rating, with 365 days as a baseline. For example where the daily rating is 12 for 175 days and 12.25 for 190 days, the annual average rating was calculated as 12.13 as illustrated in equation 2 below:

$$\left(\frac{175}{365}\ x\ 12\right) + \left(\frac{190}{365} x\ 12.25\right) = 12.13 \qquad (2)$$

The annual average long-term foreign currency sovereign credit rating is calculated for each one of the ratings issued by Fitch, Moody's and S&P. The ratings are calculated for each country, providing a potential **504 (28 x 18)** observations for the 28 countries rated by the three rating agencies between 1994 and 2011. The total observations are however 404 due to the fact that not all the countries are rated by all three rating agencies as well as the fact that each country's initial assignment is not issued in 1994. For example, Angola's initial ratings were assigned by the three agencies in 2010.

In addition to the numerically converted long-term foreign currency sovereign credit ratings, a dummy variable is assigned to each of the ratings to reflect the quality of the rating as either investment grade at Baa3 and above by Moody's or BBB- above BBB- by Fitch and S&P or below investment grade at Ba1 and below Ba1 by Moody's and BB+ and below BB+ by Fitch and S&P. The rating outlook and watchlisting are however not considered in assigning the grade of the rating as outlooks and watchlisting do not constitute an actual rating assignment but an imminent or probable direction of the assigned rating (Fitch, 2010; Moody, 2011; S&P, 2011)

iii. Control variables

In order to reduce the estimated capital flow regression models misspecification errors due to omission, variables of the macroeconomic indicators $ECONOTRS_{i,t}$ as well as the indicators of the quality of the country governance $WBGOVM_{i,t}$ are included different types of capital flow regression models. To ensure consistency of measure and definition, each one of the annual country macroeconomic indicators and indicators of the quality of the country governance were sourced from the World Bank's World Development and Governance Indicator databases. Table 3 shows the list of the macroeconomic indicators and indicators of the quality of the country governance, as well as their expected relationship with the different types of capital flows.

Table 3 control variables and their expected signs

Control Variable		Unit	FDI	Portfolio Equity	Portfolio Bond	Commercial bank loans
GDP growth	RGDPGRW	annual % at constant 2000 US$	+	+	+	+
Trade	TRADE	% of GDP	+			
Telephone lines	INFR	per 100 people	+			
Exchange Rate Volatility	EXCVOL	Stdev	-	-		-
Inflation, consumer prices	INFL	annual %	-	-		-
Gross domestic savings	GDS	% of GDP		-	-	-
Market capitalization of listed companies	MRKT	% of GDP		+		
Stocks traded, turnover ratio	STCKTNV	%		+		

Control Variable		Unit	FDI	Portfolio Equity	Portfolio Bond	Commercial bank loans
External debt stocks	EXTDEBT	% of GNI			-	-
Principal rescheduled	RSDL	current US$, % of Total External Debt			-	-
Short-term debt	SHRTDBT	% of total external debt			-	-
Interest payments on external debt	INTEXTDBT	% of GNI			-	-
Domestic credit to private sector	DCR	% of GDP			-	-
Broad money growth	BMG	annual %			+	+
Domestic Real interest rate	RRI	%			+	+
Global Real interest rate	RRI	%			-	-
S&P Global Equity Indices		annual % change		+		
Voice and Accountability	VOICE	RANKING	+	+	+	+
Political Stability and Absence of Violence	POL	RANKING	+	+	+	+
Government Effectiveness	GOV	RANKING	+	+	+	+
Regulatory Quality	REG	RANKING	+	+	+	+
Rule of Law	RULE	RANKING	+	+	+	+
Control of Corruption	CORR	RANKING	+	+	+	+

b. *Time series data properties and regression modelling*

One of the practical challenges in estimating long-run models with time series data such as the macroeconomic indicators, is that unless the time series variables are stationary (integrated of order zero – I(0)), conventional ordinary least squared (OLS) regression models cannot be applied (Koop, 2008). Data such as the size of the economy (GDP) for example, show progression or pattern of progression over a period of time (Brooks, 2008; Koop, 2008). Estimates obtained from using such non-stationary data in OLS regression models without any transformation, results in spurious regressions whose results may lead to meaningless or misleading conclusions (Brooks, 2008; Koop, 2008).

To ensure that all the data used in the current study was stationary and not exhibiting any trending or unit root characteristics, non-stationarity tests were carried out using the Augmented Dickey-Fuller (ADF) and the Phillips and Perron (PP) tests. The test for non-stationarity has a

basic objective to examine the null hypothesis (Ho) that Φ, in equation 3 below, equals one (Φ = 1):

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$$Y_t = \Phi Y_{t-1} + U_t \quad (3)$$

In practice however, the test for non-stationarity or unit root is carried out by testing a one sided alternative hypothesis that Φ < 1. This is achieved by estimating equation 4 below, with the null hypothesis accepted or rejected, based on the comparison of the estimated **α** (which is equivalent to Φ – 1) to specific critical values (Brooks, 2008; Koop, 2008).

$$\Delta Y_t = \alpha Y_{t-1} + U_t \quad (4)$$

Testing for **α,** the unit root hypothesis is rejected where **α** is more negative than -3.45 and accepted where **α** is less negative than -2.57, with the following critical numbers representing the different significant levels(Brooks, 2008; Koop, 2008):

10% significance = -2.57
5% significance = -2.86
1% significance =-3, 47

As shown in table 4 below, both the ADF and PP tests rejected the unit root or non-stationary hypothesis, indicating that both the dependent variables (different types of capital flows described in 5.1.4 above) and the independent variables (average annual credit ratings and control variables) were stationary.

Table 4 Augmented Dickey-Fuller (ADF) and the Phillips and Perron (PP) tests

Variable	Phillips-Perron test for unit root	Augmented Dickey-Fuller test for unit root	Variable	Phillips-Perron test for unit root	Augmented Dickey-Fuller test for unit root		Phillips-Perron test for unit root	Augmented Dickey-Fuller test for unit root
BMG	-88.39	-12.39	Fitch	-7.24	-7.19	FDI	-11.72	-8.43
BMGZ(t)	(0.0000)	(0.0000)	FitchZ(t)	(0.0000)	(0.0000)	FDIZ(t)	(0.0000)	(0.0000)
DCR	-3.54	-3.74	Moody's	-5.91	-5.44	Equity	-13.44	-9.81
DCRZ(t)	(0.0071)	(0.0000)	Moody'sZ(t)	(0.0000)	(0.0000)	EquityZ(t)	(0.0000)	(0.0000)
RGDPGRW	-21.93	-9.76	SP	-6.86	-7.07	PNGBOND	-24.82	-9.06
RGDPGRWZ(t)	(0.0000)	(0.0000)	SPZ(t)	(0.0000)	(0.0000)	PNGBONDZ(t)	(0.0000)	(0.0000)
GDS	-4.99	-3.72	CORR	-2.10	-0.09	PNGCOMM	-17.71	-8.15
GDSZ(t)	(0.0000)	(0.0000)	CORRZ(t)	(0.2466)	(0.0000)	PNGCOMMZ(t)	(0.0000)	(0.0000)
INTEXTDBT	-10.70	-7.77	GOV	-18.29	-9.51	PPGBOND	-17.86	-9.41
INTEXTDBTZ(t)	(0.0000)	(0.0000)	GOVZ(t)	(0.0000)	(0.0000)	PPGBONDZ(t)	(0.0000)	(0.0000)
MRKT	-3.62	-3.44	POL	-16.99	-9.48	PPGCOMM	-17.65	-10.17
MRKTZ(t)	(0.0054)	(0.0000)	POLZ(t)	(0.0000)	(0.0000)	PPGCOMMZ(t)	(0.0000)	(0.0000)
RSDL	-20.28	-8.09	REG	-18.33	-9.91			
RSDLZ(t)	(0.0000)	(0.0000)	REGZ(t)	(0.0000)	(0.0000)			
RRI	-15.81	-8.05	RULE	-17.69	-9.73			
RRIZ(t)	(0.0000)	(0.0000)	RULEZ(t)	(0.0000)	(0.0000)			
SHRTDBT	-7.22	-5.98	VOICE	-17.55	-9.19			
SHRTDBTZ(t)	(0.0000)	(0.0000)	VOICEZ(t)	(0.0000)	(0.0000)			

Variable	Phillips-Perron test for unit root	Augmented Dickey-Fuller test for unit root	Variable	Phillips-Perron test for unit root	Augmented Dickey-Fuller test for unit root		Phillips-Perron test for unit root	Augmented Dickey-Fuller test for unit root
INFR	-4.22	-4.40	TRADE	-6.83	-5.30			
INFRZ(t)	(0.0006)	(0.0000)	TRADEZ(t)	(0.0000)	(0.0000)			

3.2 A framework for empirical measurement of short-term impact on financial markets

The event study technique is a methodological approach also known as performance index tests, residual analysis and abnormal return analysis (Bowman, 1983; Brown & Warner, 1980, 1985). A general flow of steps for event studies as identified by Brown and Warner (1980; , 1985) and applied by McWilliam and McWilliam (2000) are followed in testing the impact of long-term foreign currency sovereign credit ratings adjustments on the nominal foreign exchange rates and the composite equity stock markets in African economies as described below:

a. ***Identify the event/s of interest***

The event of interest is one that gives rise to a flow of new information into the market. In event studies, the event could either be a single event which occurs at one calendar time or a type of event which might occur frequently at different calendar times (Brown and Warner, 1980; Bowman, 1983). In this study the events that give rise to new information flowing into the market are the long-term foreign currency sovereign credit rating actions or adjustments as defined by the rating agencies (Fitch, 2007; Gaillard, 2009; Moody, 2011). These are multiple events that take place at different calendar times to reflect the rating agencies assessment of a sovereign credit risk through a rating upgrade or downgrade and/or placing a sovereign credit rating under active assessment through an outlook or watch-listing (Fitch 2007; S&P 2007; Moody 2011). For the current study, an event of interest is any public announcement by any one of Fitch, Moody's or S&P, on an African sovereign credit rating upgrade, downgrade and change in outlook or watch-listing between 1994 and 2011.

b. ***Identify the event window***

In order to accumulate the events of interest together in a single study, event studies introduce the concept of "event time" and event window (Bowman, 1983; Brown & Warner, 1980; MacKinlay, 1997). While the event time is the date on which the sovereign credit rating is announced, for example, the event window is the period over which the impact brought on by the sovereign credit rating announcement is expected to last. In order to create event windows

on which statistical analysis can be carried out, numerous similar long-term foreign currency sovereign credit rating announcements, occurring on different calendar dates are standardised to create an event window. This is achieved by designating the date of the announcement and the dates around the window period, irrespective of their calendar date around the date of the long-term foreign currency sovereign credit rating adjustment announcement, such that the date of the announcement is designated "Day 0" to create an event time (Bowman, 1983; Brown & Warner, 1980; Kothari & Warner, 2006). Any period around the event date is then designated relative to the event time, such that one can determine whether the reaction to the rating adjustment is in anticipation (prior to event date) or in reaction (after the event has taken place) (MacKinlay, 1997) to the rating adjustment announcement. For example, one day after the sovereign credit rating adjustment announcement is designated as Day_{+1}, while a day before the sovereign credit rating announcement is designated as Day_{-1}.

While previous studies such as that by Steiner and Heinke (2001), have shown that the market through returns, have responded to the rating adjustments as long as 100 days prior to and 90 days after the adjustment announcement, there is no standard event window and it is up to the researcher to take a view on an appropriate window period (Bowman, 1983; Brown & Warner, 1980; MacKinlay, 1997) . In deciding on the window period however, the researcher needs to take into account the possibility of contamination of the event of interest as observed by Hand, et al (1992). The authors demonstrated, for example, that the market responds to information other than the rating adjustment announcement. In instances where such information reaches the market at the same time as the event of interest, this results in the clustering of events with the over or underestimation of the reaction to the event of interest, resulting in a Type I or Type II Error (Hand et al., 1992).

With the increase in the flow of information therefore, the number of instances of contamination for long event windows, in particular, also increase. As pointed out by Healy and Palepu (2001) for example, in addition to regulatory requirements such as the audited financial results, voluntary communication by organisations (through management forecasts, analysts' presentations and conference calls, press releases, internet sites etc.) and disclosures through information intermediaries, such as financial analysts, industry experts, and the financial press have greatly increased the flow of information across the global financial markets. For the

current study, a 30 day window period is used to coincide with the major economic news announcements that are made monthly (Balduzzi, Elton & Green, 2001; IMF, 2011; SARB, 2008). In addition, except for South Africa, Nigeria and to some extent, Kenya, most African financial markets are small and illiquid (Ncube, 2008) and choosing a shorter window period may not capture the full impact of the sovereign rating action.

c. *Abnormal reaction to the event*

In order to quantify the impact of the sovereign credit rating adjustment on financial markets, an abnormal reaction by the financial markets, reflected by returns significantly below or above the expected or normal returns, should be computed (Bowman, 1983; Brown & Warner, 1980; MacKinlay, 1997). For such a reaction to an event of interest to be classified as abnormal, actual *ex post* reaction is measured against a benchmark (Brown & Warner, 1980; MacKinlay, 1997), making it necessary to first establish the benchmark or normal performance that would have been observed in the absence of the event of interest (Brown & Warner, 1980; Steiner & Heinke, 2001)**.** The abnormal return is computed as the difference between the *ex post* reaction recorded around the event of interest and the normal or expected performance (Brown & Warner, 1985). Brown and Warner (1980) identified three models for the determination of expected reaction or normal returns of financial securities as described below:

- *The Mean Adjusted Return Model* - considered the easiest of the three models, assumes that the *ex ante* expected return for a given security *i* is equal to a constant K_i, which only differs across securities, reflecting an average return of a security over a period of time.

$$E(Ri,t) = \frac{1}{t}\sum_{i=1}^{t}(Rit) \qquad (5)$$

- *The Market Adjusted Return Model* - assumes that *ex ante* expected returns are equal across securities but not necessarily constant for a given security. The model's key assumption is that since the aggregate market index is a linear weighted average combination of all the stocks, the expected return of the single stock, *i* is equal to the expected market return:.

$$E(Ri,t) = E(Rm,t) = K \qquad (6)$$

- *The Market and Risk Adjusted Model* - presumes that some version of the Capital Asset Pricing Model generates expected returns (Brown & Warner, 1980). The risk-adjusted market model, which adds an intercept term, alpha, to the classic CAPM is expressed by the formula:

$$E(Ri,t) = \alpha + \beta Rm,t + \varepsilon t, \quad (7)$$

Where:

- $E(Ri,t)$ is the expected return on stock *i* in period t.
- Rm,t is the market return in period t.
- β is the systematic risk of stock *i* relative to the market.
- α is the intercept of the linear relationship between the returns of stock *i* relative to the return of the market.
- $\_\varepsilon t$ is the unpredictable component of $E(Ri,t)$ with an expected value of zero.

While the mean adjusted return model is considered the simplest of the three models, Brown and Warner (1980) demonstrated that for monthly data, differences between methodologies is quite small where abnormal return is present. This is confirmed in subsequent tests with daily data confirming that the type of model used to determine the expected returns is immaterial in the event study technique data (Brown & Warner, 1985). McKinlay (1997) concurs and attributes the lack of sensitivity to the expected (normal) return estimation model to the fact that the variance of the abnormal return is frequently not reduced much by choosing a more sophisticated model.

For the current study both the *Mean Adjusted Return Model* and the *Market and Risk Adjusted Models* are used to compute the expected returns for the nominal foreign exchange rate and the composite national equity returns respectively. Given the lack of a benchmark market return index for the foreign exchange rate for African countries, the *Mean Adjusted Return Model* is used to estimate the nominal foreign exchange rate returns, with the expected return for each foreign exchange rate estimated as the average return over the 100 days preceding the event window. For the composite national equity returns, the expected return is calculated using the *Market and Risk Adjusted Models,* with the MSCI emerging market index representing the benchmark market return (Rm). While ideally the MSCI FM AFRICA, index would have been a

benchmark market return for the study, the limited data of the MSCI FM AFRICA index made it impossible to consistently use the data over the study period.

The abnormal reaction is then measured as the difference between the observed *ex post* financial return on a national equity market and the return on foreign exchange rate around the event window against an estimated expected return or yield spread as follows:

$$ARit = Ri,t - E(Ri,t) \quad (8)$$

Where:

- $ARit$ is the abnormal return on the national equity market or nominal foreign exchange rate at time *t*.
- Ri,t is the observed return on the national equity market or nominal foreign exchange rate at time *t.*
- $E(Ri,t)$ is the expected national equity market or nominal foreign exchange rate return

d. *Organizing and grouping the abnormal returns*

According to MacKinlay (1997), the abnormal returns must be aggregated in order to draw an overall inference for the event of interest in a cross section of securities of interest. More importantly, Brown (1985) found through simulation of a sample of fifty securities that, while the excess returns for the different securities were not normally distributed, the aggregated excess returns in a cross section of securities converged to normality. This is confirmed by later studies by MacKinlay (1997) and Kothari and Warner (2006) as being the case for daily data as demonstrated by Brown (1985) in the earlier study.

The aggregation of the abnormal reaction to the event of interest is typically carried out in two steps (Hand et al., 1992):

- First, the simple average abnormal returns (AAR) are computed as follows:

$$AARt = \frac{1}{\mathrm{n}}\sum_{i=1}^{n}(ARit) \quad (9)$$

Where

- $AARt$ is the average abnormal return in period *t.*
- *n* is the number of securities in the sample.

The average abnormal returns are then summed over the window period to work out the cumulative average abnormal return (CAAR) as follows:

$$CAARt = \frac{1}{\mathrm{t}} + \sum_{t=-15}^{t=+15}(AARt) \qquad (10)$$

Where:

- $CAARt$ is the cumulative average abnormal return over the window period.
- *t* is the window period.

While equation 9 aggregates the excess returns across a cross section of securities, equation 10 aggregates the excess returns over a period of time in order to accommodate a multiple period event window, allowing for the measurements over the window period (MacKinlay, 1997).

e. *Test for statistical significance*

To measure the probability that the excess returns came about as a result of the event and not due to some other random event, parametric or non-parametric statistical tests are employed to test for statistical significance. Parametric *t*-tests, while widely used in event studies, require that the calculated abnormal reaction to the event of interest be normally distributed and independent in order to be tested for significance (Bowman, 1983). According to Collins and Dent (1984), the requirement that abnormal returns be independent (not correlated) is, however, often not met in event studies, especially for daily data. MacKinlay (1997), for example, found that daily stock returns in event studies were not normally distributed showing kurtosis and skewness (distribution on both sides of the mean do not look the same) with a significant proportion showing heteroscedasticity, suggesting that non-parametric tests were more appropriate for daily data. MacKinlay (1997)'s findings showed that the non-parametric Wilcoxon signed rank and the sign tests appeared to have greater power of estimating abnormal performance in the daily data as compared to the parametric tests. The author however concluded, after further analysis of a controlled sample, that the Wilcoxon signed rank and the

sign tests understated the probable type *I* error (when a statistical test rejects a true null hypothesis), confirming the conclusions by Brown and Warner (1980) that parametric *t*-tests were reasonably well specified and performed better than non-parametric tests. Brown and Warner (1980) found in a subsequent study, (Brown and Warner, (1985), that while daily returns were far from normally distributed, their excess returns (AR), when aggregated across a number of securities were close enough to or are normally distributed, to apply the parametric statistical analysis.

As with any daily data the abnormal reactions to an event over the window period may be susceptible to autocorrelation (when a variable is highly correlated with its lag) (Boehmer, 1991). Without the assumption of independence between returns therefore, the null hypothesis of no abnormal returns would be rejected too often (Brown & Warner, 1980). To overcome the possibility of autocorrelation, Miles and Rosenfeld (1983), Seyhun (1986) and Lin and Howe (1990) proposed a *t*-statistic analysis that takes into account the possibility of cross-sectional dependence between AARs by considering the standard deviation of cumulative average abnormal returns as presented in equation 11 below:

$$t = \frac{\mathrm{CAARt}}{\delta(\mathrm{CAARt})} \qquad (11)$$

Where

- $\delta(\mathrm{CAARt})$ is the standard deviation of the cumulative average abnormal returns at time *t.*
- CAARt is the cumulative average abnormal returns at time *t.*

3.2.2 *Event Study data descriptions and modelling issues*

a. *Long-term foreign currency sovereign credit rating adjustment events*

In order to test for the short-term impact of the long-term foreign currency sovereign credit ratings on the daily national equity market returns and nominal exchange rate returns, all announcements of the long-term foreign currency sovereign credit ratings are identified as events of interest. These include a rating affirmation, rating upgrade, rating downgrade, negative or positive outlook or watchlisting. In addition, to test for the differences in the

announcement impact on the different grades of the long-term foreign currency sovereign credit ratings, the ratings are classified into investment and below investment grade.

A number of studies show that financial crises leads to an increase in the number of sovereign credit rating events, with the rating agencies downgrading sovereigns as they enter the crises (Kaminsky, 2006; Kräussl, 2005; Mora, 2006). These present a potential of rating events that overlap over a short period of time, leading to clustering (Bowman, 1983; Hand et al., 1992). This may lead to a potential bias in the statistical estimate of the impact of the event of interest (Aktas, De Bodt & Cousin, 2007; Dimson & Marsh, 1986; Steiner & Heinke, 2001). The current study incorporates the years that incorporate a number of periods when the global financial markets experienced a number of crises that include the Mexican currency crisis (1994), the Asian currency crisis (1997–98), the Russian debt default (1998), the Brazilian crisis (1999), the Argentina currency crisis (2002) as well as the recent (2008) global financial crisis.

In order to avoid the potential impact of the event clustering, the current study only focused on "clean events", by eliminating from the sample, all overlapping events in line with the de-clustering process by Hand, et al. (1992).Following this de-clustering approach, a total of 295 "clean events", presented in Figure 3, were identified from a potential 324 events.

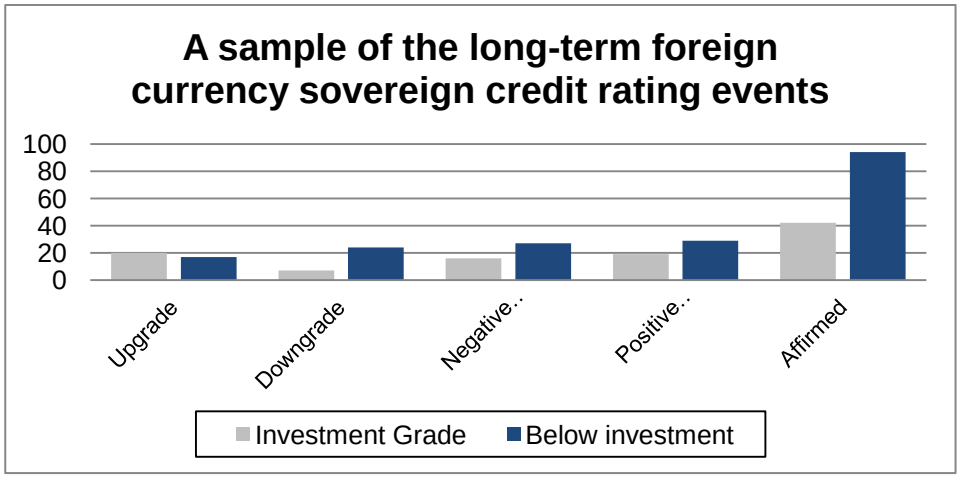

Figure 3: A sample of long-term foreign currency sovereign credit rating events

Looking at Figure 3, two features can immediately be identified. First there is a higher number of below investment grade rating events than there is for investment grade ratings. This is understandable given there are more below investment grade rating issues (23) in Africa,

compared to the 8 investment grade rating issues. Previous studies, such as those by Hand, et al. (1992) , Hite and Warga (1997) and Brooks (2004) have shown that the rating impact is more pronounced for below investment ratings, while there is no statistically significant impact for above investment rated sovereigns, and there is an expectation that the impact of long-term foreign currency sovereign credit ratings will be more pronounced in Africa.

