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Capital flight: the nexus with external debt and institutional quality in SADC

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CAPITAL FLIGHT: THE NEXUS WITH EXTERNAL DEBT AND INSTITUTIONAL QUALITY IN SADC (1996-2018)

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ABSTRACT

The relationship between capital flight and external debt has been described as bi-directional and it has attracted a lot of attention from researchers and policymakers. Due to the observed incidence of high capital flight and external debt in SADC, the study's main objective is to establish the mechanism through which capital flight manifests with special interest on political institutions and external debt. The study employs the panel autoregressive distributive lag model (ARDL) approach to investigate both long-run and short-run relationships among the variables. Furthermore, the granger causality test is employed in order to attest the level of causality between capital flight, external debt and institutional quality. The study finds a long-run causal relationship between external debt and capital flight, concluding the existence of flight-driven external debt phenomenon. The results reveal that resource-endowed economies with relatively poor quality institutions drive capital flight in the SADC region resulting in countries accumulating debt to offset the loss of domestic savings associated with capital flight. The results obtained herein further shows that capital flight persist overtime, thus if capital flight remains unabated, it will continue to lead to massive capital flight in the region. Thus there is need for authorities to set up powerful legal frameworks on transparent and responsible management of natural resources so as to abate trade mis-invoicing and other forms of illegal capital flight. Moreso, policies that lead to repatriation of capital flight need to be implemented, to ensure adequacy of capital resources required for sustainable growth in the long-run.

DECLARATION

I hereby declare that except where otherwise indicated and acknowledged in the text, footnotes, tables, figures and appendices, the research report is based on my original work. I also acknowledge that it has not been previously or concurrently submitted for any other degree at the University of the Witwatersrand or any other institutions.

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SECTION ONE

INTRODUCTION AND BACKGROUND

1.0 Introduction

Capital flight is a major concern for all governments particularly for developing countries, as it depletes revenue collections, undermines development initiatives, and hinders effective governance. A major limitation to economic development especially in African countries is the lack of sufficient financial resources in the face of immense needs in public investment in infrastructure and social service (Ndikumana & Boyce, 2018b). Despite the natural resource endowment, many countries in Africa have not closed infrastructure gaps and have huge development needs due to lack of finance.[1] Capital flight undermines effort to alleviate that constraint. It is evidenced that the rise in capital flight is estimated to be larger for developing countries than developed ones (Barry, 2014). For instance, capital flight both licit and illicit from Africa recorded at 39% of GDP as of 2010 relative to 12% of GDP in other regions (Ndikumana & Boyce, 2011a). Various literature posits that capital flight is more prevalent among natural-resource rich countries and is mainly fuelled by trade mis-invoicing[2]. Studies done in the African context (Ndikumana & Boyce, 1998; Ndikumana & Boyce, 2018a; Yalta, 2010) reveal that capital flight is both a feature and a consequence of government breakdown within economies concerned, it is as a result of bad institutions.

Embezzlement of export revenues, bribes on public and private sector contracts and trade mis-invoicing are some of the illegal practices associated with capital flight (Ndikumana & Boyce, 1998). It occurs when financial assets are siphoned from one nation to another, especially for a less developed country with high levels of inflation, political instability, and high levels of debt stocks, all of which can depreciate the value of assets. The phenomenon of capital flight

[1] See Asongu, S. A. (2013). Fighting corruption in Africa: do existing corruption-control levels matter? *International Journal of Development Issues*. ; Asongu, S. A., & Odhiambo, N. M. (2019). Challenges of doing business in Africa: A systematic review. *Journal of African Business*, *20*(2), 259-268. ; Nyasha, S., & Odhiambo, N. M. (2017). Banks, stock market development and economic growth in Kenya: An empirical investigation. Ibid., *18*(1), 1-23.

[2] See Claessens, S., Naude, D., & Mundial, B. (1993). *Recent estimates of capital flight*. World Bank Washington, DC. ; Kurul, Z., & Yalta, A. Y. (2017). Relationship between institutional factors and FDI flows in developing countries: New evidence from dynamic panel estimation. *Economies*, *5*(2), 17. ; Lemi, A. (2017). *Catch me if you can: Trade mis-invoicing and capital flight from Ethiopia*. ; Ndikumana, L., & Boyce, J. (1998). Congo's odious debt: external borrowing and capital flight in Zaire. *Development and Change*, *29*(2), 195-217. ;Kwaramba, M., Mahonye, N., & Mandishara, L. (2016). Capital flight and trade misinvoicing in Zimbabwe. *African Development Review*, *28*(S1), 50-64.

can occur legally through investors withdrawing profits or illegally through trade mis-invoicing. This process represents massive losses in revenue collections and undermines the potential of less developed countries to expand revenue base through taxes. Ndikumana and Boyce (2018b) on a sample of 30 African countries estimates a loss of 2.4 trillion in capital flight as of 2018, with trade misinvoicing as an important mechanism of capital flight, whereas the stock of debt averaged US$720 billion. These findings reveal that outflows greatly outweighed inflows in form of debt and investment in Africa.

Prior to the Covid-19 pandemic, countries have been struggling with the problem of capital flight and debt. According to the Trade and Development (2020) report, every year the continent loses an estimated US$88.6 billion or more as illicit capital flight, equivalent to 3.7% of Africa's GDP. This figure is above the US$50 billion losses per annum estimated in 2015, indicating a rise in the scale (Africa, 2015). These are the resources that are needed to finance social services and public infrastructure. Undoubtedly, the implications of capital flight are negative and poses a significant challenge upon developing countries in the African continent. A reduction in government revenues, tax burden increase on citizens, draining of scarce foreign exchange resources are chief implications of capital flight and excessive debt. To compensate for revenue losses countries are forced to borrow more, part of it which ends up being used to finance capital flight (Fofack & Ndikumana, 2010; Ndikumana & Boyce, 2003, 2011a, 2011b).

Moreover, Sub Saharan Africa was already suffering with new debt crisis prior to the Covid-19 pandemic, with 40% of the countries at high risk of debt-distress. The debt-to-GDP ratios of many countries had reached unsustainable levels. In the SADC region, Mozambique, Zambia and Angola had attained 108.8%, 91.6% and 95% respectively (Trade &Development, 2020). In addition to poor investment choices with debt resources, weak legal and institutional frameworks that result in lack of transparency and accountability, limited public participation have also increased the debt vulnerabilities of many countries. It is against this backdrop that the study seeks to examine the nexus between capital flight, external debt and institutions particularly in the SADC region.

1.1 Motivation

Rates of tax collection in Southern Africa have shrinked following the COVID-19 crisis. Part of the revenue losses is largely explained by trade misinvoicing which is the largest component of illegal capital flight in Africa. According to Action for Southern Africa's report (ACTSA) (2019), trade-related illicit outflows (an important conduit for capital flight) in Southern Africa

amounted to an average of US$8.8 billion in 2015 alone with South Africa contributing the largest amount of US$5.9 billion. Moreover, it is evidenced that two-thirds of countries in Africa involved in illicit financial flows are SADC countries, which translates to massive capital outflows in the region. Most African countries particularly in SADC depend on export of raw commodities such as oil and minerals, tax revenues from import taxation of various goods as well as taxes from corporate activities (as higher levels of poverty mean lower tax revenues from income tax), thus trade mis invoicing heavily undermine domestic resource mobilization in Southern Africa (Trade & Development, 2020). In a region like SADC, this is a serious problem because capital flight from SADC reduces resources needed to address challenges such as poverty, unemployment and poor infrastructure. Furthermore, higher levels of capital flight makes the monetary policy less effective as a tool for stimulating aggregate demand, thus retarding economic growth.

Moreover, the region is subject to unsustainable debts which are beyond the 60% thresholds (Gwatidzo, 2017). Despite huge external debt accumulation, the region has not closed the infrastructure development and financing gaps. Given that resource mobilization has various interconnected facets and institutions play crucial role in these connections, an understanding of the interlinkages is key in strategically drawing and implementing policies to deal with a country's revenues. An analysis of how the various components and strategies related to external debt and capital flight may be connected to political institutions is of paramount importance and serves as a basis for the need of a comprehensive approach to deal with revenue challenges.

1.2 Gaps in research

Literature on capital flight has largely been dominated by studies that focus mainly on the causes and explanations of the variables at hand without investigating the causal links with other variables like external debt and institutions[3]. This study's contribution to the literature is based on the need for empirical evidence on the relationship between external debt, capital flight and institutions in SADC, taking into account the endowment of natural resources within the economies. While major work on capital flight in Africa is attributed to Boyce and

[3] See Fedderke, J. W., & Liu, W. (2002). Modelling the determinants of capital flows and capital flight: with an application to South African data from 1960 to 1995. *Economic Modelling*, *19*(3), 419-444. , Kurul, Z., & Yalta, A. Y. (2017). Relationship between institutional factors and FDI flows in developing countries: New evidence from dynamic panel estimation. *Economies*, *5*(2), 17. , Smit, B. W., & Mocke, B. (1991). Capital flight from South Africa: Magnitude and causes. *South African Journal of Economics*, *59*(2), 101-117. , Wood, E., & Moll, T. (1994). Capital flight from South Africa: is underinvoicing exaggerated? Ibid., *62*(1), 17-28.

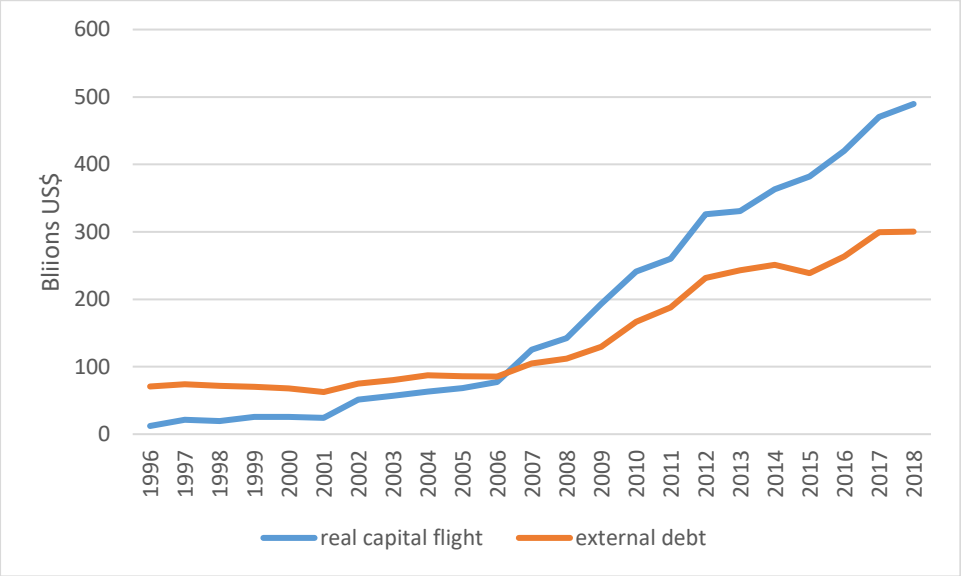
Ndikumana who have researched extensively on the subject matter, very limited attention has been put forward to assess how weak institutions aggravates capital flight, deprives domestic investment, and further exacerbate external debt crisis. Recently, a few studies have tried to link capital flight to external debt and institutions in the SADC region[4]. However, none of the studies investigated the causal link between capital flight, external debt and institutions. The current study is an extension of the subject matter which seeks to attest both short and long-run relationship between capital flight, institutions and debt as well as the level of causation using a panel ARDL approach proposed by Pesaran et al. (1999). The results aim to address a more salient policy question of how institutions can impact the flight of capital as well as debt in the region.

