CAPITAL MOBILITY AND ECONOMIC GROWTH IN SOUTH AFRICA

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DECLARATION

I, the undersigned, Nonceba Michelle Dhlamini, student number G18D8666, hereby declare that this research is my own original work and that all the reference sources have been accurately reported and acknowledged and that this document has not been previously submitted at any University, Technikons or Colleges for a similar or any other academic qualification.

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ABSTRACT

The South African current account balance has been deteriorating over the years. An investigation of the correlation between capital mobility and economic growth is of interest as South Africa is heavily reliant on capital inflows to finance the current account deficit. This research topic is of importance as there is need to devise policies that maximise the benefits the nation derives from capital mobility. The benefits that capital flows provide economies, theoretically outweigh the disadvantages, provided that capital flows are absorbed productively. The topic is also of interest in the light of the magnitude of shocks to the South African economy such as the rand crisis, dotcom bubble, stock market bubble, inflation targeting, commodity super cycle, global financial crisis, the Covid-19 pandemic and Russo-Ukrainian War, as these shocks have translated to slower economic growth and higher levels of inflation. These shocks have equally revealed that countries need to have sound macroeconomic policies in order to survive the impact of any crises.

The vision 2030 secretariat has identified capital markets as the key providers of capital required for achieving social economic blueprint. The empirical evidence locally is limited in comparison to the empirical evidence from outside of South Africa. This topic is of importance as South African studies on this topic are not as recent and this study aims to bridge that gap. Data were obtained from the South African Reserve Bank Quarterly Bulletin and the World Bank database for the period 1990 to 2022. The Autoregressive Distribution Lag model was employed in order to determine the relationship. This study relied on the supply-leading theory which posits capital markets may positively or negatively affect key indicators of economic growth. The study found that there is a positive long run relationship between net capital flows, saving-investment ratio and economic growth and a negative long run relationship between the degree of trade openness and economic growth. The findings will allow opportunity to address capital flow surges and in turn boost investor confidence. Capital flow management measures can help manage destabilizing exchange rate movements and capital flows coupled with macroprudential tools helping reduce the domestic buildup of vulnerabilities.

Keywords: Capital mobility, Economic growth, Autoregressive Distribution Lag model, Crises

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LIST OF ABBREVIATIONS

AIC	Akaike information criterion
ANC	African National Congress
APEC	Asia-Pacific Economic Cooperation
ARDL	Autoregressive Distribution Lag Model
CUSUM	Cumulative sum of residual (CUSUM)
CUSUMSQ	Cumulative sum of squares of recursive residuals
DTO	Degree of Trade Openness
ECM	Error Correction Model
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
IMF	International Monetary Fund
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
NCF	Net Capital Flows to GDP
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
OPEC	Organization of the Petroleum Exporting Countries
PP	Philips-Perron
SARB	South African Reserve Bank
SAV-INV RATIO	Saving-Investment Ratio
TYDL	Toda and Yamamoto and Dolado and Lütkepohl
UK	United Kingdom
USA	United States of America
VAR	Vector Autoregressive Model
VECM	Vector Error Correction model

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Capital mobility describes the manner in which capital is transferred across national borders with the aim of attaining productive risk-return combinations (Al-Jassar and Moosa, 2020). It is important for both the source and recipient country as it allows for the movement of capital from a less productive environment to a more productive one. There are a number of factors that determine the degree of capital mobility which range from capital controls, taxes, rules and regulations and the volatility of the exchange rate (Al-Jassar and Moosa, 2020).

Capital controls may affect the extent to which capital is mobile as these controls restrict the movement of capital across national borders. When there are periods of high capital mobility, taxes on capital allow opportunity for taxes to be evaded as funds can be taken out of the country (Montiel, 1994). During periods of high capital mobility, monetary authorities seek to avoid excessive volatility in the exchange rate. In order to achieve this, a two-way relationship should exist between exchange market pressures and short-term interest rates domestically (O'Connell et al., 2010). Interest rates which are subject to stipulated legal restrictions are affected by the implications of financial openness (Montiel, 1994).

The influence of capital mobility may prove to be either productive for economies or counterproductive (Al-Jassar and Moosa, 2020). The productivity may be assessed by looking at the better risk-return tradeoffs that have been attained or even the enhancement of the recipient developing economies. The enhancement of developing economies entails lower financing costs, the improvement in the allocation of resources across firms, the improvement in production, the boosting of aggregate productivity and the incentivizing of technology upgrades (Bau and Matray, 2020; Varela, 2017; Larrain and Stumpner, 2017; Li and Su, 2020). During periods of strong capital inflow, there are little signs of credit or asset market bubbles (Kahn, 2015).

Counter productivity on the other hand, may be assessed by looking at the consequences of high capital mobility. Financial deregulation and the liberalization of the capital account of the balance of payments result in high capital mobility. During periods of uncertainty, the sudden outflow of

capital may result in a financial crisis which if uncontained may lead to an economic downturn. A high degree of capital mobility may cause asset price bubbles and credit booms. Certain vulnerabilities associated with balance sheet effects may equally be present due to a higher degree of capital mobility (Kahn, 2015). High levels of capital mobility equally may aggravate the outcomes of exchange-rate misalignment (Haque and Montiel, 1990). Excessive volatility may be realized such as the currency being overvalued (Kahn, 2015). A higher degree of capital may possibly lead to less competitiveness as a result of real appreciation in the currency (Kahn, 2015). The consequences of high capital mobility result from the fact that the economy is exposed to external shocks and to the shifts in foreign investor sentiment (Pasricha and Nier, 2022). In an unlikely case when perfect capital mobility results, there will be noticeable loss in monetary autonomy and thus countries will fail to conduct an independent monetary policy. This reveals how the degree of capital mobility, has profound implications that affect the different policy instruments thus forcing policymakers to make alterations to existing policy or even implement new policies over time (Bayoumi, 1990).

During the apartheid era in South Africa, severe capital controls were instituted. The idea behind these controls was to encourage the channeling of local savings to domestic investment (Khumalo and Kapingura, 2014). Capital controls were also placed on residents to avoid large-scale capital flight (Alami, 2018). The apartheid era was a period of isolation in South Africa. There were various factors which contributed to this period of isolation which were the temporal suspension of financial liberalization policies, intensifying existing international sanctions and reintroducing the financial Rand and the debt moratorium (Alami, 2018).

During the post-apartheid era, however, the capital account was liberalised when the government had seen how the debt crisis, high levels of unemployment and the falling GDP had negatively affected the economy. Capital account liberalisation was equally possible because of the strength of structural economic reform (Khumalo and Kapingura, 2014). Capital account liberalisation was seen as an ideal decision by the then government as economists tied the liberalisation of the account to the development of financial markets which would improve the country's liquidity thus bettering the economy (Bacchetta, 1992). Over the years, capital account liberalisation has been viewed as a potential contributory factor affecting economic growth (Khumalo and Kapingura, 2014). In

comparison to other developing counties such as Mexico and Indonesia, the South African Gross Domestic Product is largely accounted for by its stock market (Hassan, 2013).

There are various theories that can be used to unpack the relationship between capital mobility and economic growth. The supply-leading theory, demand-following theory, mutual causation and mutual exclusion are the four main theories that can be used to describe the relationship between capital mobility and economic growth (Escobar, 2011). The financial liberalization theory can equally be used to explain the relationship between capital mobility and economic growth (Idenyi et al, 2017). Additionally, the prior-savings theory can be used to explain the relationship between capital mobility and economic growth.

Capital mobility is measured in various ways, namely, the saving-investment correlation, the interest rate parity test and other measures such as asset diversification and political risk. The saving-investment correlation is based on Feldstein and Horioka's 1980 work. This correlation depicts when capital is mobile or immobile based on the level of savings and investments available within a country. The rationale of Feldstein and Horioka's 1980 work is that under perfect capital mobility, domestic investment constrains domestic savings resulting in a low correlation between savings and investments. Asset diversification is used as a measure of capital mobility as a well-integrated capital market should facilitate risk sharing meaning that both lenders and investors can protect themselves against local risk by means of diversification outside their country's frontiers. As a country's international indebtedness rises, investors become more reluctant to lend or invest in that county (Dooley and Isard, 1980). This explains why political risk is used as a criterion to measure capital mobility.

Economic growth on the other hand, is determined by comparing how a rise in the capacity of an economy to produce goods and services changes from one period of time to another (Abbas, 2005). The level of investments within the economy, the adequacy of human capital, economic policies, the trade openness of the economy, political and demographic factors all determine how an economy has grown (Matiti, 2013). In nominal terms, economic growth can be measured with the inclusion of inflation and in real terms, economic growth is adjusted for inflation such as looking at the increase in the percent rate of the gross domestic product (Matiti, 2013). Positive economic growth can be viewed as the expansion of the economy whereas negative economic growth entails the shrinkage of the economy such as an economic recession and economic depression. Changes

in economic growth, domestic inflation and exchange-rate returns on investment have to be closely monitored as they affect capital flows within a country (Wesso, 2001).

There are a varying number of shocks that have affected the mobility of capital over the years. Global capital flows had steadily increased until the global financial crisis emerged. The rate at which capital flows had increased sharply, became negative late in 2008 (Milesi-Ferretti et al., 2011). At the beginning of the Covid-19 crisis, evidence revealed a large amount of capital outflows from South Africa (Makrelov et al., 2021). According to Wesso (2001), capital outflows will be diminished when there is high domestic real economic growth as this growth indicates a favourable investment climate. This implying the reverse causality between capital mobility and economic growth.

1.2 PROBLEM STATEMENT

Capital flows permitted a buildup of a large sovereign debt position which is a troublesome form of financing as the lender shares with the borrower relatively little risk. Sovereign debt is problematic because declining government creditworthiness also spills over to the credit profiles of firms and households. This leads to higher taxes and lower public sector investments to accommodate higher interest payments. This puts the country in an unsustainable fiscal position which becomes a drag for the economy. Capital flows have equally eroded potential growth as debt can weaken financial institutions by weakening systems of patronage and corruption, driving out skilled and diligent public servants (IMF, 2023).

However, the benefits that capital flows provide economies with, outweigh the disadvantages, provided that capital flows are absorbed productively. Global capital flows can be used to support investments opportunities, reduce financing costs and accelerate convergence in developing economies especially where domestic savings are below investment needs for countries. In such countries where domestic investments are more than local savings doing without significant economic growth is deemed as an unattractive strategy. Capital flows should instead be welcomed to control the risks and nurture institutions that can deliver productive investment choices as strength for institutions is so important (IMF, 2023).

The relationship between capital mobility and economic growth in South Africa is a topic of interest as South Africa is heavily reliant on capital inflows to finance the current account deficit. The current account balance has been widening over the years and chances are that South Africa will not be able to cover the deficit amount provided that capital outflows are not managed well. Large and sustained capital flows have allowed for a higher level of investment in Australia. Australia has relied on capital flows in order to deal with their current account deficit instead of relying only on local savings. An unsustainable current account deficit which would weaken the rand and drive up inflation which leads to slowed economic growth (IMF,2023).

An investigation on the correlation between capital mobility and economic growth is also of interest in the light of the magnitude of shocks such as the rand crisis, dotcom bubble, stock market bubble, inflation targeting, commodity super cycle, global financial crisis, the Covid-19 pandemic and Russo-Ukrainian War. These shocks have translated to slower economic growth and higher levels of inflation. And in order to address the high level of inflation, interest rates have been increased. Central banks are still working on finding ways in which inflation can be reduced in order for growth to be revitalized. One of the ways in which the central banks have worked towards reducing inflation, is by tightening policies which has an impact on capital flows.

These shocks have equally revealed that countries need to have sound macroeconomic policies in order to survive the impact of any crises. This research topic is of importance as there is need to devise policies that maximise the benefits the nation derives from capital mobility. IMF encourages policymakers to keep capital flow measures in their tool case booth for pre-emptive purposes and to address capital flow surges. Investors' scrutiny is equally good for policy making as it obliges people to pay attention to detail and to cut back on areas which may not be needed. Foreign exchange interventions and capital flow management measures can help manage destabilizing exchange rate movements and capital flows coupled with macroprudential tools helping reduce the domestic buildup of vulnerabilities.

Various authors have investigated the relationship between capital mobility and economic growth in South Africa such as Wesso (2001), Khumalo and Kapingura (2014) and Khetsi and Mongale (2015), Adeola (2017) and Rohit and Miyajima (2021). This study is of equal importance as South African studies on this topic are not as recent and this study aims to bridge that gap.

1.3 RESEARCH OBJECTIVES

General Research Objective:

The overarching goal of this study is to investigate capital mobility and economic growth in South Africa.

Specific Research Objectives:

1.3.1 Determine and analyse the trends in the degree of capital mobility in South Africa.

1.3.2 Determine the relationship between capital mobility and South Africa's economic growth.

1.4 METHODS, PROCEDURES AND ETHICAL CONSIDERATION

In this study, capital mobility is proxied by net capital flows to GDP. The control variables in the study are the saving-investment ratio and the degree of trade openness. Economic growth is measured as the growth rate of the real gross domestic product (GDP). This data has been obtained from SARB Quarterly Bulletin and the World Bank database for the period 1990 to 2022. Data on the real GDP, the saving-investment ratio and the degree of trade openness has been collected from World Bank for the period 1990 to 2022. And data on the net capital flows to GDP has been obtained from SARB Quarterly Bulletin. This period was selected as it allows opportunity to observe the varying stages of political transition within South Africa.

In order to determine and analyse the trends in the degree of capital mobility in South Africa, the savings and investment correlation approach has been adopted as it is a distinctive measure of the degree of capital mobility. The choice of the savings-investment approach is based on previous studies (Feldstein and Horioka, 1980; Sinn, 1992; Frankel, 1992; Afxentiou and Serletis, 1993; Baxter and Crucini, 1993; Tesar, 1993; Alexakis and Apergis, 1994; Holmes, 2005; Hwang and Kim, 2018; Behera, 2023). The Hodrick-Prescott Filter was used as the estimation technique to filter out the noise of the savings-investment ratio and remain with the trend. The choice of the Hodrick-Prescott Filter is based on previous studies namely Phillips and Jin (2002,2015), Phillips (2010), de Jong and Sakarya (2016), Cornea-Madeira (2017), and Hamilton (2018).

The Autoregressive Distributed Lag (ARDL) model is an econometric model which has been used to estimate the long and short run relationships between capital mobility and economic growth. The ARDL model was chosen in the study as an econometric model to study the relationships between capital mobility and South Africa's economic growth, based on previous studies Odhiambo (2009b), Fakudze, et al. (2021) and Abel, et al. (2021) which provide guidance on the framework followed within this study. Varma, 2009; Ketenci, 2015; and Murthy and Ketenci (2020) are other similar studies which have unpacked the relationships between capital mobility and economic growth.

The ARDL model was also chosen because there are various advantages it presents. This study makes use of annual data which produces a small sample size. One of the advantages in using the ARDL model is that it can produce efficient results using a small sample size. Other models such as VARs and GMM models need large samples that consume degrees of freedom. Another advantage, is that variables do not need to be pretested for stationarity as the ARDL bound model can test for relationships between variables, that have mixed orders of integration. Then post-estimation, the study has conducted dynamic multipliers on the key variables.

1.5 OUTLINE OF THESIS

This study was organised into six chapters. The following chapter discussed the underlying theories available on capital mobility and its influence on economic growth. Chapter three unpacked the existing empirical studies on the topic of discussion, both in the South African context and worldwide. Chapter four provided the research design and model that was used to establish the relationship between capital mobility and economic growth. Chapter five presented a discussion of the findings inferred from the different tests that were run. Chapter six provided a summary of what was found within the study, addressed the limitations of the study and included the policy recommendations going forward.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter has examined theoretical, methodological and empirical literature that exists on South Africa's capital mobility and the possible relationships it has with economic growth. The focus of the chapter was firstly to highlight the mechanism in which capital flows from one country to another, that being the capital market. The key issues that have been investigated in this chapter were discussions on theories that explain the relationship between capital mobility and economic growth, how capital mobility has evolved in South Africa, the implications of mobile and immobile capital on policy and the implications these have on economic growth, which methods can be used to examine the relationship between capital mobility and economic growth, unpack the empirical literature on the relationship. Then the conclusion followed with key pointers of the chapter.

2.2 THE CAPITAL MARKET: A CONCEPTUAL OVERVIEW

The capital market refers to the joining of suppliers to users of medium to long-term capital for investment in economic development plans through the usage of specialized financial institutions, varying mechanisms and infrastructure (Al-Faki, 2006). The capital market is made up of financial assets with long tenure that have attractive yields, attractive liquidity and risk characteristics which attract the savings needed by both governments and other investors in need of long-term funds (Okoye et al., 2016). There are various roles the capital market undertakes which are namely facilitating hedging, trading, the pooling of risk, the diversifying of risk and the allocation of resources (Levine, 1997). Capital markets also assist in price discovery and transaction cost reduction (Aduda et al., 2013). According to Khetsi and Mongale (2015) capital markets serve as the link between the monetary and real sectors by smoothing the process of growth in the real sector and the development of the economy. The capital market is an essential economic agent which facilitates and mobilises savings and investments through the financial market (Adoms et al., 2020). Large volumes of investments are required in order to gain sustainable economic growth and development both locally and internationally (Ekundayo, 2002). Empirical literature has revealed that countries with well-developed capital markets experience higher economic growth than countries with underdeveloped capital markets. Financial market integration is affected by

the degree of financial openness, the institutional environment and the level of global financial uncertainty (Lehkonen, 2014).

2.3 EVOLUTION OF CAPITAL MOBILITY POLICIES IN SOUTH AFRICA

2.3.1. Degree of openness of the capital account

According to Fischer (1997), the development of an economy will occur provided the country has an open capital account. Neoclassical economists are of the view that an open capital account will allow for short term capital flows which will result in the improvement of aggregate consumption which will cause an increase in the demand for goods and services and thus production will improve and that will be beneficial for the economy (Gray and Dilyard, 2005). The opening of capital accounts increases economic growth by enhancing potential risk diversification (Epstein, 2005). Evidence reveals that most capital markets in African countries are relatively underdeveloped and countries that have introduced reforms geared towards capital market development have managed to grow at relatively higher and sustainable rates (Khetsi and Mongale, 2015).

Capital mobility may impact economic growth through foreign savings which affect aggregate investment. The extent to which the capital account is open has an effect on the growth of an economy. When a country has a more open capital account, it can finance a larger current account deficit thus increasing the amount of foreign savings within the country (Edwards, 2001). If the increases of foreign services are not reflected one-to-one in domestic savings, the amount of aggregate savings will be higher. When a country has a reduced degree of capital controls, the capital inflows increase. The increase in the level of capital inflows equates to a higher current account deficit. This means that there is an increase in foreign savings which will partially crowd out private domestic savings (Edwards, 2001). Another way capital mobility may impact economic growth is through efficiency and productivity growth. The relaxation of capital controls will tend to result in a higher return to investment and higher productivity growth (Edwards, 2001). Simply put, countries with a more open capital account will outperform countries with restrictions on capital mobility.

In a case where capital is perfectly mobile, the savings of a country will be invested anywhere in the world. Contrarily, in a closed domestic economy, savings would be invested domestically and

therefore the degree of capital mobility in such an economy will be measured as the proportion of incremental savings that remain within the home country (Hwang and Kim, 2018).

Neo-classical theorists are of the view that an improved balance of payments will result from short term capital (Khumalo and Kapingura, 2014). The management of the balance of payments in South Africa has increasingly become dependent on capital inflows in order to fund the structural current account deficits within the country (Alami, 2018).

In the European Union context, analyzing the relationship between the development of capital markets and economic growth can be used to explain reasons why different countries reach their varying growth rates and this could help find solutions that allow for the process of economic growth through capital market through the use of public policy instruments (Brasoveanu et al., 2008).

2.3.2. Capital controls in South Africa

The IMF (2012) defines capital controls as restrictive regulations that are registered in the capital account of the balance of payments which control the movement of cross-border private capital flows. Historically, capital controls have played a significant role in sustaining forms of capital accumulation and in the broader sense of class-based strategies (Alami, 2018). Capital controls are believed to reduce the exchange rate volatility (Farrell, 2001).

There have been three bodies of literature on capital controls identified in South Africa. One of the bodies being a published series of policy documents and statements by the South African Reserve Bank (SARB) which recalls historical reviews of the capital controls previously deployed in the country (Stals, 1998; Farrell and Todani, 2004; SARB 2015). The second body of literature encompasses publications by researchers at the Reserve Bank, academics mandated by financial institutions and the Treasury. These bodies of literature are used to develop neoclassical economics models and econometric analyses which will be used to investigate the effectiveness of capital controls at different historical junctures in South Africa (Alami, 2018). Similarly, the third body of literature unpacks literature from the 1990s-2000s on the impact of capital account liberalisation on the South African economy.

As a result of the Great Depression and Britain's abandonment of the gold standard in 1931, massive capital outflows from South Africa were realised. And in order to avoid deflationary

adjustment, the Hertzog administration abandoned the gold standard in South Africa in 1932. This gave birth to the development of a legislative framework for capital controls. As a means of restricting outflows to non-Sterling Area countries, ensuring the free movement of funds mainly from the United Kingdom, capital controls were implemented in 1939 (Stals, 1998).

The post-war period revealed the acceleration of accumulation as a product of import-substituting industrialisation (Fine and Rustomjee, 1996). These flows were deployed by a series of policies and the Sterling Area capital control by the Smuts government which were gradually phased out bringing about the rise of the import substitution industrialisation strategy (Davis et al., 1976). In order to prevent large-scale capital flight, the state decided on and implemented a tighter and more pervasive framework (Farrell and Todani, 2004). This was noted as an important step in the capital controls policies at the given time.

During the democratic transition period, various factors inaugurated a period of isolation within South Africa. These factors include temporarily suspending financial liberalisation policies, intensifying existing international sanctions, reintroducing the financial Rand and the debt moratorium (Alami, 2018). During 1986 and 1991, capital inflows were negatively impacted (Gelb and Black, 2004). In 1995, the capital controls placed on the capital account for non-residents were lifted and asset swap arrangements allowed for the facilitation of outflows for resident institutional investors (Farrell and Todani, 2004). However, strict capital controls on residents were maintained in order to avoid large-scale capital flight (Alami, 2018).