The second feature that is apparent is that the number of downgrades is very low for investment grade ratings suggesting that African countries that transition into an investment rating manage to sustain their investment rating. This may be due to the disciplining effect that comes with maintaining a rating, as suggested by Siddiqi (2007), as countries ensure that the conditions that informed the investment rating are maintained in order to maintain the low cost of debt brought on by the investment rating (Kaminsky & Schmukler, 2002; Larraín et al., 1997).

b. *National Equity stock and nominal foreign exchange returns*

While the number of operating stock exchanges in Africa rose from 7 in 1989 to 23 in 2007, South Africa's Johannesburg Securities Exchange (JSE), as shown in Tables 5 and 6, is by far the largest stock exchange by market capitalisation in Africa. By the end of 2009, the JSE market capitalisation was 805 Billion US$, almost ten times the second largest stock exchange in Africa (The Egyptian Exchange). The JSE also plays a critical role in South Africa’s economy with the market capitalisation almost three times the GDP.

In comparison, the other stock exchanges in Africa are small and illiquid with turnover ratios ranging from half a percentage of market capitalisation to just under 30% (IMF, 2011). Singh (1999) for example, argued that given the level of development in Africa, only a small number of urban based firms would benefit from the stock market with the exclusion of the greater majority of the work force that are engaged in agriculture or informal activities. Irving (2005) supports this view, pointing out that trade in African stock exchanges is dominated by trade in one or a few stocks that often make up a sizeable proportion of the market capitalisation. Indeed the small stock and bond exchanges and the shallowness of the markets in Africa, may explain the fact

that in 2006, Africa received just over 1% of global portfolio flows, with just over 80% of Africa's portfolio flows going to South Africa (Ncube, 2008).

Table 5: A list of African stock exchanges

Stock Exchange	Location	Founded	Market Capitalisation - March 2010
Bourse Régionale des Valeurs Mobilières*-Done	Abidjan – Côte d'Ivoire	September 1998	XOF 391 billion
Bourse des Valeurs Mobilieres d'Alger- Done	Algers - Algerian	1993	DZD 7 billion
Angola Stock Exchange-Done	Proposed - first announced in 2006		
Botswana Stock Exchange- Done	Gaborone - Botswana	1989	USD 4.18 billion
Douala Stock Exchange - Bourse de Douala Done	Douala - Cameroon	2001	XAF 82,602 million
Bolsa de Valores de Cabo Verde-Done	Mindelo- Cape Verde	2005	CVE 20 trillion
The Egyptian Exchange (formerly Cairo and Alexandria Stock Exchange) -Done	Cairo and Alexandria - Egypt	1883	EGP 418,523 million
Ghana Stock Exchange-Done	Accra -Ghana	1990	USD 12,566.49 million
Nairobi Stock Exchange - Done	Nairobi - Kenya	1954	KES 10,77,622 million
Malawi Stock Exchange - done	Blantyre -Malawi	1994	MWK 1159,006.7 million

Stock Exchange	Location	Founded	Market Capitalisation - March 2010
The Stock Exchange of Mauritius Done	Port Louis Mauritius	30-Mar-89	USD 4,246.78 million
Casablanca Stock Exchange - Done	Casablanca, Morocco	1929	MAD 599 billion
Bolsa de Valores de Mozambique/Maputo Stock Exchange	Maputo Mozambique	1999	
Namibia Stock Exchange Done	Windhoek Namibian	1992	NAD 642,419 Mil
Abuja Securities and Commodities Exchange - Done	Abuja -Nigeria	1998	
Nigerian Stock Exchange Done	Lagos-Nigeria	1960	USD 125 billion
Johannesburg Securities Exchange	Johannesburg-South Africa	1887	USD 800 billion
Khartoum Stock Exchange -Done	Khartoum-Sudan.	11994	USD 5 bil
Swaziland Stock Exchange-Done	Mbabane Swaziland	1999	SZL 1.49 billion
Dar es Salaam Stock Exchange -Done	Dar es Salaam Tanzania	1996-became operational in 1998	USD 3,580 million
Bourse de Tunis -Done	Tunis-Tunisia	February 1996 Founded	USD 10,184 million
Uganda Securities Exchange -Done	Kampala-Uganda	Licensed Jun 1997 trading Jan 1998	UGX 54 billion
Lusaka Stock Exchange - Done	Lusaka Zambia	Launched February 1994	ZMK 25 trillion

Stock Exchange	Location	Founded	Market Capitalisation - March 2010
Zimbabwe Stock Exchange -Done	Harare-Zimbabwe	Founded 1896	USD 3,195 million

Source: The different African stock exchange websites

Tables 6: Summary of Africa stock exchanges market data

Economy	Market capitalization of listed companies (current US$ Billions)				Market capitalization of listed companies (% of GDP)				Turnover ratio (%)			
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
Botswana	3.9	5.9	3.6	4.3	35.9%	47.7%	26.5%	36.7%	2.3%	2.2%	3.1%	2.6%
Cote d'Ivoire	4.2	8.4	7.1	6.1	23.9%	42.2%	30.2%	27.3%	3.3%	2.5%	4.1%	2.0%
Egypt, Arab Rep.	93.5	139.3	85.9	91.1	87.0%	106.8%	52.9%	48.3%	54.8%	45.6%	61.9%	59.7%
Ghana	3.2	2.4	3.4	2.5	25.4%	15.9%	20.4%	9.6%	2.1%	3.9%	5.2%	2.0%
Kenya	11.4	13.4	10.9	11.0	50.6%	49.4%	36.0%	37.3%	14.6%	10.6%	11.8%	4.5%
Malawi	0.6	-	1.8	-	18.6%	-	41.5%	-	3.5%	-	3.9%	-
Mauritius	3.6	5.7	3.4	5.0	55.3%	75.3%	36.9%	56.2%	4.4%	8.0%	8.9%	0.3%
Morocco	49.4	75.5	65.7	64.5	75.2%	100.4%	74.0%	70.6%	35.3%	42.1%	31.1%	12.0%
Nigeria	32.8	86.3	49.8	33.4	22.3%	52.0%	24.0%	19.8%	13.6%	28.2%	29.3%	26.9%
South Africa	715.0	833.5	491.3	805.2	277.4%	293.8%	177.7%	283.5%	48.8%	55.0%	60.6%	83.8%
Swaziland	0.2	0.2	-	-	7.5%	6.9%	-	-	0.0%	-	-	-
Tanzania	0.5	-	1.3	-	3.8%	-	6.3%	-	2.1%	-	-	-
Tunisia	4.4	5.4	6.4	9.3	14.4%	15.3%	15.8%	21.4%	14.3%	13.3%	25.5%	16.0%
Uganda	0.1	-	-	-	1.2%	-	-	-	5.2%	-	-	-
Zambia	1.2	2.3	-	-	11.1%	20.6%	-	-	2.1%	4.1%	-	-
Zimbabwe	26.6	5.3	-	-	487.8%	98.0%	-	-	6.2%	5.1%	-	-

Source: IMF World Economic Outlook 2011

One of the challenges in using the daily national equity stock indices and exchange rate data is that the close of trading in the different markets is not synchronised, resulting in the mismatch on the closing prices from the different markets (Brooks et al., 2004; Hand et al., 1992; Reisen & von Maltzan, 1998). To overcome this challenge, with an exception of a few instances where data was sourced from the respective stock exchanges, the data was sourced from DataStream Global Market Indices and MSCI Global Equity Indices to ensure consistency.

4 ESTIMATION OF SOVEREIGN CREDIT RATING EFFECT ON THE CAPITAL FLOWS AND FINANCIAL MARKETS

4.1 Estimation of the long-term structural effect on capital flows

This section presents the individual and collective significance of the sovereign credit ratings in explaining the differences in the ratio of capital flow to gross domestic product (GDP). The estimates are presented with the dependent variable (the ratio of the capital flow to GDP) and the independent variables being either in their original metric or in a ratio of the GDP as presented in table 3 above. The long-term foreign currency sovereign credit rating in particular, is presented in its transformed numeric value as presented in table 2 above.

In many instances, as presented in Appendix A, the Fitch and S&P ratings are highly correlated with minimal split between the two ratings. In order to avoid autocorrelation of the Fitch and S&P issued ratings, separate models are estimated for the ratings issued by the different rating agencies. In addition, given the dominance of South Africa as a key destination for foreign capital flows, in particular portfolio flows (Arvanitis, 2005; Ncube, 2008), as well as being the leading investor in the region (UNCTAD, 2010, 2011), it becomes critical to separate the influence of South Africa in the panel regression analysis. Indeed, as shown by Jefferis and Okeahalam (2000), in addition to the size, openness, market-orientation of the individual economies as well as the size and liquidity of the stock exchange, South Africa's interest rate and GDP have an influence on the real stock market returns in Botswana and Zimbabwe. This is supported by Arora and Vamvakidis (2005) who, in a study of 47 African countries, show that South Africa's growth has a substantially positive impact on growth in Africa, even after controlling for other country specific variables. In an earlier study, Jenkins and Thomas (2002) also showed that a subsidiary of a multinational that is based in South Africa, was 32% per cent more likely to export to the African region and the rest of the world compared to when it was located anywhere else in sub-Saharan Africa, suggesting that South Africa is a gateway to the region.

In order to test for the robustness of the models and remove the obvious bias brought on by South Africa, each model is estimated for the full sample that includes South Africa, as well as for the reduced sample that excludes South Africa.

4.1.1 *Estimation of the effect of Fitch issued long-term foreign currency sovereign credit rating on capital flows*

In addition to having the unexpected negative sign, own country Fitch long-term foreign currency sovereign credit rating (RATING) results in the reduction of the adjusted R-squared when introduced to the FDI model as presented in table 7 below. While the RATING variable is of the expected positive sign for the portfolio equity (EQUITY) model, the R-squared remains unchanged at 56.1%, with the adjusted R-squared declining when the RATING variable is introduced to the model in table 8 below. The EQUITY model, however, improves with the introduction of the QUALITY of rating variable with both the R-squared and the adjusted R-squared increasing slightly. This however, is the case only when South Africa is included in the sample.

In contrast to the FDI and EQUITY flows, there is a positive relationship between the RATING variable and all types of long-term debt inflows (long-term commercial bank loans from private banks and other private financial institutions and portfolio bond flows) as presented in tables 9 and 10. The relationship, however, is only significant for the public and publicly guaranteed long-term commercial bank loans from private banks and other private financial institutions (PPGCOMM) for nonguaranteed long-term debt from bonds that are privately placed (PNGBOND) flows. In addition that for the PNGBOND is only significant when South Africa is excluded from the sample. While the RATING variable has the expected positive sign for the public and publicly guaranteed portfolio bond flows (PPGBOND) and non-guaranteed long-term commercial bank loans from private banks and other private financial institutions (PNGCOMM) models, the relationship is insignificant as presented in tables 9 and 10 below.

a. ***Estimation of the effect of Fitch issued long-term foreign currency sovereign credit rating on FDI inflows***

Consistent with theory, the 1st lag of the dependent variable (LAG_1), real economic growth (GROWTH), infrastructure development (INFRASTRUCTURE) and the indicator for political stability (POL) are all significantly related to FDI investment rate in Africa. As presented in table 7, the economic growth hypothesis holds in Africa, with economic growth explaining the differences in the dependent variable at 1% significant level. In addition, the advantage brought on by developed infrastructure as suggested by Morisset (1999) and Asiedu (2003), as represented by the number of telephones per 1000 people, is significantly related to FDI flows, with a single unit of INFRASTRUCTURE explaining 0.07 of the dependent variable.

Contrary to priori expectations however, TRADE while of the expected positive sign, is not significantly related to the FDI investment rate, suggesting that level of country openness as suggested by literature (Bevan & Estrin, 2004; Hooper et al., 2008; Janicki & Wunnava, 2004), is not a primary determinant of FDI to Africa. Surprisingly, there is a positive relationship between exchange rate volatility (EXCHVOL) and the dependent variable, suggesting that the risk of currency mismatch between the cost of production and revenue is not critical for FDI inflows to Africa. The relationship between the dependent variable and EXCHVOL however is weak and insignificant. The most significant World Bank Governance perception index was political stability and absence of violence (POL), which was found to be positively related to the dependent variable, suggesting that a strong perception of a stable political climate is important for the security of long term investment through FDI.

The introduction of the long-term foreign currency FITCH sovereign credit rating (RATING) variable to the FDI investment rate model however, does not improve the model fit, resulting in the decline in the adjusted R-squared. Despite improving the R-squared from 70.4% to 70.5%, the RATING variable has an unexpected negative coefficient in addition to being insignificant, with the adjusted R-squared declining slightly from 69.3% to 69.2%. While the introduction of the dummy variable for the quality of the rating as either investment or below investment grade (QUALITY), results in the RATING variable being positive, this seems to be spurious, with the adjusted R-squared remaining unchanged even when the R-squared increases slightly to 70.7%.

As presented in table 7, the results hold, even when South Africa is excluded from the sample with the RATING and QUALITY variables, remaining insignificant. As with the full sample, the RATING variable is negative and insignificant, becoming positive only when the QUALITY variable is introduced to the model. In addition, the introduction of the annual average South African rating (RSA), does not improve the explanatory power of the model nor does it improve the explanatory power of the RATING variable, with the adjusted R-squared declining to 71.2% from 71.4%.

Table 7: Panel regression estimations for the effect of Fitch issued long-term foreign currency sovereign credit rating on FDI inflows with p-value in parenthesis

	Dependent Variable (FDI/GDP)						
	Panel A			Panel B			
Constant	2.028	-1.75	-2.045	-2.247	-2.123	-2.441	-2.854
	(0.001)	(0.016)	(0.01)	(0.001)	(0.007)	(0.004)	(0.204)
Dependent Variable Lag							
1st Lag	0.688***	0.68***	0.671***	0.697***	0.694***	0.682***	0.68***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Rating Variables							
RATING		-0.046	0.008		-0.021	0.04	0.035
		(0.441)	(0.921)		(0.749)	(0.651)	(0.701)
QUALITY			-0.511			-0.61	-0.558
			(0.353)			(0.3)	(0.387)
RSA							0.037
							(0.843)
Economic Variables							
Growth	0.317***	0.316***	0.315***	0.327***	0.327***	0.325***	0.325***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INFR	0.065**	0.079*	0.08**	0.059*	0.065*	0.068*	0.069*
	(0.035)	(0.028)	(0.026)	(0.066)	(0.081)	(0.068)	(0.068)
TRADE	0.006	0.007	0.007	0.005	0.006	0.005	0.005
	0.207)	(0.164)	(0.182)	(0.282)	(0.264)	(0.288)	(0.285)
EXCHVOL	0.000	0.004	0.003	0.004	0.003	0.003	0.003
	(0.581)	(0.598)	(0.625)	(0.593)	(0.6)	(0.633)	(0.648)
World Bank Governance Index							
POL	0.019**	0.02**	0.019**	0.025***	0.025***	0.026***	0.026***
	(0.011)	(0.020)	(0.019)	(0.002)	(0.003)	(0.002)	(0.003)

	Dependent Variable (FDI/GDP)						
	Panel A				Panel B		
F Prob	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.704	0.705	0.707	0.727	0.727	0.729	0.730
Adj R-squared	0.693	0.692	0.692	0.715	0.714	0.714	0.712

Panel A full sample

Panel B excluding South Africa

* Significance at 10%

** Significance at 5%

*** Significance 1%

b. ***Estimation of the effect of Fitch issued long-term foreign currency sovereign credit rating on portfolio equity inflows***

As expected, the portfolio equity net inflows to GDP (EQUITY) model performs well with the R-squared of 56% and adjusted R-squared of 52.5% for the full sample, when South Africa is included in the sample. The model however, performs poorly when South Africa, which accounts for approximately two thirds of portfolio equity flows to the region for the estimation period, is excluded from the sample. As presented in table 8, the 1st lag of the dependent variable is highly significant with one unit of the 1st lag EQUITY explaining approximately 0.4 units in the differences in the dependent variable for the full sample. In line with theory, the size of the equity stock market (MRKTCAP), provides the absorptive capacity for portfolio equity flows and is highly significant and positive, as also suggested by Portes and Rey (2005). Contrary to priori expectations and the findings by Jefferis and Okeahalam (2000) however, an increase in equity stock trading relative to the size of the stock exchange, does not explain the differences in the portfolio investment rate with the stock turnover (STCKTRNOV) variable insignificant and of an unexpected negative sign. The model however confirms the findings by Portes and Rey (2005) and Taylor and Sarno (1997), that the global market performance as proxied by the S&P global index (SPIND) is significantly related to portfolio flows with the SPIND variable both positive and highly significant at 1%. This is in line with the suggestion by Kaminsky and Schumkler (2002) that performance improvements in the international markets, improves the portfolio investment climate, and investment flows to emerging markets.

Contrary to priori expectations however, domestic GROWTH does not explain the differences in the portfolio equity inflows. This is not surprising though, since South Africa's GROWTH, which accounts for over 75% of the equity flows to the region, grew at an average of 3.2% between 1994 and 2010, compared to the average output growth of 4.1% in Sub-Saharan Africa's On the other hand, the fastest growing oil producing economies such as that of Equatorial Guinea do not have equity stock markets and hardly receive any portfolio equity flows. In addition, as argued by Gerlos, et al. (2003), traditional mechanisms of country links with the rest of the world such as openness to trade (TRADE), do not help much to explain EQUITY investment rate in Africa.

As with the FDI model, the long-term foreign currency sovereign credit rating (RATING) does not explain the differences in the portfolio equity investment rate, with the introduction of the RATING variable resulting in the adjusted R-squared declining from 52.7% to 52%. While insignificant, the improvement in the model performance with the introduction of the QUALITY variable suggests that, in line with priori expectation and literature (Brooks et al., 2004; Hand et al., 1992; Hooper et al., 2008), the QUALITY of the rating is a prerequisite to access portfolio equity flows. In contrast to the FDI model, the introduction of the QUALITY variable slightly improves the model performance with R-squared and adjusted R-squared increasing to 57.6% and 52.9% from 56.1% and 52.7% respectively.

Table 8: Panel regression estimations for the effect of Fitch issued long-term foreign currency sovereign credit rating on portfolio equity flows with p-value in parenthesis

	Dependent Variable (Portfolio Equity/GDP)						
	Panel A			Panel B			
Constant	0.183	0.132	-0.211	0.043	0.157	0.124	0.089
	(0.637)	(0.811)	(0.721)	(0.818)	(0.569)	(0.667)	(0.899)
Dependent Variable Lag							
1st Lag	0.396***	0.396***	0.374***	0.146	0.15	0.153	0.154
	(0.000)	(0.000))	(0.001)	(0.316)	(0.307)	(0.301)	(0.306)
Rating Variables							
RATING		0.006	0.087		-0.013	-0.001	-0.002
		(0.894)	(0.229)		(0.568)	(0.971)	(0.965)
QUALITY			-0.598			-0.091	-0.087
			(0.144)			(0.688)	(0.716)
RSA							0.003
							(0.955)
Economic Variables							
Growth	-0.07	-0.07	-0.074	0.013	0.013	0.011	0.011
	(0.305)	(0.309)	(0.279)	(0.706)	(0.717)	(0.751)	(0.760)
MRKTCAP	0.008***	0.008***	0.008***	-0.006	-0.006	-0.006	-0.007
	(0.005)	(0.006)	(0.004)	(0.114)	(0.102)	(0.096)	(0.110)
STCKTRNOV	-0.006	-0.006	-0.01	0.006	0.007	0.007	0.007
	(0.554)	(0.548)	(0.329)	(0.304)	(0.262)	(0.315)	(0.334)
SPIND	0.021***	0.021***	0.02***	0.005	0.005	0.005	0.005
	(0.003)	(0.003)	(0.004)	(0.146)	(0.164)	(0.163)	(0.188)
F Prob	0.000	0.000	0.000	0.285	0.369	0.471	0.587
R-squared	0.561	0.561	0.576	0.118	0.125	0.128	0.128
Adj R-squared	0.527	0.520	0.529	0.027	0.013	-0.005	-0.028

Panel A full sample Panel B excluding South Africa * Significance at 10% ** Significance at 5% ***Significance 1%

c. *Estimation of the effect Fitch issued long-term foreign currency sovereign credit rating on portfolio bond net flows*

While performing weaker than the FDI and portfolio equity investment rate models, both the public and publicly guaranteed (PPGBOND) and non-guaranteed (PNGBOND) portfolio bond net flow rate models are significant with the average R-squared of between 23% and 16% respectively. Contrary to the suggestion by Froot and Stein (1991), that foreign debt is substituted by local debt as domestic wealth grows, neither the economic growth (GROWTH) nor the growth in domestic credit (DCR) explain PPGBOND or PNGBOND net flow rates, with both variables having an insignificant relationship with PPGBOND or PNGBOND net flow rates. In addition, the DCR variable is negative when South Africa is excluded from the sample for PPGBOND net flow rate model, but remains positive for the PNGBOND net flow rate model.

The 1st lag of the dependent variable does not explain the current PPGBOND and PNGBOND bond flows, with the 1st lag negative and insignificant for both types of the bond debt net flow rate models. This may be due to the low debt capacity in the developing economies as suggested by Reinhart (2000). As shown in table 9 however, it is the lags of the rescheduled debt (RSDLDBT) that have a positive and significant relationship with both the PPGBOND and PNGBOND net flow rates. The impact of RSDLDBT, however, is asymmetric with the 1st lag of RSDLDBT negative and significant for PNGBOND, but negative and insignificant for PPGBOND. In contrast, the 2nd lag of RSDLDBT is positive and significant for PPGBOND, suggesting, as posited by Reinhart and Rogoff (2008), that borrowers do not necessarily close off credit to previously defaulting sovereigns as economies transition to a developed state, with the debt markets opening up for previous defaulters as soon as their debt capacity is restored.

As shown in table 9, the impact of interest on external debt (INTEXTDBT) is heterogeneous on the different types of portfolio bond flows, with a positive and significant relationship to PPGBOND model, but negative and insignificant for PNGBOND model, suggesting that the capacity to meet interest on current debt commitments is seen as a positive sign of debt capacity for the public and publicly guaranteed bonds, but not for the non-guaranteed debt.