1.3 Problem statement

Capital flight in Sub-Saharan Africa (SSA) is rampant and countries such as Mozambique, Zimbabwe and Zambia are in debt distress (IMF, 2018), thus presenting worrisome debt sustainability concerns. Capital flight continues to be a serious constraint on financial resources in the region, between 1996 and 2018, a sample of 10 countries estimates a total amount of $497.6 billion through capital flight *(figure 1)*. This amount exceeds the US$305.3 billion in total external debts owed by these countries as of 2018. From the estimates, South Africa features at the top in terms of capital flight with US$312.03 billion, followed by Angola with US$84.4 billion, Zambia (US$31.8 billion). These statistics show that the phenomenon is increasing in the SADC region which is a huge challenge.

[4] See Anetor, F. O. (2019). Macroeconomic determinants of capital flight: evidence from the Sub-Saharan African countries. *International Journal of Management, Economics and Social Sciences (IJMESS)*, *8*(1), 40-57. ; Cerra, V., Rishi, M., & Saxena, S. C. (2008). Robbing the riches: capital flight, institutions and debt. *The Journal of Development Studies*, *44*(8), 1190-1213. ; Kollamparambil, U., & Gumbo, D. (2018). Capital flight in Africa: an analysis of macroeconomic and institutional quality determinants. *African Finance Journal*, *20*(2), 21-44.

Figure 1:Real capital flight and external debt for 10 countries in the SADC region, 1996-2018 (Billion, 2018US$)



Source: Political Economy Research Institute (PERI), 2018[5], authors calculations

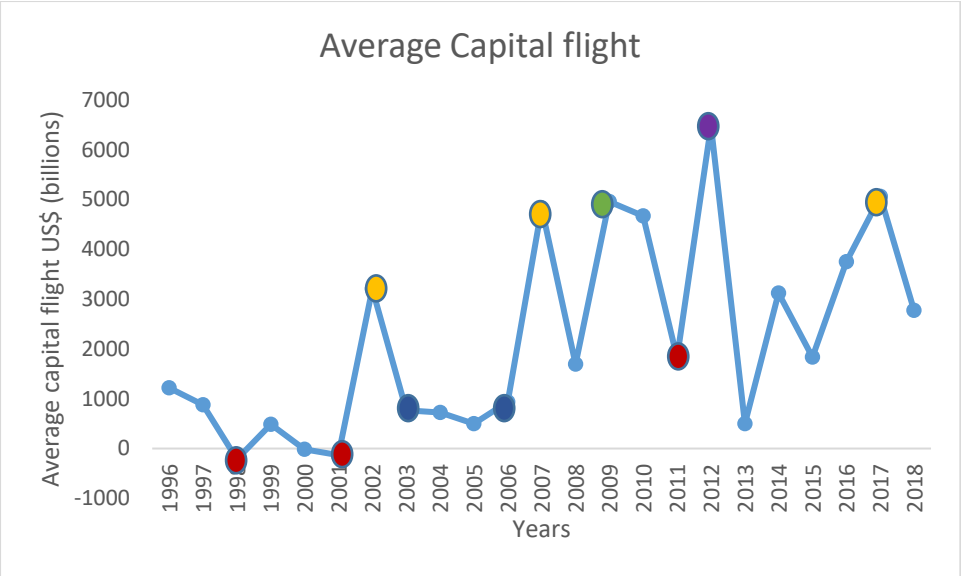
The upward trends in capital flight and external debt as depicted in figure 1 are consistent with the correlation matrix provided in Appendix table 2. The results reveal a positive association between external debt and capital flight.

Overview of capital flight in the SADC region

Figure 2 shows trends in capital flight for the 10 countries in SADC. It depicts fluctuations in capital flight in the region with major peaks in 2002, 2009, 2012 and 2017. The figure shows a huge fall in capital flight in 1996 following the Heavily Indebted Poor Country (HIPC) debt relief initiative. The debt relief initiative led to a reduction in debt stocks and debt service payments in most countries in the region, thus relieving funds for growth and development. Therefore a decline in debt stocks lured capital inflows into the region.

[5] https://www.peri.umass.edu/capital-flight-from-africa.

Figure 2: Trends in capital flight (1996-2018)



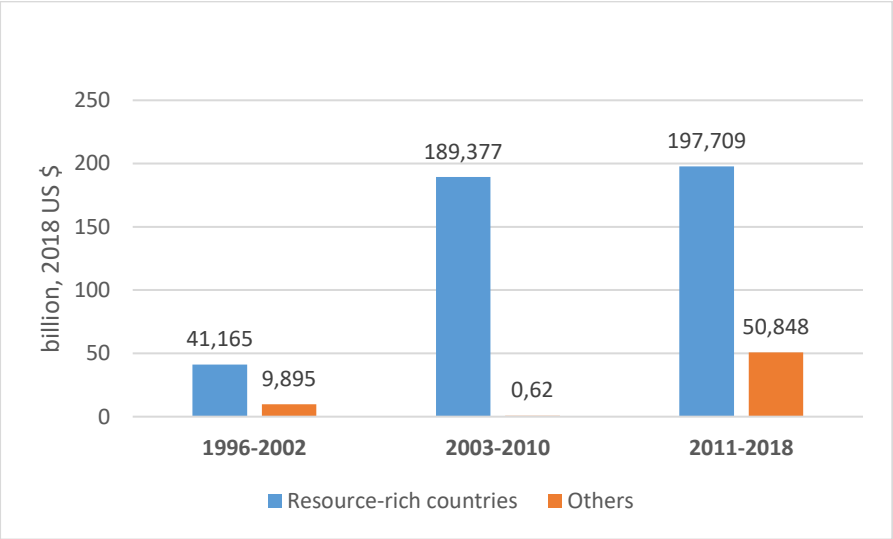
- Reversal capital flight
- 2008-09 financial crises
- Weak institutions and poor governance
- Unfavourable macro-economic environment, poor governance
- Quality institutions and good governance

Source: Author's computations

Due to unstable political and economic institutions, capital flight gained momentum in 2001-2002, in natural resource rich countries through illicit financial flows. For instance, according to the International Monetary Fund, (2018), about US$4 billion from oil sales in Angola in 2002 alone, was not reported in the national accounts (Ganesan, 2004). The rise in capital flight over the period (2006-2012) is consistent with the rise in commodity prices especially oil prior to the global financial crisis. The period was marked by a rise in the volume of capital flight from resource-intensive economies such as Angola, and South Africa with estimates US$22.3 billion and US$35.6 billion dollars as of year 2012, respectively. The massive capital outflows in the region are attributed to poor governance, weak institutions, the abundance of oil and other natural resources that the region possesses, and the poor macroeconomic environment that has plagued the region. Moreover, the global financial crisis had a downstream impact in financial sectors of many countries in the region.

Figure 3 provides an insight into where the intensity of capital flight in the SADC region is positioned, and as such the need for the entire region to assist in drawing up policies to curb the phenomenon where it is prevalent.

Figure 3: Estimates of real capital flight from resource-rich countries (Billion, constant 2018 US$)



Source: Authors' computations data obtained from Political Economy Research Institute (PERI), 2018

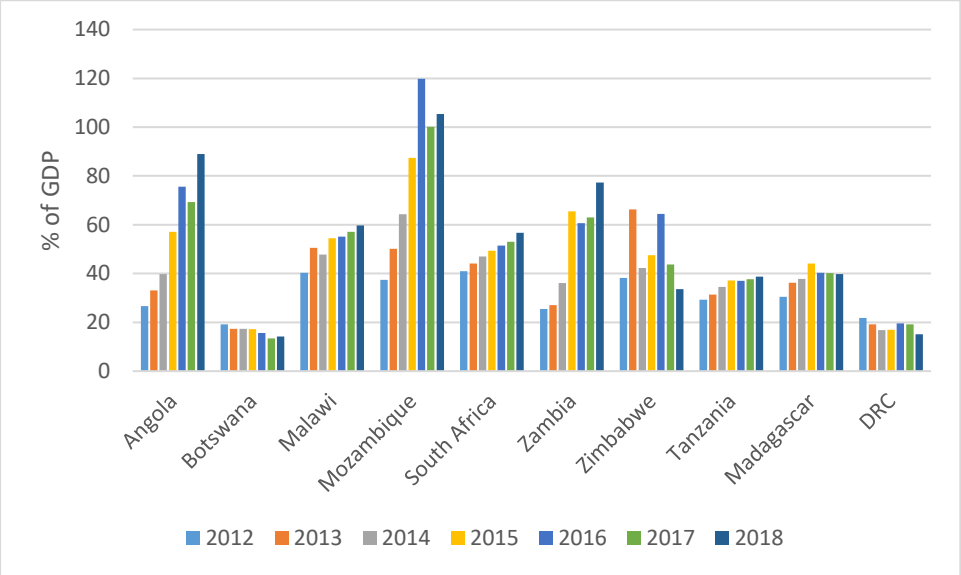
Capital flight rose rapidly among three resource-rich economies[6] relative to other countries in the sample as shown above. An important conduit of the relationship between capital flight and natural resources is the misinvoicing of exports of minerals (Kwaramba et al., 2016). One of the top contributors of capital flight is an oil-exporter (Angola) whereas the other two countries are rich in mineral resources. The volume of capital flight is highest over the period 2011-2018 for resource rich economies *(figure 3)* with estimates of US$197.7 billion relative to other countries in the sub sample with estimates of US$50.8 billion. For countries other than resource-rich economies, there is evidence of massive capital inflows *(negative capital outflows)* for the period 2003-2010 particularly for Zimbabwe, Malawi, and Tanzania. These negative capital outflows indicate reversals of foreign assets, officially unrecorded capital inflows (Demachi, 2014).