In the post-apartheid era, the political climate in South Africa had shifted and new policies were formulated as a way of re-integrating the country to countries around the world. These policies entailed a new set of exchange control regulations which included the relaxation on certain restrictions such as those on non-resident investors and the rules that governed corporate and institutional investors. These policies were enacted more specifically to increase the flow of capital within South Africa and thus increasing productivity ultimately leading to economic growth (Khumalo and Kapingura, 2014). The Growth, Employment and Redistribution (GEAR) framework was one of the policies announced and implemented in order to attract large inflows and tamed inflation. Additionally, the Accelerated and Shared Growth Initiative for South Africa was a national initiative which aimed to boost economic growth. The initiative aimed to attain 6% on average of long-term economic growth, to reduce the level of unemployment and poverty by

50% by the year 2014 (Khumalo and Kapingura, 2014). However, due to the low domestic savings rate at the given point, a sustained inflow of capital would be required.

The government adopted a gradual approach to remove the controls that were affecting both the current account and the capital account. About three-quarters of the capital controls that had been in place in 1994 were eliminated by 1998 (Gelb and Black, 2004). This was possible as the 1996 Constitution granted the South African Reserve Bank (SARB) full independence and the primary goal was to protect the value of the currency. One of the ways in which SARB ensured that industrial and banking capitals were protected from the risk of currency devaluation was through the implementation of a policy instrument 'oversold forward book'(Alami, 2018).

This gradual approach was designed by monetary authorities who followed the recommendations proposed by Edwards (1984) and McKinnon (1993). In adopting this approach, the economy had room to adjust as the capital account was being liberalised. The liberalisation of the capital account in South Africa, aimed at attracting international investors to invest within the country as a means of increasing the external savings within the economy. During the mid-1990s, the relaxation of capital accounts and broader economic reform encouraged the improvement of the balance of payments (Khetsi and Mongale, 2015).

During 2009 – 2011, various capital controls were lifted in order to benefit from the global money-capital flow era and for the channeling of money-capital flows to continue. The deployment and adjustment of the different forms of the capital controls were conducted in order to attract capital flows on the basis that these flows are available on the world market (Khetsi and Mongale, 2015). A class analysis highlighted the indirect role of the working classes in shaping capital control policies - this exists in two forms in South Africa. The first form focuses on the state had to design and implement capital controls that prevent the outflow of resources, management of the balance of payments and the facilitation of money and public debt regulation. The second form focuses on the indirect influence on the design of the capital controls from the working classes and how the state has attempted controlling and integrating these controls.

The 2016 'FeesMustFall' protests focused on the work of Patrick Bond and others to argue that enacting capital controls would allow for the channelling of resources towards education. The outcome of this protest in this particular context was unfavourable as the National Treasury was not convinced and vowed to continue with the lifting of capital controls on outflows and working

towards the transformation of remaining capital controls into macroprudential regulations (Alami, 2018). The shift towards macroprudential regulations authorized resident capitals, trusts, partnerships and banks to participate in Rand futures of the stock exchange as a way of managing their foreign exposure (SARB, 2015).

The direct role in shaping of the capital control policies and ensuring that the policies are of a more transformative nature are the challenges facing the Left and the working class in South Africa. An example of a more transformative capital control would include the empowerment of labour capital through the transformation of social relations and class configurations (Epstein, 2012; Dierckx, 2015). The liberialistion of the capital account was due to the gradual relaxation of capital controls and actively working towards its enforcement (Mohamed, 2012). This relaxation entailed the adaptation and transformation of existing capital controls in order to maintain long-term capital account liberalisation whilst ensuring against some associated risks.

2.3.3. Capital account liberalisation

Capital account liberalisation is anticipated to be a contributory factor towards the development of financial markets as it has a positive effect on the liquidity levels of the different asset classes within financial markets (Shirakawa, 2009). Capital account liberalisation and financial market liberalisation may occur around the same time (Bacchetta, 1992). This can exist in two ways. One of the ways is as a policy decision which results from the authorities voluntarily removing restrictions in the financial sector that are associated with capital account restrictions (Bacchetta, 1992). Another way is that financial market liberalisation may result due to the presence of market forces which arise because of capital account liberalisation caused by direct competition between the local market and external markets (Bacchetta, 1992).

The use of growth accounting proved that capital accumulation was the main driver of output growth within the general economy (Fedderke and Simkins, 2009). Capital account liberalisation increased economic output by approximately fifty percent within a ten year period contrary to the fourteen year period prior to capital account liberalisation (Khumalo and Kapingura, 2014). Capital market liberalisation equally contributes towards the development of financial markets through technological transfers. The liberalisation through technological transfers allows opportunity for foreign investors to make purchases of shares and bonds within a country's markets whilst simultaneously allowing for domestic investors to invest abroad (Khumalo and Kapingura,

2014). Additionally, monetary policy will be regulated through the capital account liberalisation by ensuring that authorities are disciplined in situations where there is loose monetary policy for example (Gruben and McLeod, 2001).

Capital account liberalisation will promote economic growth provided that there are no macroeconomic imbalances and the sequencing in which trade and financial liberalisation are correctly done (Khumalo and Kapingura, 2014). The implementation of sound macroeconomic policies should be the focal point when accessing how capital flows within the economy affect the growth of the economy. Interest rates, the exchange rate and an economic performance should be adequately managed in order to ensure the growth of the economy (Fischer, 1997).

Capital account liberalisation may prove to be dangerous for an economy. It has been associated with poor economic growth, an economy highly dependent on money-capital inflows, unsustainable financialisation patterns and deeply-rooted financial fragilities and vulnerabilities (Ashman, Fine and Newman, 2011a; Mohamed, 2012; McKenzie and Pns-Vignon, 2012; Bond, 2013). The inflow of short term capital may reveal a pressure situation where the economy struggles to make the necessary adjustments in time causing the domestic currency to appreciate to unanticipated levels (Rajan and Prasad, 2005).

Capital account liberalisation may also increase adverse selection (Yew, 2008). Borrowers as domestic economic agents will have more information in comparison to the lenders as foreign economic agents in relation to the domestic market. As a way of lenders protecting themselves, they will make sure to invest in projects which will allow them to have a predetermined rate of return which tends to be very high and fails to include significant investment projects. Additionally, the Left which is inclusive of organised labour, progressive economists as well as civil society organisations, has denounced capital account liberalisation. It noted that it has detrimental effects on the economy which include the constraining of policy options for development and the industrial development in the long-term (Chang and Grabel, 2004; Epstein, 2012; Gallagher, 2015). Inappropriate policies will allow for market forces to negatively affect capital flows which will have disastrous effects on the economy.

2.3.4. Capital flight in South Africa

One of the contributory factors to capital flight is the valuing of the exchange rate (Khetsi and Mongale, 2015). An overvalued exchange rate will more likely cause a depreciation of the currency

in the future. Due to the volatility of the exchange rate, individuals will house their assets elsewhere in order to avoid any capital losses that might occur.

During the post-apartheid era, particularly, during 1996 – 2000, illicit capital flight increased within South Africa. This was in attempt to build wealth reserves outside of the country as there was deep mistrust from the capitalist class in the ANC government's abilities to ensure capital accumulation and to foster the control of the poor (Alami, 2018). Capital flight continued and became a major issue within the South African economy where short-term capital inflows were used to finance long-term capital outflows. The boom in capital inflows caused poor productive accumulation and instead fueled massive accumulation of various forms of fictitious capital whilst financing the current-account deficit and capital flight.

2.3.5. Monetary policy in relation to capital mobility

Monetary policy entails the central bank taking actions which either influence or target a measure against money shocks (Rasche and Williams, 2007). The main objectives of the monetary policy within South Africa are the maintenance of financial stability and the reduction of the inflation rate known as inflation targeting (Loewald, 2021). Inflation targeting entails the announcement of the official target ranges for inflation over varying horizons (Purwanda & Rochana, 2017). Inflation-targeting allows opportunity for attracting capital inflows (Isaacs, 2014). The reduction of inflation within the country alludes to improved economic growth, to employment opportunities and better chances of an equitable distribution of income. The introduction of inflation-targeting was a period of a three-pronged shift of capital account management (Alami, 2018).

Firstly, SARB and the Treasury transformed existing capital controls into macroprudential measures for the use of banks and institutional funds. These macroprudential measures focus on establishing financial soundness of individual institutions and systemic stability (Leape and Thomas, 2011). Secondly, SARB completely removed the exchange rate policy. And this allowed for the consideration of reserve accumulation as a tool for macroprudential policy and liquidity management instead of using reserve accumulation as a method of influencing the exchange rate level. Thirdly, SARB and the Treasury worked on developing a macroprudential capital control regime which allowed for larger outflows of capital to other African countries in comparison to the capital outflows that were being received by the rest of the world. The aim in allowing for these large capital flows stem from South Africa wishing to expand their capital into other African

countries and for the consideration as a global financial hub within the rest of Africa (De Jager and Kahn, 2014).

Another objective of the monetary policy is the maintenance of real interest rates at positive levels as they encourage savings and investment (Loewald, 2021). In South Africa, capital mobility is particularly managed through monetary policy. The degree of capital mobility determines the ability of the monetary policy to affect aggregate demand (Haque & Montiel, 1990).

In open economies, international capital mobility plays an important role in how effective monetary policy is (Pierdzioch, 2002). Empirical evidence within the United States of America reveals how a strong response of the capital market exists in relation to the rules of the monetary policy of the country (Purwanda & Rochana, 2017). High levels of capital mobility affect the independence of domestic monetary policies within countries, further complicating the management of saving and investment problems (Kuen and Song, 1996). In the case of perfect capital mobility, the monetary base remains unchanged, as there will be a matching of changes in domestic assets of the central bank to the equivalent and opposite changes in net foreign assets (Al-Jassar and Moosa, 2020).

The following section will unpack the various theories on capital mobility and economic growth.

2.4 THEORIES ON CAPITAL MOBILITY AND ECONOMIC GROWTH

Capital movement is referred to as capital mobility. Capital mobility is defined as the level at which capital is mobile across nations (Al-Jassar and Moosa, 2020). This mobility exists due to financial deregulation and capital account liberalisation. Economic growth on the other hand, is defined as the real increase in the total value of goods and services produced within a country. (Abbas, 2005) The factors utilised to evaluate economic growth include macroeconomic indicators and policies.

The relationship between capital market operations and economic growth derives from studies of Smith (1776), Bagehot (1873) and Schumpeter (1911) who argued that the requirement to the growth of the real economy is a developed and efficiently run financial market (Okoye et al., 2016). Schumpeter (1911) states that countries with well-developed financial markets may stimulate and provide opportunities for high economic growth through technological change, product and

services innovation. King and Levine (1993) state that well-functioning markets lower transaction costs which in turn increases the amount of savings put into investments and allows for capital allocation to projects yielding a high level of returns which positively affect the growth of the economy. Theoretical models which address the finance growth nexus differ on three aspects namely the type of endogenous growth, the finance mechanism and how asymmetric information is treated (Trew, 2006).

The supply-leading theory was established by Schumpeter (1911). This theory unpacks how activities within capital markets may positively or negatively affect key indicators of economic growth. The supply-led theory of finance equally establishes that financial sector development determines the level of economic growth as financial sector development resolves the financing needs. According to the neoclassical economic approach, liberalised financial markets have significant effects on economic growth by promoting savings and the efficient allocation of savings (Aslan and Küçükaksoy, 2006). Goldsmith (1969) added on to this theory by contending that domestic financial market evolution may enhance and cause a high level of capital accumulation. In countries where there are deeper capital markets, there are less severe business cycle output contractions and thus lower chances of economic downturn in comparison to countries with less developed capital markets (Tharawanji, 2007).

The demand-following theory was established by Robinson (1952) and was a challenge to the supply-leading theory. This theory unpacks how various indicators must first affect the growth of the economy in order for there to be observable capital market development within a country. This approach implies that finance is a passive aspect of the growth process (Patrick, 1966). However, this theory does not consider the demand of financial services in a growing economy.

Mutual causation was established by Lewis (1955) and Patrick (1966). This hypothesis posits that there is a bi-directional relationship between capital market development and economic growth. In simple terms, there are factors that may influence capital market development which may have ripple effects on economic growth whereas there are also factors which may influence economic growth which in turn may have effects on the development of capital markets. Capital market development and economic growth strengthen each other and vice versa. This bi-directional relationship depends on which developmental stage an economy has reached, where the supply-

leading happens in the early developmental stages and the demand-following happens at the later developmental stages.

Mutual exclusion theory supports that economic growth and the development of capital markets have no causal relationship and are not linked to each other in any way. Graff (1999) found that the financial transactions within capital markets and the growth of the economy had no causal relation and that results that opposed this notion are not empirically established.

The Financial Liberalization theory was instituted by McKinnon in 1973. This theory posits that financial markets should be liberalized and credit allocation be determined by the free market as the intervention and involvement of government in the financial system, particularly in controlling interest rates and credit allocation, negatively affects financial markets. Government intervention within financial markets constrains savings mobilization, the level of investments and the growth within a given economy. The liberalization of financial markets and credit allocation allows for the adjustment of real interest rates to equilibrium and the elimination of low yielding projects. The real interest rates adjustment to equilibrium and elimination of low yielding projects allows for the increase in the overall investment efficiency, savings will increase and the total real supply of credit will also increase. Due to these increments, a higher volume of investment will be induced and that will provide room for economic growth.

One of the major downsides to the Financial Liberalization theory is the information asymmetries that result from financial reforms and financial liberalization policies (Idenyi et al., 2017). These asymmetries exacerbate risk taking within the economy which in turn threatens the financial system stability which easily puts the economy in a vulnerable position exposing it to financial crises.

Similarly, the prior-savings theory postulates that higher savings lead to higher investments, provided that the investible funds from savings are translated into actual investment which will then lead to a higher economic growth rate (Odhiambo, 2009a). The growth of the economy will increase as savings increase until the level of savings and investments stabilise. However, when the level of savings is low over a prolonged period of time, a country may be locked into a vicious cycle of low levels of investments with low economic growth. The prior-savings theory is critical within developing countries during periods where demand for loanable funds exceeds the supply

of loanable funds and where supply is the constraint on investment instead of the demand for loanable funds (McKinnon, 1973; Shaw, 1973).

2.5 METHODOLOGICAL LITERATURE REVIEW

Frankel (1989) identifies two approaches in which the degree of capital mobility can be measured namely interest rate parity tests and saving-investments correlations.

2.5.1. Interest rate parity tests

Interest rate parity tests measure whether interest rates are equalized across countries (Sinn, 1991). According to Frankel (1992), there are four definitions which can be used to define perfect capital mobility. These definitions are namely the Feldstein-Horioka condition, the real interest parity, the uncovered interest parity and the covered interest parity (Frankel, 1992). The Feldstein-Horioka condition unpacks how the exogenous changes in saving rates have no effect on investment rates. Real interest parity on the other hand entails equalising real interest rates across countries using international capital flows. Uncovered interest parity examines how capital flows equalise expected returns on different countries' bonds whilst overlooking the exposure to exchange risk on countries' bonds. Covered interest parity, on the other hand, looks at how capital flows equalise interest rates across countries when contracted in common currency. The covered interest parity approach and the uncovered interest parity approach are the most commonly used parity approaches, although the covered interest parity approach is deemed to be a better indicator of financial openness (Kuen and Song, 1996). By contrast, the covered interest rate parity is identified as being limited in empirical relevance within developing countries as forward markets only exist for very few developing-country currencies (Montiel, 1994). This deems the uncovered interest parity as the most relevant interest parity measure in many developing countries.

According to Bekaert (1995) in major industrial and developing countries there are large and high increases in the interest rate differentials which indicates that there is an increase in capital mobility in these developing countries.

2.5.2. Saving and investment correlations

The savings and investments within a country are one of the widely used quantity-based measures, used to measure the extent of capital mobility and capital immobility (Feldstein and Horioka, 1980). Long term averages of saving and investment shares are used to estimate the regression

coefficient beta which then reveals the level of capital mobility within a country (Sinn, 1991). A decline in the beta coefficient may be used to explain the loose relationship between saving and investments (Dooley et al., 1987; Obstfeld, 1986). The loose relationship can be explained by a number of reasons including capital controls which impeded international capital flows, the rapid rate at which Eurocurrency markets were growing, the rate at which multinationals activity increased, the level of advancement in telecommunications technology and OPEC surpluses recycling.

If estimated accurately, the saving-investment correlation may yield useful information about capital mobility (Hwang and Kim, 2018). Basic economic theory identifies a direct relationship between realised savings and realised investments. The higher the rates of investments within a country, *ceteris paribus*, the higher rates of real growth are realised. When capital is mobile, a weak relationship between the savings within a country and its investments is established. However, when capital is deemed immobile, a positive relationship between investment rates and saving rates is noticed. This is because if investments are greater than savings, the country has a current account deficit which must be funded by capital inflows. If savings are greater than investments, the country must have a current account surplus and an increase in capital outflows is realised or large reserves. According to the Feldstein Horioka-test, if perfect capital mobility exists, savings and investments will be uncorrelated across countries and perfectly correlated when international capital is immobile (Sinn, 1991). When there is zero capital mobility realised within a country, there is one-to-one relation present between savings and investments as savings have to be invested domestically (Hwang and Kim, 2018).

In a world of perfect capital mobility, an increase in the saving rate would have ripple effects on the increase in investment in all countries. The distribution of capital increase within countries varies positively with the country's marginal product of capital schedule elasticity (Feldstein and Horioka, 1980). In a perfect world of capital mobility, the β coefficient will be zero when country i is microscopically small relative to the world economy. However, for a relatively large country, the β coefficient would only be the order of magnitude of its share of total world capital (Feldstein and Horioka, 1980). When the β coefficient is equal to 1 the current account is not influenced by changes in the saving rate (Sinn, 1991). During periods when common sources drive both savings

and investments in the same direction, a high saving-investment correlation may be said to be consistent with a high degree of capital mobility (Hwang and Kim, 2018).

A high saving-investment correlation exists in the presence of macroeconomic shocks (Tesar, 1993; Decressin and Disyatat, 2008; Bussiere et al., 2010). Additionally, Obstfeld (1986) postulates that a high saving-investment correlation exists when there is growth in population. According to Artis and Bayoumi (1992), during periods of current account targeting, a high savings-investment correlation is present. When there are long-run constraints within a country, a high saving-investment correlation is realised (Coakley et al., 1996; Summers, 1988; Taylor, 2002). During periods of financial friction within an economy, a high savings-investment correlation exists (Bai and Zhang, 2010). In the presence of long-run risks, a high savings-investment correlation can be found (Chang and Smith, 2014). The presence of a large-country effect equally reveals a high savings-investment correlation (Murphy, 1984; Baxter and Crucini, 1993).

The savings-investment schedule draws on the assumption that both savings and investments are determined by the interest rate and other exogenous factors (Sinn, 1991). A positive sloping saving schedule indicates there are high interest rates which increase the level of planned savings. The investment schedule on the other hand is negatively sloped indicating that higher interest rates reduce the amount of investments within an economy (Sinn, 1991).

In the presence of capital mobility, the savings and investments rates are correlated because of the effect of the country size. The size of a country determines how diversified it will become and how much need there will be for borrowing from abroad. Harberger (1980) argues that larger countries will be more diversified and there will be more need to borrow funds from abroad in the case of a shock declining. Another argument relates the size of a country to how it affects the world interest rate. An increase in the level of national savings in a country will cause a decline in the world interest rate resulting in a change in optimal investment within that country and an unchanged investment schedule. And when a country is large enough to alter the world interest rate, savings and investments will be correlated in the presence of perfect capital mobility.

2.5.3. Interest rate parity tests versus saving and investment correlations

Interest rate parity tests measure if international trade in securities is unhindered. Saving and investment correlations assess the ease in which real capital flows in between countries. The

Feldstein/Horioka approach measures the level of responsiveness of real resource flows to the variations in the saving-investment rate and not the trade of securities against each other (Sinn, 1991). This highlights the distinction between the two measures, showing they address different phenomena rather than the degree of capital mobility.

Hence, this study has used the saving-investment correlation to determine and analyse the degree of capital mobility in South Africa. The Hodrick-Prescott Filter has been used to detrend the saving-investment correlation and is presented in detail in the methodology section. Previous studies have used the filter namely Phillips and Jin (2002,2015), Phillips (2010), de Jong and Sakarya (2016), Cornea-Madeira (2017), and Hamilton (2018).

2.5.4 Discussion on econometric models to use to determine the relationship between capital mobility and economic growth

The ARDL model is an econometric model that has been used within this study to estimate the relationship between capital mobility and South Africa's economic growth. Previous studies such as Odhiambo (2009b), Fakudze, et al. (2021) and Abel, et al. (2021) have provided guidance on the framework followed within this study.

Contrarily, there are other growth models which have previously been used to estimate the relationship between capital mobility and economic growth namely the Cobb-Douglas production function, VARs and other GMM models. The Cobb-Douglas Production Function Output is defined as the f (labour, capital {domestic capital, foreign capital}). The constant returns to scale assumption of the Cobb-Douglas function, is very restrictive and less often applicable to a firm, much less to a country. Not all factors that affect growth can be captured in a Cobb-Douglas function which is strictly a production technology function. VARs and other GMM models require large samples that consume degrees of freedom, and this study makes use of a small sample.

There are various studies have used different growth models to examine the relationship between capital mobility and economic growth (Barro et al., 1992; Duczynski, 2000; Tsoukis, 2003; Klyuev, 2004; Klyuev, 2004; Varma, 2009; Osvaldo, 2013; Ketenci, 2015; and Murthy and Ketenci, 2020).

2.6 EMPIRICAL LITERATURE REVIEW

2.6.1 Introduction

This section unpacks previous studies that have been done in order to establish relationships between capital mobility and economic growth in various countries around the world and most important to this study, within the South African context.