Table 9 Panel regression estimations for the effect of Fitch issued long-term foreign currency sovereign credit rating on portfolio bond flows with p-value in parenthesis

	Dependent Variable (Portfolio PPG Bond/GDP)							Dependent Variable (Portfolio PNG Bond/GDP)						
	Panel A				Panel B			Panel A				Panel B		
Constant	-0.325	-0.339	-0.488	-0.224	-0.34	-0.341	-1.948	0.015	-0.070	-0.099	0.012	-0.107	-0.153	0.164
	(0.089)	(0.171)	(0.108)	(0.279)	(0.211)	(0.288)	(0.092)	(0.884)	(0.509)	(0.423)	(0.917)	(0.379)	(0.254)	(0.690)
Dependent Variable Lag														
1st Lag	-0.032	-0.033	-0.0310	-0.0170	-0.029	-0.029	-0.0360							
	(0.681)	(0.675)	(0.688)	(0.831)	(0.726)	(0.727)	(0.669)							
Rating Variables														
RATING		0.003	0.023		0.026	0.026	0.014		0.028**	0.032		0.030**	0.036**	0.038**
		(0.930)	(0.580)		(0.508)	(0.556)	(0.752)		(0.017)	(0.646)		(0.030)	(0.021)	(0.016)
QUALITY			-0.2550			-0.003	0.125			-0.0480			-0.116	-0.140
			(0.393)			(0.992)	(0.735)			(0.6)			(0.403)	(0.323)
RSA							0.135							-0.026
							(0.147)							(0.416)
Economic Variables														
Growth								0.012	0.011	0.0120	0.011	0.013	0.013	0.013
								(0.300)	(0.348)	(0.323)	(0.390)	(0.289)	(0.293)	(0.305)
GDS								0.000	0.000	0.000	0.011	0.013	0.013	0.013
								(0.858)	(0.821)	(0.788)	(0.390)	(0.289)	(0.293)	(0.305)
BMG								-0.002	-0.002	-0.002	0.000	0.000	0.000	0.001
								(0.539)	(0.516)	(0.517)	(0.969)	(0.783)	(0.806)	(0.715)
BM								-0.001	-0.003	-0.003	-0.002	-0.002	-0.002	-0.002
								(0.339)	(0.075)	(0.070)	(0.610)	(0.612)	(0.553)	(0.571)

	Dependent Variable (Portfolio PPG Bond/GDP)							Dependent Variable (Portfolio PNG Bond/GDP)						
	Panel A				Panel B			Panel A			Panel B			
INTEXTDBT	0.40***	0.39***	0.44***		0.45***	0.44***	0.44***	-0.009	-0.029	-0.022	-0.010	-0.014	-0.003	-0.013
	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.801)	(0.415)	(0.592)	(0.814)	(0.740)	(0.945)	(0.779)
1st Lag RSDLDBT	-0.094	-0.094	-0.100		-0.1010	-0.098	-0.090	-0.81***	-0.73***	-0.72***	-0.80***	-0.73***	-0.71***	-0.73***
	(0.222)	(0.228)	(0.200)		(0.185)	(0.200)	(0.205)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
2nd Lag RSDLDBT	0.645***	0.650***	0.665***		0.612***	0.648***	0.648***							
	(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)							
SHRTDBT								-0.0020	-0.0040	-0.0040	-0.001	-0.004	-0.0040	-0.0030
								(0.623)	(0.412)	(0.383)	(0.772)	(0.378)	(0.473)	(0.510)
DCR	0.004	0.004	0.004		-0.001	-0.004	-0.004	0.0020	0.0010	0.0020	0.003	0.001	0.0020	0.0020
	(0.049)	(0.138)	(0.099)		(0.719)	(0.484)	(0.523)	(0.168)	(0.324)	(0.284)	(0.406)	(0.844)	(0.594)	(0.679)
World Bank Governance Index														
RULE	0.0000	0.0000	0.0000		0.000	0.000	0.000							
	(0.977)	(0.966)	(0.963)		(0.968)	(0.945)	(0.945)							
F Prob	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.001	0.0018	0.019	0.006	0.0083	0.0113
R-squared	0.219	0.219	0.2225	0.238	0.241	0.2411	0.2536	0.145	0.180	0.1815	0.141	0.175	0.1798	0.1845
Adj R-squared	0.187	0.182	0.181	0.203	0.1999	0.1937	0.2007	0.096	0.126	0.1214	0.083	0.111	0.1090	0.1065

Panel A full sample

Panel B excluding South Africa

PPG Public and publicly guaranteed

PNG – Non guaranteed

* Significance at 10%

** Significance at 5%

*** Significance 1%

The introduction of the RATING and the QUALITY variables however, do not improve the PPGBOND net flow rate model performance with adjusted R-squared declining to 18.2% and 18.05% when the RATING and the QUALITY variables are introduced respectively. This is also the case when South Africa is excluded from the sample, with the introduction of the RATING and QUALITY variables resulting in the adjusted R-squared declining to 19.99% and 19.37%. In contrast, the introduction of the South African average annual long term foreign currency sovereign credit rating (RSA) variable improves the model performance slightly with the adjusted R-squared increasing to 20.07%.

In contrast to the PPGBOND net flow rate model however, the RATING variable has a positive and significant relationship with PNGBOND net flow rate. This is robust, with the RATING variable remaining positive and significant at 5%, when the QUALITY and RSA rating variables are introduced to the sample that excludes South Africa. In addition, the coefficients of the RATING increase to 0.036 and 0.038 when the QUALITY and RSA rating variables are introduced to the model, suggesting the amplification of the RATING by the QUALITY of the sovereign credit rating and the RSA rating. The p-value for the RATING also declines to 0.021 and 0.016 from 0.03 when the QUALITY and RSA rating variables are introduced to the model respectively.

d. ***Estimation of the effect of Fitch long-term foreign currency sovereign credit rating on commercial banks and other private financial institutions***

As shown in table 10, a history of borrowing from commercial banks and other private financial institutions explain future borrowings, with the 1st and 2nd lags of PGGCOMM and PNGCOMM both positive and significant for the full sample of all the rated countries. The 2nd lag however, is insignificant and negative when South Africa is excluded from the sample, while the coefficient for the 1st lag increases, suggesting that borrowing capacity declines over a period of time for economies other than South Africa.

In contrast to the portfolio bond and equity flow rate however, while insignificant, there is a positive relationship between GROWTH and PPGCOMM, suggesting that economic performance does improve access to public and publicly guaranteed borrowing from the commercial bank and other private borrowers (PPGCOMM). In addition, in line with priori expectation, the current commitments towards the servicing of bank and other private borrower's debt reduce access to PPGCOM, with the interest on external debt (INTREXTBT) variable of the expected negative sign. As with the GROWTH variable however, the relationship between INTREXTBT and PPGCOMM is insignificant. Contrary to expectations however, short- term indebtedness (SHRTDBT) is positive while the DCR is insignificant confirming that there is no substitution between domestic credit and debt from commercial banks and other private borrowers.

While the RATING and QUALITY variables are of the expected positive sign, their explanatory power of PPGCOMM and PPNGCOMM is insignificant. The introduction of the RATING variable as shown in table 10, improves the R-squared of the PPGCOMM model to 9.6% from 9%. The adjusted R-squared however remains the same at 6%, while the introduction of the QUALITY variable results in a decline to the adjusted R-squared to 5.4%. With the exclusion of South Africa from the sample however, the model fit improves with the introduction of the RATING and QUALITY variables improving the R-squared to 13.2% and 13,9% from 12.3% while also improving the adjusted R-squared from 9.1% to 9.4% and 9.5% respectively. The RSA rating variable however reduces the performance of the model with the adjusted R-squared declining to 9.0% even though R-squared increases to 14.2%, contrasting the regional rating finding observed in the portfolio bond model above.

In addition to increasing the R-squared to 40.7% from 39.8% and the adjusted R-squared to 38.8% from 38.3%, the DCR variable becomes negative with the introduction of the RATING variable to the full sample PNGCOMM net flow rate model. The RATING variable however, while showing the expected positive signs, is insignificant. The QUALITY variable on the other hand while insignificant, also increases the R-squared to 41.7% and adjusted R-squared to 39.4%.

Table 10: Panel regression estimations for the effect of Fitch issued long-term foreign currency sovereign credit rating on the net flows from commercial bank loans from private banks and other private financial institutions with p-value in parenthesis

	Dependent Variable (Commercial PPG /GDP)							Dependent Variable (Commercial PNG/GDP)						
	Panel A				Panel B			Panel A				Panel B		
Constant	-0.055	-0.137	-0.135	-0.041	-0.137	-0.047	0.270	-0.092	-0.151	-0.090	-0.082	-0.112	-0.097	-0.167
	(0.576)	(0.285)	(0.374)	(0.688)	(0.300)	(0.765)	(0.631)	(0.041)	(0.012)	(0.204)	(0.020)	(0.010)	(0.054)	(0.355)
Dependent Variable Lag														
1st Lag	0.21***	0.22***	0.22***	0.34***	0.34***	0.35***	0.35***	0.43***	0.42***	0.41***	0.67***	0.67***	0.67***	0.67***
	(0.006)	(0.005)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
2nd Lag	0.125**	0.130**	0.130**	-0.093	-0.086	-0.096	-0.096	0.191***	0.177***	0.170	-0.003	-0.010	-0.013	-0.014
	(0.029)	(0.023)	(0.023)	(0.250)	(0.287)	(0.240)	(0.241)	(0.004)	(0.009)	(0.011)	(0.954)	(0.865)	(0.829)	(0.809)
Rating Variables														
RATING		0.012	0.012		0.016	0.002	0.003		0.013	0.003		0.007	0.005	0.005
		(0.316)	(0.502)		(0.248)	(0.928)	(0.862)		(0.136)	(0.744)		(0.231)	(0.425)	(0.499)
QUALITY			0.003			0.171	0.138			0.114			0.029	0.037
			(0.984)			(0.289)	(0.418)			(0.107)			(0.573)	(0.505)
RSA							-0.026							0.006
							(0.557)							(0.687)
Economic Variables														
Growth	0.013	0.014	0.014	0.011	0.011	0.012	0.012							
	(0.382)	(0.340)	(0.341)	(0.483)	(0.473)	(0.463)	(0.455)							
INTEXTDBT	-0.016	-0.023	-0.023	-0.025	-0.036	-0.063	-0.071							
	(0.720)	(0.618)	(0.643)	(0.584)	(0.443)	(0.237)	(0.196)							
SHRTDBT	0.002	0.001	0.001	0.003	0.003	0.003	0.003							

	Dependent Variable (Commercial PPG /GDP)							Dependent Variable (Commercial PNG/GDP)						
	Panel A				Panel B			Panel A				Panel B		
	(0.394)	(0.618)	(0.619)	(0.309)	(0.415)	(0.362)	(0.326)							
DCR								0.000	-0.001	-0.001*	0.001*	0.001	0.000	0.000
								(0.585)	(0.183)	(0.094)	(0.081)	(0.485)	(0.690)	(0.633)
World Bank Governance Index														
GOV								0.003***	0.002**	0.002**	0.001*	0.001*	0.001*	0.001
								(0.008)	(0.022)	(0.036)	(0.071)	(0.087)	(0.095)	(0.143)
F Prob	0.012	0.016	0.029	0.003	0.003	0.004	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.090	0.096	0.096	0.123	0.132	0.139	0.142	0.398	0.407	0.417	0.645	0.648	0.649	0.650
Adj R-squared	0.060	0.060	0.054	0.091	0.094	0.095	0.090	0.383	0.388	0.394	0.634	0.636	0.634	0.632

Panel A full sample

Panel B excluding South Africa

PPG Public and publicly guaranteed

PNG – Non guaranteed

* Significance at 10%

** Significance at 5%

*** Significance 1%

The PGNCOMM model performance improves significantly when South Africa is excluded from the sample with R-squared increasing to 64.5% while adjusted R-squared increases to 63.4%. The introduction of the RATING variable, as with the full sample, further improves the performance of the PNGCOMM model with R-squared and adjusted R-squared increasing to 64.8% and 63.6% respectively. In contrast to the full sample, for the PNGCOMM model however, the introduction of the QUALITY variable does not improve the model performance with the adjusted R-squared declining to 63.2%.

In addition, while explaining only 0.002 units of PPGCOMM, the perception of an effective civil service that is free from political influence index (GOV) is significant and positive for both models, suggesting that in the absence of public and public guarantees, borrowing from the commercial banks and other private borrowers is significantly improved by sound public service governance.

4.1.2 *Estimation of the effect of Moody's issued long-term foreign currency sovereign credit rating on capital flows*

In contrast to the FITCH issued long-term foreign currency sovereign credit rating, the Moody's RATING variable is significant for all the FDI investment grade models as presented in table 11 below. As presented in tables 12 to 14, contrary to priori expectation however, Moody's RATING variable has a negative sign and is in significant for portfolio equity (EQUITY) and all types of long-term debt inflow models (long-term commercial bank loans from private banks and other private financial institutions and portfolio bond flows)

a. *Estimation of the effect of Moody's issued long-term foreign currency sovereign credit rating on FDI flows*

The introduction of Moody's RATING variable to the FDI investment rate model, not only improves the model fit with the adjusted R-squared increasing to 40.1% from 36.3%, the RATING variable is also of the expected positive sign in addition to being significant at 5%. As presented in table 11, this was found to be the case for both the full sample as well as when South Africa is excluded from the sample, rejecting the null hypothesis that the Moody's issued long-term foreign currency sovereign credit rating does not explain the differences in FDI flows

in Africa. In contrast, the introduction of the QUALITY variable does not improve the FDI investment rate model with the introduction of the QUALITY variable resulting in the decline of the adjusted R-squared to 39.4%.

The FDI model performs in line with priori expectations with the 1st lag of the dependent variable explaining 0.421 unit increase in the dependent variable. As with the Fitch FDI investment rate model, the GROWTH variable is also the expected positive sign and significant. In contrast to the decline in the 1st lag of the dependent variable, the coefficient of the GROWTH variable however increases to 0.26 from 0.229 when the RATING variable is introduced to the model. In addition, the p-value of the GROWTH variable improves from 0.043 to 0.019, suggesting an amplification of the role of the GROWTH variable on FDI, when considered with the good sovereign credit rating. This was also found to be the case with the INFRASTRUCTURE variable, with the co-efficient of the INFRASTRUCTURE variable increasing from 0.014 to 0.022 when the RATING variable is introduced to the model. The INFRASTRUCTURE variable however, while of the expected positive sign, remains insignificant.

As with the FITCH estimated FDI investment rate model, the TRADE variable is surprisingly negative and insignificant, suggesting that openness and integration with the rest of the world is not important for FDI inflows for the countries rated by Moody. Contrary to the Fitch FDI investment rate model however, the EXCHVOL (exchange rate volatility variable) is of the expected negative sign as well as being significant. In addition, as with the GROWTH and INFRASTRUCTURE variables, the coefficient of the EXCHVOL is amplified with the introduction of the RATING variable decreasing from a -1.0678 to -1.693 while the p-value decrease from 0.04 to 0.033, confirming the reinforcing role of the RATING variable.

As with the Fitch rated sample FDI investment rate model, the most significant WORLD Bank Governance Index variable was the POL (political stability variable), with a positive relationship between the POL variable and the dependent variable.. The POL variable however while remaining positive, becomes insignificant with the introduction of the RATING variable to the model, suggesting the substitution of the political risk proxy by the RATING variable. In addition, the POL variable coefficient declines to 0.016 from 0.031 with the introduction of the RATING variable.

As shown in table 11, the performance of the model improves significantly with the exclusion of South Africa from the sample, with R-squared and adjusted R-squared increasing to 56% and 52.1% from 40.5% and 36.2% respectively. In addition, while all the other explanatory variables remain the same as with the full sample, the POL variable remains significant with the introduction of the RATING variable, suggesting that irrespective of the quality improvement in the sovereign credit rating, political stability remains a key determinant for FDI inflows for countries other than South Africa. The coefficients and p-values of the GROWTH, INFRASTRUCTURE, TRADE and EXCHVOL, however improve with the introduction of the RATING variable, confirming the reinforcing role of the RATING variable. The 1^{st} lag of the dependent variable as with the full sample model however, declines from 0.41 to 0.289 with the introduction of the RATING variable, suggesting that despite a history of investment in a particular country, a negative RATING will impact subsequent FDI inflows.

The QUALITY variable on the other hand remains negative and insignificant with the model adjusted R-squared declining to 51.7% from 52.8% when the QUALITY variable is introduced to the model. The introduction of the RSA rating variable however, improves the model R-squared and adjusted R-squared to 57.2% and 52% from 56.2% and 51.77% respectively, with the RSA rating of the expected positive sign.

Table 11: Panel regression estimations for the effect of Moody's issued long-term foreign currency sovereign credit rating on the FDI flows with p-value in parenthesis

	Dependent Variable (FDI/GDP)						
	Panel A			Panel B			
Constant	0.512	2.114	2.385	0.013	-2.583	-3.226	-4.493
	(0.580)	(0.127)	(0.148)	(0.991)	(0.101)	(0.104)	(0.082)
Dependent Variable Lag							
1st Lag	0.421***	0.341***	0.342***	0.401***	0.289***	0.298***	0.278**
	(0.000)	(0.001)	(0.001)	(0.000)	(0.007)	(0.007)	(0.013)
Rating Variables							
RATING		0.279**	0.31**		0.363**	0.413**	0.371*
		(0.014)	(0.041)		(0.020)	(0.024)	(0.052)
QUALITY			0.255			-0.547	-0.609
			(0.756)			(0.587)	(0.548)
RSA							0.134
							(0.437)
Economic Variables							
Growth	0.229**	0.262**	0.266**	0.295**	0.299**	0.313**	0.328***
	(0.043)	(0.019)	(0.018)	(0.017)	(0.013)	(0.011)	(0.009)
INFR	0.014	0.022	0.025	0.014	0.026	0.031	0.031
	(0.749)	(0.609)	(0.566)	(0.746)	(0.543)	(0.487)	(0.494)
TRADE	-0.013	-0.014	-0.013	-0.01	-0.022	-0.018	-0.017
	(0.349)	(0.293)	(0.333)	(0.515)	(0.162)	(0.316)	(0.335)
EXCHVOL	-1.678**	-1.693**	-1.7**	-3.102***	-2.126*	-2.282*	-2.7**
	(0.040)	(0.033)	(0.033)	(0.005)	(0.060)	(0.052)	(0.038)
World Bank Governance Index							
POL	0.031***	0.016	0.016	0.039***	0.023*	0.022*	0.023*
	(0.004)	(0.169)	(0.207)	(0.001)	(0.072)	(0.086)	(0.079)
F Prob	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.405	0.448	0.449	0.560	0.560	0.562	0.572
Adj R-squared	0.362	0.401	0.394	0.521	0.528	0.517	0.520

Panel A full sample Panel B excluding South Africa * Significance at 10% ** Significance at 5% *** Significance 1%

b. ***Estimation of the effect of Moody's issued long-term foreign currency sovereign credit rating on portfolio equity inflows***

As presented in table 12, the Moody's RATING variable has an insignificant relationship with the EQUITY investment rate. In addition, the introduction of the RATING and QUALITY variables results in the decline in the EQUITY investment rate model adjusted R-squared from 50.9% to 50.4% and 49.9% respectively. This is also the case when South Africa is excluded from the model, with R-squared remaining at 56% when the RATING variable is introduced to the model and only increasing slightly to 56.2% with the introduction of the QUALITY variable. The adjusted R-squared however declines from 52.8% to 52.1% and 51.7% with the introduction of both the RATING and QUALITY variables respectively. As with the FDI model, while the RSA rating is insignificant, the coefficient of the variable is of the expected positive sign. The introduction of the RSA variable to the EQUITY investment rate model also improves the model fit with the R-squared and adjusted R-squared improving to 57.2% and 52% respectively.

The most significant variable for the EQUITY variable is the 1st lag of the dependent variable, with one unit of the 1st lag of the dependent variable explaining 1.022 of the current dependent variable for the full sample and 0.995 when South Africa is excluded from the sample. As with the Fitch EQUITY investment rate model however, the GROWTH variable is negative and insignificant with both the coefficient and p-value declining with the introduction of the RATING variable.

Contrary to expectations, the relationship between the MRKTCAP and the dependent variable, while of the expected positive sign, is only significant at 10% when South Africa is excluded from the sample. The STCKTRNOV variable however, remains negative and insignificant for both the full sample and the reduced sample, while the SPIND has the expected positive sign but remains insignificant.

Table 12: Panel regression estimations for the effect of Moody's issued long-term foreign currency sovereign credit rating on the portfolio equity flows with p-value in parenthesis

	Dependent Variable (Portfolio Equity/GDP)						
	Panel A			Panel B			
Constant	1.855	0.478	1.208	-1.446	0.549	-6.570	0.000
	(0.418)	(0.924)	(0.821)	(0.819)	(0.939)	(0.481)	(0.000)
Dependent Variable Lag							
1st Lag	1.024***	1.024***	1.022***	0.995***	0.995***	0.991***	0.967***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Rating Variables							
RATING		0.11	-0.017		0.053	-0.223	-0.656
		(0.756)	(0.971)		(0.910)	(0.737)	(0.386)
QUALITY			1.112			2.01	1.775
			(0.693)			(0.558)	(0.604)
RSA							0.983
							(0232)
Economic Variables							
Growth	-0.213	-0.197	-0.195	-0.037	-0.039	-0.068	0.105
	(0.685)	(0.711)	(0.714)	(0.939)	(0.938)	(0.892)	(0.839)
MRKTCAP	0.006	0.005	0.004	0.1	0.099*	0.101*	0.074
	(0.693)	(0.764)	(0.789)	(0.075)	(0.084)	(0.081)	(0.226)
STCKTRNOV	-0.047	-0.043	-0.043	-0.109	-0.105	-0.11	-0.139
	(0.450)	(0.500)	(0.502)	(0.200)	(0.247)	(0.230)	(0.142)
SPIND	0.024	0.028	0.028	0.016	0.017	0.016	0.025
	(0.619)	(0.584)	(0.583)	(0.777)	(0.767)	(0.776)	(0.670)
F Prob	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.536	0.536	0.537	0.560	0.560	0.562	0.572
Adj R-squared	0.509	0.504	0.499	0.528	0.521	0.517	0.520

Panel A full sample Panel B excluding South Africa * Significance at 10% ** Significance at 5% *** Significance 1%

c. *Estimation of the effect of Moody's issued long-term foreign currency sovereign credit rating on portfolio bond inflows*

The full sample PPGBOND model while slightly less fitting of the estimated data, performed well with the with R-squared of between 27.94% and 33.56% and the F-static significant at 1%, to explain the variation in the public and publicly guaranteed portfolio bond net flow rates. In line with the priori expectations, the interest on the external debt (INTEXTDBT) variable is of the expected negative sign, suggesting that debt servicing commitments reduce the capacity to carry any additional debt in line with the argument by Reinhart and Rogoff (2008)

As shown in table 13, in line with the argument by Gelos, et al. (2003) that default negatively impacts access to capital, one unit of the current year rescheduled debt results in an average fifty five units reduction in PPGBOND net flow rate and is highly significant at 5%. However, as suggested by Reinhart and Rogoff (2008), a debt reschedule does not necessarily close out access to debt capital. As shown in table 13, while the current year debt reschedule is negatively related to PPGBON, the 1st lag of rescheduled debt is both significant and positive, suggesting that debt rescheduling, while negatively impacting on ability to access public and publicly guaranteed portfolio bonds in the current year, creates capacity to access public and publicly guaranteed portfolio bond debt in subsequent years.

Surprisingly, the variable for corruption is both positive and significant while that of POLITICAL and RULE are negative and significant, suggesting that while poor political stability and the rule of law will discourage PPGBOND flows, the perception of government corruption does not have a negative impact on access to bond debt.

As expected, the variable of the 1st lag of the dependent variable while the expected positive sign, is insignificant for the full sample, and only becomes significant when the QUALITY variable is included in the model. In contrast, the 1st lag of the dependent variable is both significant and positive when South Africa is excluded from the model, suggesting that while it may be difficult to access debt in the international bond markets for developing economies as posited by Gelos, et al. (2003), it becomes easier once a country has established a track record on the debt market.