[6] Angola, South Africa and Zambia.

External debts

The external debt of SADC countries constitutes of debt owed to international financial institutions and the private sector. Since these debts are denominated in foreign currencies, they are vulnerable to exchange rate volatility. The rising debt capacity of these SADC economies can partly be explained by Highly Indebted Poor Country and the Multi-lateral Debt Relief initiatives implemented in early 2000, which increased the capacity of borrowing, the growing lending activities of non-Paris countries[7] such as China (World Bank, 2015). According to IMF (2018), total average public debt increased from 34.9% of GDP in 2010 to 54.9% in 2018. It is evidenced that external debts to African countries have intensified the flight of capital from the continent (Boyce & Ndikumana, 2012).

Figure 4: General gross government debt (percentage of GDP) of 10 SADC countries, 2012-2018



Source: World Economic Outlook Database (2021)

Upon realizing that management of debt is crucial for sustainable development in SADC, a benchmark of about 60% of public debt to GDP ratio was set. However, most countries in the region are in debt distress with estimates of 79.2% and 62.4% for Mozambique and Zimbabwe as of 2016 (Makate et al., 2018). In year 2018, Mozambique records the highest proportion of

[7] The Paris Club comprise of 22 member countries representing bilateral creditors who interrelate on debt issues for less developed countries. http://www.clubdeparis.org/

government debt (105.3%) followed by Zambia (77.3%). As of 2020, more than half of the countries in the sub-sample had gross government debt exceeding 60% of the SADC target[8].

1.4 Research Questions

- What is the relationship between capital flight, external debt and institutions in SADC?
- Does the nature of institutions in SADC exacerbate capital flight and external debt?

1.5 Objectives

The chief objective of the study is to investigate the mechanism through which capital flight manifests with special interest on political institutions and external debt in SADC. The specific objectives of the study are as follows:

- To investigate the relationship between capital flight, external debt, and institutions in SADC.
- To investigate whether weak institutions increase capital flight and external debt.

1.6 Organisation of the study

The rest of the study is organized as follows; section 2 presents the literature review, section 3 specifies the methodology and data used in the study. Section 4 gives interpretation of the results. Conclusion, policy recommendations as well as future research directions are provided in section 5.

[8] Angola, Malawi, Mozambique, South Africa, Zambia and Zimbabwe record estimates of 127.1%, 67.3%, 122.2%, 77.1%, 117.8% and 88.9% respectively (Trade & Development, 2020).

SECTION TWO

LITERATURE REVIEW

2.0 Introduction

This section reviews both theoretical and empirical literature on capital flight. Under the theoretical literature, the author outlines the theories on the major causes of capital flight that have been propounded by well-known scholars. A review of the empirical studies will therefore provide more details on how the theoretical notions were assessed, which will lay more groundwork for the research methodology. With regard to theoretical literature, the study is based on two major theories of capital flight which are: the portfolio choice framework and the four direct linkages of debt-capital flight thesis (Boyce, 1992).

2.1 Theoretical literature review

2.1.1 Portfolio Choice framework

The portfolio choice framework offers a variety of explanations for the apparent movement of capital flight. Following Pastor Jr (1990), capital flight arises due to the existence of favourable investment opportunities in advanced economies, like high foreign interest rates. In other words, massive capital flight occurs when expected returns in the domestic economy are low and economic risk is high which motivates private agents to seek investment opportunities in advanced economies. Another set of literature postulates that capital movements arise due to asymmetric risk of domestic and foreign assets (John T Cuddington, 1986). When private agents assume a risk of assets being seized by the government in the domestic economy, they are motivated to invest abroad where foreign capital is secured against risk by international institutions. Tax treatment differentials of domestic and foreign assets can also motivate private agents to invest abroad in order to maximise portfolio gains.

2.1.2 Direct linkages theories (Boyce, 1992)

Boyce (1992) identifies four interconnections between external debt and capital flight. Causality may run from external debt to capital flight and vice-versa. Debt-driven capital flight is a phenomenon in which capital flows out of a country owing to an increased probability of debt crisis, deterioration of the domestic investment climate. Debt-fuelled capital flight occurs when external debt provides funds as well as basis for transferring capital abroad. Flight-driven and flight-fuelled external borrowing explain causality running from capital flight to external debt. Flight-driven external debt results when capital flight drains up foreign reserves thereby forcing the public officials to engage in external borrowing. In relation to flight-fuelled external

debt, capital siphoned abroad by residents provide funds which are transferred back to the same residents in form of loans.

2.2 Empirical literature

To explore the broad area of capital flight, the researcher classifies literature into two categories which are determinants and relationships. Literature on determinants focusses on identifying the causes of capital flight in a country or cross-section of countries setup.

Several studies have found capital flight to be positively correlated with external debt (Ajayi & Ndikumana, 2014; Boyce, 1992; John T. Cuddington, 1986; Hermes & Lensink, 1992; Ndikumana & Boyce, 2003, 2011a; Pastor Jr, 1990). Increased external borrowing may instigate capital flight owing to residents' expectations about future debt crisis, deterioration of macro-economic conditions and the devaluations on the exchange rate, both of which have impact on the returns on domestic assets.

While investigating the reverse linkages between external debt and capital flight in Phillipines, Boyce (1992) finds evidence of a causal linkage between debt and capital flight running both directions. Larger debt led to capital flight and on the other hand larger capital flight led to huge debt which suggests a vicious circle. Based on the findings, the author concludes a revolving door phenomenon. Similarly Ndikumana et al. (2014) investigate the drivers of capital flight in 39 African countries, while considering the persistence of the phenomenon of capital flight. Their study suggest that in every 5 year period, 63 to 73 cents out of every dollar borrowed is siphoned out as capital flight. The study manages to incorporate the effect of governance and political instability on capital flight, by looking at variables such as duration of the political regime, Polity2 index. Their findings reveal that institutions are important determinants of capital flight.

Other studies have looked at the impact of institutions on capital flight with respect to a third macro-economic variable such as external debt, inflation, foreign direct investment (FDI) and economic growth. Cerra et al. (2008) discuss the relationship between capital flight, institutions and debt in a large panel of developing and emerging countries. The empirical results suggest that countries with poor institutions have a higher tendency to accumulate debt because poor institutions tend to drive capital flight which, in turn, creates a 'financial need'. The authors find evidence of a revolving door relationship between debt and capital flight. Furthermore, the authors find net foreign investment inflows, just like aid to reduce capital flight.

Kollamparambil and Gumbo (2018) investigates the macro-economic and institutional determinants of capital flight by linking the institutional quality variables from the World Governance Indicators (WGI) website and external debt to capital flight. The Systems Generalized method of moments (GMM) method was used to account for endogeneity among the regressors. The key findings from the paper are that low quality institutions, external debt, inflation and economic growth contribute to the flight of capital in a panel of 29 SSA countries. However, the systems GMM approach captures the short-run dynamics only, the long-run relationships between variables tend to be ignored because the approach is normally constrained to short time series. A thorough understanding of the long-run and short-run interactions between the variables is imperative for countries to consider policies towards reducing macro-economic imbalances caused by huge debt obligations and capital flight as well as policies that lead to repatriation of capital flight, to ensure enough capital resources are put in place for sustainable growth in the long-run. The current study employs the ARDL approach which provides more robust means of estimating long-run relationships between capital flight and macro-economic variables.

Previous studies reveal that weak institutions contribute to capital flight severely in resource-intensive economies (Arezki et al., 2011; Karl, 2007). Weak institutions contribute to poor economic performance, high uncertainty which discourage investment within economies, promotes tax evasion, embezzlement of state resources by public officials thus exacerbating capital flight.

Ndikumana and Sarr (2019) assert that countries that are highly endowed with natural resources, exhibiting high resource dependence are more prone to risks of capital flight because there is high concentration of power and corruption in those countries. This scenario manifests as a result of weak institutions and poor governance of the natural resource sector. Ploeg (2010) asserts that if the institutions are weak, there is lack of transparency and the legal system disfunctions thereby encouraging rent-seeking behaviour, corruption, unfair take-overs, illegal dealings etc. The author points out that resource dependence impedes democracy and quality of governance and crowds out social capital all of which have adverse effects on economic growth. Moreover, Ljungberg and Friedl (2014) posit that capital flight in resource-rich economies is attributable to rent-seeking behaviour, which can be mitigated by controlling for the quality of institutions. In the context of African economies, the evidence shows that bad institutions drive capital flight mainly in resource-rich economies (Boyce & Ndikumana, 2015;

Ndikumana & Boyce, 2003). Particularly, variables such as political stability, rule of law, property rights, government effectiveness and corruption play important roles in capital movements.

Some studies have investigated directly the impact of political risk on capital flight (Acemoglu et al., 2003; Alam & Quazi, 2003; Baek & Yang, 2010; Fatehi, 1994; Le & Zak, 2006; Lensink et al., 1998, 2000). Lensink et al. (2000) examine the relationship between political risk and capital flight for a large set of developing countries. The authors conclude that generally political risk is a statistically significant factor of capital flight once domestic and international macro-economic circumstances are considered. Thus, weak institutions aggravates the outflow of capital from developing countries, diverting scarce resources from fundamental development projects (Lensink et al., 2000). Their findings are substantiated by Hermes and Lensink (2002) who concludes that 'perceived ill' institutions may aggravate capital flight because residents lose confidence in the domestic economy thereby transferring their funds abroad. Moreover, Alam and Quazi (2003) employs the Bounds testing and ARDL model to assess the link between capital flight and both macro and non-macroeconomic determinants. Based on the findings, political instability is the most significant factor spurring capital flight in Bangladesh.

Fatehi (1994) discusses the correlation between capital flight and variations in political stability in 17 developed and developing countries. The author concludes that political instability spur capital flight by driving potential investors away from a politically volatile country. Similarly, Lensink et al. (1998) on a cross-sectional study between political risk and capital flight argue that political risk factors play an important role in the case where no other macro-economic variables are considered. Acemoglu et al. (2003) investigates the impact of institutions and macro-economic policies such as high inflation, overvalued exchange rates and large budget deficits on economic growth, volatility (standard deviation of GDP per capita growth) and crises (worst output growth). Measures of institutions such as constraints on the executive, rule of law, property rights, were used in the study. Based on the findings, constraints on the executive is an important measure of institutional quality and extractive institutions are the major source of macro-economic instability. This implies that macro-economic policies are minor causes of crises and volatility, and are manifestations of the underlying institutional problem. In summary, these aforementioned studies do not take into account endogeneity bias

arising from reverse causality between capital flight on the one hand and other macroeconomic variables.