A study was conducted in 99 countries during the period 1970 to 2005. It was found that both financial openness and financial market integration facilitate capital mobility in both developed and developing countries (Younas and Chakraborty, 2011). Financial openness and financial market integration contribute to financial market development and hence studies on financial market development are important to include within this study. It can be argued that financial market development facilitates capital mobility in both developed and developing countries.

The following sections will review the empirical literature, which has tested the possible relationships between capital mobility and economic growth.

2.6.2 Studies That Found A Positive Relationship Between Capital Mobility And Economic Growth

Chenery and Strout (1966) employed the two-gap model to analyze how foreign assistance aided economic development. They found that foreign capital increases domestic savings which substantially increases investments and thus has a positive impact on economic growth in developing countries. This finding was consistent with the theory of foreign aid which posits that overseas development assistances drives economic growth through the supplementation of domestic capital formation. Studies conducted by Harberger (1978, 1980) argued that the degree at which capital markets were integrated must be measured by how private rates of return to capital converge across countries. Harberger used national accounts data for eleven Latin American countries in order to estimate the rates of return to private capital and found that there were similarities. More particularly, Harberger found that the private rates of return were independent of national capital-labor ratios. From these findings, he inferred that capital markets were more integrated than what an analysis of legal restrictions would provide.

A study of 16 OECD countries analysed the behaviour between savings and investments. It was found that there is a positive correlation between the savings and investment ratios. This conclusion was reached by the presumption that long term capital was as a result of significant

impediments (Feldstein and Horioka, 1980). An estimated series of Feldstein-Harioka equations were used a benchmark to gage whether a capital account is open or not (Montiel, 1994). The consensus was that a saving ratio regression of 0.6 was an adequate benchmark. A country with a regression coefficient exceeding 0.6 is categorized as having a closed capital account whereas a country with a regression coefficient lower than 0.6 has a higher degree of capital mobility (Montiel, 1994). However, the link between saving and investment is tighter among nations than within a nation (Sinn, 1991).

The degree of capital mobility was tested over 15 diverse developing countries (Haque and Montiel, 1990). These countries include Indonesia, Malaysia, Philippines, Sri Lanka, India, Kenya, Tunisia, Morocco, Zambia, Uruguay, Guatemala, Brazil, Malta, Turkey and Jordan. Ten out of these countries revealed capital mobility parameters that are significantly different from zero and insignificantly different from one. These countries being namely Guatemala, Indonesia, Kenya, Malaysia, Morocco, Philippines, Sri Lanka, Tunisia, Uruguay and Zambia. These results reveal a tendency towards financially open economies and a high degree of capital mobility (Haque and Montiel, 1990). It can be inferred from the high level of capital mobility that governments have little control over their domestic interest rates and the money supplied within their countries. In four out of the fifteen countries, the capital mobility parameter was significantly different from both zero and one which deems perfect capital mobility can possibly be ruled out (Haque and Montiel, 1990). These four countries being Brazil, Jordan, Malta and Turkey. These results reveal that the domestic interest rate is partially controlled by government, at least in the short run. Furthermore, in the last country out of the fifteen, India, the capital mobility parameter was small in magnitude, insignificantly different from zero and significantly different from one (Haque and Montiel, 1990). These results reveal that capital is immobile within India. Finally, this study reveals that the degree of openness in developing economies was large which has great implications for the effects of monetary policy (Haque and Montiel, 1990).

The causality between foreign private investment and the growth rate of GDP in Pakistan was examined by Shabbir and Mahmood (1992). Time series data were collected for the period 1959-60 to 1987-1988. A simultaneous equation model was used as single equation results are believed to be more susceptible to simultaneity bias. It was found that foreign private investment positively contributes to the growth rate level of GDP and that the link between savings and the real rate of

interest was statistically significant. The statistically significant relationship between savings and the real rate of interest should be used as a sign for policy makers to liberalize financial markets as they increase the saving rate within the country. Similarly, Khan and Rahim (1993) examined the link between foreign aid and the growth rate of GDP in Pakistan from 1960 to 1988. The Ordinary Least Squares (OLS) technique was used to estimate two equations, the savings equation and the economic growth equation. It was found that foreign aid accelerates the growth rate level of GDP and the link was statistically insignificant relationship between savings and the real rate of interest.

Atje and Jovanovic (1993) tested the link between stock market trading and economic growth using two ways. One of the methods entailed using conglomerate indices of stock market development which encompass stock market size, trading and integration. The second method entailed controlling for initial conditions and other factors that may impact the growth of the economy in the case that evidence of cross-country regression results are sensitive to conditional information set changes. It was found that stock market development promotes economic growth.

Levine and Zervos (1996) assessed whether a strong empirical relationship exists between stock market development and economic growth in forty-one countries. The assessment was from 1976 to 1993. Stock market development was measured by grouping stock market size, liquidity and the integration with world markets into an index. The study considered certain variables as control variables for initial conditions namely political stability, human capital investment and macroeconomic conditions. The study found that stock market development strongly correlates with economic growth. Similarly, Bencivenga et al (1996) found that stock market liquidity is important for growth through liquidity creation making investments less risky as savers can buy and sell an equity at a cheaper and faster rate.

A comprehensive set of cross-country indicators was constructed to gage the degree of capital mobility for 20 advanced countries and 45 emerging economies (Quinn, 1997). One of the advantages of using these indicators is that they are not restricted to a binary classification of either open or closed capital accounts. Instead, a scale ranging from 0 to 4 was used to classify the countries within the sample (Quinn, 1997). The higher the number within the given range, the more open the capital account. Another advantage of the indexes is that they cover more than one time period which allowed opportunity for researchers to investigate whether a link exists between

capital account liberalisation and economic performance. According to the Quinn Indicator, it was found that advanced countries have more open capital accounts than the emerging economies.

Luinkel and Khan (1999) found that stock market development promotes economic growth. Mahtadi and Agarwal (2001), equally studied the relationship between stock market development and economic growth within nine African countries over a period of 21 years. It was found that a strong correlation between stock market development and economic growth existed. Similarly, Arestis et al. (2001) conducted a study on the effect of capital markets on economic growth in five developed countries. The five developed counties were the USA, the UK, France, Germany and Japan. An Error correction model, was used to make the empirical analysis on the effect of capital markets on economic growth. It was found that capital markets have an effect on economic growth but financial systems in the banking sector have a greater impact of the growth of the economy.

The causality between savings and growth was examined within seven Asian countries using both the Engle and Granger VECM procedure and the VAR procedure (Agrawal, 2001). The evidence from these procedures revealed how the direction of causality primarily ran from growth to savings and how in some countries there was a feedback effect from savings to growth. Similarly, Anoruo and Ahmed (2001) conducted a study on the linkage between domestic savings and economic growth within seven African countries. It was found that savings granger cause economic growth in Congo whereas in countries namely Ghana, Kenya, Nigeria and Zambia, economic growth granger causes savings. And in the remaining two countries, a bi-directional relationship was established.

The impact of trade openness and stock market development on economic growth was examined in Nigeria for the period 1970-1997 (Udegbunam, 2002). A simple model was used and a strong correlation was found between trade openness and stock market development on economic growth. In Malaysia, the effect of the stock market on economic growth was examined and a positive correlation was revealed (Chee et al, 2003). Chee et al. (2003) revealed further evidence that stock market leads to economic growth in Malaysia on the basis of the supply-leading hypothesis.

A study by Adam and Sanni (2005), examined the role of Nigeria's stock market on economic growth by means of the Granger causality test and a regression analysis. It was found that the stock market has a significant positive impact on economic growth and equally that a bi-directional causality exists between stock market turnover and economic growth. Bolbol et al. (2005)

examined the effect of financial markets on aggregate factor productivity and growth in Egypt for the period 1974 – 2002. In this study financial markets were measured by the ratio of market capitalization to GDP and the turnover ratio whereas aggregate factor productivity and growth were measured by the GDP growth rate per capita. It was bound that there is a positive impact on factor productivity and growth, when the capital market is well-developed.

The long-run relationship between stock market development and economic growth was tested in Belgium. A Granger causality test was performed for the period 1873-1935 and the results concluded that stock market development determined economic growth in Belgium (Nieuwerburgh, Buelens and Cuyvers, 2005). Liu and Hsu (2006) investigated the effects of different components of financial systems on the growth of the economy for Taiwan, Korea and Japan. They assessed what impact stock market development would have on economic growth. Stock market development in this study was measured by market capitalization as a percentage of GDP, turnover as a percentage of GDP and stock returns. The evidence revealed that the stock market had a positive impact on economic growth. In a number of countries, the relationship between savings and economic growth was examined (Mohan, 2006). It was found that in 13 countries, economic growth granger causes savings whereas savings granger causes economic growth in two countries.

In fifteen Organisation for Economic Co-operation and Development (OECD) countries and in fifty non-OECD countries over the period 1975-2000, a long-run relationship between financial development and economic growth was examined (Apergis et al, 2007). Panel integration and cointegration techniques were used to analyse this relationship. The panel integration technique was employed as this method is believed to assist in not avoiding biases induced by omitted variables that would potentially arise, it is inclusive of simultaneity through the usage of instrumental variables and it equally controls for unobserved country-specific effects. Financial development was measured by the liquid liabilities of the financial system, bank credit and private sector credit. The findings revealed how financial development has had a bi-directional relationship with economic growth for over the course of twenty-five years (Apergis et al, 2007).

The relationship between capital mobility and economic growth was conducted in Romania and the findings revealed a positive correlation between the variables, with feedback effect (Brasoveanu *et al.*, 2008). Brasoveanu *et al.*, (2008) noted that although there is a positive

correlation between capital mobility and economic growth, the strongest relationship link in Romania is from economic growth to the capital market. This relationship suggests financial development follows economic growth. In simple terms, economic growth determines the manner in which financial institutions change and develop. For Pakistan, evidence of a positive impact of the stock market was revealed (Muhammed et al., 2008). Similarly, the VECM technique was used to examine the link between economic growth and stock market development in France for the period 1965-2007 (Vazakidis and Adamopoulos, 2009). The study revealed that economic growth granger-causes stock development. The results of the study also found that interest rate negatively affect stock market development in France.

Varma (2009) conducted an empirical investigation between capital mobility and growth in the developing world. This study used time series data for the period 1971 – 2005. The finding revealed a positive relationship between capital account openness and growth for countries within Southeast Asia. The findings equally revealed how Latin American countries have benefited less from capital account openness. Findings FDI is preferred form of capital inflow as it embodies stability, technology, and skills.

The relationship between stock market development and economic growth was investigated in Mauritius (Nowbutsing, 2009). The Error Correction Model (ECM) was employed to analyse data over the period 1989 – 2006. Stock market development was measured by market capitalization as a percentage of GDP at constant prices and the total value of shares traded as a percentage of GDP at constant price. It was found that stock market development is necessary for growth in Mauritius since it positively contributes to the health of the economy. The study revealed that stock market development positively affected economic growth in both the short and the long-run.

The link between stock market development and economic growth was tested in the West African sub-region for the period 1995-2006. Stock market development was measured by the share of market capitalization to GDP and the volume of shares traded to GDP. An ECM was employed to analyze the link between the variables and it was found that there is a positive impact of stock market development on economic growth in both the long and short-term (Tachiwou, 2010). Similarly, a study was conducted to assess the effect of stock market development on the Bangladesh economy from 1976 – 2008, where the variable of stock market development was represented by market capitalization as a ratio of GDP and economic growth was represented by

GDP and income per capita (Hossain and Kamal, 2010). The study employed granger causality and a cointegration test which revealed a unidirectional long run relationship between capital market development and economic growth. The causal relationship between financial deepening and economic growth was examined in Tanzania using a multivariate model (Odhiambo, 2011). It was found that a causal relationship instead exists between economic growth and financial depth in Tanzania.

The demand-following theory was tested within thirteen countries in Latin America and the Caribbean (Gries et al, 2011). A financial index was generated to study the relationship between financial development, trade openness and economic growth. Evidence revealed cointegration between the variables. More particularly, the evidence established a strong relationship between economic growth and financial development. The Vector Autoregressive Model (VAR) and the Vector Error Correction model (VECM) were employed to establish the causal relationship between economic growth and financial development (Gries et al, 2011). A study was conducted in Nigeria to find out if how the capital market development affected economic growth from the period 1990 – 2010 (Kolapo and Adaramola, 2012). Capital market development was proxied by market capitalization, total new issues, value of transactions and total listed equities and government stocks whereas economic growth was proxied by GDP. The Johansen co-integration and Granger causality tests were used to test for the linkage between the two variables. A positive correlation was found between the capital market and economic growth.

A correlation analysis and multivariate regression model were used to determine the impact of capital market deepening on economic growth in Kenya from 1992 to 2011(Aduda et al., 2013). The capital market deepening variables were divided into both size variables and liquidity variables and economic growth was represented by the real GDP variable. The results revealed that three out of five variables of the capital market deepening have positive relation GDP. In simple terms it was established that a positive relationship between capital market deepening and economic growth exists in Kenya. The relationship between financial sector development and economic growth was explored in northern and southern Mediterranean countries over the sample period 1985 – 2009 (Ayadi et al., 2013). The study found that stock market size and liquidity strongly contribute towards economic growth. Investments, whether domestic or in the form of Foreign Direct Investments have a significant impact on economic growth. The study equally

found that countries which had stronger institutions and lower levels of inflation are significant contributors of growth.

A study on the Jordan economy was carried out from 1978 – 2012 to test for a causal relation between capital market development and economic growth. The VECM model was employed and the Pairwise granger causality test was used to test for any relations between the variables and it was found that there is a positive and significant relation between capital market development and economic growth in Jordan (Al-Qudah, 2014). Nguyen and Pham (2014) conducted a study between 1981Q3 and 2012Q3 to gage the effect of stock market development and economic growth in Canada and Australia. It was found that there is a significantly positive relationship between stock market development and economic growth in Canada. In Australia however, a negative relationship was established between stock market development and economic growth.

Annual panel data from 36 countries for over the period 1980 – 2010, were used to investigate the role of stock market development on economic growth within Africa (Ngare et al., 2014). The main findings of these studies were that stock market development positively affects economic growth. The level of investments, degree of openness and human capital formation play a significant role on economic growth whereas macroeconomic instability more especially the level of inflation, politically unstable countries, overly corrupt countries and the rate of government consumption negatively impact economic growth. The study equally found that countries with stock markets experienced faster economic growth in comparison to countries without stock markets. Additionally, countries considered to be relatively developed with stock markets have a tendency to grow faster than less developed countries with stock markets.

The ARDL bound estimation techniques were used to examine the existence of cointegration between financial development, trade openness and economic growth in Nigeria (Lawal et al., 2016). It was found that there is a two-way cointegration relation between economic growth and financial development as well as between economic growth and trade openness.

The relationship between stock market development and the economic growth nexus of Malaysia was studied during 1981 – 2016 applying the Granger test, ARDL with bound testing approach and multivariate regression approach (Hoque and Yakob, 2017). The Granger causality test revealed a unidirectional relationship between stock market development and economic growth in Malaysia. Additionally, the bound test revealed the long run relationship between stock market

development and economic growth. These results indicate that the results of the ARDL with bound testing approach and the Granger test are consistent.

The Pedroni panel cointegration analysis was used to investigate the long run relationship between financial development and economic growth in 16 low-income countries for the sample period 1995-2014 (Bist, 2018). The study found that financial development has a significant and positive effect on economic growth. In addition, the co-integration and error correction model were employed to examine the impact of capital market development on economic growth in Nigeria for the period 1981 – 2016 (Ugbogbo and Aisien, 2019). The results revealed that the variables are cointegrated and that the development of the capital market in Nigeria has a positive impact on economic growth in both the long and the short run.

The causal relationship between financial development and Nigerian economic growth for the period 1985 to 2015 was investigated using the Toda and Yamamoto and Dolado and Lütkepohl (TYDL) approach (Okunlola et al., 2020). The banking sector was proxied by credit to the private sector and the ratio of commercial bank asset to central bank asset and economic growth was proxied by real GDP. The stock market variables on the other hand were proxied by market size, turnover ratio and the total value of share traded whilst economic growth was proxied by real GDP. A bi-directional relationship was found between financial markets indicators and economic growth whereas a unilateral relationship was found between stock market indicators to GDP. The findings are supported by the theory that a well-structured financial sector positively contributes to the growth of the economy. And thus establishes that other developing countries should ensure that they create an environment in which their financial sectors can thrive and reforms can be engaged in which allow opportunity for the economy to be stimulated.

The long-run relationship between financial development and economic growth in the Egyptian agricultural sector was investigated over the period 1995 to 2017 (El-Rasoul et al., 2020). The Autoregressive Distributive Lags (ARDL) testing approach and the Toda and Yamamoto causality test were employed within this study. The ARDL was used to investigate the long run causal relationship between financial development and economic growth whereas the Toda and Yamamoto causality test was used to investigate the relationship economic growth and financial development. It was found that in both the long and the short run, the agricultural governmental expenditure, cumulative formation capital, agricultural credit and agricultural labor influence the

agricultural gross domestic product. The results equally reveal a strong causal relationship between economic growth and financial development within Egypt.

The ARDL bounds test and the Granger causality test were employed to establish the direction of causality between financial development and economic growth in Eswatini for the period 1996 to 2018 (Fakudze et al., 2021). The ARDL results revealed that financial development and economic growth have a positive relationship in the long run. The Granger causality test results on the other hand, revealed a unidirectional relationship between economic growth and financial development which validates the demand-following theory in Eswatini.

The impact of financial structure on economic growth was assessed in 24 advanced OECD countries for the period 1980 to 2017 (Purewal and Haini, 2022). The study incorporates financial development indices that take into consideration the accessibility, depth and efficiency of financial markets and financial institutions and the study equally considers other financial development measures such as financial globalization. The study found that both financial markets and financial institutions promote economic growth however the influence of financial markets on growth is weaker than the influence of financial institutions on growth.

A study was conducted from 2010 to 2021 on the Bangladesh stock market in attempt to understand its correlation with macroeconomic drivers such as the gross domestic growth rate, the inflation rate and the industrial production index (Islam et al., 2023). The multiple regression analysis was employed and the results revealed a positive correlation between the Bangladesh stock market index and the GDP growth rate.

2.6.3 Studies That Found A Negative Relationship Between Capital Mobility And Economic Growth

Nyong, (1997) studied the relationship between capital market development and economic growth in Nigeria by employing time series data from 1970 to 1994. In the study capital market development was measured by the ratio of market capitalization to GDP, the ratio of total value of transactions on the main stock exchange to GDP, the value of equities transaction relative to GDP and listings. These measures of capital market development were combined into one composite index using principal component analysis. Financial market depth was included as a control variable. A negative relationship between capital market development and economic growth was

established in Nigeria. The results equally revealed a bi-directional causality between capital market development and economic growth.

Irving (2004) examined the link between the stock exchange and socio-economic development. It was found that the link was tenuous, possibly harmful and may have not existed. African countries were encouraged not to further devote their scarce resources into promoting stock exchange as there are many weightier issues to address in Africa such as high poverty levels, social services which are inadequate and underdeveloped infrastructure. And in the case where resources were available, stock markets could expose already fragile developing economies to short-term speculative capital inflows.

According to Licchetta (2006) capital account liberalization has adverse effects in countries. The wave of currency crises in Latin American and East Asia in the mid-1990s made the liberalization of capital accounts be questioned as reliable policy. One of the concerns of capital account liberalization was its potential at destabilizing financial systems during a period when there was an influx of short-term volatile capital inflows which were susceptible to sudden stops. The study found that there was a negative relationship between capital account liberalization and growth.

A sample of 11 Arab countries was studied for the influence of stock markets and bank system development on economic growth. The results revealed a negative influence of financial development on economic growth in countries that have underdeveloped capital markets (Naceur and Ghazouani, 2007).

According to Ferreiro et al., (2008), the liberalization of the capital account within most of the Latin American countries has been a recomposition of capital inflows in favour of FDI inflows. Capital account liberalization alone does not lead to an increased amount of capital inflows within countries and thus does not lead to economic growth. It was found that a negative relationship exists between capital account liberalization and economic growth in Latin American countries. This analysis was reached by assessing the capital inflows within the region being studied (Ferreiro et al., 2008).

The shallow nature and level of development of capital markets in developing countries are debatable factors when assessing if capital market development has led to industrial sector development and thus economic growth (Ibi et al., 2015). The interdependence between financial

development, real sector output and their effect on economic growth was studied (Ductor and Grechyna, 2015). Panel data were used for 101 developed and developing counties for over the period 1970 to 2010. The study found that the effect of financial development on economic growth was strongly influenced by private credit growth relative to real output growth. The findings suggested that periods of rapid growth in private credit are not accompanied by growth in real output causing the effect of financial development on economic growth to become negative.

The role of financial inclusion in economic growth was investigated in low-income, middle-income and high-income countries (Seven and Yetkiner, 2016). The results revealed a significantly negative relationship between the role of financial inclusion in economic growth in high-income countries.

The relationship between stock market development and the Chinese real economy investigated using the ARDL model (Pan and Mishra, 2018). The results revealed that the global financial crisis (the period of 2007-2012) had a significant impact on the real sector and financial sector. The results revealed a long-run stochastic trend with the real economy and a small negative influence on the real economy. This could be due to the fact that the Chinese stock market contributes a small fraction to the economic development of the country. Another explanation for the negative relationship between stock market development and the Chinese real economy is the fact that the Chinese government uses the stock market as a tool to achieve specific goals rather than as a real reflection of the growth of the economy.

Panel data of 26 European Union countries were used for over the period 1990 – 2016 in order to examine the relationship between financial development and economic growth on the face of the global financial crisis (Asteriou and Spanos, 2019). The study employed multiplicative dummies in order to compare the two periods – before and after the crisis. The results revealed that there was a positive correlation between financial development and economic growth before the crisis whereas a negative correlation was revealed after the crisis.

The relationship between stock market development and economic growth was assessed in Tanzania over the sample period 2001q1 to 2019q2 using the ARDL model with bound testing procedures (Kapaya, 2020). The results revealed that there is a negative relationship between stock market liquidity and economic growth in the short run and long run.