The introduction of the RATING variable however, does not improve the model performance, suggesting, as with the FITCH model, that public guarantees may be sufficient to allay any risk. As shown in table 13, the introduction of the RATING variable while improving the R-squared to 28.28% from 27.94%, results in the reduction of the adjusted R-squared to 18.61% from 19.34%. The introduction of the RATING variable also results in the F-statistic increase from 0.0035 to 0.0059, indicating that the annual average long-term foreign currency sovereign credit rating does not explain the variability in public and publicly guaranteed portfolio bond net capital flows in Moody's rated African countries. In contrast, the introduction of the rating QUALITY variable not only improves the F-statistic to 0.0028, but also increases the R-squared and adjusted R-squared to 32.30% and 21.89%, suggesting, as posited by Reinhart (2000), that the quality of the rating as opposed to the rating itself, is critical in accessing international bond markets. In addition to being statistically significant, the introduction of the rating QUALITY variable improves the p-values of the RSDLTDBT, the lag of the RSDLDBT, POL and RULE to 1% significant from 5% significant level (and 10% for RULE), suggesting, that the QUALITY variable not only explains but reinforces and amplifies the explanatory significance of the other variables. In contrast to the EQUITY model however, the introduction of the RSA rating variable results in the reduction of the adjusted R-squared to 19.23%, with the increase in the p-values of the CORR, POL, RULE and RSDLBT, suggesting that for PPGBOND flows, as opposed to the FDI and portfolio equity flows, the regional proxy of South Africa does not hold.

Table 13: Panel regression estimations for the effect of Moody's issued long-term foreign currency sovereign credit rating on the portfolio bond flows with p-value in parenthesis

	Dependent Variable (Portfolio PPG Bond/GDP)							Dependent Variable (Portfolio PNG Bond/GDP)						
	Panel A				Panel B			Panel A			Panel B			
Constant	0.384	0.651	0.022	0.548	1.026	1.108	1.460	-0.257	-0.307	-0.370	-0.003	-0.002	-0.002	-0.008
	(0.391)	(0.294)	(0.974)	(0.158)	(0.075)	(0.107)	(0.209)	(0)	(0.005)	(0.003)	(0.783)	(0.877)	(0.919)	(0.729)
***Dependent Variable** Lag*														
1st Lag	0.1480	0.1440	0.165**	0.196**	0.192**	0.190**	0.183**	-0.26**	-0.26***	-0.27***	-0.012	-0.012	-0.013	-0.016
	(0.135)	(0.146)	(0.093)	(0.022)	(0.025)	(0.028)	(0.040)	(0.010)	(0.009)	(0.008)	(0.915)	(0.915)	(0.916)	(0.896)
Rating Variables														
RATING		-0.0320	0.0740		-0.0560	-0.0690	-0.0450		0.0040	0.0120		0.0000	0.0000	0.0000
		(0.530)	0.323)		(0.257)	(0.367)	(0.658)		(0.537)	(0.257)		(0.974)	(0.974)	(0.863)
QUALITY			-0.6660			0.0750	0.0530			-0.0620			0.0000	0.0000
			(0.057)			(0.821)	(0.876)			(0.327)			(0.986)	(0.995)
RSA							-0.0310							0.0010
							(0.705)							(0.621)
Economic Variables														
Growth								0.009	0.009	0.0110	-0.001	-0.001	-0.001	-0.001
								(0.310)	(0.302)	(0.239)	(0.306)	(0.310)	(0.319)	(0.364)
INFR	0.0290	0.0250	0.053**	0.033**	0.0290	0.0260	0.0310							
	(0.105)	(0.192)	(0.028)	(0.042)	(0.084)	(0.237)	(0.234)							
BMG								0.005**	0.005**	0.005**	0.0000	0.0000	0.0000	0.0000
								(0.025)	(0.026)	(0.021)	(0.179)	(0.182)	0.199)	(0.191)
DCR								0.0030	0.0030	0.0030	0.0001	0.0001	0.0001	0.0000
								(0.702)	(0.710)	(0.758)	(0.702)	(0.710)	(0.758)	(0.778)

	Dependent Variable (Portfolio PPG Bond/GDP)							Dependent Variable (Portfolio PNG Bond/GDP)						
	Panel A			Panel B				Panel A			Panel B			
INTEXTDBT	-0.0680	-0.0910	-0.0450	-0.1230	-0.1650	-0.1720	-0.1860							
	(0.524)	(0.423)	(0.692)	(0.191)	(0.104)	(0.107)	(0.103)							
RSDLDBT	-56.11**	-55.208**	-48.632***	-55.869**	-55.053**	-55.779**	-53.446**							
	(0.030)	(0.033)	(0)	(0.010)	(0.011)	(0.011)	(0.020)							
1st Lag RSDLDBT	24.326**	23.189**	21.669***	24.365**	22.746**	22.888**	22.141**							
	(0.031)	(0.043)	(0)	(0.010)	(0.017)	(0.017)	(0.025)							
World Bank Governance Index														
CORR	0.034***	0.035***	0.04***	0.037***	0.042***	0.041***	0.041***							
	(0.000)	(0)	(0)	(0.002)	(0.001)	(0.001)	(0.002)							
POL	-0.018***	-0.017**	-0.017***	-0.017**	-0.016**	-0.016**	-0.017**							
	(0.007)	(0.011)	(0)	(0.013)	(0.016)	(0.018)	(0.019)							
RULE	-0.028*	-0.026*	-0.040***	-0.035**	-0.034**	-0.033**	-0.036*							
	(0.073)	(0.094)	(0)	(0.020)	(0.021)	(0.046)	(0.057)							
F Prob	0.0035	0.0059	0.0028	0.0056	0.0066	0.0121	0.0201	0.0000	0.0000	0.001	-0.702	-0.710	-0.758	-0.778
R-squared	0.2794	0.2838	0.3230	0.3165	0.3331	0.3337	0.3356	0.2645	0.2677	0.2757	0.6098	0.7493	0.8501	0.8944
Adj R-squared	0.1934	0.1861	0.2189	0.2153	0.2198	0.2056	0.1923	0.2318	0.2266	0.2263	0.0363	0.0363	0.0363	0.0397

Panel A full sample

Panel B excluding South Africa

PPG Public and publicly guaranteed

PNG – Non guaranteed

* Significance at 10%

** Significance at 5%

*** Significance 1%

In contrast to the PPGBOND, the 1st lag of the dependent variable is both significant and negative for the non-guaranteed portfolio bond net flows (PNGBOND) model. The variable for broad money growth (BMG) on the other hand is both positive and significant at 5% suggesting that, while previous private non-guaranteed portfolio bond flows reduce the capacity for further access to this type of debt, the growth in domestic financial markets, improves access to non-guaranteed bond debt markets. GROWTH on the other hand while the expected positive sign, is insignificant, confirming the findings by Gelos, et al.(2003) that the macroeconomic variables do not explain access to international debt.

The RATING variable for the PNGBOND model is of a positive sign, but remains insignificant. In addition, the introduction of the RATING variable, while increasing the model R-squared slightly to 26.77% from 26.45%, results in a decline in the adjusted R-squared from 23.18% from 22.66%. In contrast to the PPGBOND model where the QALITY of the rating was positive and significant, the QUALITY variable is negative and insignificant for the PNGBOND model. In addition, the introduction of the QUALITY variable results in the adjusted R-squared declining slightly to 22.63% from 22.66%.

As expected, the PNGBOND model, while having very high R-squared of between 60.98% and 89.44% when South Africa is excluded from the sample, performs poorly and is insignificant with the adjusted R-squared of between 3.63% and 3.97% and F-statistic of -0.7. This is understandable given that, except for South Africa, none of the countries rated by Moody's issued any private non-guaranteed bond debt during the estimation period (between1994 and 2011).

d. *Estimation of the effect of Moody's issued long-term foreign currency sovereign credit rating on commercial banks and other private institutions net flows*

Both the 1st lag and 2nd lag of the dependent variable are negative and significant for the PPGCOMM model suggesting, as expected, that previous borrowing reduces the borrowing capacity for future borrowing from commercial banks and private institutions. Contrary to priori expectation however, the economic growth (GROWTH) variable both

is negative and insignificant, while exchange rate volatility (EXCHVOL) has the expected negative sign as well as being significant. Indeed, it is expected that a mismatch and uncertainty on the currency of debt and that of revenue generation increase vulnerability to default (Edwards, 2001). In addition, while insignificant, the interest on external debt (INTEXTDBT) is of the expected negative sign, while the real interest rate (RRI) variable is significant, with the expected negative sign, suggesting that as the domestic real interest rates increase, international commercial debt increases to substitute expensive domestic debt.

While insignificant, the introduction of the RATING variable to the PPGCOMM model improves both the R-square and adjusted R-squared to 34.9% and 27.5% from 33.2% and 26.5% respectively. In addition, the introduction of the RATING variable improves the p-values of the GROWTH variable to be significant at 10%, while the p-value of those of REG and RULE also improve to 0.002 and 0.016 from 0.007 and 0.033 respectively, confirming the reinforcing role of the RATING variable. In contrast, the introduction of the rating QUALITY variable does not improve the model performance resulting in the decrease of adjusted R-squared to 26.5% while the R-squared remains the same, with the p-values GROWTH, REG and RULE increasing slightly.

Contrary to priori expectation however, the introduction of the South African rating (RSA) variable improves both the R-squared and adjusted R-squared to 39% and 27.6% from 36, 5% and 25.9% respectively. The RSA rating variable, however, is not significant in addition to having the unexpected negative sign. The introduction of the RSA rating however, improves the p-values of the variables such as REG and INTEXTDBT (to 10% and 5% significant from being insignificant).

Table 14: Panel regression estimations for the effect of Moody's issued long-term foreign currency sovereign credit rating on the net flows from commercial bank loans from private banks and other private financial institutions with p-value in parenthesis

	Dependent Variable (Commercial PPG /GDP)							Dependent Variable(Commercial PNG/GDP						
	Panel A			Panel B				Panel A			Panel B			
Constant	0.205	0.581	0.577	-0.157	0.221	0.218	1.248	0.058	0.053	0.000	-0.078	-0.056	-0.259	0.044
	(0.267)	(0.072)	(0.085)	(0.507)	(0.615)	(0.645)	(0.130)	(0.654)	(0.852)	(0.999)	(0.598)	(0.857)	(0.486)	(0.933)
Dependent Variable Lag														
1st Lag	-0.189*	-0.176*	-0.175*	-0.175	-0.166	-0.166	-0.168	0.396***	0.397***	0.394***	0.533***	0.533***	0.532***	0.524
	(0.051)	(0.068)	(0.078)	(0.110)	(0.130)	(0.153)	(0.143)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
2nd Lag	-0.225***	-0.244***	-0.244***	-0.196**	-0.217**	-0.217**	-0.218**	0.266**	0.266**	0.257**	0.174	0.174	0.154	0.150
	(0.010)	(0.006)	(0.006)	(0.044)	(0.030)	(0.031)	(0.029)	(0.010)	(0.011)	(0.015)	(0.129)	(0.133)	(0.190)	(0.203)
Rating Variables														
AAR		-0.034	-0.033		-0.033	-0.032	-0.015		0.000	0.008		-0.001	0.019	0.023
		(0.155)	(0.257)		(0.307)	(0.415)	(0.712)		(0.987)	(0.748)		(0.934)	(0.484)	(0.407)
Rating Quality			-0.009			-0.004	-0.048			-0.066			-0.146	-0.148
			(0.956)			(0.986)	(0.825)			(0.651)			(0.323)	(0.317)
RSA							-0.084							-0.023
							(0.127)							(0.419)
Economic Variables														
Growth	-0.041	-0.047*	-0.047	0.043	0.039	0.039	0.023							
	(0.146)	(0.099)	(0.102)	(0.128)	(0.174)	(0.178)	(0.445)							
EXCHVOL	-0.731***	-0.777***	-0.777***	-0.775***	-0.858***	-0.857***	-0.690**							
	(0)	(0)	(0)	(0.002)	(0.001)	(0.002)	(0.016)							
INTEXTDBT	-0.022	-0.042	-0.042	-0.017	-0.040	-0.040	-0.096							
	(0.705)	(0.479)	(0.482)	(0.790)	(0.561)	(0.569)	(0.222)							
RRI	-0.036***	-0.038***	-0.038***	-0.035***	-0.037***	-0.037***	-0.050***							

	Dependent Variable (Commercial PPG /GDP)							Dependent Variable(Commercial PNG/GDP						
	Panel A				Panel B			Panel A				Panel B		
	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.002)	(0.001)							
DCR								0.000	0.000	0.000	0.001	0.001	0.002	0.003
								(0.946)	(0.945)	(0.961)	(0.553)	(0.570)	(0.338)	(0.311)
SWSRRI								-0.013	-0.013	-0.012	0.014	0.013	0.015	-0.005
								(0.707)	(0.748)	(0.755)	(0.674)	(0.736)	(0.695)	(0.905)
World Bank Governance Index														
REG	0.017***	0.021***	0.021***	0.012	0.017	0.017	0.020*							
	(0.007)	(0.002)	(0.003)	(0.214)	(0.117)	(0.130)	(0.069)							
RULE	-0.014**	-0.016**	-0.016**	-0.008	-0.011	-0.011	-0.013							
	(0.033)	(0.016)	(0.019)	(0.376)	(0.243)	(0.251)	(0.188)							
F Prob	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.332	0.349	0.349	0.354	0.365	0.365	0.390	0.354	0.354	0.356	0.452	0.452	0.459	0.464
Adj R-squared	0.265	0.275	0.265	0.271	0.271	0.259	0.276	0.326	0.318	0.312	0.421	0.413	0.413	0.410

Panel A full sample

Panel B excluding South Africa

PPG Public and publicly guaranteed

PNG – Non guaranteed

* Significance at 10%

** Significance at 5%

*** Significance at 1%

In contrast to the PPGCOMM where the 1st and 2nd lags of the dependent variable are negative, both lags of the nonguaranteed borrowing rate from the commercial banks and other private institutions (PNGCOMM) are significant and positive for the full sample model. While retaining the positive sign, the 2nd lag of the dependent variable is however insignificant when South Africa is excluded from the sample. In addition, the 1st lag of the dependent variable remains significant with the coefficient increasing to 0.533 from 0.396 when South Africa is excluded from the sample. The DCR (Growth in Domestic credit) as with the FITCH PNGCOMM model however is insignificant, discounting the substitution of international debt with local debt as suggested by Hite and Warga (1997) and Gelos, et al. (2003).

The introduction of the RATING variable not only results in the R-squared remaining the same at 35.4%, but results in the decline in the adjusted R-squared to 31.8% from 32.6%. Similarly the QUALITY variable results in the adjusted R-squared declining to 31.2%, with minimal increase of the R-squared to 35.6%. The introduction of the RATING and QUALITY variables also result in the increase in the p-value of the 2nd lag of the dependent variable to 0.11 and 0.15 from 0.01 respectively. This lack of explanatory power of the RATING and QUALITY variables on PNGCOMM borrowing rate, persists when South Africa is excluded from the sample, with the introduction of the RATING and QUALITY variables resulting in the reduction of the adjusted R-squared to 41.3% from 42.1%. Similarly, the introduction of the RSA rating results in the decline in the adjusted R-squared to 41%.

4.1.3 *Estimation of the effect of S&P issued long-term foreign currency sovereign credit rating on capital flows*

As presented in tables 15 to 18 below, S&P issued long-term foreign currency sovereign credit rating capital flow rate models perform well for all types of capital flows, with the F-statistic significant for all the estimates. The impact of S&P long-term foreign currency sovereign credit rating on the different types of capital flows, however, is mixed. While the RATING variable is the expected positive sign for FDI, it is negative for the EQUITY, becoming positive only when the QUALITY variable is introduced to the model as presented in tables 15 and 16 respectively. In addition, while the RATING

variable is negatively related to the PPGBOND and PNGBOND net borrowing rate, the RATING variable is only significant for the PPGBOND model. The RATING is also negative for the PPGCOMM net flow rate model but becomes positive when the QUALITY variable is introduced to the model, and only when South Africa is excluded from the sample. As shown in table 18 in contrast, the RATING variable is insignificant for the PNGCOMM net flow rate model and becomes negative when the QUALITY variable is introduced to the model. The different capital flow models are discussed in details in the paragraphs below.

a. ***Estimation of the effect of S&P issued long-term foreign currency sovereign credit rating on FDI net inflows***

In line with the empirical specifications, the FDI inflow rate model in table 15 performs well with the 1st lag of the dependent variable positive and highly significant at 1%. Everything remaining the same, one unit increase in the 1st lag of the dependent variable explains approximately 0.57 unit increase in the dependent variable. In addition, the GROWTH variable is positive and significant at 1%, with one unit of the GROWTH variable explaining just over 0.29 units of the dependent variable and increasing to 0.31 units when South Africa is excluded from the sample. In line with priori expectations, the INFRASTRUCTURE variable as well as the TRADE variables, while insignificant, are of the expected positive sign, with the POLITICAL variable significant and positively related to the dependent variable.

The RATING variable however, while of the expected positive sign, is insignificant and does not improve the model performance, with the introduction of the RATING variable resulting in the slight decline of the adjusted R-squared from 59.8% to 59.6%. In addition, the introduction of the RATING variable results in the decline of the POLITICAL and INFRASTRUCTURE variable coefficients to 0.02 and 0.044 from 0.021 and 0.058 respectively, suggesting in contrast to the Moody's issued sovereign credit rating, that the RATING variable does not reinforce the other variable. The adjusted R-squared however improves slightly to 59.8% when the rating QUALITY variable is introduced to the model, with the R-squared improving to 61.7%. The rating QUALITY variable however, is insignificant and also negatively related to the dependent variable.

Table 15: Panel regression estimations for the effect of S&P issued long-term foreign currency sovereign credit rating on FDI with p-value in parenthesis

	Dependent Variable (FDI/GDP)						
	Panel A			Panel B			
Constant	-1.904	-2.306	-2.731	-2.055	-2.593	-3.125	-4.597
	(0.003)	(0.006)	(0.004)	(0.003)	(0.005)	(0.003)	(0.132)
Dependent Variable Lag							
1st Lag	0.572***	0.575***	0.569***	0.578***	0.58***	0.574***	0.567***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Rating Variables							
RATING		0.044	0.099		0.058	0.124	0.12
		(0.465)	(0.222)		(0.363)	(0.154)	(0.168)
QUALITY			-0.622			-0.781	-0.689
			(0.308)			(0.262)	(0.339)
RSA							0.128
							(0.607)
Economic Variables							
Growth	0.295***	0.298***	0.296***	0.309***	0.313***	0.311***	0.313***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INFR	0.058	0.044	0.047	0.061	0.042	0.045	0.049
	(0.141)	(0.322)	(0.289)	(0.165)	(0.379)	(0.352)	(0.313)
TRADE	0.01	0.011	0.012	0.007	0.01	0.011	0.01
	(0.227)	(0.171)	(0.151)	(0.390)	(0.277)	(0.230)	(0.279)
EXCHVOL	0.005	0.006	0.006	0.005	0.006	0.007	0.006
	(0.521)	(0.442)	(0.411)	(0.528)	(0.422)	(0.385)	(0.416)
World Bank Governance Index							
POL	0.021**	0.02**	0.022**	0.027***	0.025***	0.028***	0.027***
	(0.016)	(0.027)	(0.017)	(0.004)	(0.006)	(0.003)	(0.006)

	Dependent Variable (FDI/GDP)						
	Panel A				Panel B		
F Prob	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.613	0.614	0.617	0.636	0.638	0.641	0.642
Adj R-squared	0.598	0.596	0.598	0.619	0.618	0.619	0.617

Panel A full sample

Panel B excluding South Africa

* Significance at 10%

** Significance at 5%

*** Significance 1%

The introduction of the RATING variable remains insignificant when South Africa is excluded from the sample with the adjusted R-squared declining slightly to 61.8% from 61.9%, despite the increased R-squared to 63.8% from 63.6%. As with the full sample model, the introduction of the RATING variable results in the slight decline of the POLITICAL and INFRASTRUCTURE variable coefficients while those of GROWTH, TRADE and EXCHVOL variables improve slightly. The introduction of the S&P issued RSA rating variable, in contrast to the Fitch issued rating does not improve the model fit, with the adjusted R-squared declining slightly from 61.9% to 61.7%.

b. ***Estimation of the effect of S&P issued long-term foreign currency sovereign credit rating on portfolio equity flows***

Overall, the EQUITY net flow rate model performs according to priori expectation with the relationship between the dependent variable and the 1st lag of the dependent variable and the MARKTCAP positive and significant. In line with the suggestion by Reinhart and Rogoff (2008) and Hernandez, et al. (2001), that a positive global investment environment improves the investment flows to developing economies, the SPIND variable is also positive and significant. In line with the findings for the Fitch and Moody's models, the GROWTH and STCKTRNOV variables are negative and insignificant.

As with the FDI model, the EQUITY model performs well with the R-squared of 55.5% and adjusted R-squared of 58.1%. The introduction of the RATING variable however, while increasing the R-squared to 56.1%, results in the decline of the adjusted R-squared to 51.7%. The adjusted R-squared however increases to 52.1% when the rating QUALITY variable is introduced to the model with R-squared increasing to 57.1%.

Table 16: Panel regression estimations for the effect of S&P issued long-term foreign currency sovereign credit rating on portfolio equity with p-value in parenthesis

	Dependent Variable (Portfolio Equity/GDP)						
	Panel A			Panel B			
Constant	0.293	-0.230	-0.674	0.371	0.394	0.341	-0.528
	(0.449)	(0.738)	(0.384)	(0.088)	(0.243)	(0.315)	(0.623)
Dependent Variable Lag							
1st Lag	0.392***	0.380***	0.363***	0.102	0.102	0.099	0.116
	(0.000)	(0.000)	(0.001)	(0.471)	(0.475)	(0.486)	(0.422)
Rating Variables							
RATING		0.065	0.123		-0.003	0.0163	0.029
		(0.36)	(0.147)		(0.93)	(0.649)	(0.458)
QUALITY			-0.46209			-0.781	-0.689
			(0.213)			(0.262)	(0.339)
RSA							0.128
							(0.607)
Economic Variables							
Growth	-0.067	-0.059	-0.056	0.006	0.0054	0.004	0.004
	(0.241)	(0.311)	(0.333)	(0.825)	(0.842)	(0.881)	(0.869)
MRKTCAP	0.008***	0.0083***	0.009***	0.006**	0.006**	0.008**	0.009**
	(0.003)	(0.002)	(0.001)	(0.018)	(0.019)	(0.01)	(0.008)
STCKTRNOV	-0.008	-0.009	-0.011	0.002	0.002	0.001	0.002
	(0.415)	(0.324)	(0.245)	(0.673)	(0.671)	(0.741)	(0.648)
SPIND	0.019***	0.019***	0.018***	0.0044	0.0044	0.0044	0.004
	(0.003)	(0.003)	(0.004)	(0.16)	(0.163)	(0.163)	(0.154)
F Prob	0.000	0.000	0.000	0.117	0.183	0.184	0.214
R-squared	0.555	0.561	0.571	0.172	0.172	0.193	0.205
Adj R-squared	0.518	0.517	0.521	0.077	0.059	0.064	0.059

Panel A full sample Panel B excluding South Africa * Significance at 10% ** Significance at 5% *** Significance 1%

As with the Fitch rated sample model, except for South Africa, many of the S&P rated economies in the sample do not receive portfolio equity flows. This is reflected in the estimated model that performs poorly when South Africa is excluded from the sample, with the R-squared ranging from 17.2% to 20.5% while the adjusted R-squared range from 5.9% to 7.7%. The estimate is spurious, with the 1st lag of the dependent variable that is significant but of a negative sign, suggesting, contrary to expectations, that the history of portfolio equity flows discourages future portfolio equity flows. The model is also insignificant with the F-statistic ranging from 0.117 to 0.214.