Most literature on the determinants of capital flight have utilized time-series data (Chipalkatti & Rishi, 2001; Harrigan et al., 2002; Lawal et al., 2017; Liew et al., 2016; Ljungwall & Zijian, 2008). Regarding the correlation between external debt and capital flight, there are two conflicting arguments found in literature. The first strand of literature argues that foreign investors will export their capital abroad when the perceived risk of investment *(taxes, exchange controls, weak institutions)* and or expropriation in the domestic economy is higher than that elsewhere. Under such conditions, an increase in external debt will result in greater capital flight (Boyce, 1992; Harrigan et al., 2002; Khan & Ajayi, 2000; Ljungwall & Zijian, 2008). Another strand of literature suggests that an increase in external debt can lead to a reduction in capital flight, provided that external debt borrowed is used in productive sectors to stimulate economic development. Under such circumstances, lowering down external debt may deteriorate conditions in the domestic economy and result in massive capital flight (Chipalkatti & Rishi, 2001; Chunhachinda & Sirodom, 2007; Liew et al., 2016).

Harrigan et al. (2002) examines the determinants of capital flight for Malaysian time series data during the period 1970-1996. The authors employ the Johansen cointegration technique to estimate both long and short-run capital flight functions. Based on findings, changes in external debt, exchange rate movements, real GDP growth and FDI have long-run relationship with capital flight. The authors conclude a positive long-run relationship between external debt and capital flight, thus substantiating the revolving door hypothesis. All short-run dynamics between macroeconomic variables and capital flight were found to be statistically significant. Moreover, Liew et al. (2016) utilizing the bounds test for cointegration and the ARDL approach examine the determinants of capital flight in Malaysia. The key findings were that political risk and external debt have a long-run relationship with capital flight. The study also concludes a short-run causal impact from both determinants towards capital flight. However, in contrast to other studies, Liew et al. (2016) finds a negative long-run correlation between external debt and capital flight. Their findings are consistent with (Chipalkatti & Rishi, 2001) results.

In a nutshell, the relationship between external debt and capital flight has been the main focus of many researchers and policymakers, with the revolving door phenomenon being a more common research finding. However, little attention has been brought towards assessing how institutions can impact the flight of capital as well as debt in the SSA region. The researcher

feels the need to fill this gap as well as to attest the level of causality between the variables in a panel data setup.

SECTION THREE

DATA AND METHODOLOGY

3.0 Introduction

This section outlines the methodology that is used in analysing the nexus between capital flight, external debt and institutional quality. The methodology section is a vital component in research as it evaluates the study's overall validity and reliability. Various tests such as diagnostic tests, unit root tests, cointegration analysis and Ganger causality test will be performed. The study closely follows Ndikumana and Boyce (2008) for model specification.

3.1 Data

Panel data ranging from 1996 to 2018 for 10 SADC countries is utilized. Previous studies[9] attest that there is a positive correlation between natural resource-endowment and capital flight. Given the persistent and very high levels of capital flight in the SADC region, the author seeks to investigate the linkage by employing a sample of 10 resource-endowed countries in the region. These countries were selected based on data availability[10].

3.1.1 Capital flight

Literature has shown different definitions of the term capital flight thus resulting in various measures of capital flight. Boyce and Ndikumana (2012) define the phenomenon of capital flight as capital outflows from one country to another that are not captured in the Balance of Payments. The key channels through which capital flight exists are leakages through the balance of payments and trade mis-invoicing. The current study employs the residual estimate of capital flight adopted by Boyce and Ndikumana (2012) where;

$$capital\ flight = f(\Delta\ in\ stock\ of\ gross\ external\ debt, net\ foreign\ investment\ inflows, current\ account\ deficit, stock\ of\ official\ foreign\ reserves, misinvoicing, remittance\ inflow\ discrepancy)$$

The results of capital flight are expressed in constant 2018 dollars, making use of the US GDP deflator to convert nominal to real values of capital flight (Ndikumana & Boyce, 2018b). Data on capital flight (CF) is obtained from the Political Economy Research Institute (Peri) website.

[9] Demachi (2014); Atkinson and Hamilton (2003), Sachs and Warner (1995).
[10] Capital flight data is available up to 2018 whilst data on institutional indicators is available from the year 1996.

3.1.2 Institutional variables

Data on institutions used to capture numerous types of risk is obtained from World Governance Indicators. These indicators are political stability (POLSTA), rule of law (RL), control of corruption (CC), voice and accountability (VA), regulatory quality (RQ), and government effectiveness (GE). The standard units of these indicators ranges from (-2.5 to 2.5) with lower values implying the presence of weak institutions[11]. Moreover, to investigate governance, the author incorporates the Polity2 index[12] which measures the level of democracy, openness of a country`s elections and executive recruitment, the proportion of evaluation on administrative authority (Acemoglu et al., 2001). The data which ranges from (-10 to 10) is obtained from the Polity IV project database and the International Country Risk Guide (ICRG). Higher values indicate good governance, less likelihood of political instability. Hence a negative relationship between capital flight and Polity2 index is expected[13].

In order to mitigate the problem of multi-collinearity (*as shown in appendix 4*), the author constructs a composite indicator, which is the principal component analysis (PCA) to create an index of institutional quality (INST_Q). The rationale behind PCA technique is to reduce the magnitude of a set of highly correlated variables into a smaller set of uncorrelated variables, known as the principle components. The institutional quality variables are then considered separately in estimations.

3.1.3 External debt

Various literature shows a positive correlation between external debt and capital flight (Ajayi & Ndikumana, 2014; Boyce, 1992; John T. Cuddington, 1986; Hermes & Lensink, 1992; Ndikumana & Boyce, 2003, 2011a; Pastor Jr, 1990). Increased external borrowing may instigate capital flight owing to resident's expectations about future debt crisis, deterioration of macro-economic conditions and the devaluations on the exchange rate, both of which have impact on the returns on domestic assets. Given this, a positive relationship is expected between

[11] Following (Kollamparambil and Gumbo, 2018), the author rescales these indicators as $((10 - Indicator)^2)$ such that lower values imply better governance. These variables are then renamed to political instability, lack of rule of law, corruption, lack of voice and accountability, government ineffectiveness and lack of regulatory quality so that a positive relationship between capital flight and these transformed variables is expected. See appendix 5 for variable transformations.

[12] The Polity2 index has the advantage that it is reported over the authors's full sample period. Other measures of institutions such as the World Governance Indicators records missing values for years 1997, 1999 and 2001. These missing values are filled in by interpolation with the average of the values from the adjacent years.

[13] After rescaling the variable as $((10 - Indicator^2))$, higher values imply bad governance, thus a positive relationship is expected between the Polity2 index and capital flight. See appendix 5.

external debt and capital flight. For the purpose of the analysis, the author utilizes data on total external debt (ED) obtained from the World Bank.

3.1.4 Other macro-economic determinants

Some variables that are standard macro-economic determinants of capital flight in literature include foreign direct investment (FDI), inflation, trade openness, the level of foreign exchange reserves, GDP growth, natural resource abundance (Lensink et al., 1998). Natural resource abundance is deemed as an asset which can be liquidated in order to finance investment in other productive sectors of an economy. Thus, in principle countries with natural resource abundance should accrue more benefits in terms of growth and investment than resource poor countries. Hence, a negative correlation between natural resources and capital flight is anticipated. However, empirical literature has shown that resource-rich countries tend to lag behind in terms of growth and development (Sachs & Warner, 1995) which substantiates the resource curse hypothesis. A positive correlation between capital flight and natural resources may indicate that revenues obtained from natural resource exploitation finance capital flight. Hence the expected sign is ambiguous. Following Atkinson and Hamilton (2003), the author employs the share of all total rent in GDP (Rent) as a measure of resource abundance[14].

Trade openness drives capital flight through the removal of imposed restrictions on foreign trade and foreign exchange transactions which makes the transfer of funds abroad easier. Therefore, a positive relationship is expected between trade openness and capital flight. Moreover, decline in GDP growth rates leads to capital flight owing to the fact that investors might find safer places with higher returns to invest their funds. Therefore, an inverse relationship between GDP growth rates and capital flight is expected (Boyce & Ndikumana, 2012). The relationship between FDI and capital flight is expected to be negative.

[14] See appendix 5 for variable definitions and data sources.

Table 1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Kurtosis
Realcapitalflight	230	2167.52	6828.39	-19767.10	40811.52	19.81
ED	230	15515.42	28992.54	364.73	177125.69	16.85
GE	200	-.57	.62	-1.55	1.02	2.51
POLSTA	200	-.21	.65	-2.31	1.11	3.35
RR	200	-.57	.66	-1.85	.73	2.36
CC	200	-.53	.68	-1.52	1.22	2.99
RQ	200	-.56	.71	-2.24	.80	2.74
VA	200	-.37	.67	-1.67	.86	2.06
Polity2	230	3.62	4.29	-6	9	2.17
FDI	230	4.24	6.25	-6.37	40.17	15.37
RENT	230	11.66	10.86	.72	55.85	6.05
Tradeopenness	230	67.08	23.77	23.98	152.55	3.49
GDPGrowth	230	4.45	4.76	-17.67	19.67	7.19

Source: Author's computations

The summary of descriptive statistics above shows that capital flight, institutional quality variables and external debt differ across countries within the sample. Capital flight for the 10 countries in the study averaged US$2.167 billion dollars with a maximum value estimate of US$40.811 billion dollars. The distribution of capital flight in the region has a long-right tail (positively skewed) indicating higher values than the sample average, thus capital flight is more rampant in the SADC region. External debt stocks have an average US$15.515 billion and a standard deviation of US$28.992 billion, hence there is high variability in the levels of external debt in the region. Furthermore, all the indicators of institutional quality except for political stability are platykurtic, there are lower values below the sample average, implying the existence of low quality institutions in the SADC region. Foreign direct investment (FDI), trade openness and GDP growth have positively skewed distributions, hence there are higher values above the sample average.

3.2 Estimation Model

Following Ndikumana and Boyce (2008), the author constructs an econometric model that gives more weight to external borrowing, hysteresis and institutional quality variables.

Assuming a non-linear relationship between capital flight and institutional quality variables, the author adds the square of institutional variables to equation (1). The capital flight equation is estimated as follows:

$$\boldsymbol{KF_{it} = \sum_{j=1}^{q} \theta_j KF_{i,t-j} + \alpha_1 ED_{it} + \alpha_2 Quality_{it} + \alpha_3 Quality\ Squared_{it} + X_{it} + n_i + \varepsilon_{it}} \quad \textbf{(1)}$$

Where for country i,

KF is the real capital flight variable and (j=1….q is the number of lags), ED is external debt, $Quality\ Squared$ is the transformed institutional variable, X represents a vector of other macro-economic determinants such as trade openness (TO), foreign direct investment (FDI) and GDP growth, n_i is the country-specific intercept capturing the unobserved individual country characteristics, and ε is white noise error term.