The direct effects and spill-overs of the Covid-19 pandemic on stock markets was assesed in China, Italy, South Korea, France, Spain, Germany, Japan and the United States of America using the conventional t-tests and nonparametric Mann-Whitney tests (He et al., 2020). The study found that the Covid-19 pandemic had negative effects on the development of stock markets in the long run and bi-directional spillover effects between Asian, European and American countries.

A negative long run relationship was found between savings and economic growth in South Africa as there are low rates of domestic savings within the country and the country is heavily reliant on foreign savings in the form of foreign direct investment, official development assistance and cross-border bank flows (van Wyk and Kapingura, 2021).

The effect of financial sector development on macroeconomic volatility was assessed in the SADC region (Kapingura et al., 2022). The results revealed that the banking sector indicators and capital market development negatively affect economic growth.

2.6.4 Studies That Found No Relationship Between Capital Mobility And Economic Growth

There are studies that found no relation between capital account liberalization and economic growth (Rodrik, 1998; Alfaro et al., 2004; Tang, 2006; Ardic and Damar, 2006; Ewah et al., 2009; Nwaolisa et al., 2013; Menyah et al., 2014; Shahbaz et al., 2017; Gupta and Rao, 2018; Alakbarov and Murshudova, 2020).

Rodrik (1998) established that the liberalization of the capital account has no impact on the level of investment, the growth of the economy and on any other real variable that may have significant welfare implications. The study equally revealed how the benefits of an open capital account are not readily apparent instead the costs are evident and seen in the form of recurrent emerging-markets crises. In addition, Alfaro et al., (2004) examined how financial markets affect the relationship between foreign direct investment (FDI) and economic development. It was found that well-developed financial markets benefit from FDI and that FDI contributes to the development of the economy. There was no evidence of financial markets directly affecting economic development.

Tang (2006) tested for the effect of financial development on economic growth in fourteen Asia-Pacific Economic Cooperation (APEC) countries during 1981 – 2000. The modified growth model was used to establish the relationship with financial development and economic growth. Three

aspects of financial development were considered in this study these being the stock market, the banking sector and capital flow. The study incorporated the country-specific effect by differentiating between developed and developing countries as a way of considering the impact of the level of economic development in the countries included in the sample. The developed APEC countries in this study were United States, Canada, Japan, Australia, New Zealand, Singapore, Hong Kong and South Korea. The developing APEC countries in this study were Malaysia, Indonesia, China, Mexico, Thailand and the Philippines. The countries were split into groups (developed versus developing countries) as a way of addressing the argument that the growth effect may be greater in financially developed countries in comparison to less developed ones. The results revealed that the stock market rather than the banking sector development promote higher economic growth only for the APEC developed countries. The results equally revealed that increased capital flows would generally not yield high levels of economic growth in APEC countries. Finally, it was also found that the development of the banking sector has different growth effects on developed and developing countries. Countries that have a well-functioning banking sector are believed to boost the growth effect of capital flow only in APEC developing countries.

Ardic and Damar (2006) investigated how financial sector deepening had effects on economic growth in Turkey for the period 1996-2001. They found that there was no obvious relationship between financial development and economic growth and deemed that the correlation established between the variables by other researchers were merely results of historical peculiarity.

Ewah et al., (2009) investigated the effect of capital market efficiency on economic growth within Nigeria using data from 1961-2004. The relationship was analysed using the ordinary lest square estimation technique and a multiple regression. The study found that there was no significant effect of capital market development on economic growth within Nigeria. The capital market has the potential to be growth inducing because of low market capitalization, low absorptive capitalization and the misappropriation of funds.

The impact of capital market development on economic growth in Nigeria was studied (Nwaolisa et al., 2013). The study revealed that the impact between the variables was not statistically significant and thus no relationship could be established.

A financial development index was constructed for 21 African countries in order to examine the causal relationship between financial development and economic growth. The financial development index was based on four financial development indicators. The study found that financial development did not significantly influence economic growth (Menyah et al., 2014).

Shahbaz et al. (2017) investigated the relationship between financial development and economic growth in India. The study found that there is a nonlinear relationship between financial development and economic growth in India.

The Toda-Yamamoto causality test was used to investigate the relationship between financial development and economic growth in BRICS economies from 1996 to 2016 (Gupta and Rao, 2018). The test results revealed that there is no causality between financial development and economic growth within the BRICS economies.

The relationship between financial markets and economic growth was investigated in Georgia over the sample period of 1995 – 2017 (Alakbarov and Murshudova, 2020). The study found that there was no causal relationship between financial market development and economic growth. However, the study found that causality instead existed between economic growth and the productivity of financial markets.

2.6.5 Studies Found On Capital Mobility And Economic Growth In South Africa

The relationship between financial development and economic growth was tested in thirty countries including South Africa (Al Yousif, 2002). The Granger causality test within the Error Correction Model (ECM) was used to test for the relationship between financial development and economic growth. The findings of the study revealed a bidirectional relationship between financial development and economic growth within the ten of the thirty countries, one of the counties being South Africa. The other findings revealed a unidirectional relationship, there was causality from economic growth and financial development in nine of the counties and in four of the countries there was causality from financial development and economic growth. And in the remaining seven countries there was no significant relationship between the two variables being examined.

A study was conducted on the causality between savings and economic growth in South Africa from 1950 to 2005 (Odhiambo, 2009a). The main question that is being answered was whether savings act as an engine to economic growth or whether economic growth drives savings

accumulation. The Johansen-Juselius cointegration method and the error-correction mechanism were employed to answer the main question. The results reveal that a bi-directional causal relationship exists between savings and economic growth in the short run, however, in the long run a causal flow from economic growth to savings exists. The relationship in the long run is explained by the fact that the real sector would have grown and thus driven up the accumulation of savings.

Evidence of a causal link between stock market development and economic growth in South Africa was found using the Autoregressive Distributed Lag (ARDL) Bounds testing technique (Odhiambo, 2009b). Evidence revealed a causal impact of economic growth on stock market development. These results raised fundamental questions as to whether the research outcomes of Odhiambo (2009b) were a function of the nature of data and the method that was adopted to test for the relationship between stock market development and economic growth.

Ndako (2009) studied the causal relationship between stock market development and economic growth within thirteen African countries. South Africa was one of the thirteen African countries. The Vector Error Correction Mechanism (VECM) was used to study what relationship exists between stock market development and economic growth in South Africa. The collected data included real GDP, stock market capitalization, total value of stock traded and turnover ratio, foreign direct investment, secondary school enrollment and government consumption spending. It was found in the study that economic growth granger causes stock market development.

A long run causal relationship in ten Sub-Saharan African countries was examined between financial development and economic growth using Granger causality (Akinlo and Egbetunde, 2010). It was found that financial development granger causes economic growth in Central African Republic, Congo, Gabon and Nigeria whilst economic growth granger causes financial development in Zambia. Akinlo and Egbetunde (2010)l equally found that a bidirectional relationship between financial development and economic growth exists in Kenya, Chad, Sierra Leone, Eswatini and South Africa.

A study was conducted to investigate the impact of capital account liberalization on economic growth in South Africa. The study covered the period 1994 to 2010 and employed the Johansen cointegration approach to establish the impact capital account liberalization had on economic growth for that period. The results found that the opening of the capital account in South Africa

increases the capital flows within the country and thus increased economic growth rate which caused the economy to become more susceptible to an economic crisis (Khumalo and Kapingura, 2014).

Khetsi and Mongale (2015) conducted a study to access the impact of capital markets on economic growth in South Africa. Annual data were collected from 1971 to 2013. In the study, economic growth was proxied by Gross Domestic Production and the capital market is represented by Value of Transactions and Market Capitalization. It was found that capital markets positively impact developed countries in the long term in comparison to the impact they have on developing countries. Empirical review reveals that the lack of facilities such as macroeconomic stability, political stability and well-developed financial systems, hinders any progress to economic growth (Khetsi and Mongale, 2015).

Adeola (2017) conducted a study on foreign capital flows and economic growth in Selected Sub-Saharan African Economies for the time period 1970 to 2011. In the study GDP per capita was used as a proxy for economic growth. There were five variables used to proxy capital flows and nine control variables. The study revealed that remittances, which are a growing form of foreign capital flows, mostly contribute to economic growth in two out of the four countries studied in sub-Saharan Africa. The findings equally revealed how foreign direct investment also another capital flow contributes to economic growth. There was a unidirectional causality running from economic growth both to debt liabilities and portfolio equity in South Africa revealed whereas the opposite was the case for foreign direct investment. The causality between economic growth and remittances was however mixed as both bi-directional and unidirectional causality were observed.

Osakwe and Ananwude (2017) looked at the relationship between stock market development and economic growth within Nigeria and South Africa. The results reveal that economic growth is correlated to stock market capitalization in South Africa whereas there was an insignificant effect of economic growth on stock market capitalization in Nigeria. Similarly, a study was conducted to examine the relationship between stock market capitalization and economic growth in Nigeria and South Africa from 2000 – 2018. Evidence from the study revealed how significant and positive the relationship between stock market capitalization and economic growth in South Africa is in comparison to the insignificant relationship between stock market capitalization and economic

growth in Nigeria (Osakwe, Ogbonna and Obi-Nwosu, 2020). Positive correlation exists between the economic growth of one country and its size of its capital market.

The relationship between financial development and economic growth was analysed in Nigeria and South Africa over the period 1980 to 2014 (Odo et al., 2020). The variables employed in the study were the domestic credit to private sector to GDP, the ratios of broad money supply, the real interest rate and economic growth. The VECM and Granger causality were used to establish the linkage between financial development and economic growth. The study found unidirectional causality in Nigeria and bidirectional causality in South Africa.

The relationship between stock market development and economic growth was investigated in Southern African Development Community (SADC) over the period 1993-2017 (Abel et al., 2021). The ARDL model was employed to study the relationship between stock market development and economic growth and it was found that there is a bidirectional relationship between stock market development and economic growth in both the long and short run in the SADC countries. The study also found that in the long run, trade openness and investment are deterministic factors of stock market development and economic growth.

Rohit and Miyajima (2021) analyzed capital flow drivers using the 'At-Risk' framework in South Africa's for the timespan Q1 1990– Q4 2019. The findings of the study reveal how lower growth dampens FDI (both resident and nonresident) further weakening economic growth and how portfolio and other investment flows tend to fall as growth improves.

The correlation between tax policies, financial development and economic growth was investigated in 12 Sub-Saharan African countries over the sample period 2000-2019 (Ekpeyong and Adewoyin, 2023). These 12 Sub-Saharan African countries were namely Nigeria, Ghana, Senegal, Cameroon, Mali, Benin, Cape Verde, Burkina Faso, Kenya, Tanzania, Namibia and South Africa. The mean group ARDL estimation method was used to analyse the relationship and it was found that foreign direct investment significantly impacts economic growth.

2.7 CONCLUSION

This chapter briefly gives an overview of the capital market. The chapter equally reviewed literature on the opposing theories on the link between capital mobility and economic growth.

These theories being the supply-leading theory, demand-following theory, mutual causation, mutual exclusion, the financial liberalization theory and the prior-savings theory. The various tests of capital mobility were explored within the chapter and finally the chapter discussed the evolution of capital mobility policies in South Africa. The following chapter will unpack the existing literature on the relationship between capital mobility and economic growth in various countries around the world.

This chapter unpacked the previous studies that were conducted to establish the relationship between capital mobility and economic growth around the world. The empirical evidence locally is limited in comparison to the empirical evidence from outside of South Africa. The findings of the empirical literature share commonalities but remain inconclusive. The studies revealed various results such as a unidirectional relationship, either being a positive or negative relationship between capital mobility and economic growth; a bidirectional relationship between capital mobility and economic growth; and no relationship between capital mobility and economic growth. Several studies reveal a positive relationship between capital mobility and economic growth and equally a bidirectional relationship between the key variables. Hence these empirical studies can be attributed to the supply-leading theory and mutual causation theory. Additionally, the majority of the empirical studies used a VECM to establish the relationship between financial development and economic growth, however this study will employ an Autoregressive Distributed Lag (ARDL) model to establish the relationship between capital mobility and economic growth.

Odhiambo (2009b), Fakudze, et al. (2021) and Abel, et al. (2021) provide guidance on the framework to follow within this study. Based on the empirical literature the following chapter will address the research design and model that has been used to established to determine the relationship between capital mobility and economic growth.

CHAPTER THREE

METHODOLOGICAL APPROACH

3.1 INTRODUCTION

This chapter has outlined the methodology that has been applied to achieve results that answer to the overarching goal of this study which is to investigate capital mobility and economic growth in South Africa. The first objective of this study is to firstly determine and analyse the trends in the degree of capital mobility in South Africa. Secondly, to determine the relationship between capital mobility and South Africa's economic growth. The savings and investment correlation approach and the Hodrick-Prescott Filter have been adopted to achieve the results in answering the first objective which is to determine and analyse the trends in the degree of capital mobility in South Africa. The Autoregressive Distribution Lag model and various estimation techniques namely various stationarity tests, the lag selection criteria and various diagnostic tests have been used to achieve the results in answering the second objective which is to determine the relationship between capital mobility and South Africa's economic growth.

This study has employed the quantitative research method. The chapter described the research paradigm, the definition of each of the variables as well as an expectation of what the results were most likely to be, specified which approach and filter have been used to produce the results. Thereafter, econometric techniques namely various stationarity tests and the lag selection criteria that have been utilized in the analysis, were unpacked. After the econometric techniques, the ARDL model that was used to produce the results was explained and a discussion of how the model was applied followed. Then post-estimation, various diagnostic tests were used. Then the conclusion followed thereafter.

3.2 RESEARCH PARADIGM

The research paradigm has outlined how the researcher conducted their study, more especially, it outlined which methods were employed throughout the study and how the data obtained has been analysed to obtain results and draw conclusions (Kivunja and Kuyini, 2017). There are three paradigm assumptions which are the critical theory paradigm, interpretivism/constructivist and positivism paradigm. The positivist paradigm was founded on Auguste Comte's idea of testing

priori hypotheses that are categorised quantitatively, more especially where relationships can be established between independent and dependent variables.

The post-positivist paradigm is validated by applying four criteria, these being internal and external validity, reliability and objectivity (Burns, 2000). The research design adopted in this study draws on a post-positivist paradigm, which is a quantitative, empirical, analytic based research – it requires the collection of data, specification of econometric models and analysis to study the key phenomenon (Wang et al., 2007). This paradigm directly helps understand the relationship between capital mobility and economic growth.

3.3 VARIABLE MEASUREMENT, A PRIORI EXPECTATION AND DATA SOURCES

This study was conducted through the usage of secondary data. Capital mobility was proxied by net capital flows to GDP. Economic growth was measured as the growth rate of the real gross domestic product (GDP). The degree of trade openness and the saving-investment correlation were used as control variables within the study. This data were obtained from the World Bank database and SARB Quarterly Bulletin for the period 1990 to 2022.

3.3.1 Variable measurement

Net capital flows to GDP (netcf) representing capital mobility. Net capital flows to GDP is defined as the change in the transfer of capital and the net value of assets and liabilities in the financial accounts including transactions that are unrecorded (Wesso, 2001). Capital flows are measured by the difference between outflows and inflows of capital instead of assessing outflows and inflows of capital separately (Lipzey, 1999). The measure of net capital flows to GDP has been used by Lipzey (1999) and Wesso (2001).

The saving-investment ratio (savinv) represents the current account. Feldstein and Horioka (1980) proposed the correlation of savings and investments as a measure of the degree of capital mobility within the country. The ratio was achieved by dividing domestic savings by the level of domestic investments within South Africa. The measure of the saving-investment ratio has been used by Sinn (1992) and Hwang and Kim (2018).

The degree of trade openness (dto) is described as the integration of global economies which allows opportunity for resources to be transferred between more emerging and advanced economies (Fujii, 2018). The degree of trade openness is measured by the sum of exports and imports of goods and services measured as a share of gross domestic product. Trade openness

creates opportunities for developing countries to change the structure of their participation in international markets in order to address balance of payment issues which promotes economic growth (Sakyi et al., 2012). A higher degree of trade openness is an indication of a more open economy whereas a lower degree of a less open economy.

The choice of the degree of trade openness variable in this study is based on its popularity in many research works reviewed (Gries et al., 2011; Matiti, 2013; Lawal et al., 2016; Adeola, 2017; Fujii, 2018 and Abel et al., 2021).

Real GDP (g) is described as the logarithm of the Gross Domestic Product. It measures economic growth by taking the economic activities into account. The growth of the economy is associated with higher living standards within a country. The choice of the real GDP variable in this study is based on its popularity in many research works reviewed (Khumalo and Kapingura (2014); Khetsi and Mongale (2015) and Adeola (2017)).

3.3.2 Expected Priori

The degree of trade openness is expected to be positive as most restrictions affecting have been removed and South Africa is well involved in international trade. The degree of trade openness could equally be negative as domestic industries can be negatively affected. When exports dominate, a positive effect is realised in the degree of trade openness whereas when imports are dominant, a negative effect is realised in the degree of trade openness. The net capital flows per GDP are expected to be positive as there is more foreign capital flowing into South Africa which allows for the current account deficit to be reduced. The saving-investment ratio is expected to be high because of the recent macroeconomic shocks to the South African economy. Economic growth is expected to increase as there is more foreign capital inflows expected and can be used to reduce the current account deficit.

Table 3.1 Expected Priori

Variable	**Expected Sign**
Gross Domestic Product	Positive (+)
Net Capital Flows/GDP	Positive (+)
Saving-Investment Ratio	Positive (+)
Degree of Trade Openness	Positive/Negative (+/-)

3.4 THE SAVINGS-INVESTMENT APPROACH AND THE HODRICK-PRESCOTT FILTER

In order to determine and analyse the trends in the degree of capital mobility in South Africa, the savings and investment correlation approach is adopted in this study as a distinctive measure of the degree of capital mobility (Feldstein and Horioka, 1980). Feldstein and Horioka (1980) identifies a basic correlation between savings and investment as follows:

$$\frac{I_t}{Y_t} = A + B\left(\frac{NS_t}{Y_t}\right) + v_t \quad \ldots\ldots (1)$$

Where $\frac{I_t}{Y_t}$ is the investment rate and $\frac{NS_t}{Y_t}$ is the saving rate determined as (private saving –budget deficit) divided by national income. Coefficient B is the focal point – its size and sign are crucial. When coefficient B is zero, perfect capital mobility exists whereas when coefficient B is one perfect capital immobility exists. When international capital is mobile, a weak relationship between the savings and investment in a country is established. However, when capital is deemed immobile, a positive relationship between investment rates and saving rates is noticed.

Subsequent time series studies such as Afxentiou and Serletis (1993), Tesar (1993) and Alexakis and Apergis (1994) confirmed the results of Feldstein and Horioka (1980). Sinn, 1992; Frankel, 1992; Baxter and Crucini, 1993; Holmes, 2005; Hwang and Kim, 2018 and Behera, 2023 equally used the savings and investment correlation approach as a measure for degree of capital mobility.

The Hodrick-Prescott Filter has been used to filter out the noise of the various trends within the study and remain with the trend. This filter is a long-standing standard technique which has been used to separate the long-run trend in a data series from short-run fluctuations (de Jong and Sakarya, 2020). The Hodrick-Prescott Filter was introduced initially by Whittaker (1923) and later popularized within the economics discipline by Hodrick and Prescott (1997). Previous studies such as Phillips and Jin (2002,2015), Phillips (2010), de Jong and Sakarya (2016), Cornea-Madeira (2017), and Hamilton (2018) have used the Hodrick-Prescott Filter to separate the long-run trend in a data series from short-run fluctuations.

3.5. ESTIMATION TECHNIQUES

Before any test can be run to establish the relationships between the variables, unit root tests using a number of tests such as the augmented Dickey-Fuller and the Phillip-Peron tests (Khumalo and Kapingura, 2014). This study employed the augmented Dickey-Fuller test, the Phillips-Peron test and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test as different tests have varying strengths of uncovering non-stationary. In order to establish the long-run relationships between the variables, the ARDL was used. And finally, the robustness of the model was assessed using various diagnostic tests.

3.5.1 Testing for stationarity

Econometricians assume that time series data are initially in non-stationary form. Hence, all variables should be tested for unit roots before other tests can be conducted on the variables within the study. When OLS is applied to non-stationary data, misspecified regressions that are of a spurious nature are produced (Brooks, 2002). The variables within the model need to be tested for stationarity in order to avoid the spurious regression problem, biased t-ratios and an exaggerated R-squared value. A regression that produces such results cannot be relied on and thus will be meaningless.

3.5.1.2. Augmented Dickey Fuller Test

The Augmented Dickey Fuller (ADF) test is a formal test used to measure unit roots in a time series sample. The presence of a unit root is assessed by looking at the calculated value of the ADF and comparing it to the critical value. The decision criteria for an ADF test is that we fail to reject the null hypothesis when the t-statistic is greater than the critical value and consider the series as non-stationary. And we reject the null hypothesis when the t-statistic is less than the critical value and consider the series as stationary. The tau statistic must have larger negative values for the null hypothesis to be rejected and the alternative hypothesis to be considered as that is an indication of a stationary process (Brooks, 2002).

The Augmented Dickey Fuller (ADF) test is preferred over the simple Dickey Fuller test as it contains an unknown number of differences of the dependent variable which will capture autocorrelation in variables that have been omitted which may have become part of the error term.

3.5.1.3. Phillips-Perron Test

The Phillips-Perron test differs from the ADF in a number of ways. Firstly, the Phillips-Perron test has an automatic correction incorporated in order to allow for autocorrelated residuals. Cashins and McDermott (2003) argue that the Phillips-Perron test has better comparative power and yields tighter confidence intervals in comparison to the ADF test. Another difference between the Phillips-Perron test and the ADF, is that the Phillips-Perron test is a non-parametric adjustment which performs better under structural changes.

3.5.1.4. Kwiatkowski-Phillips-Schmidt-Shin (KPSS)

The KPPS test caters for the drawbacks of both the ADF and Phillips-Perron test (Kwiatkowski et al., 1992). In the instance where the results of the ADF and KPSS tests differ, the KPSS test results is opted for. The KPPS test assumes that at the null hypothesis y_t is stationary (Kwiatkowski et al., 1992). The alternative hypothesis is that y_t is not stationary.