The introduction of the RATING and rating QUALITY variables do not improve the model performance with the adjusted R-squared declining from 7.7% to 5.9% with the introduction of the RATING variable and 6.4% with the inclusion of the QUALITY variable. The RATING variable is also the unexpected negative sign and only becomes positive when the QUALITY variable is introduced to the model.

c. *Estimation of the effect of S&P issued long-term foreign currency sovereign credit rating on portfolio bond flows*

Overall the public and publicly guaranteed portfolio bond net flow rates (PPGBOND) model performed well with the R-squared and adjusted R-squared of between 43.65% and 48.95% and 41.41% and 45.42% respectively. As expected, debt rescheduling during the current year is negatively related to the dependent variable. However, as suggested by Reinhart and Rogoff (2004), the market does forgive defaulters following a reschedule, with the 1st lag of rescheduled debt (RSDLDBT) highly significant and positive. The economic growth (GROWTH) variable, however, while positively related to the dependent variable, is insignificant. A history of borrowing in the bond market, however, improves access to the bond market, with the 1st lag of the dependent variable positive and significant.

As shown in table 17, it is the QUALITY of the rating as opposed to the actual rating that determines access to bond debt. Contrary to expectation, the introduction of the RATING variable does not improve the model performance with the adjusted R-squared declining from 41.41% to 41.18%, In contrast, the introduction of the QUALITY

variable, while insignificant, improves the adjusted R-squared slightly to 41.42% in addition to being the expected positive sign.

The model remains significant at 1% when South Africa is excluded from the sample, with the 1st lag of rescheduled debt remaining highly significant and positive. In contrast to the full sample model however, the RATING variable is significant at 10%, suggesting as with the FITCH model, that for countries other than South Africa, in addition to the rating QUALITY, the rating level does have an effect on the PPGBOND net flows. In addition, the introduction of the RATING variable results in the gross domestic savings (GDS) variable becoming significant at 10% when South Africa is excluded from the sample, while the coefficients of the GROWTH and GDS variables also increase slightly, confirming the reinforcing role of the RATING variable.

Interestingly, the introduction of the RSA rating variable improves the model performance significantly with the R-squared and the adjusted R-squared increasing to 48.95% and 45.42% respectively. In addition, the RSA rating variable is positive and significant, reinforcing the role of the South African rating as a proxy for regional risk. The South African rating also seems to substitute for some of the local variables. In addition to the GDS variable becoming insignificant with the introduction of the RSA variable, the p-values of the RATING and QUALITY variables increase to 0.411 and 0.928 from 0.276 and 0.832 respectively. The substitution effect of the RSA variable is supported by the increasing p-value to 0.058 from 0.01 of the 1st lag of the dependent variable, when the RSA rating variable is introduced to the model.

Table 17: Panel regression estimations for the effect of S&P issued long-term foreign currency sovereign credit rating on portfolio bond with p-value in parenthesis

	Dependent Variable (Portfolio PPG Bond/GDP)							Dependent Variable (Portfolio PNG Bond/GDP)						
	Panel A			Panel B				Panel A			Panel B			
Constant	-0.674	-0.296	-0.303	-0.806	-0.348	-0.404	-5.663	0.022	0.024	0.019	0.029	0.035	0.027	-0.138
	(0.056)	(0.501)	(0.545)	(0.034)	(0.453)	(0.450)	(0.016)	(0.754)	(0.772)	(0.838)	(0.653)	(0.641)	(0.756)	(0.697)
Dependent Variable Lag														
1st Lag	0.197***	0.189***	0.189***	0.212***	0.199***	0.199***	0.149*							
	(0.007)	(0.010)	(0.010)	(0.006)	(0.010)	(0.010)	(0.058)							
Rating Variables														
RATING		-0.058	-0.057		-0.077	-0.068	-0.051		0.000	0.001		-0.001	0.001	0.001
		(0.157)	(0.317)		(0.096)	(0.276)	(0.411)		(0.967)	(0.940)		(0.876)	(0.952)	(0.922)
QUALITY			-0.013			-0.106	-0.044			-0.012			-0.019	-0.018
			(0.975)			(0.832)	(0.928)			(0.887)			(0.840)	(0.850)
RSA							0.410**							0.013
							(0.022)							(0.630)
Economic Variables														
Growth	0.003	0.000	0.000	0.020	0.021	0.020	0.011	0.003	0.003	0.003	0.004	0.004	0.003	0.004
	(0.956)	(0.993)	(0.994)	(0.712)	(0.696)	(0.707)	(0.831)	(0.703)	(0.705)	(0.708)	(0.664)	(0.668)	(0.679)	(0.675)
GDS	0.013	0.020	0.020	0.013	0.022*	0.022*	0.019							
	(0.274)	(0.117)	(0.118)	(0.295)	(0.097)	(0.096)	(0.155)							
BMG								-0.003	-0.003	-0.003	-0.004*	-0.004*	-0.004*	-0.004*
								(0.166)	(0.171)	(0.170)	(0.066)	(0.072)	(0.071)	(0.074)
BM								-0.001	-0.001	-0.001	0.001	0.001	0.001	0.001
								(0.515)	(0.539)	(0.534)	(0.449)	(0.443)	(0.609)	(0.660)
RSDLDBT	-0.788	-0.860	-0.860	-0.759	-0.828	-0.823	-0.728							
	(0.398)	(0.355)	(0.357)	(0.430)	(0.386)	(0.391)	(0.441)							

	Dependent Variable (Portfolio PPG Bond/GDP)							Dependent Variable (Portfolio PNG Bond/GDP)						
	Panel A				Panel B			Panel A				Panel B		
1st Lag RSDLDBT	7.92***	7.49***	7.50***	8.05***	7.51***	7.54***	7.3***	-0.90***	-0.91***	-0.90***	-0.99***	-1.00***	-0.99***	-0.98***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
2nd Lag RSDLDBT								-0.114*	-0.114*	-0.113*	-0.116**	-0.118**	-0.116**	-0.114**
								(0.055)	(0.059)	(0.063)	(0.027)	(0.028)	(0.032)	(0.038)
SHRTDBT								0.002	0.002	0.002	0.004	0.004	0.004	0.004
								(0.246)	(0.248)	(0.253)	(0.043)	(0.044)	(0.044)	(0.062)
DCR								0.001	0.001	0.001	-0.002	-0.002	-0.002	-0.001
								(0.184)	(0.195)	(0.200)	(0.300)	(0.329)	(0.449)	(0.540)
F Prob	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R-squared	0.4365	0.444	0.444	0.4569	0.4683	0.4685	0.4895	0.2280	0.2281	0.2284	0.2280	0.2281	0.2284	0.2296
Adj R-squared	0.4141	0.4181	0.4142	0.4324	0.4401	0.4360	0.4542	0.1902	0.1846	0.1791	0.1902	0.1846	0.1791	0.1746

Panel A full sample

Panel B excluding South Africa

PPG Public and publicly guaranteed

PNG – Non guaranteed

* Significance at 10%

** Significance at 5%

*** Significance 1%

While the R-squared and adjusted R-squared for the PNGBOND models are lower at between 22.8% and 22.96% and 17.46% and 19.02% respectively, the PNGBOND model performs well with the F-statistic significant at 1%.

The RATING and QUALITY variables however, remain insignificant for the non-guaranteed portfolio bond net flow rates model (PNGBOND). The introduction of the RATING and QUALITY variables also result in the decline of the adjusted R-squared to 18.46% and 17.91% from 19.02%. In addition, as opposed to the PPGBOND model, the introduction of the RSA rating variable does not improve non-guaranteed portfolio bond net flow rates, with the adjusted R-squared declining to 17.46%, while the RATING and QUALITY variable coefficients improve slightly to 0.0012 and -0.018 from 0.0007 and -0.192 respectively.

As shown in table 17, contrary to a positive relationship between the 1st lag of rescheduled debt and PPGBOND, the relationship between PNGBOND and the 1st lag of rescheduled debt is negative and significant. In addition, 2nd lags of rescheduled debt, is also highly significant and negative, suggesting that in the absence of public guarantees, debt rescheduling does not improve access to bond debt. This is the case for the full sample as well as the reduced sample that excludes South Africa.

d. *Estimation of the effect of S&P issued long-term foreign currency sovereign credit on commercial bank and other private institutions net flows*

As presented in table 18 below, in contrast to the FDI, portfolio equity and portfolio bond flows; the 1st lag of the dependent variable, while positive, is insignificant for public and publicly guaranteed net flows from commercial bank loans from private banks and other private financial institutions (PPGCOMM). Surprisingly, the 2nd lag of the dependent variable is highly significant at 1%, but has an unexpected negative relation to the dependent variable, suggesting that previous borrowing may reduce debt capacity to borrow from private banks and other private financial institutions over time. Economic growth (GROWTH) however, is positive and significant suggesting that good economic performance may offset the decline in credit capacity.

Contrary to expectations, the PPGCOMM has a positive and significant relationship with the interest burden on external debt (INTEXTDBT). This is unexpected as one would expect the increased burden of servicing debt to decrease the capacity to carry more debt over a period of time. This is in line with the findings by Reinhart, et al. (2003) that the debt capacity for developing economies such as those in Africa was low at 15% of GDP, as the burden of indebtedness increase. In line with Froot and Stein (1991)'s suggestion that reduction of domestic cost of capital results in the substitution of foreign debt, the RRI is negative and highly significant at 1% level. .

Interestingly, the sovereign credit rating (RATING) appears to be a proxy for good governance with the REG variable becoming insignificant with the introduction of the RATING variable. However, while improving the R-squared to 21.6% and 21.9% respectively, the introduction of the RATING and QUALITY variables result in the adjusted R-squared declining to 16.8% and 16.5% respectively. In addition, the RATING and QUALITY variables are negative and insignificant, suggesting that private bank and other private institutions may be employing alternative measures of risk rating to the bond market.

The RATING variable remains insignificant when South Africa is excluded from the sample, with the introduction of the RATING variable to the PPGCOMM net flow rate model resulting, in the decline of the adjusted R-squared declining from 16.5% to 16.1% The introduction of the RSA rating however, improves the model performance significantly with the adjusted R-squared increasing to 19.2% while the R-squared increase to 25.8%. As with the PPGBOND model, the RSA rating variable is also positive and significant, also improving the p-value for the RATING variable to 0.701 from 0.969.

Table 18: Panel regression estimations for the effect of S&P issued long-term foreign currency sovereign credit rating on the net flows from commercial bank loans from private banks and other private financial institutions with p-value in parenthesis

	Dependent Variable (Commercial PPG /GDP)							Dependent Variable (Commercial PNG/GDP)						
	Panel A			Panel B				Panel A			Panel B			
Constant	-0.139	-0.058	-0.142	-0.122	-0.043	-0.139	-2.305	0.021	-0.071	-0.035	-0.06	-0.071	-0.035	0.386
	(0.364)	(0.756)	(0.515)	(0.507)	(0.846)	(0.596)	(0.012)	(0.796)	(0.425)	(0.749)	(0.45)	(0.425)	(0.749)	(0.509)
Dependent Variable Lag														
1st Lag	0.089	0.083	0.081	0.085	0.081	0.079	0.051	0.32***	0.37***	0.36***	0.37***	0.36***	0.36***	0.353***
	(0.318)	(0.351)	(0.366)	(0.374)	(0.401)	(0.415)	(0.594)	(0.000)	(0.000)	(0.000)	(0.00)	(0.000)	(0.000)	(0.000)
2nd Lag	-0.26***	-0.27***	-0.26***	-0.26***	-0.27***	-0.25***	-0.26***	0.26**	0.179**	0.18**	0.18**	0.179**	0.180**	0.179**
	(0.003)	(0.002)	(0.004)	(0.005)	(0.004)	(0.008)	(0.006)	(0.001)	(0.028)	(0.027)	(0.026)	(0.028)	(0.027)	(0.028)
Rating Variables														
RATING		-0.012	-0.001		-0.011	0.001	0.009		0.002	-0.002		0.002	-0.002	-0.001
		(0.447)	(0.967)		(0.533)	(0.969)	(0.701)		(0.806)	(0.87)		(0.806)	(0.866)	(0.90)
QUALITY			-0.120			-0.134	-0.062			0.057			0.057	0.042
			(0.456)			(0.487)	(0.744)			(0.57)			(0.566)	(0.68)
RSA							0.174**							-0.032
							(0.014)							(0.46)
Economic Variables														
Growth	0.044	0.042	0.041	0.047	0.045	0.044	0.044							
	(0.018)	(0.028)	(0.030)	(0.026)	(0.037)	(0.039)	(0.036)							
INTEXTDBT	0.092*	0.092*	0.103**	0.089*	0.089*	0.100*	0.137**							
	(0.059)	(0.058)	(0.043)	(0.091)	(0.093)	(0.071)	(0.016)							
EXCHVOL	0.001	0.001	0.001	0.002	0.001	0.001	0.001							
	(0.484)	(0.688)	(0.665)	(0.548)	(0.756)	(0.717)	(0.675)							

	Dependent Variable (Commercial PPG /GDP)							Dependent Variable (Commercial PNG/GDP)						
	Panel A			Panel B				Panel A			Panel B			
RRI	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.02**							
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.010)							
DCR								0.000	0.002	0.002	0.002	0.002	0.002	0.002
								(0.88)	(0.19)	(0.19)	(0.13)	(0.189)	(0.194)	(0.24)
SWSRRI								-0.023	0.003	0.002	0.004	0.003	0.002	-0.012
								(0.35)	(0.90)	(0.941)	(0.88)	(0.90)	(0.94)	(0.70)
World Bank Governance Index														
REG	-0.008*	-0.008	-0.007	-0.010*	-0.010	-0.008	-0.013**							
	(0.082)	(0.108)	(0.190)	(0.096)	(0.111)	(0.173)	(0.047)							
RULE	0.009*	0.009*	0.008*	0.009*	0.010*	0.00*9	0.010*							
	(0.060)	(0.054)	(0.085)	(0.065)	(0.059)	(0.083)	(0.053)							
GOV								0.001	0.000	0.000	0.000	0.000	0.000	0.000
								(0.387)	(0.799)	(0.932)	(0.73)	(0.799)	(0.932)	(0.79)
F Prob	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.213	0.216	0.219	0.215	0.217	0.220	0.258	0.272	0.312	0.314	0.312	0.312	0.314	0.317
Adj R-squared	0.170	0.168	0.165	0.165	0.161	0.158	0.192	0.250	0.284	0.280	0.288	0.284	0.280	0.278

Panel A full sample

Panel B excluding South Africa

PPG Public and publicly guaranteed

PNG – Non guaranteed

* Significance at 10%

** Significance at 5%

*** Significance 1%

In contrast to the public and publicly guaranteed borrowing from private banks and other private financial institutions (PPGCOMM), a history of non-guaranteed borrowing (PMGCOMM), seems to improve future net flow rates. The 1st and 2nd lags of the dependent variable have a positive and significant relationship to PNGCOMM for the full sample, with a higher long-term foreign currency sovereign credit rating, improving access.

The introduction of the RATING variable to the model however, while of the expected positive sign, is insignificant. The introduction of the RATING also improves the model performance, with the adjusted R-squared increasing to 28.4% from 25%, while the R-squared increases to 31.2% from 27.2%. The introduction of the rating QUALITY variable on the other hand, results in the slight increase of the R-squared to 31.4%, but does not improve the model performance with the adjusted R-squared declining to 28%. The RATING variable also becomes negative when the rating QUALITY variable is introduced to the full sample PNGCOMM net flow rate model, with the p-value increasing slightly to 0.866 from 0.806.

As shown in table 18, in contrast to the full sample PNGCOMM model, sovereign credit rating does not improve access to non-guaranteed borrowing from private banks and other private institutions when South Africa is excluded from the sample. While the R-squared remains at 31.2%, with the introduction of the RATING variable, the adjusted R-squared declines to 28.4% from 28.8%. In addition, the rating QUALITY variable results in a further decline in the adjusted R-squared to 28%, while the introduction of the RSA rating results in a further decline in the model performance, with the adjusted R-squared declining to 27.8% , while the R-squared increases to 31.7%.

4.2 Estimation of the short-term announcement impact on financial markets

The following sections present the announcement impact of the long-term foreign currency sovereign credit ratings on the aggregate equity stock and exchange rate returns. Previous studies have shown financial markets in below investment rated economies react differently to long-term sovereign credit rating adjustments to those in investment rated economies markets with the reaction more pronounced in below investment grade economies (Brooks et al., 2004; Hand et al., 1992; Reisen & von Maltzan, 1998). Cantor and Packer (1996a), for example, show that the sovereign credit rating adjustments have a highly significant impact on below investment rated sovereign bonds yields, while the impact is insignificant on investment rated sovereigns. Kaminsky and Schmukler (2002), on the other hand, show that sovereign credit rating announcements' impact on emerging market sovereign bonds yield is significant when put on a negative outlook review, in line with the findings by Brooks, et al. (2004) that the impact on equity stock returns was only significant for downgrade announcements.

To this effect, separate tests are conducted for investment rated and below investment rated sovereigns in the current study. In addition, the different types of rating announcements (downgrade, upgrades, positive outlooks and watchlistings and negative outlooks and watchlistings and rating confirmations) are tested separately for investment rated and below investment rated sovereigns. .

4.2.1 *Estimation of the announcement impact of the long-term foreign currency sovereign credit on the aggregate national equity stock markets*

Contrary to the findings by Kaminsky and Schmukler (2002), however, the average excess aggregate stock returns are not statistically different from the normal returns for both the full sample as well as when South Africa is excluded from the sample, during the negative outlook or watchlisting announcement window period. As presented in table 19 below, there is a significantly negative average excess aggregate equity stock

return 15 days (day -15) prior to below investment rated sovereign downgrade announcements for a full sample. The negative composite stock return downgrade impact however is weak at 10% significant level. While the significantly negative average excess aggregate equity stock return downgrade announcement impact is also computed when South Africa is excluded from the sample, this is slightly delayed to 10 days prior to a downgrade announcement (day -10). The negative downgrade announcement impact however is not persistent and is only computed for a single day, suggesting that the negative average excess aggregate equity stock returns may be due to a reaction to an event other than the negative rating adjustment.

In contrast, there is a persistent and statistically significant positive reaction to a positive rating outlook or watchlisting announcement on below investment rated sovereigns in Africa. While the reaction to the positive rating outlook or watchlisting announcement is delayed, with the statistically significant positive aggregate equity stock returns computed only from the day of the announcement (day 0), the positive impact is statistically significant into the fourth day (day +4) following the announcement. This is followed by three more days on days +10, +11, and +12 following the positive rating outlook or watchlisting. The positive aggregate equity stock returns are however only statistically significant when South Africa is excluded from the sample.

Delayed positive average excess aggregate stock returns are also computed 10 days (+10) following the below investment grade rating affirmation announcement. The positive aggregate equity stock rating affirmation announcement impact persists up to the 15th day following the rating affirmation announcement (day +15).

Table 19: Estimation of below investment long-term foreign currency sovereign credit ratings announcement impact on the aggregate national equity stock markets

Day	Downgrade		Negative		Positive		Confirmed	
	CAAR		CAAR		CAAR		CAAR	
	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA
-15	-0.011*	-0.002	0.000	-0.002	0.000	0.003	0.001	-0.001
-14	-0.018	-0.001	0.001	-0.004	0.001	0.007	-0.002	-0.004
-13	-0.015	-0.004	0.002	-0.003	0.007	0.015	-0.002	-0.002
-12	-0.009	-0.005	0.000	0.003	0.017	0.021	-0.002	0.001
-11	-0.002	-0.013	-0.008	0.000	0.013	0.016	-0.003	0.003
-10	-0.005	-0.010*	-0.003	0.005	0.013	0.021	-0.003	0.005
-9	-0.010	-0.009	-0.006	0.011	0.015	0.023	-0.003	0.003
-8	-0.008	-0.011	-0.008	0.014	0.015	0.020	-0.003	0.001
-7	-0.010	-0.006	-0.013	0.008	0.012	0.018	-0.002	0.000
-6	-0.004	-0.005	-0.010	0.012	0.011	0.020	0.003	0.001
-5	-0.006	-0.006	-0.016	0.011	0.010	0.020	0.002	0.003
-4	-0.020	-0.007	-0.017	0.009	0.008	0.017	0.005	0.003
-3	-0.018	-0.012	-0.009	0.013	0.006	0.015	0.005	0.006
-2	-0.017	-0.016	-0.026	0.011	0.004	0.017	0.011	0.011
-1	-0.018	-0.016	-0.047	0.012	0.005	0.020	0.011	0.016
0	-0.019	-0.010	-0.048	0.010	0.010	0.026*	0.011	0.016
+1	-0.017	-0.009	-0.056	0.001	0.007	0.024*	0.011	0.017
+2	-0.017	-0.012	-0.051	0.004	0.010	0.029*	0.009	0.013
+3	-0.022	-0.017	-0.047	0.005	0.008	0.029*	0.009	0.010
+4	-0.026	-0.016	-0.037	0.011	0.004	0.025*	0.012	0.013
+5	-0.028	-0.017	-0.046	0.008	0.003	0.023	0.013	0.015
+6	-0.020	-0.026	-0.048	0.009	0.003	0.024*	0.011	0.019
+7	-0.018	-0.025	-0.050	0.007	-0.002	0.018	0.012	0.021
+8	-0.014	-0.031	-0.044	0.014	0.003	0.023	0.014	0.021

Day	Downgrade		Negative		Positive		Confirmed	
	CAAR		CAAR		CAAR		CAAR	
	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA
+9	-0.004	-0.035	-0.047	0.011	0.006	0.025	0.011	0.022
+10	-0.007	-0.030	-0.042	0.008	0.008	0.026*	0.014	0.024*
+11	-0.010	-0.035	-0.042	0.009	0.011	0.027*	0.011	0.024*
+12	-0.015	-0.033	0.045	0.015	0.005	0.024*	0.011	0.024*
+13	-0.013	-0.026	-0.048	0.013	0.004	0.023	0.015	0.030*
+14	-0.008	-0.027	-0.050	0.015	0.006	0.026	0.016	0.032**
+15	-0.007	-0.026	-0.059	0.009	0.008	0.030	0.012	0.034**

NB: There were no tests carried out for the rating upgrade on the below investment grade sovereign ratings with only one upgrade event during the sample period.

* Significance at 10%

** Significance at 5%

*** Significance 1%

For investment rated sovereigns, there is a persistent and statistically significant positive announcement impact, two days prior (day -2) to an upgrade announcement, that continues to the 6th day (day +6) following the upgrade announcement. The positive announcement reaction to the rating upgrade however, is insignificant when South Africa is excluded from the sample, suggesting that the significant rating upgrade may be transmitted from South Africa.

As shown in table 20 below, the positive average excess aggregate stock returns are also significant for positive outlook or watchlisting. In contrast to the upgrade however, the positive average excess aggregate stock returns to a positive outlook or watchlisting are significant only when South Africa is excluded from the sample. In addition, the positive outlook or watchlisting impact on investment grade rated sovereigns is not persistent and only significant on the 8th day prior to the positive outlook or watchlisting announcement.