3.3 Estimation Methodology

The analyses comprises of a heterogenous dynamic panel modelling where N<T for a sample period from 1996-2018[15]. An econometric problem encountered in time series data is the autocorrelation of residuals which might result in some or all coefficients being biased. The study seeks to minimize this problem by employing a panel autoregressive distributive-lag approach (ARDL) with an appropriate lag structure. The problem of autocorrelation can be mitigated by including a lags of dependent and independent variable or lags of first differences if a regressor is I(1) (Philips, 2018). The series of steps in an ARDL procedure include unit root tests followed by cointegration and lastly causality analysis. The use of this approach is motivated by the fact that most economic time series data is nonstationary, hence by applying this method, the author can investigate whether a relationship exists in the subject matter. However, the series must not be integrated of order two (I(2)). Furthermore, the ARDL approach permits different variables to have different lags thus, making the approach more flexible and versatile (Menegaki, 2019).

[15] The author could not employ the systems GMM method because of the condition N<T, one of the prime conditions to employ the systems GMM method is that T<N. Moreover, the use of Non-overlapping intervals in the GMM approach to satisfy T<N would result in estimated coefficients being interpreted as short-run effects (Asongu et al, 2016).

For robustness check purposes, the author employs the two-stage least squares (2SLS) procedure. Since the ARDL uses OLS, it is not capable of resolving the endogeneity problem, hence the instrumental variable approach such as the 2SLS is used. Thus, the author incorporates lagged variables of capital flight and debt among other instruments to cater for the endogeneity bias. Moreover, this method is used to account for hystereris in capital flight. Capital flight may exhibit habit-formation effect, as private agents gain experience in the smuggling of capital or the extensive corrosion of the legitimacy of capital controls (contagion effect). Following Ndikumana and Boyce (2003), the author incorporates two lagged levels of capital flight as instruments for the lagged difference of the endogenous variable.

3.3.1 Panel unit root test

It is necessary to check the integration order of the variables before examining any long-run relationship. Hence, the author performs unit root tests for all variables in the dataset. Considering that the panel might have a cross-sectional dependence (problem in macro panels with long time series), the author applies the Bresuch Pagan Langrage Multiplier (LM) test to check if the series are cross-sectionally dependent. The test is suitable for small N and large T panels ($N < T$). The procedure is then followed by an appropriate panel unit root test (CIPS) that accounts for cross sectional dependence in order to examine whether the series are stationary or not. The null hypothesis in this test is that all series are non-stationary.

3.3.2 Panel cointegration

If the presence of cross sectional dependence is confirmed in the model, using the general panel cointegration tests, such as Pedroni and Kao, will increase the occurrence of the spurious cointegration results. Hence, the author employs the Westerlund panel cointegration test.

Westerlund cointegration test

The Westerlund (2007) test is employed, which develops four new panel cointegration tests which are $G_t, G_a, P_t \; and \; P_a$. Regarding G_a and G_t rejection of the null hypothesis implies evidence of cointegration of atleast one of the cross sectional units. Considering P_a and P_t, however, implies evidence of cointegration for the panel as a whole. Westerlund employs the bootstrap approach to eliminate the cross sectional dependency effects on the tests.

3.3.3 Panel causality

The author then uses the PMG estimator to examine the relationship between capital flight, external debt and institutions. The PMG estimator allows for homogeneity in the long-run coefficients but restricts short-run coefficients (including the speed of adjustment) and the

regression intercept to be heterogeneous. The long run coefficients are estimated jointly across countries whereas the short run coefficients are estimated on a country-by country basis using the long run coefficients previously obtained. Pesaran et al. (1999) suggest other two different estimators which are the MG and DFE estimators. In order to test the suitability of the PMG estimator relative to other estimators, the author uses the Hausman (1978) test. Furthermore, the Schwartz-Bayesian criterion is used to select the best model with the lowest Bayesian information criterion. The base model between capital flight, external debt, institutions and other macro-economic determinants as ARDL (2, 2, 2, 2) is as follows:

$$\Delta \boldsymbol{CF_{it}} = \left[\boldsymbol{CF_{i,t-1}} - \boldsymbol{\gamma_i X_{i,t}}\right] + \sum_{j=1}^{p-1} \boldsymbol{\varepsilon_{ij}}\, \Delta \boldsymbol{CF_{i,t-j}} + \sum_{j=0}^{q-1} \boldsymbol{\beta'_{ij}}\, \Delta \boldsymbol{X_{i,t-j}} + \boldsymbol{\varphi_i} + \boldsymbol{e_{it}} \qquad \textbf{(2)}$$

Notes

- $\theta_i = -(1 - \delta_i)$, group-specific speed of adjustment coefficient (expected that $\theta_i < 0$)
- γ_i' = vector if long-run relationships
- $ECT = [CF_{i,t-1} - \gamma_i X_{i,t}]$, the error correction term
- ε_{ij} , β'_{ij} are the short-run dynamic coefficients

Panel causality can be drawn from the coefficients of the error correction term (ECT), which determines joint causality. Short-run and long-run causality can be drawn from the short-run and long-run coefficients respectively, whereas the ECT, long-run and short-run coefficients determine strong causality. Furthermore, the Dumitrescu and Hurlin (2012) granger non-causality test is performed.

Moreover, external debt has consistently shown in literature as a significant determinant of capital flight, suggesting the existence of a revolving door hypothesis. The author further estimates a 2SLS[16] approach to address the endogeneity problem arising from a bi-directional relationship between external debt and capital flight. The author observes that the specification gives similar results to those where the macro-economic variables are termed exogenous.

[16] The author could not employ the sys-GMM method because the sample size N<T. The condition for employing a GMM technique is T<N, hence the prime condition for use of the GMM is not satisfied.

SECTION FOUR

EMPIRICAL RESULTS PRESENTATION AND ANALYSIS

4.0 Introduction

This section focusses on the estimation, presentation and interpretation of results guided by the methodological procedure outlined in section three. The analysis first presents results for the unit root and cointegration tests followed by the Autoregressive Distributed Lag (ARDL) approach.

4.1 Cross sectional dependency test

Table 2 indicates results of the LM statistics for cross sectional testing. The results suggests a rejection of the null hypothesis that proposes cross-section units are independent for the entire variable.

Table 2: Cross sectional dependency testing

Test	Chi square	DF	p-value
Breusch Pagan LM test	71.85	45	0.007***

*Notes: *** denotes rejection of H_0 of the independency between cross section at 1% level of significance*

4.2 Unit root testing

Having found the presence of cross-sectional dependence in the panel, the first-generation unit root tests are not appropriate in this study. Hence, the author employs the second-generation unit root tests. Table 3 represents results of the CPIS unit root test. For robustness checking, the order of integration was rechecked using Pesaran's CADF test. The results of the CADF test are available upon request from the author.

Table 3: The CPIS unit root test

Variables	level	trend	First difference	Order of integration
L.RCF[17]	-2.839***	-3.179***		I(0)
L.ED[18]	-1.726	-2.631	-4.516***	I(1)
FDI	-3.191***	-3.339***		I(0)
GDP growth	-3.069***	-3.549***		I(0)
Rent	-2.579***	-2.859**		I(0)

[17] L.RCF represents the natural log of real capital flight.
[18] L.ED represents the natural log of external debt.

Trade openness	-2.689**	-3.241***		I(0)
GE	-1.698	-2.546	-3.547***	I(1)
POLSTA	-1.906	-2.251	-3.597***	I(1)
RR	-1.589	-1.976	-2.879***	I(1)
CC	-1.694	-1.831	-3.44***	I(1)
RQ	-1.871	-2.335	-3.668***	I(1)
VA	-2.173	-2.543	-3.076***	1(1)
POLITY2	-1.971	-2.023	-3.391***	1(1)

*Notes: *, **, *** denotes rejection of the null hypothesis of a unit root at 10%, 5% and 1% significance level respectively.*

The table 3 reports the CPIS unit root tests results. The results conclude that real capital flight, FDI, GDP growth, rent and trade openness are stationary in level. On the other hand, external debt, government effectiveness, political stability, rule of law, regulatory quality, voice and accountability and the Polity2 index are nonstationary in level. In summary, the existence of I(0) and I(1) variables in the model enables the author to successfully estimate short-run and long-run relationships between capital flight, external debt, institutions and other macroeconomic determinants using the ARDL approach.

4.3 Tests for cointegration

Table 4: Westerlund (2007) cointegration test results

Statistic	value	z-value	p-value	Robust p
Gt	-2.976	-2.372	0.009*	0.060
Ga	-9.073	1.366	0.914	0.170
Pt	-10.426	-4.284	0.000***	0.110
Pa	-10.237	-0.673	0.251	0.310

Notes: *, **, *** *indicate significance at 10%, 5% and 1% respectively.*

The author used the Westerlund ECM test to detect cointegration in the sample. The purpose of applying bootstrap approach is to eliminate cross sectional dependency effects on the tests as presented in robust P. Applying bootstrap to all the tests shows that the model has cointegration and there is a long run relationship between the variables. To verify further about the cointegration relationship, the author performs another cointegration test, the Pedroni (2004) test. Table 5 reports the results.

Table 5: Pedroni (2004) Cointegration test results

	statistic
Panel v-statistic	-2.976***
Panel rho-statistic	2.176***
Panel PP-statistic	-6.724***
Panel ADF-statistic	4.029***
Group rho-statistic	3.243***
Group PP-statistic	-9.585***
Group ADF-statistic	3.098***

*Notes: These statistics must be in absolute value larger than the critical value to reject the null hypothesis of no cointegration for all units in the panel. *, **, *** indicate significance at 10%, 5% and 1% respectively.*

Table 5 shows results of the Pedroni (2004) cointegration test. From both seven statistics, the author fails to reject the null hypothesis of no cointegration at 1% level of significance. Therefore, the author concludes that there is a long-run relationship between capital flight, external debt and institutions in the SADC region. The estimated model is based on the Schwatz Bayesian criterion (SBC). Table 6 presents results of the choices between the PMG and MG as well as the PMG and DFE estimators.[19]

As long as the long-run relationship exists in the model to be estimated, the study proceeds to ascertain the long-run and short-run estimates using the Pooled mean group (PMG) estimator.