3.5.2 LAG SELECTION CRITERIA

One of the most important steps when looking to use an econometric model is estimating the lag length of an autoregressive process for a time series. When using time series data to estimate regressions, the lagged values of the dependent variable must be included as independent variables. The ARDL model has its own lag selection procedure which is in-built. Brooks (2002) proposes the usage of multivariate versions of the information criteria. The ARDL model is estimated under each information criterion and the information criterion with the smallest SE of the regression was selected.

3.6. AUTOREGRESSIVE DISTRIBUTED LAG MODEL

The ARDL model is an econometric model that has been used to estimate the relationship between capital mobility and South Africa's economic growth. The ARDL model was developed by Pesaran et al. (2001). There are various advantages that have been identified when considering the ARDL model. Firstly, the cointegration relationship can be estimated once the lag order has been identified which is unlike the other multivariate cointegration techniques. And secondly, the variables included in the model do not have to be pre-tested for unit roots or stationarity like other testing techniques. The ARDL bound model has been used to test for relationships between variables that have mixed orders of integration. The underlying regressors can be I(0) and I(1). Another reason the ARDL model is an efficient model to use is because of its ability to use a small

sample size (Fosu and Magnus, 2006). This study employed annual data and hence has a small sample size making the ARDL model an ideal model. The Error Correction model has been estimated to reveal how the short-run dynamic parameters associated with the long-run estimates (Fosu and Magnus, 2006). This model, in essence, estimates the relationships in the short-run whilst equally taking the speed of adjustment of the coefficients. It measures how quickly GDP will return to equilibrium after experiencing a short-term shock. Error Correction models (ECMs) are useful for estimating the short and long term effects of how one time series influences another. ECMs directly estimate the speed at which past deviations from the equilibrium can be corrected.

The ARDL is specified as follows:

$$g_t = \alpha + \sum_{i=1}^{p} \delta_i g_{t-i} + \sum_{j=0}^{p} \beta_j savinv_{t-j} + \sum_{h=0}^{p} \beta_h netcf_{t-h} + \sum_{k=0}^{p} \beta_k dto_{t-k} + \mu_t \ldots\ldots\ldots(2)$$

The short run ARDL model is represented as:

$$\Delta g_t = \alpha + \sum_{i=1}^{p} \delta_i \Delta g_{t-i} + \sum_{j=0}^{p} \beta_j \Delta savinv_{t-j} + \sum_{h=0}^{p} \beta_h \Delta netcf_{t-h} + \sum_{k=0}^{p} \beta_k \Delta dto_{t-k} + \varphi_1 g_{t-1} + \varphi_2 savinv_{t-1} + \varphi_3 netcf_{t-1} + \varphi_4 dto_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

The ECM_{t-1} term is a linear combination of the four variables expressed as:

$$ECM_{t-1} = \varphi_1 g_{t-1} + \varphi_2 savinv_{t-1} + \varphi_3 netcf_{t-1} + \varphi_4 dto_{t-1} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4)$$

The null hypothesis of the ARDL depicts that the long run multipliers are equal to zero indicating that there are no long run relationships between the variables. The alternative hypothesis depicts that the long run multipliers are not equal to zero indicating that there are long run relationships between the variables. The decision criteria for the ARDL bound test is that when the F-statistic is above the I(1) value [upper critical value], the null hypothesis that there is no long run relationship can be rejected (Fosu and Magnus, 2006). When the F-statistic is below the I(0) value [lower critical value], the null hypothesis that there is no long run relationship cannot be rejected (Fosu and Magnus, 2006). And when the statistic falls between both the I(0) and I(1) values, the test result is considered to be inconclusive. The test for the existence of a long run relationship between growth and the explanatory variables saving-investment ratio, net capital flows ratio and trade openness ratio is carried out through an F-bounds test. From (4), the null hypothesis of no cointegration and its alternative are stated as:

$H_0: \varphi_1 = \varphi_2 = \varphi_3 = \varphi_4 = 0$ vs. $H_1: \varphi_1 \neq \varphi_2 \neq \varphi_3 \neq \varphi_4 \neq 0$……..(5)

Odhiambo (2009b), Fakudze, et al. (2021) and Abel, et al. (2021) provide guidance on the framework to follow within this study. In contrast, other studies made use of different growth models to examine the relationship between capital mobility and economic growth (Barro et al, 1992; Duczynski, 2000; Tsoukis, 2003; Klyuev, 2004; Klyuev, 2004; Varma, 2009; Osvaldo, 2013; Ketenci, 2015; and Murthy and Ketenci, 2020).

3.7 POST-ESTIMATION TESTS

3.7.1 WALD CAUSLAITY TEST

Every ARDL model run, allows for short-run and long-run Granger causality tests as this is part of the post-estimation procedures that need to be conducted.

3.7.2 DIAGNOSTIC TESTS

Gujarati and Porter (2009) state that diagnostic testing is necessary based on the assumptions of the Classical Linear Regression model, more especially, that the results produced by the model can be relied on and accepted when drawing conclusion on possible relationships between variables. The diagnostic tests that have been employed within this study to assess whether the model is acceptable and that the results can be trusted are the Autocorrelation Lagrange Multiplier (LM) test, the White's general Heteroscedasticity test and the Residual Normality test.

3.7.2.1 Autocorrelation LM test

The LM Test is a multivariate test statistic that assesses the residual serial correlation up till a specified lag order. According to Harris (1995), the lag order of the LM test should be the same to that of the corresponding model. The null hypothesis of the LM test is that there is no serial correlation present within the model. The probability-value of the LM test statistic is assessed when determining if the null hypothesis should be rejected or not. When the probability-value of the LM test statistic surpasses the five percent level of significance, we fail to reject the null hypothesis and conclude that there is no serial correlation within our model (Gujarati and Porter, 2009).

3.7.2.2 Heteroscedasticity test

There are a number of tests for heteroscedasticity. The commonly known test for heteroscedasticity is the White's general test. The null hypothesis is that there is no conditional heteroscedasticity and conclude that there is homoscedascity instead. When the probability-value of the prob-value of the White test statistic surpasses the five percent level of significance, we fail to reject the null hypothesis (Gujarati and Porter, 2009). Whites's (1980) general test assumes that the estimated regression model is standard linear.

3.7.2.3 Residual Normality Test

This test entails making correction to a small portion of the test sample which are transformed residuals. The null hypothesis of this test is that residuals are normally distributed. In accessing the Jarque-Bera probability-value, we can conclude that there is normal distribution as the prob-value is greater than five percent (Gujarati and Porter, 2009). An indication of non-normality in the residuals arises when the Jarque-Bera statistic is not significant. The Jarque-Bera statistic is based on the sample kurtosis and skewness (Gujarati and Porter, 2009).

3.7.2.4 Cumulative sum of residual (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests

The CUSUM and the CUSUMSQ tests are used to determine parameter stability within models. These tests were introduced into econometrics literature by Brown et al. (1975). The main aim these diagnostic tools were to detect structural breaks (Turner, 2010). However, in the recent years, the CUSUM tests are used to test for constancy of parameters.

3.8 CONCLUSION

This chapter identified the techniques that were used to estimate the impact of capital mobility on economic growth. In the chapter a step-to-step guideline was provided as to how the goals of the study were achieved. Firstly stationarity was assessed using three tests the Augmented Dickey-Fuller test, the Phillips-Peron test and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS). Thereafter the ARDL model, was conducted then various diagnostic tests were run on the test sample.

CHAPTER FOUR

EMPIRICAL FINDINGS AND DISCUSSION

4.1 INTRODUCTION

The overarching goal of this thesis has been to investigate the impact of capital mobility on economic growth in South Africa. The sub-goals included determining and analyse the trends in the degree of capital mobility in South Africa as well as determining the relationship between capital mobility and South Africa's economic growth. The various test results namely the trend analysis results and correlation analysis results aim to answer the first objective of this study which is to determine and analyse the trends in the degree of capital mobility in South Africa. Other test results namely the unit root tests, the Autoregressive Distributive Lag estimation, Wald Causality test results, dynamic multiplier results and diagnostic tests aim to answer the second objective of this study which is to determine the relationship between capital mobility and South Africa's economic growth.

Data variables obtained from the World Bank database representing capital mobility and economic growth in South Africa were investigated over the period 1990 to 2022. This period was selected as it allows opportunity to observe the varying stages of political transition within South Africa.

4.2 TREND ANALYSIS RESULTS

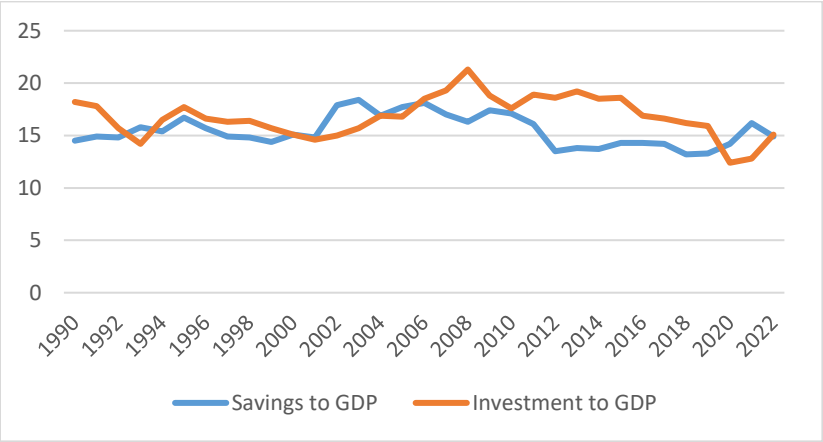

Figure 4.1: Unfiltered Saving-investment trends

Source: *Primary data computed from World Development Indicators*

Table 4.1: Saving-investment trend results

Period	Savings Trend (%)	Investments Trend (%)
1994 (Independence)	15.40	16.50
Mid 1990s – 2000 (Dotcom Bubble)	-1.60	-2.60
1996 – 1998 (Rand Crisis)	-1.80	-0.70
2000 (Inflation Targeting)	15.10	14.60
2002-2008 (Commodity Supercycle)	1.60	6.20
2008-2010 (Financial Crisis)	1.30	-3.70
2020-2021 (Covid-19 Pandemic)	2.00	0.40
2022 (Russo-Ukrainian War)	15.10	15.10

Source: *Primary data computed from World Development Indicators*

The trends of savings and investments from 1990-2022 are portrayed in Figure 4.1 and Table 4.1. The tables have been completed by inferring from the applicable graphs. The trend analysis section starts off by unpacking the saving-investment trends given their role in capital mobility as explained in Chapter 2. When international capital is mobile, a weak relationship between the savings and investment in a country is established. However, when capital is deemed immobile, a positive relationship between investment rates and saving rates is noticed. The link between savings and investments is equally important as it holds the link between savings and economic growth. There seems to be an overall positive correlation between the trends except for during the financial crisis (2008-2010) where the savings trend(S) and the investment trend(I) signs differ. During periods where I is greater than S, less consumption is realised and the desired level of

inventory is lower than the planned level of inventory. However, when S is greater than I, more consumption is realised and the desired level of inventory is above than the planned level of inventory. The portrayal of the trends is contextualised in terms of the broader macroeconomic situations and policies in the country in attempt to throw some light on what happened in the background.

The fluctuations in the trends could possibly be governed by the commodity super cycle and the global financial crisis. When looking at Figure 4.1 and Table 4.1, it can be observed that there was a significant fall in the saving-investment trends during 2002-2008 in comaprison to in the year 2000. The saving trend fell by 13.50% whereas the investment trend fell by 8.40%. During 2008-2010, there is a negative correlation between the saving-investment trends. The investment rate (21.30%) increased significantly during the global financial crisis, in 2008, in comparison to the savings rate (16.30%). According to the National Treasury (2009), in 2008, the savings and investment gap widened further causing an increment in the current account balance deficit. Hence, the rise in the investment rate is supported by the budget deficit growth. The South African budget deficit grew from 0.50 percent in 2008 and worsened to five percent by 2009 (Redda, 2021).

Years after, the budget deficit growth has stayed between four and five percent. This indicates that the aftereffects of a crisis are felt within the country long after the crisis has happened. According to the National Treasury (2023), stagnating economic growth was observed for more than a decade from 2008/2009 and this is due to structural constraints and the rate at which state capture had drained the confidence and resources of the country. Economic growth drives investment within the country and thus it can be concluded that low economic growth is negatively associated with high levels of investment (National Treasury, 2016).

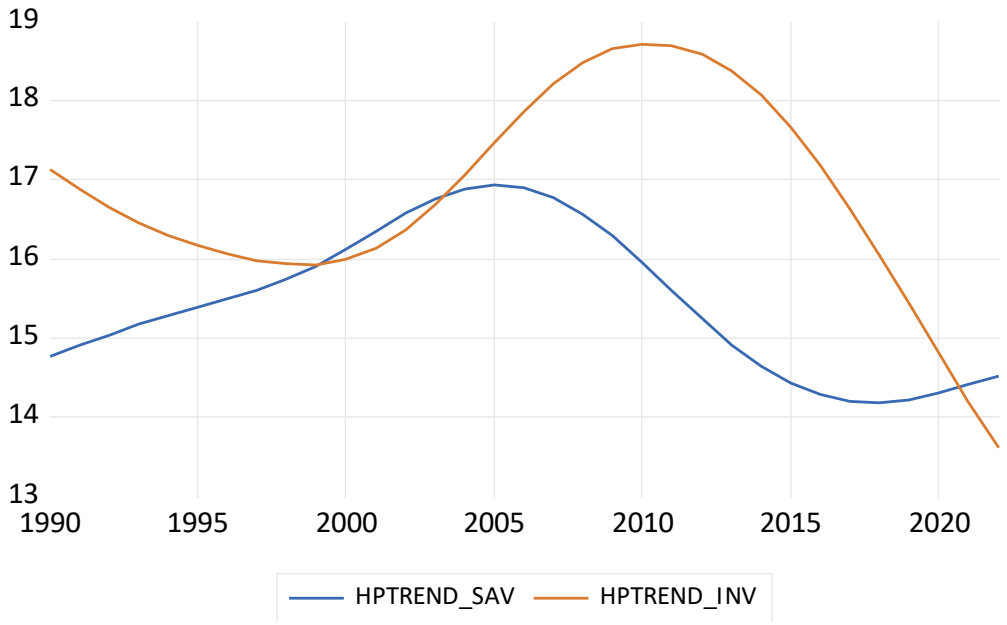

Figure 4.2: Filtered Saving-investment trends

Source: *Primary data computed from World Development Indicators*

In Figure 4.2, the Hodrick-Prescott Filter has been used to filter out the noise of the saving-investment trends and remain with the trend. The HPTREND_SAV is the filtered savings trend and the HPTREND_INV is the filtered investment trend. The filtered trends appear to be more volatile than the unfiltered saving-investment trends in Figure 4.1. Figure 4.2 reveals periods (2004-2021) where the savings and investment gap had widened. The widening of the savings and investment gap further causing an increment in the current account balance deficit (National Treasury, 2009).

Additionally, when comparing the unfiltered saving-investment trends and filtered trends, in 2009 to 2017 the trends differ. This time frame identifies with the global financial crisis and its aftereffects. This time frame revealed the effects of structural constraint and the rate at which state capture had drained the confidence and resources of the country (National Treasury, 2023).

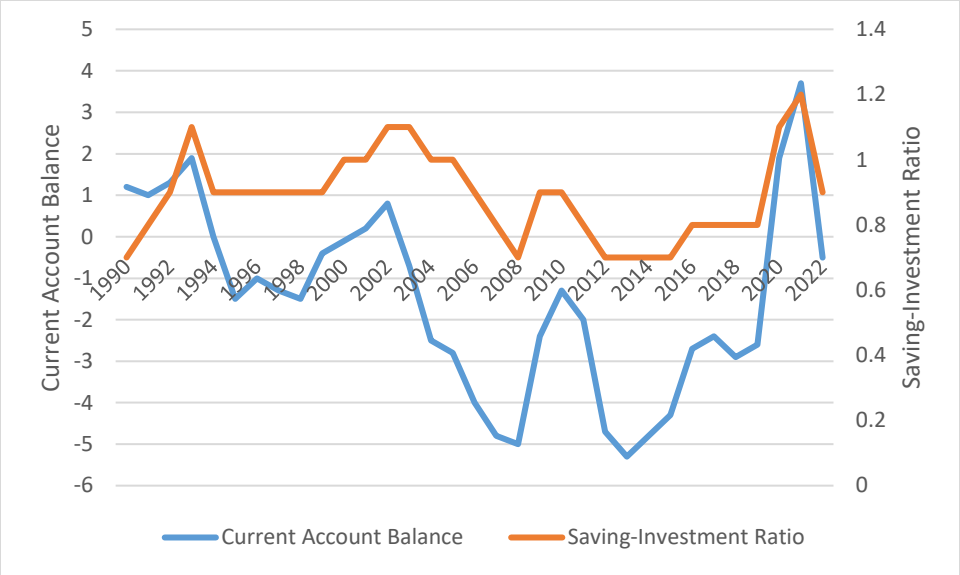

Figure 4.3: The unfiltered current account balance and the saving-investment ratio

Source: *Primary data computed from World Development Indicators*

Table 4.2: The current account balance and the saving-investment ratio results

Period	**Current Account Balance (%)**	**Saving-Investment Ratio (x100)**
1994 (Independence)	0.00	1.10
Mid 1990s – 2000 (Dotcom Bubble)	-0.50	0.90
1996 – 1998 (Rand Crisis)	-0.50	0.90
2000 (Inflation Targeting)	-0.40	0.90
2002-2008 (Commodity Supercycle)	-4.30	-1.70
2008-2010 (Financial Crisis)	3.00	0.20
2020-2021	2.80	0.30

(Covid-19 Pandemic)		
2022 (Russo-Ukrainian War)	-0.50	0.90

Source: *Primary data computed from World Development Indicators*

Figure 4.3 and Table 4.2 show that the current account balance is correlated with the saving-investment ratio. The saving-investment ratio is affected by a number of factors which either cause the ratio to be high or low. A high saving-investment ratio is noticeable during a period of macroeconomic shocks as the desire to save increases for firms during ths period. A high saving-investment ratio is equally noticeable during a period of financial friction, long-run constraints within a country, when the population has grown. There are several factors which contribute towards a low savings rate namely high cost of capital and the lack of investment opportunities which are profitable. The current account balance is affected by the number of imports, exports, outgoing and incoming transfer payments and the earnings received from investments within the country and from abroad. According to the two gap model, a savings-investment imbalance is reflected in a current account imbalance. This means that when SAV/INV is less than 1, the external account finances the domestic savings gap (Artis and Bayoumi, 1989). The fluctuations in the trends could possibly be governed by the rand crisis, commodity super cycle, inflation targetting and the Russo-Ukrainian War.

South Africa's susceptibility to both domestic and external shocks in the 1990s was intensified by the extremely weakened international reserve position. This position was prompted by years' worth of economic isolation and by the SARB who attempted in 1996 and 1998 to tackle exchange rate pressures through aggressive market intervention (Nowak, 2005). The improved financial account position resulted in the strengthening of the overall balance of payments position mid-1994 (Wesso, 2001). The period 1996-1998, the currency suffered a speculative attack – referred to the rand crisis. This period was exacerbated by intervention policies which encompassed the running down of official reserves in order to defend the currency and increasing short-term interest rates in order to fight depreciation pressures. These policies affected both the current account balance and the saving-investment ratio. The increase of short-term interest rates negatively affects the current account balance. Figure 4.3 and Table 4.2 show that the current account balance was -0.50% during the rand crisis period.

In 2000, inflation targetting was adopted in South Africa. The period when inflation targetting was adopted revealed a slight increase in the current account balance(-0.20%). The current account balance was in deficit due to the increase in the volume of imports, weaker agricultural commodity exports, a deterioration in the country's terms of trade and the widening of the services account deficit of the balance of payments (SARB, 2000). This current account deficit was funded by global capital inflows.

The commodity super cycle of 2002 – 2008 was a period where commodity prices rose to extraordinary pricing levels. South Africa's economic development has been shaped by commodities. During this period, the current account balance fell significantly (-4.30%) as well as the saving-investment ratio (-1.70). South Africa is highly dependent on foreign savings and thus on foreign investments as domestic savings are low. The dependence on foreign savings weakens the economy and thus makes it more susceptible to shifts in international capital (StatsSA, 2013; Prinsloo, 2000).

The current account balance fell to -0.50% whereas the saving-investment ratio rose to 0.90 during the Russo-Ukrainian War. According to National Treasury (2023), the current account deficit in 2022 was as a result of slowed net trade gains.

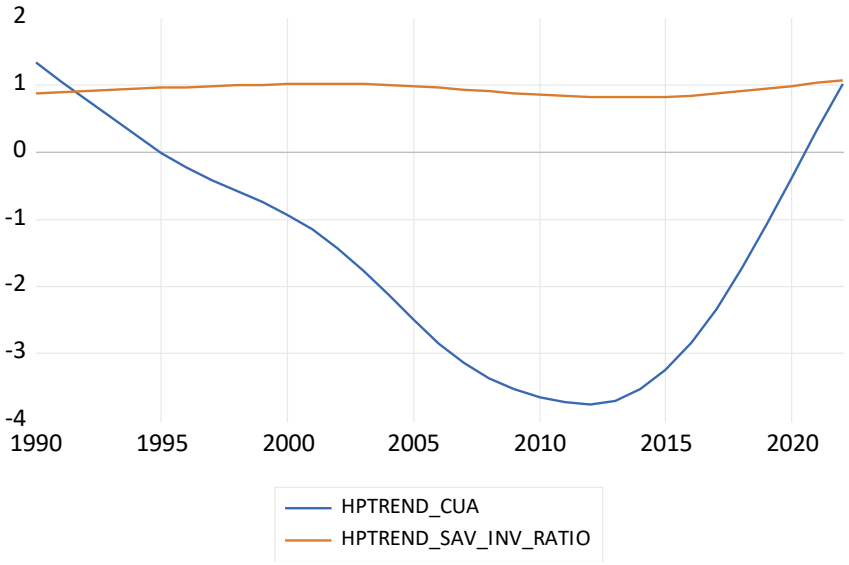

Figure 4.4: Filtered current account balance and the saving-investment ratio

Source: *Primary data computed from World Development Indicators*

In Figure 4.4, the Hodrick-Prescott Filter has been used to filter out the noise of the interaction between the current account balance trend and the saving-investment ratio trend. The HPTREND_CUA is the filtered current account balance trend and HPTREND_SAV_INV_RATIO is the filtered savings-investment trend. The current account balance trend significantly fell since independence (1994) until 2013. When observing Figure 4.4, the gap within the trends widened over time. When making comparisons between the unfiltered trend (Figure 4.3) to the filtered trend (Figure 4.4), it can be inferred both figures have a gap between the trends. In Figure 4.3, from 2007 – 2018, the SAV/INV was less than 1, meaning the external account finances the domestic savings gap (Artis and Bayoumi, 1989).