In contrast to the positive outlook or watchlisting, the negative outlook or watchlisting announcement impact on an investment grade rating is significant for a number of days

when South Africa is excluded from the sample. The statistically significant negative outlook or watchlisting announcement impact is first computed on 9 days (day -9) prior to a negative outlook or watchlisting announcement, persisting up to the 15th day following the announcement. While the negative outlook or watchlisting is weakly significant at 10% 9 days (day -9) prior to the negative outlook or watchlisting announcement, the significant level increases to 5%, on the day of the negative outlook or watchlisting announcement (day 0) and 2 days following the announcement (day +1 and +2). While the significant level drops to 10% from the 3rd day (day +3) following the negative outlook or watchlisting announcement, negative average excess aggregate equity stock returns significance level increase to 5%, 14 days following the announcement that persists on the 15th day following the announcement. Surprisingly the aggregate equity stock reaction to a downgrade is insignificant for the investment rated sovereigns, while there is a statistically negative reaction to a rating affirmation. As with the rating upgrade however, the reaction to a rating affirmation is only significant when South Africa is included in the sample and insignificant when South Africa is excluded from the sample. The investment rated sovereign rating affirmation seems to be anticipated by the market with the statistically significant negative aggregate equity stock returns computed only on days -14, -13 and -12.

Table 20: Estimation of investment grade long-term foreign currency sovereign credit ratings announcement impact on the aggregate national equity stock markets

Day	Upgrade		Downgrade		Negative		Positive		Confirmed	
	CAAR		CAAR		CAAR		CAAR		CAAR	
	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA
-15	0.001	-0.001	0.002	0.000	-0.006*	-0.004	0.001	0.001	-0.002	-0.001
-14	0.002	0.001	0.001	0.000	-0.001	0.000	0.008	0.014	-0.009*	-0.007
-13	0.004	0.003	-0.002	0.000	-0.002	-0.004	0.003	0.007	-0.010*	-0.007
-12	0.004	0.001	-0.001	0.000	-0.003	-0.008	0.002	0.007	-0.014*	-0.013
-11	0.004	0.003	0.003	0.000	-0.006	-0.012	0.006	0.012	-0.008	-0.009
-10	0.000	0.006	-0.007	0.000	-0.008	-0.013	0.005	0.015	-0.006	-0.004

Day	Upgrade		Downgrade		Negative		Positive		Confirmed	
	CAAR		CAAR		CAAR		CAAR		CAAR	
	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA
-9	0.000	0.008	-0.010	0.000	-0.014	-0.020*	0.002	0.014	-0.007	-0.007
-8	0.000	0.008	-0.010	0.000	-0.002	-0.009	0.004	0.016**	0.003	0.001
-7	0.003	0.011	-0.005	0.000	-0.005	-0.012	0.011	0.029	0.007	0.009
-6	0.007	0.014	-0.006	0.000	-0.004	-0.013	0.007	0.021	0.004	0.006
-5	0.006	0.009	-0.008	0.000	-0.005	-0.017	0.006	0.018	0.000	0.004
-4	0.006	0.009	-0.006	0.000	-0.009	-0.021	0.007	0.022	0.002	0.002
-3	0.010	0.009	-0.018	0.000	-0.011	-0.022	0.008	0.030	-0.002	-0.004
-2	0.018*	0.019	-0.043	0.000	-0.014	-0.026	0.004	0.035	-0.002	-0.003
-1	0.026*	0.027	-0.039	0.000	-0.020	-0.032*	0.001	0.029	-0.002	-0.004
0	0.021*	0.020	-0.040	0.000	-0.018	-0.029**	0.006	0.035	-0.007	-0.007
+1	0.022	0.021	-0.040	0.000	-0.023	-0.037**	0.006	0.035	-0.008	-0.010
+2	0.025*	0.023	-0.037	0.000	-0.026	-0.042**	0.006	0.031	-0.005	-0.006
+3	0.023	0.020	-0.031	0.000	-0.019	-0.034*	0.013	0.041	-0.007	-0.010
+4	0.026*	0.018	-0.029	0.000	-0.021	-0.035	0.014	0.049	-0.007	-0.012
+5	0.025*	0.019	-0.037	0.000	-0.029	-0.044*	0.015	0.042	-0.007	-0.011
+6	0.024*	0.019	-0.036	0.000	-0.027	-0.041*	0.015	0.036	-0.008	-0.010
+7	0.020	0.015	-0.035	0.000	-0.027	-0.042*	0.013	0.033	-0.009	-0.009
+8	0.019	0.016	-0.033	0.000	-0.023	-0.041*	0.021	0.038	-0.007	-0.009
+9	0.013	0.005	-0.031	0.000	-0.021	-0.040*	0.020	0.040	-0.021	-0.029
+10	0.016	0.006	-0.031	0.000	-0.020	-0.038	0.025	0.051	0.004	0.006
+11	0.018	0.007	-0.032	0.000	-0.017	-0.036	0.018	0.037	0.003	0.006
+12	0.018	0.006	-0.034	0.000	-0.018	-0.038	0.016	0.035	0.000	0.001
+13	0.025	0.014	-0.037	0.000	-0.019	-0.039	0.017	0.039	0.000	0.000
+14	0.030	0.019	-0.037	0.000	-0.026	-0.046**	0.017	0.036	-0.001	0.000
+15	0.030	0.020	-0.037	0.000	-0.029	-0.050**	0.018	0.029	-0.004	-0.002

* Significance at 10%

** Significance at 5%

*** Significance 1%

a. ***Estimation of the announcement impact of the long-term foreign currency sovereign credit announcement on the nominal foreign exchange rate***

Contrary to the statistically significant positive reaction to the positive outlook or watchlisting announcement by the aggregate equity stocks, the reaction from the nominal foreign exchange rate is insignificant for below investment rated sovereigns. As shown in table 21, however the positive reaction to the upgrade announcement on below investment rated sovereigns, is significant and persists throughout the entire window period (from day -15 to day +15), with the significance level increasing to 5% closer to the rating announcement. While the positive average excess nominal foreign exchange returns are not significant on days 14 to 10 and between days 8 and 7, the positive average excess aggregate foreign exchange returns are significant at 10% level on days -9 and -6 and increasing to 5% on day -3 and persists until the 15th day following the upgrade announcement. Contrary to the aggregate equity stock return reaction to an upgrade, that is only significant when South Africa is included in the sample, the nominal foreign exchange rate reaction is only significant when South Africa is excluded from the sample. Similarly there is no negative announcement (downgrade or negative outlook or watchlisting) on the nominal exchange rated returns for below investment rated sovereigns, suggesting, as with the aggregate stock returns, that the market rewards positive rating news but does not punish the negative rating announcements for below investment grade ratings. This is contrary to the previous studies such as that of Hand, et al. (1992) and Kaminsky and Schmukler (2002) who found that negative rating announcements were more pronounced for below investment grade ratings.

Table 21: Estimation of below investment long-term foreign currency sovereign credit ratings announcement impact on nominal foreign exchange rate

Day	Upgrade		Downgrade		Negative		Positive		Confirmed	
	CAAR		CAAR		CAAR		CAAR		CAAR	
	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA
-15	0.002	0.001*	-0.003	0.000	-0.001	-0.001	0.000	0.000	0.000	0.001
-14	0.002	0.001	-0.004	-0.001	-0.001	-0.001	0.001	0.001	0.001	0.001
-13	0.003	0.000	-0.004	0.000	-0.002	-0.002	0.000	-0.001	0.000	0.001
-12	0.001	0.000	-0.004	0.000	-0.002	-0.004	0.000	0.001	0.000	0.001
-11	0.001	0.002	-0.006	-0.002	-0.003	-0.005	0.000	0.002	0.001	0.002
-10	0.002	0.004*	-0.005	0.000	-0.003	-0.006	-0.001	0.000	0.001	0.002
-9	0.001	0.002	-0.006	0.000	-0.003	-0.006	-0.001	-0.001	0.002	0.003*
-8	0.002	0.001	-0.009	0.001	-0.002	-0.006	0.003	0.003	0.002	0.003*
-7	0.001	0.002	-0.006	0.000	-0.001	-0.006	0.004	0.004	0.000	0.000
-6	0.003	0.005*	-0.005	0.000	0.000	-0.007	0.005	0.002	0.001	0.001
-5	0.000	0.002	-0.009	-0.001	0.003	-0.006	0.005	0.004	0.001	0.001
-4	0.001	0.004	-0.008	0.000	-0.001	-0.008	0.004	0.003	0.000	0.001
-3	0.005	0.012**	-0.006	0.000	-0.003	-0.009	0.005	0.004	0.000	0.001
-2	0.004	0.011*	-0.009	-0.002	-0.001	-0.010	0.005	0.004	-0.001	0.000
-1	0.004	0.012*	-0.007	0.001	0.000	-0.011	0.002	0.001	-0.002	0.000
0	0.004	0.013*	-0.007	0.001	0.000	-0.012	0.000	-0.001	-0.001	-0.001
+1	0.005	0.013**	-0.009	-0.004	0.002	-0.012	0.001	0.001	-0.002	-0.001
+2	0.005	0.012*	-0.010	-0.003	-0.002	-0.013	0.001	0.001	-0.001	0.000
+3	0.005	0.014*	-0.008	-0.001	-0.003	-0.014	0.003	0.003	-0.001	0.000
+4	0.005	0.014*	-0.010	-0.002	-0.004	-0.015	0.002	0.001	-0.001	0.000
+5	0.005	0.014	-0.008	-0.001	-0.003	-0.016	0.001	-0.001	-0.003	-0.001
+6	0.006	0.013*	-0.008	-0.002	-0.003	-0.017	0.000	-0.002	-0.002	-0.001
+7	0.007	0.014*	-0.008	-0.002	-0.003	-0.017	0.003	0.002	-0.002	0.001
+8	0.006	0.013	-0.008	-0.002	-0.004	-0.018	0.005	0.003	-0.003	-0.002
+9	0.009*	0.014**	-0.008	-0.002	-0.005	-0.019	0.006	0.002	-0.003	-0.002

Day	Upgrade		Downgrade		Negative		Positive		Confirmed	
	CAAR		CAAR		CAAR		CAAR		CAAR	
	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA
+10	0.010	0.017*	-0.008	-0.002	-0.006	-0.019	0.006	0.005	-0.003	-0.005
+11	0.009	0.015*	-0.006	0.000	-0.005	-0.019	0.005	0.002	-0.004	0.005
+12	0.009	0.016*	-0.007	0.001	-0.006	-0.021	0.005	0.001	-0.005	0.006
+13	0.006	0.016*	-0.006	-0.001	-0.005	-0.021	0.003	-0.001	-0.006	-0.007
+14	0.007	0.015*	-0.007	-0.001	-0.005	-0.022	0.003	-0.001	-0.006	-0.006
+15	0.006	0.014*	-0.006	-0.001	-0.002	-0.022	0.002	-0.002	-0.007	-0.008

* Significance at 10%

** Significance at 5%

*** Significance 1%

As shown in table 22 below, there is a significant nominal foreign exchange rate reaction to an investment rated sovereign downgrade announcement. The negative downgrade announcement impact was computed for both the sample including and excluding South Africa, with the negative average excess nominal foreign exchange returns computed from the 3rd day prior to a downgrade announcement and continuing until the 11th day following the downgrade announcement.

As shown in table 22, there is also an anticipated negative reaction to the negative outlook or watchlisting announcement on an investment grade rating that is highly significant at 5% level, when South Africa is excluded from the sample. The average excess nominal foreign exchange rate returns are however, an unexpected positive and not persistent, observed for a single day on 7 days (day -7) prior to the negative outlook or watchlisting, suggesting a reaction to an event other than the rating negative outlook or watchlisting announcement.

Table 22: Estimation of investment grade long-term foreign currency sovereign credit ratings announcement impact on nominal foreign exchange rate

Day	Upgrade		Downgrade		Negative		Positive		Confirmed	
	CAAR		CAAR		CAAR		CAAR		CAAR	
	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA	All	Excl RSA
-15	0.001	0.001	-0.003*	-0.002	-0.001	-0.001	0.000	0.002	0.001	-0.001
-14	0.005	0.004	-0.004	-0.003	-0.001	0.001	0.001	0.001	0.002	0.001
-13	0.004	0.004	-0.004	-0.002	0.004	0.006	0.001	0.002	0.003	0.001
-12	0.005	0.004	-0.002	0.000	0.004	0.006	0.002	0.003	0.005	-0.001
-11	0.006	0.003	-0.002	-0.001	0.005	0.007	0.007	0.009	0.007	-0.001
-10	0.006	0.001	-0.002	-0.002	0.006	0.007	0.005	0.012	0.008	0.000
-9	0.006	0.002	-0.001	-0.002	0.002	0.006	0.003	0.009	0.006	-0.004
-8	0.007	0.001	0.000	-0.002	0.000	0.003	0.003	0.015	0.008	0.003
-7	0.009	0.004	-0.002	-0.004	0.002	0.005**	0.006	0.019	0.006	0.001
-6	0.009	0.004	-0.003	-0.006	0.002	0.003	0.000	0.018	0.007	0.002
-5	0.006	0.006	-0.006	-0.010	0.001	0.002	0.004	0.021	0.009	0.003
-4	0.006	0.006	-0.005	-0.008	0.000	0.001	0.000	0.018	0.008	0.004
-3	0.002	0.007	-0.005*	-0.008*	-0.001	0.001	0.002	0.025	0.009	0.006
-2	0.004	0.006	-0.005	-0.008*	-0.001	0.002	-0.001	0.026	0.009	0.005
-1	0.006	0.006	-0.007*	-0.010**	-0.001	0.002	0.000	0.023	0.009	0.004
0	0.005	0.006	-0.009*	-0.013**	-0.001	0.001	0.006	0.027	0.008	0.002
+1	0.008	0.009	-0.010*	-0.013*	0.001	0.003	0.006	0.023	0.007	0.002
+2	0.008	0.011	-0.011*	-0.015*	0.001	0.005	0.009	0.026	0.007	0.000
+3	0.007	0.011	-0.011*	-0.014*	-0.005	-0.001	0.005	0.023	0.008	0.001
+4	0.011	0.016	-0.012**	-0.014**	-0.004	-0.001	0.005	0.025	0.009	0.002
+5	0.009	0.015	-0.012	-0.017**	-0.003	-0.001	0.002	0.020	0.008	-0.001
+6	0.003	0.011	-0.014**	-0.017**	-0.002	0.000	0.004	0.017	0.009	0.000
+7	0.006	0.012	-0.015**	-0.019**	0.000	0.001	0.000	0.016	0.009	-0.001
+8	0.004	0.011	-0.019**	-0.024**	-0.002	0.001	0.001	0.020	0.009	-0.001
+9	0.004	0.008	-0.019**	-0.022**	-0.003	-0.002	-0.002	0.025	0.006	-0.003
+10	0.006	0.012	-0.017**	-0.019**	-0.004	-0.004	0.000	0.024	0.008	0.000
+11	0.002	0.010	-0.017**	-0.018*	-0.004	-0.003	0.008	0.021	0.008	0.002
+12	0.001	0.010	-0.017	-0.017	-0.006	-0.005	0.007	0.021	0.007	0.000
+13	0.001	0.011	-0.015	-0.015	-0.005	-0.004	0.008	0.023	0.007	0.001
+14	0.002	0.012	-0.017	-0.016	-0.004	0.000	0.014	0.027	0.005	0.000
+15	0.000	0.013	-0.015	-0.014	-0.002	0.001	0.021	0.027	0.004	-0.004

* Significance at 10%

** Significance at 5%

*** Significance 1%

4.2.2 *Conclusions*

The first part of this section reveals that the effect of the long-term foreign currency sovereign credit ratings issued by Fitch, Moody's and S&P (RATINGS) on the different types of capital flows is marginal. The empirical estimation of the different types of capital flows show that the long-term foreign currency sovereign credit ratings are not a substitute for the economic factors that they do not encapsulate, nor do they promote new capital flows. In particular, the empirical models reveal that the RATINGS reinforce the primary determinants of capital flows, with the introduction of the RATING variable accentuating the model of economic control variables, through improved p-values and/or increased coefficients. In addition, the empirical estimation shows that a RATING becomes important for explaining the differences in capital flows, where there is already a history of the particular type of capital inflow. This is contrary to the findings by Kim and Wu (2008) that the RATINGS promote capital flow through their development of financial markets. In contrast, the current study shows that the relationship between the RATING and capital flows is only positive where the financial markets are already in place. For example, with the exclusion of South Africa (with the highly developed equity market and accounting for almost two thirds of portfolio equity flows to Africa) from the portfolio equity net flow rate model, the models become insignificant even where the RATING variable is included in the model.

On the other hand, the long-term foreign currency sovereign credit ratings have a significant relationship with each of the other types of capital flows namely, foreign direct investment (FDI), portfolio bond (Bond) and borrowing from commercial banks and other private institutions. Interestingly, while FDI and borrowing from commercial banks and other private institutions is widely distributed across the number of countries in Africa as shown in Appendix A, South Africa is the regular issuer of bond debt in the global markets, and, as observed with the portfolio equity flows, one would have expected the portfolio bond models to perform poorly when South Africa is excluded from the sample. This was found not to be the case, with the portfolio bond flow models performing well, even when South Africa is excluded from the sample.

In particular, the empirical analysis reveals significant relationships between the long-term foreign currency sovereign credit ratings and the following types of capital flows:

- Moody's issued long-term foreign currency sovereign credit ratings and FDI inflow rates. This is interesting, particularly considering that only Moody's issued ratings have a positive and significant effect on FDI. While the coefficient for the S&P and Fitch rating variables are of the expected positive sign, they were insignificant. Looking at the capital flow data in Appendix A though, it is evident that, of the 8 countries rated by Moody's in Africa, 5 countries, namely, Angola, Egypt, Morocco, South Africa and Tunisia, are major recipients of FDI in Africa, accounting for approximately 41% of FDI flows during the observation period (1994 to 2011). This supports the finding that the RATING becomes important for explaining the differences in capital flows, where there is already a history of the particular type of capital inflow as opposed to promoting new capital flows;
- S&P issued long-term foreign currency sovereign credit ratings and public and publicly guaranteed portfolio bond borrowing rates (PPGBOND), only when South Africa is excluded from the sample; and
- Fitch issued long-term foreign currency sovereign credit ratings and non-guaranteed portfolio bond flows (PNGBOND).

In some instances however, while the relationships between the long-term foreign currency sovereign credit ratings and the capital flows are statistically insignificant, the empirical analysis revealed a marginal contribution of the RATINGS in the explanation of the differences in capital flows to the different countries. In these instances, the introduction of the long term foreign currency sovereign credit ratings to the capital flow rate models improves the models' fit, supportive of the finding that the RATINGS reinforce, as opposed to substituting, the primary determinants of capital flows:

- The introduction of Fitch issued long-term foreign currency sovereign credit ratings improve the public and publicly guaranteed commercial banks and other private borrowing rate model fit with the adjusted R-squared increasing slightly from 9.1% to 9.5%, when South Africa is excluded from the sample. In contrast,

the Fitch RATING improves the non-guaranteed commercial banks and other private borrowing rate model fit for all the samples, with the adjusted R-squared increasing from 38.3% to 38.8% when South Africa is included in the sample and from 63.6% to 63.6% when South Africa is excluded from the sample;

- The introduction of Moody issued long-term foreign currency sovereign credit rating on the other hand, improves the public and publicly guaranteed borrowing rate from commercial banks and other private institutions model, when South Africa is excluded from the sample, with the adjusted R-squared improving slightly from 21.53 to 21.98%; and
- S&P issued long-term foreign currency sovereign credit rating improves the borrowing rate from non-guaranteed commercial banks and other private institutions and the public and publicly guaranteed portfolio bond models, with the adjusted R-squared increasing from 25% to 28.4% and from 43.24 to 44.01% respectively.

In line with expectations and in support of the argument by Arora and Vamvakidis (2005), the empirical analysis further reveals evidence of South Africa's effect on capital flows to other African countries. In particular, the panel regression models demonstrate that South Africa's Fitch, Moody's and S&P RATINGS operate as a proxy for the regional rating, with a significant effect on the debt capital flows namely, the portfolio bond and the commercial bank and other private institutions net flow (public and publicly guaranteed and non-guaranteed). In some instances, as is the case with the PPGBOND, own country S&P sovereign credit rating becomes insignificant with the introduction of South Africa's S&P issued RATING variable to the model, suggesting a substitution of own country RATING by the South African RATING.

On the other hand, while not statistically significant, South Africa's FITCH issued sovereign credit rating has a positive relationship with PPGBOND net flow rates for countries other than South Africa, with the introduction of the South African RATING variable, improving both the model R-squared and adjusted R-squared. Similarly, the introduction of South Africa's Moody's RATING variable improves both the PPGCOMM

and PNGBOND flow rates panel regression models R-squared and adjusted R-squared, when South Africa is excluded from the sample.

The second part of the section analyses the short-term, transitory long-term foreign currency sovereign credit rating event announcement impact on the aggregate national equity stock and nominal foreign exchange rate returns. The event study analysis reveals that the long-term foreign currency sovereign credit ratings events have an announcement impact on the aggregate national equity stock and nominal foreign exchange rate returns. In particular, the event study analyses reveal that, contrary to the findings of studies such those by Hand, et al. (1992) and Kaminsky and Schmukler (2002), both the rating upgrades and downgrades as well as the imminent rating changes events have an announcement impact on the aggregate national equity stock and nominal foreign exchange rate returns for Africa.

The long-term foreign currency sovereign credit ratings announcement impact is however asymmetric for below investment and investment grade ratings, with the downgrade and negative outlook announcement insignificant for below investment grade ratings, while the opposite is true for positive rating announcements. The analyses reveal that any improvement in below investment grade rating, either through a positive outlook or watchlisting, yields significant positive equity stock and foreign exchange returns. In addition, there is a positive below investment grade rating upgrade impact on the foreign exchange returns when South Africa is excluded from the sample, suggesting improved market focus with the expected progression towards investment grading. This is supported by the positive and significant outlook and watchlisting impact on below investment rated equity stock returns, only when South Africa is excluded from the sample.

In contrast, both positive and negative rating announcements have a significant transitory impact on the investment grade rating aggregate national equity stock and nominal foreign exchange rate returns. Consistent with the findings, where the panel regression model performed poorly when South Africa was excluded from the sample, the event study analyses reveal that a positive upgrade announcement impact on the

aggregate equity stock returns for investment grade ratings is significant only when South Africa is included in the sample. In contrast, the negative outlook or outlook announcement impact is highly significant on the aggregate equity stock returns only when South Africa is excluded from the sample, while the downgrade impact is significant on the nominal foreign exchange rate for both samples.

5 CONCLUSIONS

5.1 Overview of the study and research findings

With designations such as the Nationally Recognised Statistical Rating Organisations, (a designation afforded to agencies whose ratings are used as a benchmark by the U.S. government in financial regulations), the regulatory endorsements afforded to the rating agencies, make them a *de facto* requirement to access international debt markets (Cantor, 2004). Three international rating agencies namely Fitch, Moody's and S&P in particular, dominate the sovereign credit rating market (SEC 2003, 2011).

A number of studies have shown that sovereign credit ratings issued by Fitch, Moody's and S&P have a short-term announcement impact on the cost of borrowing as well as return on equity stock returns (Hooper et al., 2008; Li et al., 2008; Reisen & von Maltzan, 1998). Studies such as Reinhart and Rogoff (2004) argue that the lack of capital flows from developed to poor countries is related to, among other factors, their sovereign default risk as reflected in their sovereign credit ratings. Ratha, et al. (2007), for example, show that access and cost of foreign capital can be improved through the acquisition and improvement of sovereign ratings, with an estimated savings in bond yield spreads of between 320 and 450 basis points on improvement of a rating from B to BBB. Taylor and Sarno (1997), on the other hand, show through unit root tests that there was a permanent component of statistical significance of credit ratings affecting portfolio flows to developing countries. Bevan and Estrin (2000) also show that, for 11 Central and Eastern Europe transition economies, in addition to the market size, the main factor influencing FDI inflows was the country risk as represented by the Institutional Investor's Country credit rating.