4.4 Pooled mean group (PMG) results

Table 7 reports results based on the Pooled mean group (PMG) estimator. According to the Hausman test, the author accepts the PMG as a consistent and efficient estimator[20]. The PMG calculations were obtained by estimating a common ARDL (2, 2, 2, 2, 2, 2)[21] for all countries under study. According to the results, there is a strong causal relationship between capital flight

[19] The joint hausman test for comparison between the PMG and MG estimator records a pvalue of 0.855 in favor of the Pooled mean group (PMG) estimator. Furthermore, the test between the PMG and DFE estimator records a pvalue of 0.73 infavor of the PMG estimator.
[20] The results of the MG and DFE estimators are available upon request to the author.
[21] The author used Akaike and Schwartz Bayesian lag selection criteria with a maximum lag order of 2 (in order to maintain sufficient degrees of freedom) to select the most appropriate ARDL model. The results from the two methods point to a lag order of 2 for all variables (capital flight, external debt, institutional quality variables, FDI, GDP growth, trade openness and natural resource rents).

and external debt as shown by the long run and short run coefficients which are statistically significant. The persistent positive coefficient of external debt in the error correction model, further supports the direct association between external debt and capital flight. Thus, a rise in external debt has detrimental effects on capital flight as it raises agents' expectations about future taxation and exchange rate depreciation, which motivates them to acquire foreign assets. The findings of (Lensink et al., 1998; Ndikumana & Boyce, 2003) supports the hypothesis that external debt deters capital flight. Notably, the magnitude of external debt on capital flight becomes smaller once institutional variables are considered. This can only imply that capital flight in the region is highly driven by poor institutions (*further substantiated by the 2SLS estimates in Table 10*).

Regarding natural resource abundance, the coefficient of rent is positive and statistically significant even after controlling for institutional quality variables. This implies that resource abundant countries in SADC are prone to risks of capital flight. This finding is in line with studies by Ljungberg and Friedl (2014).

Moreover, the results show some variations in institutional variables. The first column in Table 7 indicates a composite index score (Inst_Q), containing 7 sub-components[22]. The estimation results indicate that marginal change in institutional quality as measured by (Inst_Q) score drives capital flight in the region. For robustness check, all sub-components of the institutional quality index were estimated. However, not all sub-components are significant factors affecting capital flight. Measures of political risk appear to be a strong driving force of capital flight in the SADC region. Among the sub-components of political risk, the common factors are political stability, rule of law, polity2 index *(which measures governance)*, all of which are associated with a threat to domestic and foreign investment as well as risk of future taxation. These measures show the expected negative signs in their estimated coefficients, indicating that marginal changes to the quality of institutions induces a response in capital flight at higher levels of institutional quality. The results also indicate that rule of law and the polity2 index are significant both in the short-run and long-run, whereas political stability is significant in the long-run. The relationship remains very strong after controlling for macro-economic variables that have been used in empirical literature. This is in line with Lensink et al. (1998) who conclude that capital flight can be mitigated by controlling for the quality of institutions such as political instability and uncertainty. According to them, residents faced with unstable

[22] Political stability, government effectiveness, control of corruption, rule of law, regulatory quality, voice and accountability and Polity2.

macro-economic environment and uncertainty are motivated to transfer their funds abroad in order to circumvent the likelihood of the government eroding the future value of their asset holdings.

The estimated results also reveal a nonlinear relationship between institutions and capital flight as indicated by the significant squared Inst_Q coefficient. In relation to the transformed variables, the positive sign indicates that marginal changes to quality of institutions induces a response in capital flight at lower levels of institutional quality. The impact of the squared institutions appear to be more stronger in that regression coefficients are significant at 1% and 5% even after controlling for other determinants. Most of the sub-components are significantly positive implying that poor quality institutions drive capital flight in the region. Again, the sub-components of political risk appear to be strong drivers of capital flight. Institutional variables such as political instability, lack of voice and accountability and polity2 index for governance show statistically significant non-linear relationships both in the long-run and short-run. In addition, the results further indicate measures of economic institutions to be drivers of capital flight in the short-run. Among them, control of corruption and rule of law show statistically significant positive coefficients after controlling for other macro-economic determinants. These variables are closely linked to risk of expropriation of assets of domestic residents. The results are supported by Le and Zak (2006), who reports that corruption has a positive significant impact on capital flight.

The coefficients of the error correction term (ECT) are both negative and significant. This indicates that there is a stable long-run relationship between the variables and an adjustment process occurs very quickly. In addition, the error correction term (ECT) indicates that all the variables jointly have an impact on capital flight.

Moreover, the coefficient of GDP growth in the long run and short run is negative and statistically significant. This implies that increasing GDP growth has the potential of reducing capital flight in the SSA region. Higher GDP growth rates indicate the existence of a good investment climate which in turn encourages investors to undertake more investments, thus lessening capital flight. The inverse relationship between GDP growth and capital flight concurs with the findings of Ndikumana and Boyce (2003), and Cerra et al. (2008). In line with Kant (1998), the FDI coefficient is negative and significant in the long run and short run, which shows that FDI is a strong driver of capital flight. This implies that capital flows serve as an indication of favourable returns to investment in the domestic economy, thus deterring capital

flight. The coefficient of trade openness is found to be insignificant for all short and long-run relationships. The lags of capital flight are excluded from the PMG results because the inclusion of lags of the dependent variable will result in inefficiencies.

Table 6: Hausman test for joint significance between PMG and MG as well as PMG and DFE estimation methods

	PMG	**DFE**
Chi(2) statistic	0.31 (0.855)	0.25 (0.734)
Number of iterations	8	
Log likelihood ratio	189.16	

P-value in parantheses

Table 7: PMG estimates for the 10 countries in SADC

Table 7: Dependent variable Capital flight: PMG results

Pooled Mean Group Estimates									
Variable	**Inst_Q**	**Political stability**	**Voice and accountability**	**Polity2**	**Control of corruption**	**Government effectiveness**	**Rule of law**	**Regulatory quality**
Long-Run Coefficients								
ED	0.839* (0.458)	0.014** (0.006)	0.029*** (0.005)	0.013*** (0.003)	0.0202* (0.012)	0.017* (0.009)	0.167*** (0.043)	0.011* (0.006)
FDI	-0.067* (0.054)	0.005* (0.001)	-0.005*** (0.001)	- 0.001*** (0.001)	-0.005*** (0.001)	-0.005** (0.001)	-0.003*** (0.001)	-0.005*** (0.001)
TO	0.030 (0.019)	0.0004 (0.0002)	0.0001 (0.0001)	0.001 (6.28e-05)	0.0002 (0.0002)	0.226 (0.226)	0.001 (8.79e-05)	0.0004 (0.0001)
GDPGrowth	-0.117 (0.084)	-0.002* (0.001)	-0.002 (0.001)	-0.006* (0.001)	-0.001 (0.001)	-0.0001 (0.002)	-0.002* (0.001)	-0.006*** (0.002)
Natural resource abundance (Rent)	0.019*** (0.005)	0.024*** (0.0047)	0.025** (0.009)	0.027** (0.008)	0.032*** (0.003)	0.031*** (0.007)	0.0384*** (0.007)	0.0411* (0.022)
Institutions#	-4.095* (2.250)	-0.051 (0.017)	-0.092 (0.019)	-0.054* (0.008)	0.045 (0.017)	-0.185 (0.099)	-0.099* (0.021)	0.286 (0.518)
Squared institutions	0.015*** (0.042)	0.051*** (0.017)	0.005*** (0.001)	0.003*** (0.0003)	0.004 (0.001)	0.0002 (0.002)	0.009 (0.001)	0.017 (0.034)
Hausman Test	0.855							
ECM	-0.86*** (0.106)	-0.74*** (0.074)	-0.79*** (0.098)	-0.57*** (0.102)	-0.69*** (0.079)	-0.72*** (0.075)	-0.70*** (0.097)	-0.73*** (0.0743)
Short-Run Coefficients								
Δ*ED*	0.533*** (0.083)	0.302*** (0.102)	0.218*** (0.101)	0.322*** (0.084)	0.125*** (0.007)	0.097*** (0.028)	0.112*** (0.034)	1.738 (1.465)
Δ*FDI*	- 0.024*** (0.007)	- 0.009*** (0.001)	-0.006* (0.003)	- 0.001*** (0.0004)	-0.009*** (0.002)	-0.006* (0.004)	-0.006** (0.002)	-0.056* (0.054)
Δ*TO*	0.00583 (0.003)	0.006 (0.005)	0.0108 (0.009)	0.002 (0.001)	0.009 (0.004)	0.0003 (0.0002)	0.001 (0.001)	0.003 (0.003)
Δ*GDPGrowth*	- 0.025*** (0.008)	- 0.004*** (0.001)	-0.007*** (0.002)	- 0.008*** (0.001)	-0.006*** 0.002	-0.006*** (0.002)	-0.004*** (0.001)	-0.025 (0.026)
Δ*Natural resource abundance (Rents)*	0.027** (0.009)	0.004** (0.002)	0.0111* (0.006)	0.061** (0.008)	0.003* (0.002)	0.158* (0.673)	0.011** (0.005)	0.009 (0.001)
Δ*Institutions#*	-0.834* (1.145)	-0.266** (0.085)	-0.105 (0.033)	-0.311* (0.082)	0.4299 (0.089)	0.411 (0.088)	-0.041** (0.017)	-0.159 (0.054)
Δ*Squared institutions*	0.004** (0.002)	0.018*** (0.004)	0.027*** (0.007)	3.95e-05*** (0.001)	0.002*** (0.007)	0.259 (0.255)	0.005* (0.001)	4.496 (4.008)
Constant	8.730*** (0.641)	6.900*** (0.662)	7.898*** (0.929)	5.251*** (0.892)	6.445*** (0.681)	6.702*** (0.703)	5.948*** (0.783)	5.440*** (0.561)
Observations	160	160	160	160	160	160	160	160

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

#Indicators have been rescaled $((10 - Indicator)^2)$ such that lower values imply better governance

Furthermore, by looking at the long-run coefficients of the PMG, the author infers a long-run causal impact between institutional variables[24], external debt, GDP growth and FDI at 1% and 10% level of significance.

While theory suggests that capital flight exhibits a strong degree of persistence, both the PMG, MG and DFE results are limited by the fact that they do not incorporate this possibility. Therefore, the author undertakes the Dumitrescu and Hurlin (2012) non-granger causality test and the two stage least squares estimations with lagged dependent variables included. The 2SLS however, offer benchmarks for comparison purposes.

To test whether the model fits well and is overall significant, the following diagnostic tests were performed.