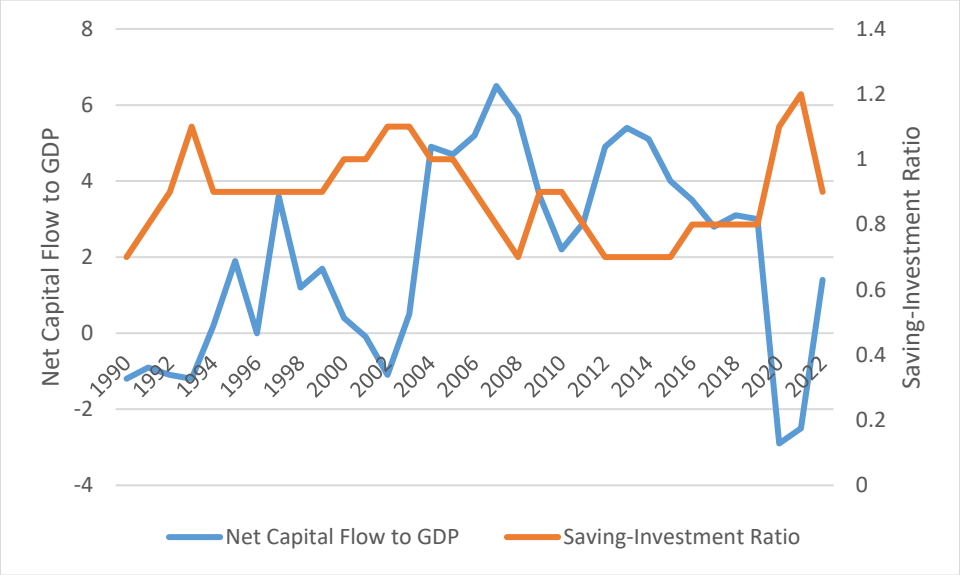

Figure 4.5: Unfiltered Net Capital Flow to GDP and Saving-Investment Ratio

Source: *Primary data computed from World Development Indicators*

Table 4.3: Net Capital Flow to GDP and Saving-Investment Ratio Results

Period	**Net Capital Flow to GDP (%)**	**Saving-Investment Ratio (x100)**
1994 (Independence)	-1.80	0.90
Mid 1990s – 2000 (Dotcom Bubble)	-0.20	0.90

1996 – 1998 (Rand Crisis)	-1.70	0.90
2000 (Inflation Targeting)	1.80	0.90
2002-2008 (Commodity Supercycle)	2.90	-0.30
2008-2010 (Financial Crisis)	-4.50	0.90
2020-2021 (Covid-19 Pandemic)	-3.00	0.40
2022 (Russo-Ukrainian War)	-1.50	0.90

Source: *Primary data computed from World Development Indicators*

Figure 4.5 and Table 4.3 show that net capital flows/GDP is correlated with the saving-investment ratio.When the saving-investment ratio is equal to one, the domestic private sector gap is balanced (Artis and Bayoumi, 1989). When the saving-investment ratio is less than one, the domestic sector balance is in deficit hence capital flows finance it. If the saving-investment ratio is greater than one, there is a savings glut and outflows are noticed as domestic agents seek better returns elsewhere.The fluctuations in the trends could possibly be governed by independence, commodity super cycle, Covid-19 pandemic and the Russo-Ukrainian War.

When observing, Figure 4.5 and Table 4.3, the period of independence entailed a sharp increase in the saving-investment ratio (0.90) and in the net capital flows per GDP (-1.80%). The effects of the Apartheid government explain why net capital flows per GDP were low when South Africa became independent – the lack of global integration explains the low rates of net capital flows per GDP.

During inflation targetting, the net capital flows per GDP (1.80%) doubled the saving-investment ratio(0.90). The trend of capital flows in South Africa may be influenced by macroeconomic conditions and economic policies implemented by the government (Wesso, 2001).

Additionally, the commodity super cycle of 2002 – 2008 was a period where the net capital flows (2.90%) significantly rose whereas the saving-investment ratio(-0.30) slightly fell. The liberalisation of the financial account, inadequate macroeconomic and financial policies may heighten the vulnerability to both domestic and external shocks (Wesso, 2001).

When Covid-19 struck hardest, the savings-investment ratio(-3.10) stayed stagnant whereas the net capital flows per GDP fell (0.40%). In 2020, a significant fall in the level of investments in both public and private sectors was anticipated (SARB, 2020). It was also ancipated that in 2021, economies which have large imbalances externally, fiscal deficits and high debt levels are likely to experience pronounced levels of risk aversion (SARB, 2020). The Covid-19 period entailed weakend commodity export prices, stagnant investment and long term scarring effects of the pandemic on the economy (SARB, 2021). The growing uncertainties and higher global inflation caused capital flow volatility (SARB, 2021).

The Russo-Ukrainian War impaired trade and caused the rising of food prices, a wide range of energy and other commodities (SARB, 2022). The Russo-Ukrainian War the savings-investment ratio fell significantly (-1.50) whereas the net capital flows per GDP rose (0.90%).

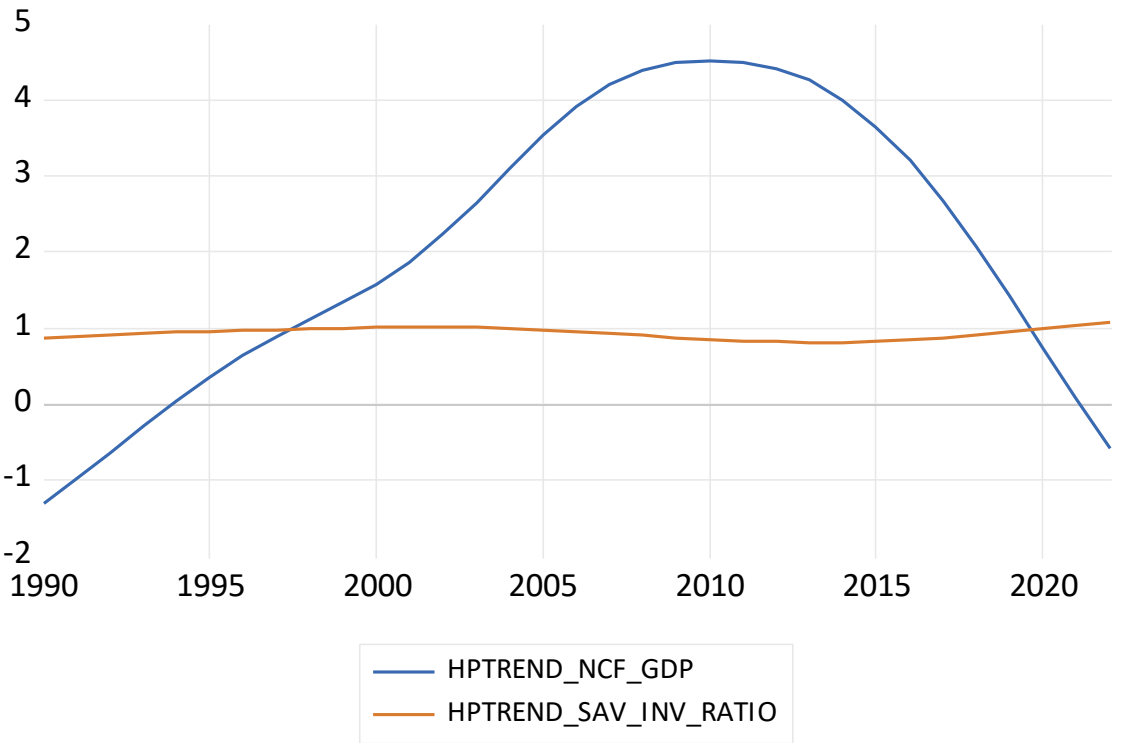

Figure 4.6: Filtered Net Capital Flow to GDP and Saving-Investment Ratio

Source: *Primary data computed from World Development Indicators*

In Figure 4.6, the Hodrick-Prescott Filter has been used to filter out the noise of the interaction between the net capital flow to GDP trend and the saving-investment trend. The HPTREND_NCF_GDP is the filtered net capital flow to GDP trend and the HPTREND_SAV_INV_RATIO is the filtered savings-investment ratio. The net capital flow to GDP trend sharply increased after independence and a sharply fell during the global crisis period. The sharp fall of the net capital flow to GDP trend was due to the liberalisation of the financial account, inadequate macroeconomic and financial policies may heighten the vulnerability to both domestic and external shocks (Wesso, 2001).

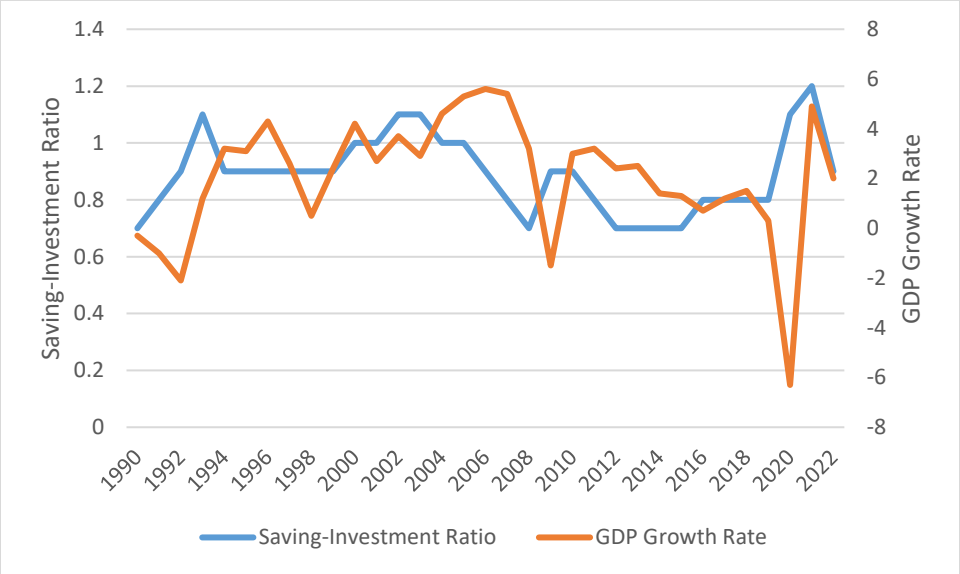

Figure 4.7: Unfiltered Saving-Investment Ratio and Growth rate

Source: *Primary data computed from World Development Indicators*

Table 4.4: Saving-Investment Ratio and Growth rate Results

Period	**Saving-Investment Ratio (x100)**	**Growth Rate (%)**

1994 (Independence)	1.10	3.00
Mid 1990s – 2000 (Dotcom Bubble)	0.90	-2.50
1996 – 1998 (Rand Crisis)	0.90	-4.00
2000 (Inflation Targeting)	0.90	1.90
2002-2008 (Commodity Supercycle)	-0.40	-2.00
2008-2010 (Financial Crisis)	0.20	-2.00
2020-2021 (Covid-19 Pandemic)	0.40	11.00
2022 (Russo-Ukrainian War)	0.90	2.00

Source: *Primary data computed from World Development Indicators*

When asesssing Figure 4.7 and Table 4.4, a correlation between the saving-investment ratio and the GDP growth rate is noticed. Savings play a crucial role for investments and thus economic growth and as a result the low savings rate realised in South Africa has perpetuated a growth trap (Aron and Muellbauer, 2000). The fluctuations in the trends could possibly be governed by the rand crisis, the dotcom bubble, commodity super cycle, the global financial crisis and the Covid-19 pandemic.

The dotcom bubble revealed a slight fall in the saving-investment ratio (0.90) and economic growth (-2.50%) had fallen more than double the amount of saving-investment ratio. During the dotcom bubble, the saving-investment ratio and economic growth were negatively correlated. During the rand crisis period, where the saving-investment ratio was (0.90) whilst the level of economic growth significantly fell (-4.00%). The high inflation rates caued investor uncertainty and prohibitive interest rates over a long period of time this contributed towards the significant fall in economic growth (National Treasury, 1998).

The commodity super cycle, was a period where the saving investment ratio dropped (0.40) because of the heightened level of inflation associated with the high prices of commodities and economic growth fell (-2.00%). During the financial crisis, it is also noticeable that the saving-investment ratio and economic growth were negatively correlated during this period. The global imbalances caused by the crisis were anticipated to result in a severe economic slowdown (National Treasury, 2008). However, the strength of the public finances allowed opportunity for a more concerted response to the global financial crisis which increased the level of investments in key infrastructure projects and thus positively affected economic growth (National Treasury, 2010).

The Covid-19 period was charaterised by a slight rise in net capital flows to GDP (0.40%) and a significant rise in the saving-investment ratio (11.00). The inflation rate has risen higher than the expected inflation which has pushed major central banks to accelerate the normalisation of policy rates (SARB, 2022). This caused the tightening of global financial conditions and caused the rise in risk profiles of economies which needed foreign capital. Many developing and emerging countries sought emergency financing through the IMF and other international financial institutions (Chun et al., 2022). During this period, it is also noticeable that the GDP rate rose significantly faster than the saving-investment ratio.

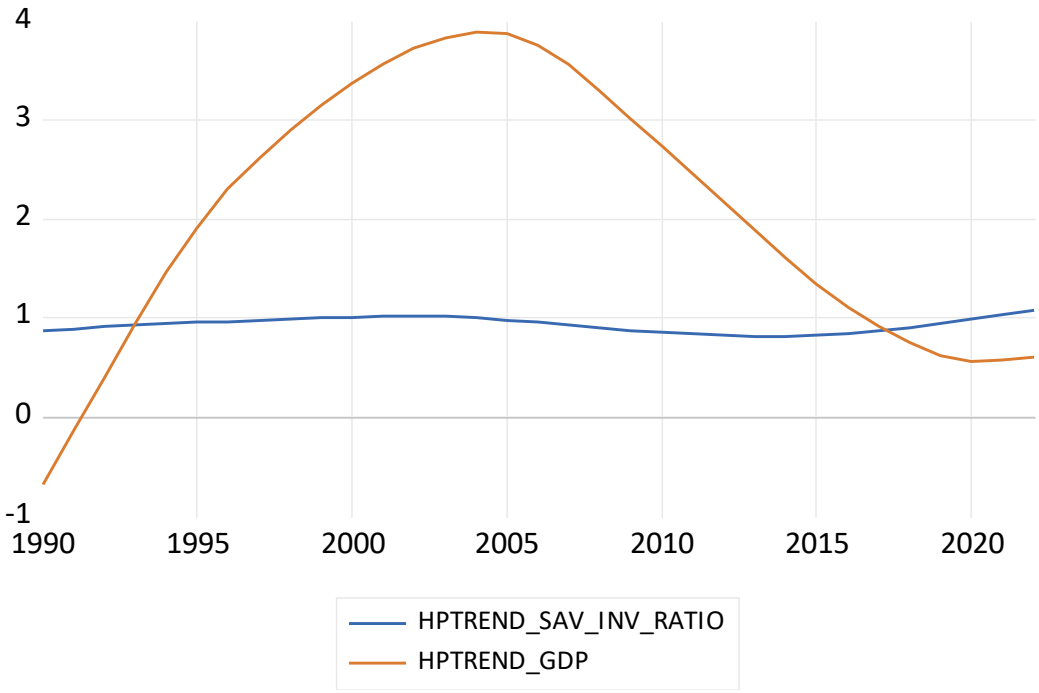

Figure 4.8: Filtered Saving-Investment Ratio and Growth rate

Source: *Primary data computed from World Development Indicators*

In Figure 4.8, the Hodrick-Prescott Filter has been used to filter out the noise of the interaction between the saving-investment ratio trend and the growth rate trend. The HPTREND_SAV_INV_RATIO is the filtered savings-investment ratio trend and the HPTREND_GDP is the filtered growth rate trend. There is a big gap in the saving-investment ratio trend and the growth rate trend between 1993 and 2017. The saving-investment ratio trend fluctuates around 1. The domestic private sector gap is balanced when the saving-investment ratio is equal to one (Artis and Bayoumi, 1989). However, when the saving-investment ratio is less than one, the domestic sector balance is in deficit hence capital flows finance it.

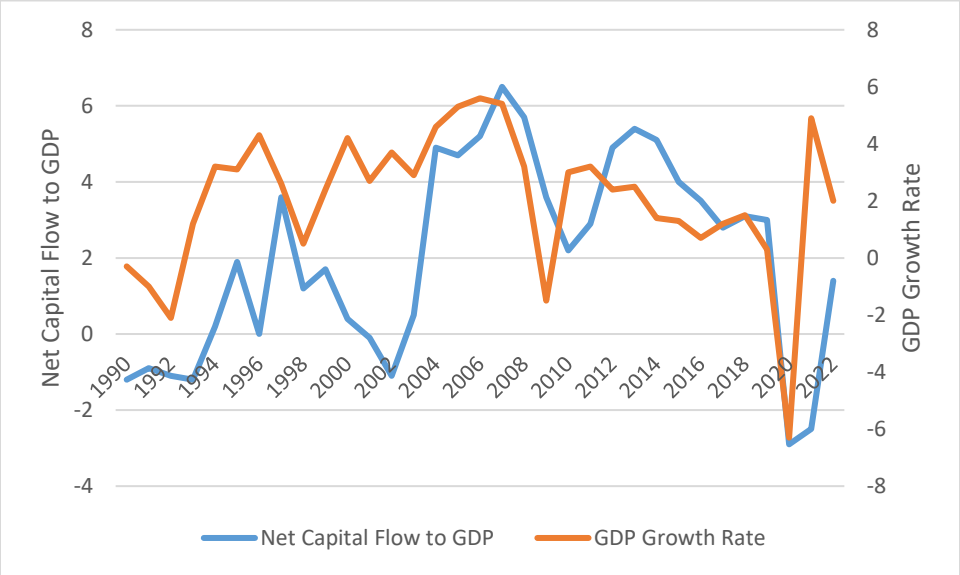

Figure 4.9: Unfiltered Net Capital Flow to GDP and Growth rate

Source: *Primary data computed from World Development Indicators*

Table 4.5: Net Capital Flow to GDP and Growth rate

Period	**Net Capital Flow to GDP (%)**	**Growth Rate (%)**
1994 (Independence)	-1.80	3.00

Mid 1990s – 2000 (Dotcom Bubble)	-0.50	2.00
1996 – 1998 (Rand Crisis)	3.80	1.00
2000 (Inflation Targeting)	0.50	4.00
2002-2008 (Commodity Supercycle)	3.10	2.00
2008-2010 (Financial Crisis)	-4.00	-5.00
2020-2021 (Covid-19 Pandemic)	-6.00	-2.00
2022 (Russo-Ukrainian War)	1.70	2.00

Source: *Primary data computed from World Development Indicators*

Figure 4.9 and Table 4.5, show that net capital to GDP is correlated with economic growth. There are various factors that contribute towards the rising and the falling of the net capital flows/GDP. A decrease of international interest rates relative to the domestic interest rate causes capital inflows to increase. The increased rate at which capital flows has heightened market volatility and the transmission of shocks (Pruski and Szpunar, 2008). Increasing the interest rate domestically causes a decrease in net capital outflows. Economic growth is made up of consumption, investment, government spending and the difference between exports and imports. When there is a decrease in the quantity of these factors, the economy will not experience much growth if any in comparison to if the factors increase in quantity.

The fluctuations in the trends could possibly be governed by independence, the dotcom bubble, rand crisis, the global financial crisis, and the Russo-Ukrainian War. The period of independence (1994), was a period marked by a rise in the net capital flows/GDP(-1.80%) in comparison to during Apartheid. The rise in net capital inflows was due to the normalised international financial relationships, regained access to international capital markets and available foreign trade financing which occurred at relatively favourable costs (Wesso, 2001). When observing Figure 4.9 and Table

4.9, it is noticeable that the economy had significantly grown (3.00%) during independence. This fact is true due to the capital restrictions that were in place prior-independence and hence the flows were not as great within that year but grew significantly after South Africa had become independent and could interact with other economies worldwide (Wesso, 2001).

During the dotcom bubble, it is observed that the net capital flows/GDP fell (-0.40%) in comaprison to the amount the net capital flows/GDP held during previous periods whereas economic growth fell (2.00%). Mid-1999, the current account deficit was financed by relatively strong capital inflows which as a result led to the first net capital outflow since the third quarter of 1998 (Wesso, 2001).

Additionally, during the rand crisis, the net capital flows/GDP (3.80%) almost doubled the economic growth. The South African Rand had fallen in comparison to the major currencies. However, the financial crisis revealed a significant fall in net capital flows/GDP (-4.00%) and economic growth (-5.00%). The fall in net capital flows/GDP during this period was due to the fact that cross-border corporate activity was reduced as a result of the global economic slowdown (National Treasury, 2009). Economies globally were negatively affected which affected the level of international interest rates relative to the domestic interest rate.

During the period of the Russo-Ukrainian War, the net capital flows per GDP (1.70%) rose and economic growth (2.00%) fell significantly. During the Russo-Ukrainian War period, economic growth fell in South Africa due to the prolonged power failures, the poor operational performance of the transport industries, the significant rise in inflation, the reopening of China's economy and pick-up in both global trade and demand (National Treasury, 2023).