It is within this context that, in an effort to facilitate access to foreign private capital, the United States (US) Department of State, Bureau of African Affairs and the United Nations Development Program (UNDP) launched separate programs to assist developing economies, including those of Africa, to acquire sovereign credit ratings (S&P, 2003; USDepartmentState, 2002). Indeed it is suggested that sovereign credit

ratings improve both the access and cost of capital for both the sovereign government as well as the sub-sovereigns and corporates domiciled in the sovereign (S&P, 2003). Peter and Grandes (2005), for example, show that in the case of South Africa, the sovereign credit rating was the most significant variable in explaining the cost of capital for resident corporations, suggesting that corporates can piggyback on the sovereign credit rating to access foreign debt at favourable rates. Siddiqi (2007) further suggests that the process of acquiring the sovereign credit rating, not only improves transparency but may also promote policy discipline in order to maintain a favourable rating, while also providing regional differentiation where there is information asymmetry.

Despite their implied importance in assisting especially developing countries to access foreign capital, it is surprising that many of the empirical studies on sovereign credit ratings have focused on their short-term announcement impact and not on their long-term structural influence on capital flows, leaving a critical knowledge gap (Cantor & Packer, 1996b; Hooper et al., 2008). Kim and Wu (2008), partly address this knowledge gap, by studying the impact of S&P issued sovereign credit ratings on financial developments and capital flows in emerging economies. While studies such as those by Bevan and Estrin (2004) and Janicki and Wunnava (2004), also attempt to address this knowledge gap, these studies were focused on the periodically issued, industry survey based International Investor country risk rating, as opposed to the independent ratings issued by Fitch, Moody's and S&P. In addition to that, these studies are focused on emerging markets and exclude the developing African economies, whose financial markets are largely still in their infancy.

With this background evidence in mind, the current study investigates the long-term structural impact of long-term foreign currency sovereign credit ratings (RATING) issued by Fitch, Moody's and Standard and Poor's (S&P) on capital inflows to Africa for the period between 1994 and 2011. Through regression analysis, the long-term effect of long-term foreign currency sovereign credit ratings on the different types of capital flows namely, foreign direct investment (FDI), portfolio equity (EQUITY), portfolio bond (BOND) as well as commercial private banks and other private institutions (COMMERCIAL) is investigated. In so doing, the conjecture that the RATING is a *de*

facto requirement to access capital is explored empirically, while controlling for the macroeconomic factors, which have been proved to influence both the capital flows and the long-term foreign currency sovereign credit ratings. Secondly, the study investigates the short-term transitory impact of the long-term foreign currency sovereign credit ratings on the aggregate national equity stock and nominal foreign exchange rates in Africa. Specifically, the study tests the hypotheses that:

1. Sovereign credit ratings do not have a long-term marginal effect on the foreign private capital flows to African economies;
2. Sovereign credit ratings do not have a statistically significant announcement impact on the aggregate equity stock returns in Africa; and
3. Sovereign credit ratings do not have a statistically significant announcement impact on the nominal foreign exchange rate returns in Africa.

Overall, the empirical evidence support priori expectations and the findings by Hernández, et al. (2001), that the country's past investment rate (total net capital inflow/GDP) was an important determinant of capital flows to developing economies. For FDI flows, the empirical evidence overwhelmingly supports the growth hypothesis advanced by studies such as those by (Ajayi, 2006; Martin & Rose-Innes, 2004; Mlambo, 2005). Contrary to priori expectations however, the empirical evidence shows a positive but insignificant relationship between trade openness and FDI flows. The empirical evidence further corroborates the findings by Singh and Jun (1995), Sachs (2003) and Asiedu (2003), that political stability has a positive and significant relationship with FDI flows.

Confirming the findings by Gerlos, et al. (2003), the empirical evidence reveals that traditional mechanisms of country links with the rest of the world, such as trade openness, transactional liquidity and macroeconomic indicators, do not help much to explain access to debt flows. Except for public and publicly guaranteed borrowing from commercial banks and other private institutions, the model results show that the effect of economic growth on portfolio equity and debt inflows (bond and borrowing from commercial banks and other private institutions), is insignificant.

While empirical estimation of regression models partially support the findings by Kim and Wu (2008), that there is relationship between the long-term foreign currency sovereign credit ratings (RATINGS) and the different types of capital flows, the current study reveals that the contribution of the long-term foreign currency sovereign credit ratings to capital flows is marginal. In particular, the empirical evidence shows that the long-term foreign currency sovereign credit ratings are not a substitute for the economic factors that they encapsulate, as suggested by the findings by Cantor and Packer (1996a) for bond yield spreads nor that they encourage new capital flows as suggested by Kim and Wu (2008). Instead, the long-term foreign currency sovereign credit ratings are found to reinforce the primary determinants of capital flows such as the economic growth, history of particular capital flow to the country and equity stock market capitalisation. For example, as shown in Appendix A, compared to South Africa, with a more developed equity stock market and a history of significant portfolio equity (EQUITY) flows over the observation period (1994 to 2011), countries rated by Moody's receive proportionally insignificant equity flows compared to FDI. This is revealed in the empirical evidence through a positive and significant relationship between the RATINGS and the FDI flow for a sample of Moody's rated countries. In contrast, the relationship between Moody's RATING and portfolio equity flows (EQUITY) is insignificant, suggesting that with smaller equity stock markets and limited history of portfolio equity flows, countries such as Botswana continue to attract fewer portfolio flows despite their investment grade Moody's RATINGS.

The empirical evidence further reveals that sovereign credit ratings issued by the different rating agencies have an asymmetric relationship with capital flows. For example, while the relationship between the FDI investment rate (FDI/GDP) models fit the modelled data with R-squared ranging from 40.6% and 73%, the relationship between FDI investment rate and Fitch issued RATINGS was negative while the opposite was true for S&P issued RATINGS, despite the fact that S&P and Fitch, disagree in only 4 of the 16 sovereigns for which they issue the ratings over the observation period. In addition, as opposed to the positive and significant relationship between S&P issued RATINGS and non-guaranteed commercial private banks and

other private institutions (PNGCOMM), Fitch issued RATINGS revealed a positive and significant relationship with non-guaranteed portfolio bond flow rates (PNGBOND).

To some extent, the empirical evidence supports Arora and Vamvakidis (2005)'s suggestion that South Africa has a potential to influence the regional access to outside private capital flows. The introduction of South Africa's Fitch issued RATING to the public and publicly guaranteed portfolio bond flow rate (PPGBOND) model for example, not only improves the model R-squared but also the adjusted R-squared. This is also the case for South Africa's S&P issued RATINGS, with the rating having a positive and significant relationship with the public and publicly guaranteed portfolio bond net flow rates to countries other than South Africa. The relationship between South Africa's RATING and capital flows to countries other than South Africa, was however not confined to the PPGBOND net flow rates. In addition to a positive and significant relationship between S&P issued South African RATING and the public and publicly guaranteed commercial banks and other private institutions (PPGCOMM) net flow rates to countries other than South Africa, the introduction of Moody's issued South African RATING to the PPGCOMM net flow rate model for a sample that excludes South Africa, improved the model fit with the adjusted R-squared increasing from 27.1% to 27.6%.

Despite the lack of a long-term relationship between the long term foreign currency sovereign credit ratings and portfolio equity flows, the empirical evidence supports the findings by studies such as those by Brooks, et al. (2004), and Reisen and von Maltzan (1998) that the long-term foreign currency sovereign credit ratings have an announcement impact on the aggregate equity stock returns. In addition, contrary to the findings by Brooks, et al (2004), and Gaillard (2009) that only downgrades have an announcement impact on the aggregate equity stock returns, the event study results also show that both the upgrades and downgrades have an announcement impact on the aggregate equity stock returns in Africa. The event study analysis further corroborates the findings by Hite and Warga (1997), that both the actual and imminent rating change have a significant announcement impact on the aggregate national equity stock and nominal foreign exchange rate returns.

The event study analysis reveals that in the short-term, while there is an incentive for a positive rating announcement, the punishment for a negative announcement is not significant. This is contrary to earlier studies that the downgrade impact was more pronounced for below investment grade ratings (Cantor & Packer, 1996a; Reisen & von Maltzan, 1998) In particular, empirical evidence shows that there is a positive and significant rating announcement impact for below investment grade ratings while the negative rating announcement is insignificant, suggesting that the market prices the negative rating action upfront for below investment markets in Africa .

In contrast to below investment grade ratings, while there is an incentive to improve the investment grade rating, there is equally a punishment for a negative rating announcement. In addition, the event analysis reveal that for the aggregate equity stock market in particular, the upgrade announcement impact on investment grade ratings is only significant when South Africa is included in the sample, and insignificant when South Africa is excluded from the sample. In contrast, the negative outlook and watchlisting announcement show persistent and negative aggregate equity stock returns when South Africa is excluded from the sample. For the nominal foreign exchange rate, only the downgrade announcement on an investment grade rating show a negative return, while there is no significant announcement impact for the negative or positive outlook or watchlisting.

5.2 Contributions of the Study

The key contribution of the thesis is that, it undertakes a comprehensive theoretical and empirical analysis of the long-term effect of long-term foreign currency sovereign credit ratings issued by the three dominant rating agencies on capital flows in Africa. Indeed while there is conjecture that sovereign credit ratings are a *de facto* requirement to gain access to foreign capital, many studies on the subject focused on the short-term announcement impact of the ratings on bond yield spreads and equity stock returns (Brooks et al., 2004; Gaillard, 2009; Reisen & von Maltzan, 1998). Kim and Wu (2008) attempted to close this gap by investigating the long-term effect of sovereign credit ratings on the different types of capital flows. Kim and Wu (2008)'s study however,

partially closed this knowledge gap by only focusing on sovereign credit ratings issued by S&P, one of the three leading rating agencies. In addition, the study's sample was made up of countries classified as emerging economies, excluding many African countries that are classified as developing economies. Indeed, many studies on the effect of sovereign credit ratings have thus far only included Egypt, South Africa and Tunisia (Brooks et al., 2004; Cavallo & Valenzuela, 2007; Gaillard, 2009) leaving a gap on the effect of sovereign credit ratings on the African economies that are predominantly not integrated with the international financial markets (Kasekende, Ndikumana & Rajhi, 2009).

The thesis systematically and separately tests the long-term relationship between the long-term foreign currency sovereign credit ratings issued by Fitch, Moody's and S&P and different types of capital flows (FDI, portfolio equity, portfolio bond and commercial borrowing), providing a new direction of literature for developing economies that are largely not financially integrated with the international financial markets. While the current empirical analysis extends previous work by studies such as those by Kim and Wu (2008), Asiedu (2003) and Janicki and Winnava (2004) by introducing the sovereign credit ratings to the reduced form equation specified by Edwards (1984) and widely applied in studies on capital flows (Asiedu & Lien, 2004; Bevan & Estrin, 2004), the study demonstrates the importance of separating sovereign credit ratings issued by the different rating agencies. In particular, the lag in the rating adjustment identified by Alsakka and ap Gwilym (2010), becomes critical when a weighted average annual rating has to be computed. While the lag in the rating adjustment is insignificant where a single agency rating issue is investigated and applied by Kim and Wu (2008), the timing of the rating adjustment becomes critical when a time proportioned annual average rating has to be computed for multiple agency issued ratings.

By testing the relationship between South Africa's sovereign credit ratings and capital flows to countries other than South Africa, the study tests the hypothesis that, by virtue of its economic advantage, South Africa has an influence on the regional business and consumer confidence and by extension the attractiveness of the region to capital flows (Arora & Vamvakidis, 2005). Indeed literature and data shows that South Africa's

economy and financial market is fundamentally different to many of the countries in the region. In addition to being a regular issuer of debt in the global market, South Africa's financial market is highly developed as well as being broad, with the flows to the country more skewed towards portfolio flows as compared to FDI across the region (Arvanitis, 2005; Ncube, 2008). In addition, South Africa is also a leading investor in the region, making it difficult for South Africa to be compared to any particular peer economy across the region (UNCTAD, 2011; UNCTD, 2010). Indeed, Jefferis and Okeahalam (2000) show that, while South Africa's equity stock market is impacted on by the global financial developments, Zimbabwe and Botswana's equity stock markets are impacted on by the regional financial and economic developments as represented by South Africa's real interest rates and GDP.

By separately testing two samples, one that includes South Africa as well as the other one that excludes South Africa, the current study takes a significant step towards demonstrating some of the weaknesses in generalised inferences from analytical frameworks such as regression analysis and event study methodologies (Brooks, 2008; Kothari & Warner, 2006). This is demonstrated in particular by the portfolio equity models that become statistically insignificant when South Africa, which accounts for over 70% of portfolio equity flows over the observation period, is excluded from the sample. This is further demonstrated by the differences in the announcement impact from event studies that are fundamentally different for a sample that includes South Africa as opposed to one that excludes South Africa.

5.3 Lessons for Future Research

While the study attempted to test the role of a strong regional economy on capital flows, through an empirical analysis of the effect of South Africa's long-term foreign currency sovereign credit rating on capital flow rates on countries other than South Africa, there is an opportunity to further explore this topic. In particular, the study did not capture the effect of sub regional dominant economies such as those of Nigeria in West Africa and Kenya in East Africa. To this effect, future research on the effect of long-term foreign currency sovereign credit rating on capital flow rates can make further contributions to

this topic by exploring the effect of sub regional dominant economies sovereign credit ratings on capital flows to the sub region. In particular, this needs to be in the context of the sub regional economic blocks such as the Economic Community of West African States (ECOWAS) and Common Market for Eastern and Southern Africa (COMESA). Malefane (2007), for example, demonstrates that markets seeing FDI flow to smaller economies such as that of Lesotho, are more likely attracted to a larger regional market as opposed to the domestic market. Similarly, one will expect any negative sovereign risk rating on Nigeria to be transmitted across ECOWAS where Nigeria not only has the biggest economy, but also hosts the biggest equity stock exchange, a larger population as well as sharing a common passport with the members of ECOWAS.

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APPENDIX A

Moody's - Sovereign Rating History as in July 2012

Fitch - Complete Sovereign Rating History as in July 2012Country	Date	long-term	short-term	outlook/Watch	long-term	outlook/Watch
Angola	23 May 2012	BB-	B	positive	BB-	positive
Angola	24 May 2011	BB-	B	stable	BB-	stable
Angola	19 May 2010	B+	B	positive	B+	positive
Benin	25 Jan 2012	withdrawn	withdrawn	withdrawn	withdrawn	withdrawn
Benin	15 Sep 2004	B	B	stable	B	stable
Cameroon	30 May 2012	B	B	stable	B	stable
Cameroon	6 Mar 2007	B	B	stable	B-	stable
Cameroon	12 Jun 2006	B	B	stable	CCC	positive
Cameroon	21 Dec 2005	B-	B	positive	CCC	positive
Cameroon	4 Nov 2005	B-	B	positive	CCC+	positive
Cameroon	15 Feb 2005	B-	B	stable	CCC+	stable
Cameroon	5 Jul 2004	B	B	Rating Watch Negative	B	Rating Watch Negative
Cameroon	4 Sep 2003	B	B	stable	B	stable
Cape Verde	22 Jun 2009	B+	B	stable	BB-	stable
Cape Verde	11 Mar 2008	B+	B	positive	BB-	positive
Cape Verde	15 Aug 2003	B+	B	stable	BB-	stable
Egypt	15 Jun 2012	B+	B	negative	B+	negative
Egypt	30 Dec 2011	BB-	B	negative	BB	negative
Egypt	28 Jun 2011	BB	B	negative	BB+	negative
Egypt	3 Feb 2011	BB	B	Rating Watch negative	BB+	Rating Watch negative
Egypt	28 Jan 2011	BB+	B	negative	BBB-	negative
Egypt	18 Aug 2008	BB+	B	stable	BBB-	stable

Fitch - Complete Sovereign Rating History as in July 2012Country	Date	long-term	short-term	outlook/Watch	long-term	outlook/Watch
Egypt	18 Jun 2007	BB+	B	positive	BBB	stable
Egypt	15 Dec 2004	BB+	B	stable	BBB	stable
Egypt	2 Dec 2003	BB+	B	stable	BBB	negative
Egypt	21 Aug 2002	BB+	B	stable	BBB	stable
Egypt	22 Jan 2002	BBB-	F3	negative	BBB+	negative
Egypt	22 Aug 2001	BBB-	F3	stable	BBB+	stable
Egypt	21 Sep 2000	BBB-	F3	stable	A-	stable
Egypt	19 Aug 1997	BBB-	F3	-	A-	-
Gabon	5 Apr 2012	BB-	B	positive	BB-	positive
Gabon	29 Oct 2007	BB-	B	stable	BB-	stable
Gambia	6 Jul 2007	-	-	-	-	-
Gambia	21 Dec 2005	CCC	C	stable	CCC	stable
Gambia	26 Jan 2005	CCC+	C	stable	CCC+	stable
Gambia	11 Nov 2002	B-	B	stable	B-	stable
Kenya	16 Jan 2009	B+	B	stable	BB-	stable
Kenya	30 Jan 2008	B+	B	negative	BB-	negative
Kenya	12 Dec 2007	B+	B	stable	BB-	stable
Lesotho	31 May 2011	BB-	B	negative	BB	negative
Lesotho	27 Apr 2010	BB-	B	stable	BB	negative
Lesotho	18 Sep 2006	BB-	B	stable	BB	stable
Lesotho	4 Nov 2005	BB-	B	negative	BB+	negative
Lesotho	30 Nov 2004	BB-	B	stable	BB+	stable
Lesotho	26 Sep 2003	B+	B	positive	BB	positive
Lesotho	2 Sep 2002	B+	B	stable	BB	stable
Libya	13 Apr 2011	-	-	-	-	-
Libya	13 Apr 2011	B	B	stable	B	stable
Libya	1 Mar 2011	BB	B	Rating Watch negative	BB	Rating Watch negative
Libya	21 Feb 2011	BBB	F3	Rating Watch negative	BBB	Rating Watch negative
Libya	7 May 2009	BBB+	F2	stable	BBB+	stable
Malawi	25 Aug 2009	-	-	-	-	-
Malawi	6 Mar 2007	B-	B	stable	B-	stable
Malawi	21 Dec 2005	CCC	C	positive	CCC	positive
Malawi	30 Jul 2004	CCC+	C	positive	CCC+	positive
Malawi	20 May 2003	CCC+	C	stable	CCC+	stable
Mali	4 Dec 2009	-	-	-	-	-
Mali	30 Apr 2004	B-	B	stable	B-	stable
Morocco	19 Apr 2007	BBB-	F3	stable	BBB	stable

Fitch - Complete Sovereign Rating History as in July 2012Country	Date	long-term	short-term	outlook/Watch	long-term	outlook/Watch
Mozambique	15 Jul 2003	B	B	stable	B+	stable
Namibia	9 Dec 2011	BBB-	F3	stable	BBB	stable
Namibia	13 Dec 2010	BBB-	F3	positive	BBB	positive
Namibia	7 Dec 2005	BBB-	F3	stable	BBB	stable
Nigeria	21 Oct 2011	BB-	B	stable	BB	stable
Nigeria	22 Oct 2010	BB-	B	negative	BB	negative
Nigeria	23 May 2008	BB-	B	stable	BB	stable
Nigeria	30 Jan 2006	BB-	B	stable	BB-	stable
Rwanda	24 Aug 2010	B	B	stable	B	stable
Rwanda	16 Dec 2006	B-	B	positive	B-	positive
South Africa	13 Jan 2012	BBB+	F2	negative	A	negative
South Africa	17 Jan 2011	BBB+	F2	stable	A	stable
South Africa	9 Nov 2008	BBB+	F2	negative	A	negative
South Africa	17 Jun 2008	BBB+	F2	stable	A	stable
South Africa	25 Jul 2007	BBB+	F2	positive	A	positive
South Africa	25 Aug 2005	BBB+	F2	stable	A	stable
South Africa	21 Oct 2004	BBB	F3	positive	A-	positive
South Africa	2 May 2003	BBB	F3	stable	A-	stable
South Africa	11 Mar 2003	BBB-	F3	Rating Watch positive	BBB+	Rating Watch positive
South Africa	20 Aug 2002	BBB-	F3	positive	BBB+	positive
South Africa	21 Sep 2000	BBB-	F3	stable	BBB+	stable
South Africa	27 Jun 2000	BBB-	F3	-	BBB+	-
South Africa	19 May 2000	BB+	B	-	BBB+	-
South Africa	28 May 1998	BB	B	-	BBB	-

Fitch - Complete Sovereign Rating History as in July 2012Country	Date	long-term	short-term	outlook/Watch	long-term	outlook/Watch
South Africa	17 Feb 1998	BB	B	Rating Watch positive	BBB	Rating Watch positive
South Africa	5 Jun 1996	BB	B	-	BBB	-
South Africa	26 Oct 1995	BB	B	-	-	-
South Africa	22 Sep 1994	BB	-	-	-	-
Tunisia	2 Mar 2011	BBB-	F3	negative	BBB	negative
Tunisia	14 Jan 2011	BBB	F2	Rating Watch negative	A-	Rating Watch negative
Tunisia	24 May 2001	BBB	F2	stable	A-	stable
Tunisia	21 Sep 2000	BBB-	F3	positive	A-	positive
Tunisia	26 Sep 1996	BBB-	F3	-	A-	-
Tunisia	26 Oct 1995	BBB-	F3	-	-	-
Tunisia	14 Sep 1995	BBB-	-	-	-	-
Uganda	7 Oct 2011	B	B	stable	B	stable
Uganda	19 Aug 2009	B	B	positive	B	positive
Uganda	17 Mar 2005	B	B	stable	B	stable
Zambia	1 Mar 2012	B+	B	negative	B+	negative
Zambia	2 Mar 2011	B+	B	stable	B+	stable