Table 8: Diagnostic test results

Diagnostic test	**p-value**
Breusch-Godfrey serial correlation LM test	0.18
Breusch-Pagan Godfrey heteroskedasticty test	0.44
Jarque-Bera normality test	0.91

Source: Author's computations

The outcome of the diagnostic tests results indicates that the regression model passes all diagnostic tests against serial correlation, heteroscedasticity and normality of errors. This is because; the corresponding p-values are higher than 5% level of significance, hence the author rejects the null hypothesis.[25]

4.5 Causality analysis

For robustness check purposes, the author employs the Dumitrescu and Hurlin (2012) test to establish the direction of causality between capital flight and the variables of interest. The Dumitrescu and Hurlin (2012) causality analysis is the advanced form of granger causality analysis, and is suitable for panel data (Yüksel, 2017). The method requires that variables to be used in the analysis should be stationary (Dumitrescu & Hurlin, 2012). From the unit root table presented (*Table 3*), the variables real capital flight, FDI, GDP growth, rent and trade openness are stationary in levels. External debt and all institutional quality variables are non-

[24] Lack of political stability, voice and accountability, rule of law and Polity2 index.
[25] H_0: There is serial autocorrelation; the errors are heteroscedastic; the errors are not normally distributed.

stationary in levels, therefore the first differences of these variables are used in the analysis. Following Ndikumana and Boyce (2003), the author employs two lags of capital flight in the estimation method.[26]

Table 9: Dumitrescu Hurlin causality test results

Null hypothesis	Ztilde	Prob	Granger causality
ED does not granger cause RCF	0.945	0.434	Unidirectional causality RCF→ED
RCF does not granger cause ED	4.449	0.021	
GE does not granger cause RCF	0.925	0.355	No causality
RCF(-1) does not granger cause RCF	-1.403	0.161	No causality
RCF(-2) does not granger cause RCF	7.715	0.000	RCF(-2)→RCF
POLSTA does not granger cause RCF	2.498	0.012	POLSTA→RCF
RR does not granger cause RCF	0.462	0.644	No causality
CC does not granger cause RCF	4.352	0.037	CC→RCF
RQ does not granger cause RCF	-1.356	0.175	No causality
VA does not granger cause RCF	3.561	0.000	VA→RCF
PolityIV does not granger cause RCF	3.699	0.002	PolityIV→RCF
GDP growth does not granger cause RCF	-1.601	0.109	No causality

[26] The inclusion of two lags of capital flight is motivated by the fact that current capital flight might not respond to previous capital flight with immediate effect (1 period lag). The effects of capital flight might persist after some periods of time (ie 2 period lags and more).

FDI does not granger cause RCF	2.351	0.018	FDI→RCF
Rent does not granger cause RCF	2.304	0.060	RENT→RCF
Trade openness does not granger cause RCF	1.494	0.135	No causality

Table 9 details information about the causality relationship between the variables. The results indicate a uni-directional causality between capital flight and external debt, which runs from capital flight to external debt. Therefore, the author infers that there is a flight-driven external debt phenomenon prevalent in the region, which creates a 'financing need'. This suggests that external borrowing substitutes for the outflow of capital in the region. The estimated results indicate that natural resource abundance granger cause capital flight in the region, after rejecting the null hypothesis of no causality at 10% level of significance. This may due to the fact that there is high risk of embezzlement of revenues generated from resource rents due to corruption and rent-seeking in the management of natural resources (Ndikumana et al., 2014). Moreover, the null hypothesis of no causality between institutional quality variables[27] and capital flight were rejected, since the p-values were significant. Therefore, the nature of institutions drives capital flight in the SADC region, as the indicators of political institutions have a strong impact on capital flight. This leads to the conclusion that countries with poor quality institutions are highly linked to external debt accumulation through the withdrawal of domestic savings via capital flight.

In addition, foreign direct investment (FDI) has a causal impact on capital flight in the region, since the p-value is less 5% level of significance. This is in line with studies by (Cerra et al., 2008; Ndikumana & Sarr, 2019). An increase in FDI may be indicative of a strong domestic investment climate, which helps to stem capital flight. Moreover, previous capital flight has a causal impact on current capital flight, since the p-value is significant at 1% level. This implies that capital flight is persistent overtime, and past capital flight spur more capital flight in the

[27] Polity2 index, lack of voice and accountability, political instability and control of corruption at 1% and 5% level of significance respectively.

SADC region. Hence hysteresis is one of the drivers of capital flight. This finding is substantiated by the two-stage least squares (2SLS) results presented in Table 10.

4.6 Two stage least squares

Due to the presence of endogeneity between real capital flight and external debt, a two-stage least squares (2SLS) estimation method is used. The results in Table 10 serve as a robustness test for the results presented in Table 7. The hausman test[28] rejects the null hypothesis of exogeneity in the capital flight equation. Given the endogeneity problem, the author presents two stage least squares equations for capital flight and external debt. The author uses the lagged values of capital flight and GDP growth rate as instruments for capital flight, whereas the lagged values of external debt, trade openness and FDI serve as instruments for external debt. The use of lags of the endogenous variables as instruments is preferable since the endogenous variables are predetermined and therefore not correlated with the error term. The F-statistic for the joint significance of the debt instruments is 399 and 258 for the capital flight instruments, indicating that the instruments are strong and relevant. Table 10 provides results of the two stage least squares approach.

[28] Results of the Hausman test for endogeneity shown in appendix 6.

Table 10: Two-stage Least Squares results

VARIABLES	(1) L.RCF	(2) L.ED	(3) L.RCF	(4) L.ED
L.ED	0.317**		0.218**	
	(1.049)		(2.141)	
RENT	0.008**	0.001	0.518*	0.400
	(0.018)	(0.002)	(1.748)	(0.892)
RENT × L.ED			0.051**	
			(0.073)	
$(Inst_Q)^2$	0.031**	0.006	0.024***	0.036
	(0.116)	(0.019)	(0.164)	(0.079)
$(Inst_Q)^2$**× L.ED**			0.205**	
			(0.552)	
GDPGrowth	-0.004*		-0.006**	
	(0.044)		(0.024)	
Inst_Q	0.653	0.143	-0.592*	0.742
	(2.478)	(0.383)	(3.286)	(1.586)
Inst_Q × L.ED			-4.976	
			(10.64)	
L.RCF(-1)	0.0616**	0.00117*	0.0782***	0.0376*
	(0.103)	(0.0158)	(0.0752)	(0.0439)
L.RCF(-2)	0.040*	0.018	0.037**	0.016
	(0.075)	(0.038)	(0.076)	(0.042)
Inst_Q× RENT			-0.111	-0.093*
			(0.369)	(0.190)
$(Inst_Q)^2$**× RENT**			0.005***	0.004**
			(0.018)	(0.008)
L.ED(-1)	0.108		0.120	
	(0.116)		(0.0945)	
FDI(-1)	-0.003		-0.003*	
	(0.027)		(0.020)	
TO(-1)	0.061*	0.001	0.052*	0.001
	(0.008)	(0.002)	(0.013)	(0.003)
L.RCF		0.666***		0.743**
		(0.139)		(0.243)
$(Inst_Q)^2$**× L.RCF**				0.1629***
				(0.0278)
FDI		-0.042*		-0.025**
		(0.021)		(0.006)
GDPGrowth(-1)		-6.92e-05**		-0.002
		(0.004)		(0.013)
Constant	14.55	-0.130	14.46	-9.512
	(13.25)	(2.854)	(16.30)	(8.461)
Observations	190	190	190	190
R-squared	0.426	0.408	0.439	0.413

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Author's computations

The relationship between external debt and capital flight may be bi-directional, thus indicating simultaneity. External debt may provide resources that may be channeled abroad (debt-fuelled capital flight) or capital flight may drain financial resources thus creating a financing need (flight-driven external debt). In the latter, external borrowing may act as a substitute for the outflow of domestic savings. From the evidence above (*see table 10*), both debt-fuelled capital flight and flight-driven external debt are significant in the 2SLS table. With reference to the debt-fuelled capital flight, for each dollar of external borrowing, 32 cents and 21 cents flows

out as capital flight respectively. Furthermore, the flight-driven external debt channel indicates that each dollar of capital flight draws in 66 cents and 74 cents of external debt respectively. The flight-driven external debt hypothesis continues to dominate in the region which conforms to the granger-causality test results in table 9. The regressions also tentatively indicate that better quality institutions are associated with less capital flight. The coefficient ($Inst_Q$) is negative and significant at 10% level, even after controlling for interaction terms. In line with the PMG results, a non-linear relationship between the quality of institutions and capital flight is observed, as indicated by the significant ($Inst_Q^2$) coefficient. The impact of institutions on capital flight is positive and significant whereas on external debt it is insignificant. This indicates that poor institutions affect capital flight directly resulting in massive capital outflows. The resultant capital shortage is met by external borrowing which supports the flight-driven external debt thesis. These findings are collaborated by Cerra et al. (2008). Furthermore, the results also indicate a vicious cycle of capital outflow that is previous capital flight drives the flight of capital in the region.

Sachs and Warner (1999) stress on the role of institutions in explaining the adverse effects of natural resource abundance on growth. If previous literature attest the presence of the resource curse hypothesis[29], it would be interesting to examine the moderating effect of institutions conditioned on natural resource abundance in the debt-capital flight regressions. For instance, interacting natural resource abundance with the quality of institutions might indicate whether it is the combination of resource abundance and institutions that drives capital flight in the region. The combined effect of both resource abundance and institutional quality on capital flight and external debt is examined in regression (3) and (4) in Table 10. While the coefficient of RENT is found to be positive and insignificant in regression (1), the interaction between ($RENT \times L.ED$) in regression (3) is positive and significant at 5% level. This appears to suggest that resource abundant countries with relatively high levels of external debt drive capital flight in the region. This implies that external debt is an important driver of capital flight in the region. Demachi (2014) concludes that while a positive correlation between capital flight and resource rents is found, there is a stronger correlation between capital flight and external debt inflows. In order to assess whether good institutions mitigate the effects of natural resource rents on capital flight, an interaction term ($Inst_Q \times RENT$) was incorporated in regression

[29] See Atkinson, G., & Hamilton, K. (2003). Savings, growth and the resource curse hypothesis. *World development*, *31*(11), 1793-1807. ; Sachs, J. D., & Warner, A. (1995). Natural resource abundance and economic growth.

(3). Unlike Ndikumana and Sarr (2019), the coefficient on the interaction term is negative as expected, however it is not significant.