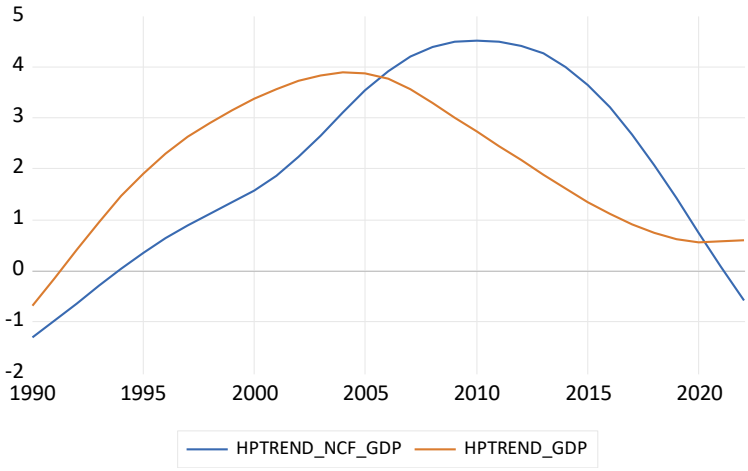

Figure 4.10: Filtered Net Capital Flow to GDP and Growth rate

Source: *Primary data computed from World Development Indicators*

In Figure, 4.10 the Hodrick-Prescott Filter has been used to filter out the noise of the interaction between the net capital flow to GDP trend and the growth rate trend. The HPTREND_NCF_GDP is the filtered net capital flow to GDP trend and the HPTREND_GDP is the filtered growth trend. When observing Figure 4.10, from 2005 to 2010, it is evident that as the filtered net capital flow to GDP trend rises, the filtered growth rate trend fell significantly. The global trend of shrinking economic growth after the global financial crisis, especially for most countries in sub-Saharan Africa has been partly linked to the effects of foreign capital flows (Macias & Massa, 2010).

4.3 CORRELATION ANALYSIS RESULTS

Table 4.6: Correlation Analysis Results

Period Sample: 1990 - 2022				
Variables	**GDP**	**NCF/GDP**	**SAV-INV RATIO**	**DTO**
GDP	1.00			
NCF/GDP	0.39*	1.00		
SAV-INV RATIO	0.12	-0.60*	1.00	
DTO	0.19	0.53*	-0.22	1.00
Period Sample: 1990 – 2008				
Variables	**GDP**	**NCF/GDP**	**SAV-INV RATIO**	**DTO**
GDP	1.00			
NCF/GDP	0.66*	1.00		
SAV-INV RATIO	0.29	-0.24	1.00	
DTO	0.62*	0.66*	-0.02	1.00
Period Sample: 2009 – 2022				
Variables	**GDP**	**NCF/GDP**	**SAV-INV RATIO**	**DTO**
GDP	1.00			
NCF/GDP	0.29	1.00		
SAV-INV RATIO	-0.16	-0.95*	1.00	
DTO	0.41	0.21	-0.21	1.00

Source: *Author's Analysis*

Note: * means $p < 0.05$

A correlation analysis depicting how the different variables are correlated is shown in Table 4.6. The negative sign indicates that a negative relationship exists between the variables. In the case where there is no negative sign, a positive relationship can be explained between the variables. The further the digits are from plus/minus one, the weaker the linear association between the variables. The closer the digits are to plus/minus one, the greater the magnitude of the relationship between the variables. Significance at the five percent level is used to establish whether the relationship is worth paying attention to or not.

The greatest negative correlation that exists in Table 4.6 under the full sample period 1990 – 2022, is the one between the net capital flows per GDP and the savings-investment ratio and vice versa (-0.60). And the greatest positive correlation that exists in Table 4.6 is the one between the net capital flows to GDP and the degree of trade openness and vice versa (0.53). The periodisation of the sub-samples is due to the fact that literature suggests that capital flows changed their behaviour after the Global Financial Crisis. According to Milesi-Ferretti et al., (2011), global capital flows had steadily increased until the global financial crisis emerged.

In Table 4.6 under the full sample period 1990 – 2022, economic growth is positively correlated to the net capital flows per GDP. As the level of capital inflows rise, the economy will grow. However, capital inflows may lead to the appreciation of the real exchange rate, loss of competitiveness and thus complicate the management of the macro economy (Combes et al., 2016).

In Table 4.6 under the full sample period 1990 – 2022, net capital flows to GDP is positively correlated to the degree of trade openness which contradicts economic theory. The degree of trade openness determines the flow of capital into a country. The higher the degree of trade openness is within a country, the more foreign capital flows into a country. Hence, it can be concluded that there is positive relationship between net capital flows and the degree of trade openness.

In Table 4.6 under the full sample period 1990 – 2022, net capital flows to GDP is negatively correlated to the saving-investment ratio, which is inconsistent with economic theory. Economic theory posits that investment less national savings equate to a negative current account balance = $I - S_{national} = -(X-M)$. The saving-investment ratio assimilate the current account balance. According to the savings-investment approach a deficit on the current account balance indicates

that there is negative saving on either the private sector or the government has overspent beyond what was budgeted. When there is a negative domestic savings imbalance for example when S is less than I is financed by capital inflows, indicating net capital flows to GDP is negatively correlated to the saving-investment ratio. Hence, when the current account balance is in deficit, the amount of savings will be lower in comparison to the amount of investments within the country. A current account deficit is an indication of excess investments in comparison to the amount of savings available. However, in the long run, investments ensure the rebalance of the current account (Olivei, 2000).

According to Bryman (2006), the rule of thumb for a high degree of collinearity is that the correlation between two variables exceeds 0.8. In looking at our full sample period correlation results in Table 4.6, the highest correlation coefficient is 0.60 which is below the 0.8 mark. Hence, it can be concluded that the degree of collinearity that exists amongst the variables is low and insignificant.

When determining and analysing the trends in the degree of capital mobility, the correlation coefficient of NCF/GDP and GDP are compared between the sub-samples 1990-2008 and 2009-2022. However, the rate at which capital flows had increased sharply channeled late in 2008, becoming negative. The sub-sample 1990-2008 has a correlation coefficient of 0.66 whereas the sub-sample 2009-2022 has a correlation coefficient of 0.29. The correlation coefficients over the sub-samples are both positive but differ by 0.37. The correlation coefficient of the sub-samples 1990-2008 is significant as the prob-value is below the five percent level of significance. However, the sub-sample 2009-2022 is insignificant. This is due to the fact that the probability-value is above the five percent level of significance. This indicates how the level of significance has changed overtime.

According to Haque and Montiel (1990), when the correlation coefficient is significantly different from 0 and insignificantly different from 1, perfect capital mobility can be ruled out and the tendency is towards openness and a high degree of capital mobility (Haque and Montiel, 1990). When the correlation coefficient is significantly different from both 0 and 1, neither completely financially-closed economy nor completely financially open can be ruled out (Haque and Montiel, 1990). However, when the correlation coefficient is insignificantly different from 0 and insignificantly different from 1, capital is deemed immobile (Haque and Montiel, 1990). Hence,

when comparing the correlation coefficients between the sub-samples, it can be concluded that the South African economy displays a tendency towards openness and a high degree of capital mobility in the sub-samples 1990-2008. However, for the sub-sample 2009-2022, capital is deemed immobile as the correlation coefficient is insignificantly different from 0 and insignificantly different from 1. It can also be concluded when comparing between the sub-samples 1990-2008 and 2009-2022 that capital flows are becoming less stable than before as the correlation coefficient has become smaller.

4.4 UNIT ROOT TEST RESULTS

Table 4.7: ADF, Philips-Perron and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) Unit Root Tests Results

Unit Root Tests	Levels		First difference		Order of integration
ADF					
Variable	Intercept	Intercept & trend	Intercept	Intercept & trend	
DTO	-1.33	-3.13‡	-5.85**	-5.75**	ONE
GDP	-4.11*†	-4.10‡	-5.49**	-5.67**	ZERO
NCF/GDP	-2.46	-2.34	-4.33**	-4.45**	ONE
SAV-INV Ratio	-2.80†	-3.19‡	-4.81**	-4.71**	ONE
Philips-Perron					
Variable	Intercept	Intercept & trend	Intercept	Intercept & trend	Order of integration
DTO	-0.70	-2.96	-11.11**	-10.76**	ONE
GDP	-4.11**	-4.07**	-12.31**	-16.09**	ZERO
NCF/GDP	-2.44	-2.33	-5.57**	-6.31**	ONE
SAV-INV Ratio	-2.90	-2.94	-4.72**	-4.46**	ONE
Kwiatkowski-Phillips-Schmidt-Shin (KPSS)					
Variable	Intercept	Intercept & trend	Intercept	Intercept & trend	Order of integration
DTO	0.69*	0.16*	0.50*	0.50	ZERO
GDP	0.18***	0.17***	0.36***	0.50	ZERO
NCF/GDP	0.26***	0.16***	0.21***	0.15***	ZERO
SAV-INV Ratio	0.14***	0.10***	0.18***	0.15	ZERO

Source: *Author's Analysis*

Note: *** means $p < 0.01$; ** means $p < 0.05$ and * means $p < 0.10$ percent level; † means intercept is significant and ‡ means trend is significant.

The null hypothesis for the Augmented Dickey-Fuller test and the Philips-Perron test is that the series has a unit root. And the alternative hypothesis for both tests, is that the series does not have a unit root. The augmented Dickey-Fuller test, the Philips-Perron test and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test were employed as different tests have varying strengths of uncovering unit root problems.

According to the augmented Dickey-Fuller test results in Table 4.7, economic growth is stationary in level terms and is equally stationary in level terms according to the Philips-Perron test results. However, for the other variables which are not stationary at level terms there is a possibility that cointegration exists for those variables. Hence, a cointegration test must be performed. The Augmented Dickey-Fuller test and the Philips-Perron test reveal that there is a mixed order of integration between the variables.

Additionally, KPSS Unit Root test was conducted to compare its results to both the ADF Unit Root test and the Philips-Perron test. The decision criteria for significance is that if the KPSS test statistic is greater than the critical value at the one percent level of significance, we reject the null hypothesis that the series is stationary meaning that the series is non-stationary. However, if the KPSS test statistic is less than the critical value at the one percent level of significance, we fail to reject the null hypothesis that the series is stationary meaning that the series is stationary. The results reveal that the variables are all stationary at level terms.

4.5 AUTOREGRESSIVE DISTRIBUTIVE LAG ESTIMATION

4.5.1 *Lag Selection Criteria*

The estimation of the lag length is an important aspect to consider when looking to use an ARDL model as it assists with forecasting, analyzing the effects of structural shocks and handling serial correlation. The results are tabled in Table 4.8.

Table 4.8: Optimal Lag Structure Results

	Optimal Lag Structure for ARDL		
Variable	AIC	SIC	HQ
GDP	1	1	1
SAV-INV Ratio	4	0	2
NCF/GDP	3	0	0

DTO	4	1	2
SE Reg	1.35*	1.60	1.55

Source: *Author's Analysis*

When looking at the Optimal Lag Structure Results in Table 4.8, the Akaike information criterion (AIC) that is asterisked indicates the lowest figure and is the best lag to choose for the model. Thus it can be concluded that the lag that must be used in the ARDL is (1,4,3,4).

4.5.2 ARDL Bounds Testing Approach

Table 4.9: ARDL Bounds Test Results

Test Statistic	Value	K
F-statistic	8.71	4
Critical Value Bounds		
Significance	Lower Bound	Upper Bound
10%	2.72	3.77
5%	3.23	4.35
1%	4.29	5.61

Source: *Author's Analysis*

The decision criteria for the Bounds Testing approach is that when the F-statistic is above the upper bound, the null hypothesis that there are no long-run relationships is rejected and it can be concluded that long-run cointegration relationship(s) exist. Table 4.10 shows that economic growth has long-run cointegration relationships with net capital flows to GDP, saving-investment ratio and the degree of trade openness within the South African context.

4.5.3 Long-run and short-run coefficient analyses

Table 4.10: Long-run Coefficients Estimation with lag

GDP	**Coefficient**	**Standard Error**	**t-statistic**	**Probability**
Constant	4.12	5.01	0.82	0.42
NCF/GDP	1.37	0.44	3.06	0.00

SAV-INV Ratio	8.14	2.95	2.75	0.01
DTO	-0.24	0.08	-2.97	0.00

Source: *Author's Analysis*

Table 4.10 reveals that the long-run coefficients of the ARDL (1,4,3,4) model are significant at the five percent level of significance. The coefficient of the net capital flows to GDP is positive and significant at the five percent level indicating that net capital flows to GDP have a positive influence on economic growth.

A 1% point increase in NCF/GDP, on average, will result in a 1.37% point increase in GDP growth, holding other variables fixed. In the long run, if capital flows/GDP are managed well, the economy may grow. Wesso (2001) employed a VAR model to investigate the dynamics between capital flows and other economic variables in South Africa from 1991 to 2000. The results revealed a positive long-run correlation between net capital flows and economic growth.

Results from Table 4.10 show that SAV-INV Ratio and GDP have a positive long run relationship. A 1% point increase in SAV-INV Ratio, on average, will result in an 8.14% point increase in GDP growth, holding other variables fixed. The Solow growth model posits that in the long run the more savings a country accumulates, the more investments will grow and thus the economy will be positively affected. In the long-run, the SAV-INV Ratio is very responsive to economic growth. A study on the linkage between domestic savings and economic growth was conducted within certain African countries. It was found that savings granger cause economic growth in Congo whereas in countries namely Ghana, Kenya, Nigeria and Zambia, economic growth granger causes savings (Anoruo and Ahmed, 2001).

Results from Table 4.10 show that DTO and GDP have a negative long run relationship. A 1% point increase in DTO, on average, will result in a 0.24% point decrease in GDP growth, holding other variables fixed. According to economic theory, however, trade openness and economic growth are positively correlated in the long run. This correlation is due to the fact that trade openness boosts the level of foreign reserves within the country through increased exports and access to a larger market which then positively impacts economic growth. However, trade openness can also result in problems such as dumping and fierce competition from foreign goods, which can kill domestic industries. In the South African context, this is true within the textile

industry. In addition, a higher degree of trade openness is associated with increased inflation and lowered exchange rates pausing to have a negative effect on economic growth. Additionally, countries that specialise in low-quality product production have a negative correlation between the degree of trade openness and economic growth (Haussmann et al., 2007).

The impact of trade openness on economic growth in Cote d'Ivoire was examined over the period 1965 – 2014 using the Autoregressive Distributed Lag bounds test and the Toda and Yamamoto Granger causality test (Keho, 2017). The results revealed a positive correlation between trade openness and economic growth in both the short and long run. In the long run, countries that have a higher degree of trade openness have registered better economic growth.

Table 4.11: Short-run Error Correction Model Results and Diagnostic Test Results

Variable	**Coefficient**	**Standard Error**	**t-statistic**	**Probability**
COINTEQ	-1.22	0.18	-6.54	0.00
D(SAV-INV)	14.73	4.19	3.51	0.00
D(SAV-INV(-1))	8.71	3.68	2.36	0.03
D(SAV-INV(-2))	-5.82	4.45	-1.30	0.20
D(SAV-INV(-3))	10.04	3.22	3.11	0.00
D(NCF/GDP)	1.63	0.27	5.99	0.00
D(NCF/GDP(-1))	-0.59	0.23	-2.52	0.02
D(NCF/GDP(-2))	-0.65	0.23	-2.74	0.01
D(DTO)	0.17	0.05	3.00	0.00
D(DTO(-1))	0.24	0.09	2.63	0.01
D(DTO(-2))	0.04	0.06	0.70	0.49
D(DTO(-3))	0.10	0.06	1.72	0.10
Constant	4.12	0.69	5.96	0.00
R^2	0.90	-	-	-
F-statistic	12.94	-	-	-
Normality JB test	-	-	0.08	0.95

Serial correlation LM test, χ^2 [p-value]	-	-	0.03 [0.96]	-
Heteroscedasticity test, χ^2 [p-value]	-	-	0.83 [0.63]	-

Source: *Author's Analysis*

The short run dynamic coefficients estimated in the ARDL (1,4,3,4) model are shown in Table 4.11. The Error Correction model reveals the short-run relationships between GDP and other variables. The error correction term (COINTEQ) depicts the speed of adjustment towards restoring an equilibrium between variables. The coefficient COINTEQ is -1.222 which shows that the speed of adjustment is 122.2%. There is an overcorrection of 22.2%. This means that it is an oscillatory convergence process (Narayan and Smyth, 2006). The coefficient is significant at the five percent level of significance, as the prob-value is 0.000 hence these results confirm the short-run relationship among the variables.

Table 4.11 shows that in the short run, a 1% point increase in NCF/GDP, on average, will result in a 1.63% point increase in GDP growth, holding other variables constant but the lagged short run effects are negative. Economic theory posits that a large increase in capital inflows may be beneficial to an economy but if mismanaged, the economy may be at the risk of overheating, exchange rate volatility may increase and that may result in a large outflow of capital which will have negative effects on the growth of the economy. When the exchange rate appreciates, it effects capital inflows and this is evident in undermined exports.

In the short run, there is a positive coefficient of SAV-INV Ratio, on average, which will result in a 14.73% point increase in GDP growth, holding other variables constant. When the level of aggregate savings increases within a country, more investments result and thus positively contributing towards the overall growth of the economy. Additionally, the more available savings within a country, the more loanable funds can be supplied within a country and the more available credit is which will cause a fall in the level of interest rates.

Finally, Table 4.11 shows that there is a positive coefficient of DTO, in the short run, which will on average result in a 0.17% point increase in GDP growth, holding other variables constant. The

degree of trade openness is a driver of economic growth. The degree of trade openness is associated with the boosting of foreign reserves which positively affect economic growth.

4.6 WALD CAUSLAITY TEST RESULTS

Table 4.12: Wald Test Results

Hypothesis	Wald stat. [p-value]	Conclusion
All coefficients of SAV-INV =0	3.89 [0.02]	SAV-INV → GDP
All coefficients of NCF/GDP =0	5.16 [0.01]	NCF/GDP → GDP
All coefficients of DTO =0	4.69 [0.01]	DTO → GDP

Source: *Author's Analysis*

The null hypothesis of the Wald causality test is that lagged coefficients equal zero. And the alternative null hypothesis is that null hypothesis is not equal to zero. The decision criteria is that the null hypothesis should be rejected if the prob-value of the Wald-statistic is smaller or equal to 0.05.

There are a few significant relationships according to the results the Wald Causality test. The first significant relationship is between saving-investment ratio and economic growth. The test posits that the saving-investment ratio does not granger cause economic growth with a prob value of 0.02. According to the Wald Causality test decision criteria, the saving-investment ratio granger causes economic growth as the test statistic is smaller than 0.05. This result is consistent with both the long and short run results of the ARDL.

The next significant relationship is between net capital flows to GDP and economic growth. The test posits that the net capital flows to GDP does not granger cause economic growth with a prob value of 0.01. According to the Wald Causality test decision criteria, the net capital flows to GDP granger causes economic growth as the test statistic is smaller than 0.05. This result is consistent with both the long and short run results of the ARDL.

Finally, there is a significant relationship is between the degree of trade openness and economic growth. The test posits that the degree of trade openness does not granger cause economic growth with a prob value of 0.01. According to the Wald Causality test decision criteria, the degree of

trade openness granger causes economic growth as the test statistic is smaller than 0.05. This result is consistent with the long run results of the ARDL.

4.7 DYNAMIC MULTIPLIER RESULTS

The various cumulative dynamic multiplier figures are visualisations of the ARDL results.

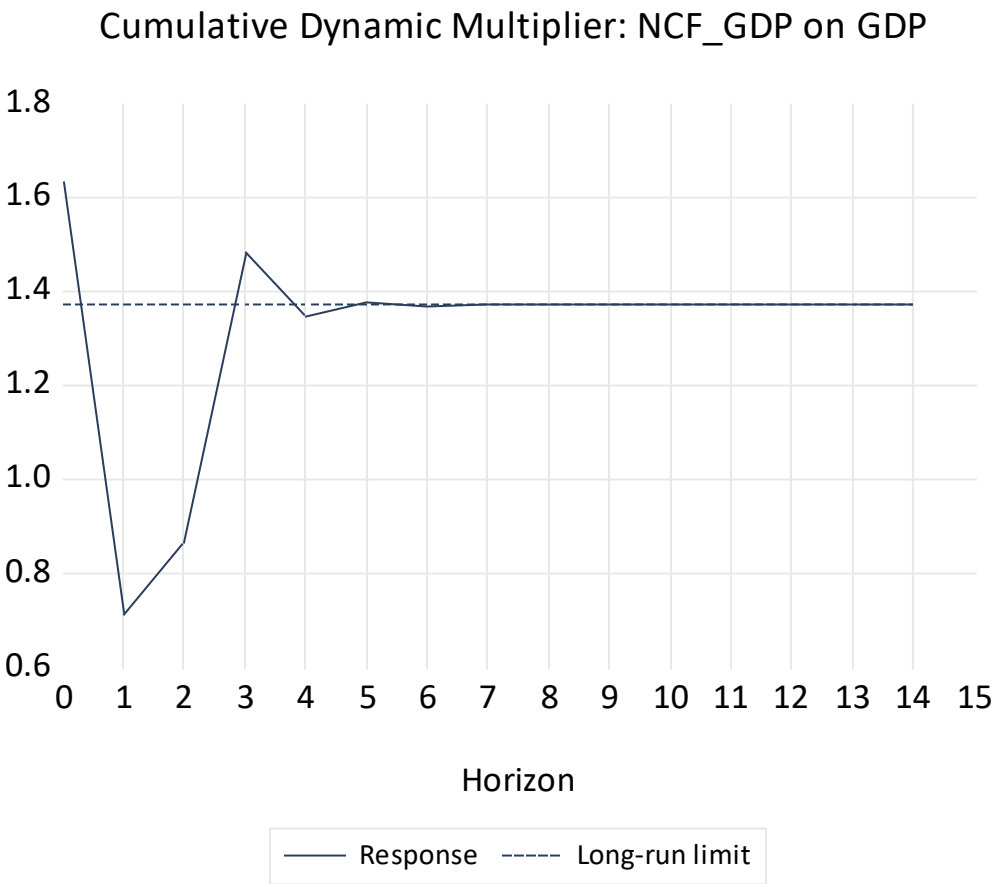

Figure 4.11 Dynamic Multiplier of NCF/GDP on GDP

Source: *Author's Analysis*

Figure 4.11 shows that in the short run (under 1 year) NCF/GDP has a declining but positive effect on growth, estimated at between 0.7% points and 1.6% points. However, in the medium term (2-5 years), NCF/GDP has a positive and increasing effect on growth, estimated at between 0.7% points and 1.5% points. In the long run, the effect is 1.4% points. This means growth is more elastic to NCF/GDP.