Source: Fitch Ratings

Moody's - Sovereign Rating History as in July 2012

	Foreign Currency Ceilings				Government Bonds		Outlook	Date
	Bonds & Notes		Bank Deposit		Foreign Currency	Local Currency		
	Long-term	Short-term	Long-term	Short-term				
Angola								
Rating Raised	Ba1	NP	B1	NP	Ba3	Ba3	Stable	June-11
Review for Upgrade	Ba3	NP	B2	NP	B1	B1	RUR+	February-11
Rating Assigned	Ba3	NP	B2	NP	B1	B1	Positive	May-10
Botswana								
Outlook Changed	--	--	A2	--	A2	A2	Stable	November-11
Outlook Changed	--	--	A2	--	A2	A2	Negative	February-10
Rating Lowered	--	--	--	--	--	A2	Stable	March-09
Outlook Changed	Aa3	--	A2	--	A2	--	Stable	March-09
Outlook Changed	Aa3	--	A2	--	A2	--	Positive	August-07
Rating Raised	Aa3	--	--	--	--	--	--	May-06
Rating Assigned	A2	P-1	A2	P-1	A2	A1	Stable	March-01
Egypt								
Rating Lowered & Review for Downgrade	Ba3	NP	B3	--	B2	B2	RUR-	December-11
Rating Lowered	Ba2	NP	B2	--	B1	B1	Negative	October-11
Rating Lowered	Ba1	NP	B1	--	Ba3	Ba3	Negative	March-11
Rating Lowered	Baa3	P-3	Ba3	--	Ba2	Ba2	Negative	January-11
Outlook Changed	Baa2	P-2	Ba2	--	Ba1	Ba1	Stable	August-09
Outlook Changed	Baa2	P-2	Ba2	--	Ba1	Ba1	Negative	June-08
Rating Lowered	--	--	--	--	--	Ba1	--	June-08
Rating Raised	Baa2	P-2	--	--	--	--	--	May-06
Rating Lowered	--	--	--	--	--	Baa3	Negative	May-05
Outlook Changed	--	--	--	--	--	Baa1	Negative	November-01
Rating Assigned	--	--	--	--	Ba1	--	--	July-01
Rating Assigned	--	--	--	--	--	Baa1	--	March-99
Rating Raised	Ba1	--	Ba2	--	--	--	Stable	November-97
Review for Upgrade	Ba2	--	Ba3	--	--	--	RUR+	October-97
Outlook Changed	--	--	--	--	--	--	Positive	August-97
Outlook Assigned	--	--	--	--	--	--	Stable	March-97
Rating Assigned	Ba2	NP	Ba3	NP	--	--	--	October-96
Mauritius								
Rating Raised	A2	--	Baa1	--	Baa1	Baa1	Stable	June-12
Review for Upgrade	Baa1	--	Baa2	--	Baa2	--	RUR+	March-12
Rating Confirmed	Baa1	--	Baa2	--	Baa2	--	Stable	December-07
Rating Lowered	--	--	--	--	--	Baa2	Stable	December-07
Review for Downgrade	Baa1	--	Baa2	--	Baa2	Baa1	RUR-	August-07
Rating Lowered	--	--	--	--	--	Baa1	--	June-06
Rating Raised	Baa1	--	--	--	--	--	--	May-06
Review for Downgrade	--	--	--	--	--	A2	RUR-	March-06
Outlook Changed	--	--	--	--	--	--	Negative	December-05
Rating Assigned	--	--	--	--	--	A2	--	January-99
Rating Assigned	Baa2	P-2	Baa2	P-2	Baa2	--	--	March-96
Morocco								
Rating Raised	Baa2	P-2	--	--	--	--	--	May-06

	Foreign Currency Ceilings				Government Bonds		Outlook	Date
	Bonds & Notes		Bank Deposit		Foreign Currency	Local Currency		
Outlook Changed	--	--	--	--	--	--	Stable	June-03
Rating Assigned	--	--	--	--	--	Ba1	Negative	December-01
Rating Assigned	--	--	--	--	Ba1	--	--	July-99
Rating Assigned	Ba1	NP	Ba2	NP	--	--	Stable	March-98
Namibia								
Rating Assigned	A3	--	Baa3	--	Baa3	Baa3	Stable	September-11
Senegal								
Rating Assigned	A2	--	A2	--	B1	B1	Stable	March-11
South Africa								
Outlook Changed	A1	--	A3	--	A3	A3	Negative	November-11
Rating Raised	A1	--	A3	--	A3	--	Stable	July-09
Rating Lowered	--	--	--	--	--	A3	Stable	July-09
Review for Downgrade	--	--	--	--	--	A2	RUR-	March-09
Outlook Changed	A2	--	Baa1	--	Baa1	--	Positive	June-07
Rating Raised	A2	P-1	--	--	--	--	--	May-06
Rating Raised	Baa1	--	Baa1	--	Baa1	--	Stable	January-05
Review for Upgrade	Baa2	--	Baa2	--	Baa2	--	RUR+	October-04
Outlook Changed	--	--	--	--	--	--	Positive	February-03
Rating Raised	Baa2	P-2	Baa2	P-2	Baa2	A2	Stable	November-01
Review for Upgrade	Baa3	--	Ba1	NP	Baa3	Baa1	RUR+	October-01
Rating Assigned	--	NP	--	--	--	--	--	October-01
Outlook Changed	--	--	--	--	--	--	Positive	February-00
Rating Confirmed	Baa3	--	Ba1	--	Baa3	Baa1	Stable	October-98
Review for Downgrade	Baa3	--	Ba1	--	Baa3	Baa1	RUR-	July-98
Outlook Assigned	--	--	--	--	--	--	Stable	March-97
Rating Assigned	--	--	--	--	--	Baa1	--	November-95
Rating Assigned	--	--	Ba1	NP	--	--	--	October-95
Rating Assigned	Baa3	--	--	--	Baa3	--	--	October-94
Tunisia								
Rating Lowered	Baa1	P-3	Baa3	P-3	Baa3	Baa3	Negative	January-11
Rating Raised	A3	P-2	--	--	--	--	--	May-06
Rating Raised	Baa2	--	Baa2	P-2	Baa2	--	Stable	April-03
Rating Assigned	--	--	--	--	Baa3	--	--	October-00
Outlook Changed	--	--	--	--	--	--	Positive	February-00
Rating Assigned	--	--	--	--	--	Baa2	--	June-99
Outlook Assigned	--	--	--	--	--	--	Stable	March-97
Rating Assigned	--	--	Ba1	NP	--	--	--	October-95
Rating Assigned	Baa3	--	--	--	--	--	--	April-95

Source: Moody's Investor Services

Standard and Poor's - Sovereign Rating History as in July 2012

		Local-currency rating			Foreign-currency rating		
		Long-term Sovereign Credit Rating	Outlook	Short-term Sovereign Credit Rating	Long-term Sovereign Credit Rating	Outlook	Short-term Sovereign Credit Rating
Angola	10 July 2012	BB-	Stable	B	BB-	Stable	B
Angola	12 July 2011	BB-	Stable	B	BB-	Stable	B
Angola	19 May 2010	B+	Stable	B	B+	Stable	B
Benin	10 July 2012	B	Stable	B	B	Stable	B
Benin	1 Dec. 2010	B	Stable	B	B	Stable	B
Benin	19 Dec. 2007	B	Positive	B	B	Positive	B
Benin	10 April 2007	B	Stable	B	B	Stable	B
Benin	7 Sept. 2006	B	Negative	B	B	Negative	B
Benin	1 Nov. 2005	B+	Stable	B	B+	Stable	B
Benin	29 Dec. 2003	B+	Stable	B	B+	Stable	B
Botswana	10 July 2012	A-	Stable	A-2	A-	Stable	A-2
Botswana	23 Nov. 2011	A-	Stable	A-2	A-	Stable	A-2
Botswana	15 Feb. 2010	A	Stable	A-1	A-	Stable	A-2
Botswana	19 Feb. 2009	A+	Negative	A-1	A	Negative	A-1
Botswana	6 April 2006	A+	Stable	A-1	A	Stable	A-1
Botswana	1 Nov. 2005	A+	Stable	A-1	A	Stable	A-1
Botswana	2 April 2001	A+	Stable	A-1	A	Stable	A-1
Burkina Faso	10 July 2012	B	Stable	B	B	Stable	B
Burkina Faso	6 Aug. 2008	B	Stable	B	B	Stable	B
Burkina Faso	6 July 2006	B	Positive	B	B	Positive	B
Burkina Faso	1 Nov. 2005	B	Stable	B	B	Stable	B
Burkina Faso	5 March 2004	B	Stable	B	B	Stable	B
Cameroon	10 July 2012	B	Stable	B	B	Stable	B
Cameroon	26 Feb. 2007	B	Stable	B	B	Stable	B
Cameroon	3 May 2006	B-	Stable	C	B-	Stable	C
Cameroon	1 Nov. 2005	CCC	Stable	C	CCC	Stable	C
Cameroon	3 Dec. 2004	CCC	Stable	C	CCC	Stable	C
Cameroon	26 Nov. 2003	B	Stable	B	B	Stable	B
Cape Verde	10 July 2012	B+	Stable	B	B+	Stable	B
Cape Verde	24 May 2011	B+	Stable	B	B+	Stable	B
Cape Verde	24 Dec. 2009	B+	Negative	B	B+	Negative	B
Cape Verde	4 Dec. 2008	B+	Stable	B	B+	Stable	B

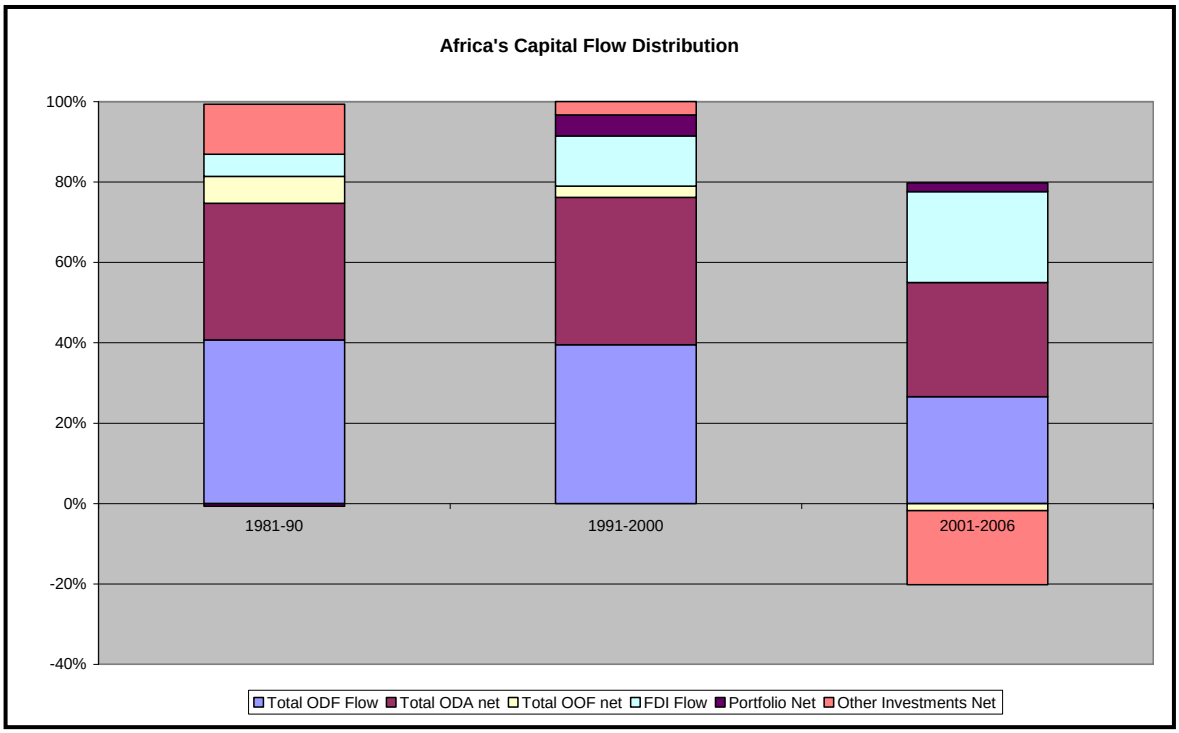
		Local-currency rating			Foreign-currency rating		
		Long-term Sovereign Credit Rating	Outlook	Short-term Sovereign Credit Rating	Long-term Sovereign Credit Rating	Outlook	Short-term Sovereign Credit Rating
Egypt	10 July 2012	B	Watch Neg	B	B	Watch Neg	B
Egypt	25 June 2012	B	Watch Neg	B	B	Watch Neg	B
Egypt	10 Feb. 2012	B	Negative	B	B	Negative	B
Egypt	24 Nov. 2011	B+	Negative	B	B+	Negative	B
Egypt	18 Oct. 2011	BB-	Negative	B	BB-	Negative	B
Egypt	10 March 2011	BB+	Negative	B	BB	Negative	B
Egypt	1 Feb. 2011	BB+	Watch Neg	B	BB	Watch Neg	B
Egypt	12 June 2007	BBB-	Stable	A-3	BB+	Stable	B
Egypt	3 Nov. 2005	BBB-	Stable	A-3	BB+	Stable	B
Egypt	1 Nov. 2005	BBB-	Stable	A-3	BB+	Stable	B
Egypt	14 March 2005	BBB-	Stable	A-3	BB+	Stable	B
Egypt	22 Aug. 2003	BBB-	Negative	A-3	BB+	Negative	B
Egypt	22 May 2002	BBB	Stable	A-3	BB+	Stable	B
Egypt	22 June 2001	BBB+	Negative	A-2	BBB-	Negative	A-3
Egypt	3 July 2000	A-	Negative	A-1	BBB-	Negative	A-3
Egypt	15 Jan. 1997	A-	Stable	A-1	BBB-	Stable	A-3
Gabon	10 July 2012	BB-	Stable	B	BB-	Stable	B
Gabon	8 Nov. 2007	BB-	Stable	B	BB-	Stable	B
Ghana	10 July 2012	B	Stable	B	B	Stable	B
Ghana	27 Aug. 2010	B	Stable	B	B	Stable	B
Ghana	16 March 2009	B+	Negative	B	B+	Negative	B
Ghana	19 Sept. 2007	B+	Stable	B	B+	Stable	B
Ghana	6 April 2006	B+	Stable	B	B+	Stable	B
Ghana	1 Nov. 2005	B+	Stable	B	B+	Stable	B
Ghana	4 Sept. 2003	B+	Stable	B	B+	Stable	B
Kenya	10 July 2012	B+	Stable	B	B+	Stable	B
Kenya	19 Nov. 2010	B+	Stable	B	B+	Stable	B
Kenya	4 Aug. 2008	B	Positive	B	B	Positive	B
Kenya	10 March 2008	B	Stable	B	B	Stable	B
Kenya	4 Feb. 2008	B	Negative	B	B	Negative	B

		Local-currency rating			Foreign-currency rating		
		Long-term Sovereign Credit Rating	Outlook	Short-term Sovereign Credit Rating	Long-term Sovereign Credit Rating	Outlook	Short-term Sovereign Credit Rating
Kenya	2 Jan. 2008	B+	Watch Neg	B	B+	Watch Neg	B
Kenya	8 Sept. 2006	BB-	Stable	B	B+	Stable	B
Libya	10 July 2012	NR			NR		
Libya	10 March 2011	NR			NR		
Libya	10 March 2011	BB	Negative	B	BB	Negative	B
Libya	22 Feb. 2011	BBB+	Watch Neg	A-2	BBB+	Watch Neg	A-2
Libya	18 March 2009	A-	Stable	A-2	A-	Stable	A-2
Madagascar	10 July 2012						
Madagascar	11 May 2009	NR	NM	NR	NR	NM	NR
Madagascar	18 March 2009	B-	Negative	B	B-	Negative	B
Madagascar	2 Feb. 2009	B	Negative	B	B	Negative	B
Madagascar	1 Nov. 2005	B	Stable	B	B	Stable	B
Madagascar	25 May 2004	B	Stable	B	B	Stable	B
Mali	10 July 2012						
Mali	03-Jul-08	NR	NM	NR	NR	NM	NR
Mali	1 Nov. 2005	B	Stable	B	B	Stable	B
Mali	5 May 2004	B	Stable	B	B	Stable	B
Morocco	10 July 2012	BBB	Stable	A-2	BBB-	Stable	A-3
Morocco	13 July 2011	BBB	Stable	A-2	BBB-	Stable	A-3
Morocco	23 March 2010	BBB+	Stable	A-2	BBB-	Stable	A-3
Morocco	11 April 2008	BBB	Stable	A-3	BB+	Stable	B
Morocco	18 June 2007	BBB	Positive	A-3	BB+	Positive	B
Morocco	26 March 2007	BBB	Positive	A-3	BB+	Positive	B
Morocco	6 April 2006	BBB	Stable	A-3	BB+	Stable	B
Morocco	1 Nov. 2005	BBB	Stable	A-3	BB+	Stable	B
Morocco	9 Aug. 2005	BBB	Stable	A-3	BB+	Stable	B
Morocco	8 March 2004	BBB	Stable	A-3	BB	Positive	B
Morocco	21 Feb. 2003	BBB	Stable	A-3	BB	Stable	B
Morocco	2 Nov. 2001	BBB	Negative	A-3	BB	Negative	B
Morocco	2 March 1998	BBB	Stable	A-3	BB	Stable	B
Mozambique	10 July 2012	B+	Stable	B	B+	Stable	B
Mozambique	21 Dec. 2007	B+	Stable	B	B+	Stable	B

		Local-currency rating			Foreign-currency rating		
		Long-term Sovereign Credit Rating	Outlook	Short-term Sovereign Credit Rating	Long-term Sovereign Credit Rating	Outlook	Short-term Sovereign Credit Rating
Mozambique	6 April 2006	B	Positive	B	B	Positive	B
Mozambique	1 Nov. 2005	B	Positive	B	B	Positive	B
Mozambique	7 July 2004	B	Positive	B	B	Positive	B
Nigeria	10 July 2012	B+	Positive	B	B+	Positive	B
Nigeria	29 Dec. 2011	B+	Positive	B	B+	Positive	B
Nigeria	18 Jan. 2011	B+	Stable	B	B+	Stable	B
Nigeria	21 Aug. 2009	B+	Stable	B	B+	Stable	B
Nigeria	27 March 2009	BB	Negative	B	BB-	Negative	B
Nigeria	6 Feb. 2006	BB	Stable	B	BB-	Stable	B
Rwanda	10 July 2012	B	Positive	B	B	Positive	B
Rwanda	29 Dec. 2011	B	Positive	B	B	Positive	B
Senegal	10 July 2012	B+	Negative	B	B+	Negative	B
Senegal	27 May 2010	B+	Negative	B	B+	Negative	B
Senegal	8 Dec. 2009	B+	Stable	B	B+	Stable	B
Senegal	26 May 2009	B+	Stable	B	B+	Stable	B
Senegal	27 July 2006	B+	Negative	B	B+	Negative	B
Senegal	1 Nov. 2005	B+	Stable	B	B+	Stable	B
Senegal	18 Dec. 2000	B+	Stable	B	B+	Stable	B
Seychelles	10 July 2012						
Seychelles	17 Aug. 2009	NR	NR		NR	NR	
Seychelles	1 Oct. 2008	B	Negative	B	SD	NM	SD
Seychelles	7 Aug. 2008	B	Negative	B	SD	NM	SD
Seychelles	1 Aug. 2008	B+	Watch Neg	B	CCC	Watch Neg	C
Seychelles	2 Nov. 2007	B+	Negative	B	B	Negative	B
Seychelles	15 Sept. 2006	B+	Stable	B	B	Stable	B
South Africa	10 July 2012	A	Negative	A-1	BBB+	Negative	A-2
South Africa	28 March 2012	A	Negative	A-1	BBB+	Negative	A-2
South Africa	25 Jan. 2011	A	Stable	A-1	BBB+	Stable	A-2
South Africa	11 Nov. 2008	A+	Negative	A-1	BBB+	Negative	A-2
South Africa	3 Nov. 2005	A+	Stable	A-1	BBB+	Stable	A-2
South Africa	1 Nov. 2005	A+	Stable	A-1	BBB+	Stable	A-2
South Africa	1 Aug. 2005	A+	Stable	A-1	BBB+	Stable	A-2
South Africa	7 May 2003	A	Stable	A-1	BBB	Stable	A-3
South Africa	12 Nov. 2002	A-	Positive	A-2	BBB-	Positive	A-3
South Africa	25 Feb.	A-	Stable	A-2	BBB-	Stable	A-3

		Local-currency rating			Foreign-currency rating		
		Long-term Sovereign Credit Rating	Outlook	Short-term Sovereign Credit Rating	Long-term Sovereign Credit Rating	Outlook	Short-term Sovereign Credit Rating
	2000						
South Africa	6 March 1998	BBB+	Stable	A-2	BB+	Stable	B
South Africa	20 Nov. 1995	BBB+	Positive	NR	BB+	Positive	NR
South Africa	3 Oct. 1994				BB	Positive	NR
Tunisia	10 July 2012	BB	Stable	B	BB	Stable	B
Tunisia	23 May 2012	BB	Stable	B	BB	Stable	B
Tunisia	28 July 2011	BBB	Negative	A-3	BBB-	Negative	A-3
Tunisia	16 March 2011	BBB	Stable	A-3	BBB-	Stable	A-3
Tunisia	18 Jan. 2011	BBB+	Watch Neg	A-2	BBB	Watch Neg	A-3
Tunisia	1 April 2009	A-	Stable	A-2	BBB	Stable	A-3
Tunisia	6 April 2006	A	Stable	A-1	BBB	Stable	A-3
Tunisia	1 Nov. 2005	A	Stable	A-1	BBB	Stable	A-3
Tunisia	21 March 2000	A	Stable	A-1	BBB	Stable	A-3
Tunisia	10 April 1997	A	Stable	A-1	BBB-	Stable	A-3
Uganda	10 July 2012	B+	Stable	B	B+	Stable	B
Uganda	9 Dec. 2008	B+	Stable	B	B+	Stable	B
Zambia	10 July 2012	B+	Stable	B	B+	Stable	B
Zambia	22 March 2011	B+	Stable	B	B+	Stable	B

Source: Standard & Poor's Ratings Direct.



Source: World Bank World Development Indicators.

To African FDI net inflows countries 1991- 2010

Foreign direct investment, net inflows (BoP, current US$)					
Country	1991-1995	1996-2000	2001-2005	2006-2010	1991-2010
Angola	1 897	5 056	7 468	-274	14 147
Libya	88	-295	1 550	14 019	15 363
Algeria	42	1 708	4 769	11 104	17 624
Tunisia	1 909	2 329	3 100	10 437	17 776
Morocco	1 875	315	4 942	10 850	17 982
Sudan	110	1 232	6 452	12 440	20 235
South Africa	1 892	7 649	16 757	21 776	48 074
Nigeria	5 993	6 329	11 927	33 689	57 938
Egypt	3 059	4 903	8 023	44 213	60 198
Total (Africa)	**21 176**	**43 147**	**90 568**	**231 745**	**386 636**

Source: World Bank World Development Indicators

Top African portfolio equity net inflow countries 1991- 2010

Portfolio equity, net inflows (BoP, current US$)					
Country	1991-1995	1996-2000	2001-2005	2006-2010	1991-2010
Zambia	-	20	15	88	123
Togo	3	56	48	20	127
Tunisia	119	122	42	-59	223
Namibia	86	174	48	21	329
Mauritius	24	53	54	284	416
Egypt	-	1 281	615	-1 253	643
Morocco	282	227	654	-86	1 077
Nigeria	-	-	751	4 911	5 662
South Africa	2 263	29 593	13 226	34 112	79 194
Total (Africa)	**2 853**	**31 614**	**15 575**	**38 140**	**88 182**

Source: World Bank World Development Indicators

Top African portfolio bond net inflow countries 1991- 2010

Portfolio investment, bonds (PPG + PNG) (NFL, current US$)					
Country	1991-1995	1996-2000	2001-2005	2006-2010	1991-2010
Senegal	-	-	-	200	200
Seychelles	-	-	-	303	303
Ghana	-	250	-250	750	750
Gabon	-	-	-	883	883
Morocco	-	229	275	738	1 242
Egypt.	-	100	2 650	2 143	4 893
South Africa	2 234	4 185	6 494	8 695	21 608
Total (Africa)	**1 284**	**4 972**	**10 846**	**11 912**	**29 015**

Source: World Bank World Development Indicators

Top African commercial banks and other lending net flow countries 1991- 2010

Commercial banks and other lending (PPG + PNG) (NFL, current US$)					
Country	1991-1995	1996-2000	2001-2005	2006-2010	1991-2010
Algeria	1 230	-4 628	-2 409	-2 942	-8 750
Nigeria	-2 514	-1 296	-861	-542	-5 213
South Africa	768	-4 348	45	1 269	-2 266
Cote d'Ivoire	-90	-915	-582	-663	-2 251
Morocco	270	177	-1 072	-1 046	-1 671
Ethiopia	185	-205	301	1 546	1 827
Angola	1 429	137	2 837	653	5 056
Total (Africa)	**-1 300**	**-11 487**	**-1 351**	**-1 483**	**-15 621**

Source: World Bank World Development Indicators