The estimated results also indicate nonlinear relationships between the combination of institutional quality, natural resource abundance and external debt on flight of capital. The interaction between squared institution and external debt ($Inst_Q^2 \times L.ED$) is positive and significant at 5% level. This indicates that a combination of high external debt and low quality institutions motivates the flight of capital in the SSA region. Regression (1) includes RENT as an explanatory variable and finds that the coefficient is positive and insignificant. Notably, in regression (3), the coefficients on the interaction ($Inst_Q^2 \times RENT$) is positive and highly significant at 1% level. This seems to indicate natural resource endowment alone cannot impact on capital flight but a combination of low quality institutions and resource abundance, ceteris paribus aggravates capital flight. In other words, resource dependent countries with relatively low quality institutions motivates capital flight in the region by promoting rent-seeking behaviors. This concurs to the findings of Perez et al. (2012) who concludes that natural resources may provide a channel for rent-seeking capital inflows that are driven by illicit motives. The evidence suggests that natural resources act as a conduit of capital flight in the context of bad institutions.

Interestingly, in regression (4), the coefficient on the interaction ($Inst_Q^2 \times L.RCF$) is positive and significant at 5% level. This seems to indicate that countries with massive capital flight coupled with low quality institutions source out funds by acquiring more external debt in order to offset liquidity shortage, thus creating a 'financing need'. The results are supported by Cerra et al. (2008).

SECTION FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.0 Introduction

A summary of the study is provided in this section, which analyses the mechanism through capital flight manifests with respect to institutions and external debt. Thereafter, major policy recommendations and suggested areas of further study are outlined.

5.1 Summary of findings and conclusion of the study

The study estimates the relationship between capital flight, external debt, institutional quality variables as well as other controlled macro-economic variables of the model. The author utilizes the ARDL approach to achieve this objective. From the PMG estimates, external debt retained its expected sign and statistically significant across all specifications it appeared in the model. The relationship remains very strong after controlling for macro-economic and institutional quality variables that affect capital flight. Moreover, the author infers that institutional quality variables have a non-linear impact on capital flight. Variables such as lack of political stability, voice and accountability, Polity2 index (*which measure the extent of democracy, and political confidence*), rule of law and control of corruption significantly affect capital flight in the short-run, whereas in the long-run, political institutions (lack of political stability, Polity2 score, and voice and accountability) spur capital flight. Furthermore, other macro-economic variables regressed on capital flight reveals interesting results, including a statistically significant negative effect between FDI and capital flight as well as between GDP growth and capital flight in the short-run. However, FDI is statistically significant and negative in the long-run. Foreign direct investment, unlike debt, eliminates the risk of higher future taxation thereby reducing capital flight. This indicates that FDI plays a critical role in explaining capital flight in the region. Moreover, countries with natural resources are highly prone to capital flight in the region as indicated by the significant coefficient of the share of rent in GDP.

The author further provides estimates of the granger causality test to analyse the level of causality between the variables. Results of the Dumitrescu and Hurlin (2012) non-granger causality test predicts a uni-directional relationship running from capital flight to external debt. The results supports the flight-driven external debt hypothesis. Furthermore, institutional quality variables such as political stability, voice and accountability as well as the variable which measures political confidence and extent of democracy (Polity2 score) were found to

granger-cause capital flight. This provides evidence that the nature of institutions particularly political institutions drive capital flight in the SADC region. Furthermore, FDI granger causes capital flight in the region. The results also indicate that past capital flight spur more capital flight in the region (hysteresis). This suggests that capital flight persist overtime and past capital flight begets more capital flight in the region.

To cater for endogeneity between external debt and capital flight, the author runs a two stage least squares (2SLS) approach. From the regressions estimates, the author concludes a revolving door hypothesis. There is evidence of debt-fuelled capital flight as well as flight-driven external debt, although the magnitude of the latter is very high. The extent of flight-driven external debt phenomenon is more prevalent in the SADC region. Furthermore, the author concludes that the effect of natural resource abundance is non-trivial, but rather natural resource abundance coupled with poor institutions drive capital flight in the region. The interaction between natural resources and external debt also appear to be a driver of capital flight in the region. This implies that excessive borrowing in resource-rich economies might instigate capital flight owing to increased probability of debt crisis. Moreover, institutional quality variables are found to be statistically significant determinants of capital flight. Interestingly, institutional quality variables do not impact external debt directly but lead to a rise in external debt through capital flight. Thus, in conclusion, resource-rich economies with relatively poor quality institutions drive capital flight resulting in countries accumulating debt to offset the loss of domestic savings associated with capital flight.

5.1 Contribution of the study

The contribution was based on the need to assess the relationship between capital flight, external debt and institutional quality in SADC. The study explored the effect of natural resource on capital flight and examined whether poor quality institutions exacerbate the resource-capital flight link. The author finds that natural resource endowment is a possible mechanism for the capital flight-external debt phenomenon in countries with relatively poor institutions. Regarding institutional quality, a non-linear relationship on capital flight was found, and this effect remains significant after controlling for natural resource abundance. In relation to the debt-flight hypothesis, the study reveals that high capital flight induce domestic governments to acquire external debt to offset the financial shortages within economies. As of institutions, the study finds no direct impact of institutional quality on external debt, however, institutions impact on debt indirectly by increasing capital flight, which in turn generates a ‘financing need’ that is met by further accumulating debt. Based on the findings, the existence

of poor quality institutions in resource abundant economies aggravates capital flight in the SADC region.

5.2 Recommendation/s (Policy insights)

The study indicates that resource-endowed economies in the SADC region are exposed to capital flight, which may take the form of export mis-invoicing and embezzlement of funds. Therefore, African governments need to set up powerful legal frameworks on transparent and responsible management of natural resources so as to abate trade mis-invoicing and manipulation of transfer pricing in the SADC region. More so, there is need to formulate policies that will generate capital flight reversal as well as prevent further capital flight in the region. Political institutions matter for instance, better democratic environment coupled with better domestic investment climate conducive to allocating available funds to beneficial projects are important fundamentals to achieving this. Curtailing capital flight not only avail resources for developmental projects within economies, but generates the funds necessary to mitigate the impact of Covid-19-induced economic crisis as well as intensify resource-mobilization efforts to achieve the 2030 Agenda for Sustainable Development.

Due to data constraints, the study ignores other socio-political factors such as property rights that could possibly have a major impact in the flight of capital from the SADC region. The issue of property rights is one of the biggest hurdles to wealth creation and economic development in the continent of Africa. Thus, further research should incorporate this factor into account, as it will guide policy makers in formulating policies concerning capital flight.

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Appendices

Appendix 1: Correlation matrix of institutional variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) GE	1.000						
(2) POLSTA	0.646	1.000					
(3) RR	0.888	0.804	1.000				
(4) CC	0.933	0.736	0.917	1.000			
(5) RQ	0.905	0.727	0.935	0.909	1.000		
(6) VA	0.906	0.733	0.932	0.895	0.936	1.000	
(7) Polity2	0.636	0.651	0.705	0.685	0.679	0.769	1.000

Appendix 2: Correlation matrix for macro-economic variables

Variables	(1)	(2)	(3)	(4)	(5)
(1) Realcapitalfli~t	1.000				
(2) ED	0.611	1.000			
(3) FDI	-0.088	-0.142	1.000		
(4) Tradeopenness	-0.041	-0.131	0.346	1.000	
(5) GDPGrowth	-0.029	-0.142	0.135	0.079	1.000

Appendix 4: Principal component analysis

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	5.866	5.382	0.838	0.838
Comp2	0.484	0.120	0.069	0.907
Comp3	0.364	0.240	0.052	0.959
Comp4	0.124	0.057	0.018	0.977
Comp5	0.067	0.011	0.010	0.986
Comp6	0.056	0.016	0.008	0.994
Comp7	0.040	.	0.006	1.000

Appendix 5: Variable definitions and data sources

Variable name	Definition	Expected sign of coefficient for unchanged variable	Rescaling	Expected sign for rescaled variable	Data source
Real capital flight		Dependent variable	-	-	PERI Research Report. https://www.peri.umass.edu/capital-flight-from-africa
External debt	External debt stocks, total (constant US$)	Positive	-	-	The World Development Indicators http://data.worldbank.org
FDI	Net inward FDI flows as a percentage of GDP	Negative	-	-	The World Development Indicators http://data.worldbank.org
TO	Trade openness: exports + imports as a percentage of GDP	Positive	-	-	The World Development Indicators http://data.worldbank.org
GDP growth	Growth rate in Gross Domestic Product (at constant USD prices)	Negative	-	-	The World Development Indicators http://data.worldbank.org
Natural resource abundance	Share of resource rents in GDP	Positive	-	-	The World Development Indicators http://data.worldbank.org
Political stability	Political Stability and Absence of Violence. Government stability and the unlikelihood of internal and external conflict. Range= -2.5 (worst) to 2.5 (best)	Negative	$((10 - Indicator)^2)$	Positive	The World Bank-Worldwide Governance Indicators (www.govindicators.org)

Regulatory quality	The investment profile of a country and the assessment of factors related to the risk of investment. Range= -2.5 (worst) to 2.5 (best)	Negative	$((10 - Indicator)^2)$	Positive	The World Bank-Worldwide Governance Indicators (www.govindicators.org)
Rule of law	Measures the extent to which agents abide by the rules of society. It includes indicators for the protection of property rights and predictability of the judiciary. Range= -2.5 (worst) to 2.5 (best)	Negative	$((10 - Indicator)^2)$	Positive	The World Bank-Worldwide Governance Indicators (www.govindicators.org)
Government effectiveness	Capacity of the government to formulate and enforce policies. It includes measures of the quality of civil service and bureaucratic efficiency. Range= -2.5 (worst) to 2.5 (best)	Negative	$((10 - Indicator)^2)$	Positive	The World Bank-Worldwide Governance Indicators (www.govindicators.org)
Control of corruption	Controls on the level of corruption and the extent	Negative	$((10 - Indicator)^2)$	Positive	The World Bank-Worldwide Governance Indicators (www.govindicators.org)

	to which public power is exercised for private gain. Range= -2.5 (worst) to 2.5 (best)				
Voice and accountability	Captures the extent to which citizens participate in the selection of governments and freedom of press. Range= -2.5 (worst) to 2.5 (best)	Negative	$((10 - Indicator)^2)$	Positive	The World Bank-Worldwide Governance Indicators (www.govindicators.org)
Polity2 index	Polity 2 score= -10 (worst) to 10 (best)	Negative	$((10 - Indicator)^2)$	Positive	PolityIV Project database (online)

Appendix 6: Hausman test for exogeneity

Durbin (score) chi2(1)	25.0914 (p=0.000)
Wu-Hausman F(1, 193)	25.139 (p=0.000)

Appendix 7: Countries in sample

Angola	Mozambique
Botswana	South Africa
DR. Congo	Tanzania
Malawi	Zambia
Madagascar	Zimbabwe