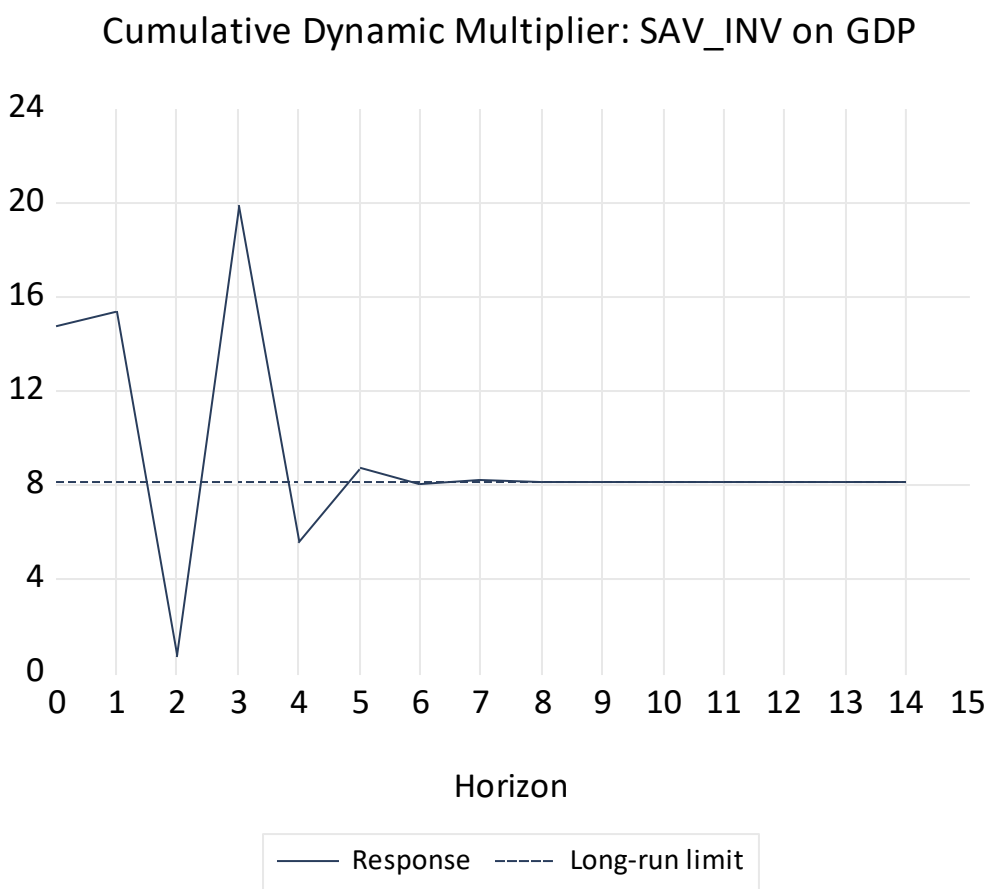

Figure 4.12 Dynamic Multiplier of SAV-INV Ratio on GDP

Source: *Author's Analysis*

Figure 4.12 shows that that in the short run (under 1 year) SAV-INV has a positive effect on growth, estimated at 15.0% points. Additionally, in the medium term (2-3 years), SAV-INV has a positive and increasing effect on growth, estimated at between 1.0% points and 20.0% points. However, in the medium term (3-4 years), SAV-INV has a negative and decreasing effect on growth, estimated at between 20.0% points and 6.0% points. In the medium term (4-5 years), SAV-INV has a positive and increasing effect on growth, estimated at between 6.0% points and 8.5% points. In the long run, the effect is 8.0% points. This means growth is more elastic to SAV-INV. A high saving-investment correlation is associated with higher economic growth. A high saving-investment correlation exists during periods of population growth, current account targeting, periods of long-run constraints and financial friction.

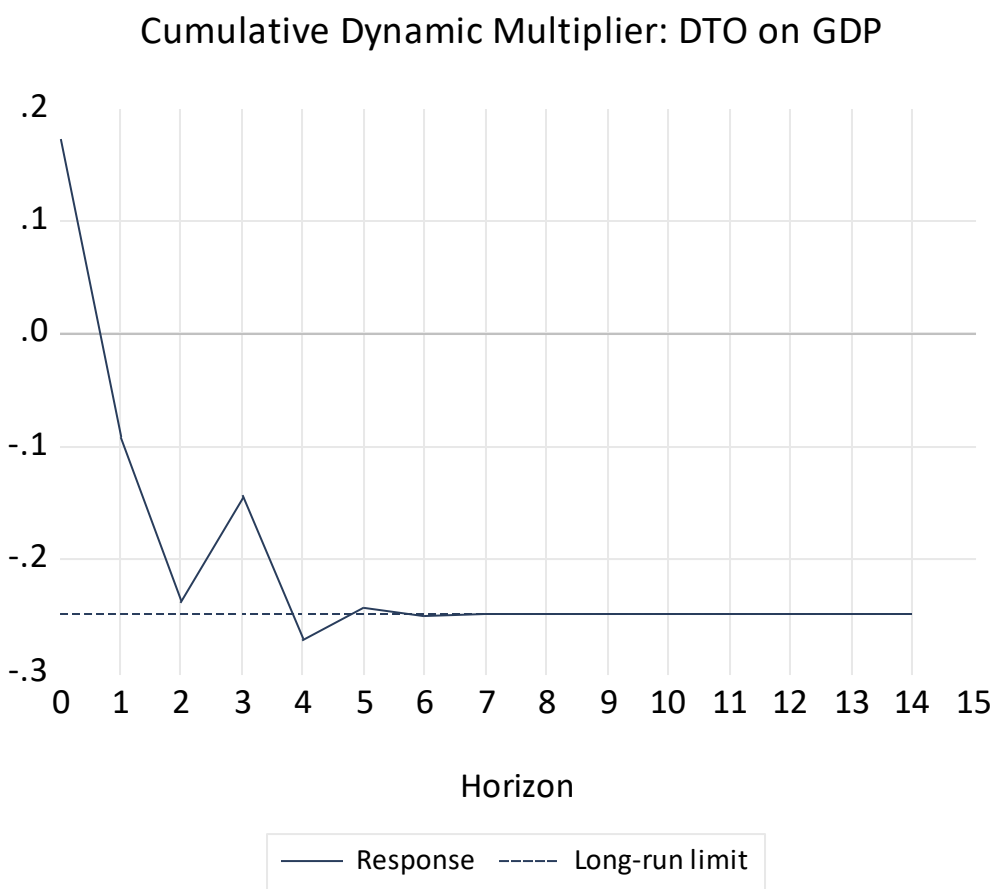

Figure 4.13 Dynamic Multiplier of DTO on GDP

Source: *Author's Analysis*

Figure 4.13 shows that in the short run (under 2 years) DTO has a declining positive effect in the first half year on growth, estimated at between 0.18% points and -0.23% points. In the medium term (2-5 years), DTO has a negative and decreasing effect on growth, estimated at between -0.15% points and -0.28% points. In the long run, the effect is -0.25% points. This indicates that the effect became negative from year one to the long run. This means growth is less elastic to DTO. Trade openness can result in problems such as dumping and fierce competition from foreign goods, which can kill domestic industries and thus negatively impact economic growth. In addition, a higher degree of trade openness is associated with increased inflation and lowered exchange rates which may have negative effects on economic growth.

4.8 DIAGNOSTIC TESTS

The running of diagnostic tests is important as it reveals if there were any problems within the residuals when estimating the model. And in the likelihood that there were any problems, it would be an indication that the model is biased.

The LM results shown in Table 4.11 suggest that we cannot reject the null hypothesis that there is no serial correlation. The LM test statistic is 0.03 with a prob-value of 0.96. The prob-value surpasses the five percent level of significance which is why we fail to reject the null hypothesis and conclude that there is no serial correlation within our model.

In addition, the model does not have conditional heteroscedasticity as the prob-value of the White test is 0.63 which surpasses the five percent level of significance. The Jarque-Bera test statistic is 0.08 and a prob-value of 0.95. In accessing the Jarque-Bera prob-value, we can conclude that there is normal distribution as the prob-value is greater than 5%. In essence, there is no misspecification in the model and the results can be relied on.

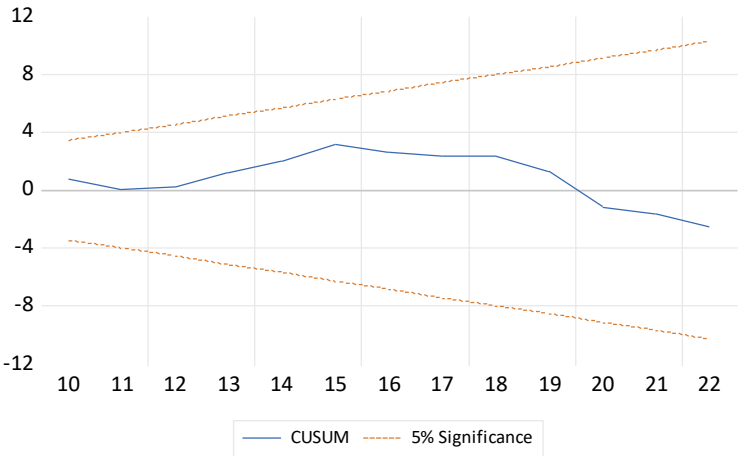

Figure 4.14: CUSUM Test

Source: *Author's Analysis*

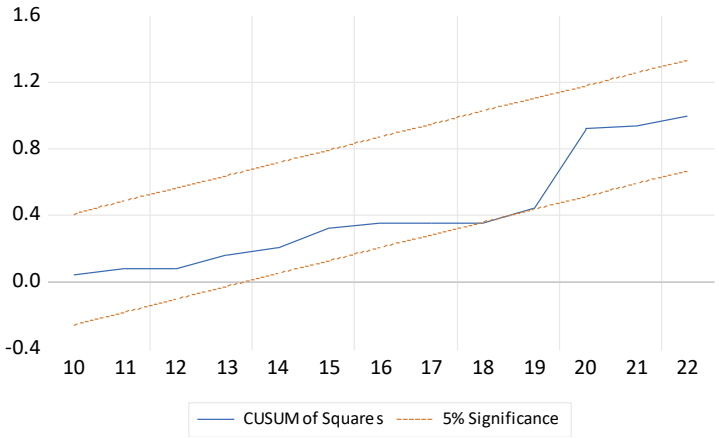

Figure 4.15: CUSUM of Squares Test

Source: *Author's Analysis*

The CUSUM and the CUSUMSQ tests were employed to assess the stability of the GDP equation. Figure 4.9 and Figure 4.10 show the results of the tests. Figure 4.9 reveals that the CUSUM test result is within the critical bounds. Figure 4.10 however, reveals that CUSUM of Squares test result has a period where the residuals were bordering around the critical bound meaning the model may be suffering from structural breaks.

4.9 CONCLUSION

This chapter analysed the impact of capital mobility on economic growth within the South African context. The augmented Dickey-Fuller test and the Philips-Perron test reveal that there is a mixed order of integration between the variables. Hence, the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) Unit Root test was employed to compare and contrast the results.The KPSS Unit Root test revealed all the variables were stationary at level terms and thus permitted other tests to be conducted. The trend analysis reveals how the several shocks within the economy have affected economic growth both positively and negatively and how that affects the relationship between capital mobility on economic growth.

The correlation analysis results revealed that the degree of collinearity that exists amongst the variables is below the rule of thumb for a high degree of collinearity. The correlation analysis results revealed three significant relationships. The first relationship revealed is that of economic growth being positively correlated to the net capital flows per GDP. Another relationship is that

of net capital flows to GDP being positively correlated to the degree of trade openness. And finally, net capital flows to GDP is negatively correlated to the saving-investment ratio.

The results of the lag selection criteria provided that the lags that must be used in the ARDL is 1,4,3,4. The ARDL model estimated both short-run and long-run relationships between the variables. In the short run it was revealed that the saving-investment ratio, net capital flows to GDP and the degree of trade openness have a positive relationship with economic growth. In the long run, it was revealed that the saving-investment ratio and net capital flows to GDP have a positive relationship with economic growth whereas the degree of trade openness has a negative relationship with economic growth.

The dynamic multiplier results revealed that net capital flows to GDP has a positive and increasing effect on growth and growth is more elastic to net capital flows to GDP in the long run. The results reveal that saving-investment ratio has a positive and increasing effect on growth in the long run. The dynamic multiplier results equally reveal that the degree of trade openness has a negative effect on growth from year one to the long run.

According to the Wald Causality test results, the saving-investment ratio granger causes economic growth. This result is consistent with both the long and short run results of the ARDL. In addition, the net capital flows to GDP granger causes economic growth. This result is consistent with both the long and short run results of the ARDL. The Wald Causality test results also revealed that the degree of trade openness granger causes economic growth. This result is consistent with the long run results of the ARDL.

The diagnostic results revealed that there was a normal distribution of residuals throughout the model, the models are stable and hence the empirical findings of this study can be relied on.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter has concluded the study. The chapter emphasised the focus and purpose of the study, unpacked the underlying theories within the study, the methodology and the results. Thereafter, the chapter concluded with the recommendations and finally highlighted possible areas of focus.

5.2 SUMMARY

The overarching goal of this study is to investigate the impact of capital mobility on economic growth in South Africa. The sub goals are therefore to determine and analyse the trends in the degree of capital mobility in South Africa as well as to determine the relationship between capital mobility and South Africa's economic growth. In order to achieve these goals, a number of sequential chapters were done. Chapter one provided a brief context of the study including the background, it set out the main objectives of the study, outlined the problem statement and identified the importance in carrying out the study.

Chapter two unpacked the theories on capital mobility and economic growth, tests for capital mobility and how capital mobility policies have evolved within South Africa. The chapter equally presented empirical findings that attempted to explain the link between capital mobility and economic growth in various countries. It was found that there are four kinds of relationships between capital mobility and economic growth these being, a positive, negative, no relationship and a bidirectional relationship. The chapter equally outlined studies which guided the methodology approach of this study.

The data variables were obtained from both the SARB and World Bank databases and covered the period 1990 to 2022. The data were firstly tested for stationarity before any other tests could be conducted. The augmented Dickey-Fuller test, the Philips-Perron test and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) Unit Root test were employed to test for stationarity. These tests were followed by the trend analysis, Hodrick-Prescott Filter on the selected trends, correlation analysis, Autoregressive Distributive Lag estimation and diagnostic tests. The trend analysis

revealed how the rand crisis, the dotcom bubble, commodity super cycle, the global financial crisis, the Covid-19 pandemic period and the Russo-Ukrainian War were periods which influenced the relationships between the key variables (the saving-investment ratio ($\frac{I_t}{Y_t} = A + B\left(\frac{NS_t}{Y_t}\right) + v_t$), net capital flows to GDP and the degree of trade openness) and economic growth.

The correlation analysis revealed that net capital flows per GDP and the savings-investment ratio have a negative correlation (-0.60). The analysis also revealed a positive correlation between the net capital flows to GDP and economic growth (0.39). The ARDL model revealed that in the short run the saving-investment ratio, net capital flows to GDP and the degree of trade openness have positive relationships with economic growth. In the long run, it was revealed that the saving-investment ratio and net capital flows to GDP have a positive relationship with economic growth whereas the degree of trade openness has a negative relationship with economic growth.

Both the correlation analysis and the ARDL model results indicate that there is a positive correlation between the net capital flows to GDP and economic growth which agrees with the supply-leading hypothesis. The findings of Khetsi and Mongale (2015) and Ekpeyong and Adewoyin (2023) are most consistent with the results of this study.

This study employs various diagnostic tests namely multicollinearity through the correlation analysis, serial correlation, heteroskedasticity and normal distribution in order to determine whether the model was well-constructed or not and whether the results are reliable or not. The study found that the model was free of multicollinearity, serial correlation, heteroskedasticity and the variables were normally distributed. The CUSUM and the CUSUMSQ were used to assess the stability of the model and it was found that the model employed is stable. Hence, the empirical findings can be relied on.

5.3 CONCLUSION

In order to bridge the existing knowledge void, data from 1990 – 2022 was used which includes the Covid-19 pandemic and the Russo-Ukrainian War (2020-2022 period) which previous studies do not include as those events had not occurred as yet.

The specific goals of this study were to determine and analyse the trends in capital mobility and to also determine the relationship between capital mobility and South Africa's economic growth.

The study used the Hodrick-Prescott Filter to separate the long-run trend in a data series from short-run fluctuations as a way of determine and analyse the trends in capital mobility. The Hodrick-Prescott Filter was used to determine and analyse the trends in capital mobility. The saving-investment trend reveals a positive interaction between savings and investments within South Africa.

ARDL model was used to estimate the relationship between capital mobility and South Africa's economic growth. ARDL bounds test found a long-run cointegration relationship between economic growth and net capital flows to GDP, economic growth and the saving-investment ratio, and economic growth and the degree of trade openness in the South African context. More specifically, economic growth has positive relationships with both net capital flows to GDP and the savings-investment ratio in the long-run. A negative relationship between the degree of trade openness and economic growth was confirmed in the long run.

The dynamic multiplier of net capital flows to GDP on economic growth showed how growth is more elastic to net capital flows to GDP over the long run. The dynamic multiplier between the savings-investment ratio on economic growth showed a higher level of elasticity of economic growth to the savings-investment ratio in the long-run. However, the dynamic multiplier between the degree of trade openness on economic growth was negative from the short-run to the long-run.

The results of the ARDL bounds test and the dynamic multiplier are consistent with one another. And it can be concluded that capital mobility proxied by net capital flows to GDP and South Africa's economic growth proxied by real GDP have a positive relationship in the long run.

5.4 RECOMMENDATIONS

There are certain factors that should be incorporated in order to have a successful capital market. These include an effective legal and regulatory framework, an effective and secure settlement and custodial system, credible government, political stability within the country, effective ways of disclosing information, sound policies (both fiscal and monetary) and sound debt management. The empirical findings cited in Chapter 5 suggests that South Africa has shortcomings in these areas.

In order to benefit from foreign capital flows, there should be a clearly outlined development strategy which identifies the role of foreign capital and a prudent macroeconomic framework that

is easily implementable. The South African economy should strive to finance the country's growth and development through domestic savings instead of relying on foreign finance as countries that reduce their reliance on foreign capital as a way of fostering growth and development are more likely to achieve more productive and sustainable economic results in the long-run(van Wyk and Kapingura, 2021). One of the ways in which domestic savings can be mobilized effectively is through capital market deepening. This creates opportunities for more companies to be listed to the stock exchange and increases liquidity. Incentives should be provided to small and medium enterprises in order for them to be listed on the capital market.

5.5 LIMITATION AND AREAS FOR FURTHER RESEARCH

The study used annual data for a 32-year period which can be considered to be relatively small in order to make inference on studying the relationship between the key variables. This is a limitation as it may affect the validity of the research study but is however necessitated by the limited existence of data prior to the Financial Service Board founded in 1990 which has been replaced by the Financial Sector Conduct Authority in 2018.

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APPENDIX

Data Set

YEAR	NCF/GDP	GDP	SAV	INV	SAV-INV RATIO	DTO	CUA
1990	-1.2	-0.3	14.5	18.2	0.7	38.2	1.2
1991	-0.9	-1	14.9	17.8	0.8	34.9	1
1992	-1.1	-2.1	14.8	15.7	0.9	34.3	1.3
1993	-1.2	1.2	15.8	14.2	1.1	35.7	1.9
1994	0.2	3.2	15.4	16.5	0.9	37.1	0
1995	1.9	3.1	16.7	17.7	0.9	39.5	-1.5
1996	0	4.3	15.7	16.6	0.9	42.2	-1
1997	3.6	2.6	14.9	16.3	0.9	42.3	-1.3
1998	1.2	0.5	14.8	16.4	0.9	44	-1.5
1999	1.7	2.4	14.4	15.7	0.9	42.3	-0.4
2000	0.4	4.2	15.1	15.1	1	46.2	-0.1
2001	-0.1	2.7	14.8	14.6	1	49.2	0.2
2002	-1.1	3.7	17.9	15	1.1	53.5	0.8
2003	0.5	2.9	18.4	15.7	1.1	45.7	-0.7
2004	4.9	4.6	16.9	16.9	1	45.6	-2.5
2005	4.7	5.3	17.7	16.8	1	47.4	-2.8
2006	5.2	5.6	18.1	18.5	0.9	53.8	-4
2007	6.5	5.4	17	19.3	0.8	57.1	-4.8
2008	5.7	3.2	16.3	21.3	0.7	65.9	-5
2009	3.6	-1.5	17.4	18.8	0.9	49.6	-2.4
2010	2.2	3	17.1	17.6	0.9	50.4	-1.3
2011	2.9	3.2	16.1	18.9	0.8	54.6	-2
2012	4.9	2.4	13.5	18.6	0.7	55.6	-4.7
2013	5.4	2.5	13.8	19.2	0.7	58.9	-5.3
2014	5.1	1.4	13.7	18.5	0.7	59.5	-4.8
2015	4	1.3	14.3	18.6	0.7	56.7	-4.3
2016	3.5	0.7	14.3	16.9	0.8	55.9	-2.7
2017	2.8	1.2	14.2	16.6	0.8	53.5	-2.4
2018	3.1	1.5	13.2	16.2	0.8	54.6	-2.9
2019	3	0.3	13.3	15.9	0.8	54.1	-2.6
2020	-2.9	-6.3	14.2	12.4	1.1	50.8	1.9
2021	-2.5	4.9	16.2	12.8	1.2	56.2	3.7
2022	1.4	2	14.9	15.1	0.9	64.9	-0.5