THE IMPACT OF FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH IN SOUTH AFRICA (1985-2019)

BY

RITO SONNY MATHEBULA

STUDENT NO: 16012070

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Supervisor: Dr M.A. Dagume

Co-Supervisor: Mr AR Khangale

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DECLARATION

I, Rito Sonny Mathebula (16012070) hereby declare that this dissertation for Master of Commerce in Economics titled **"The impact of foreign direct investment on economic growth in South Africa (1985-2019)"** submitted to the Department of Economics at the University of Venda has not been submitted previously for any degree at this or another university. It is original in design and in execution, and all reference materials contained therein have been duly acknowledged.

Student:  Date: 15/06/2023

Rito Sonny Mathebula (16012070)

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DEDICATION

I dedicate this dissertation to the young ones who are about to lose hope in life and those who have already given up. It is possible, Black Child, you can still make it; it is not too late.

ABSTRACT

Foreign direct investment (FDI) is considered one of the most essential drivers for economic growth. Despite their previous small or even declining share of global investments, foreign direct investment (FDI) has risen to become the most prominent means of generating external resource flows to developing countries and has become an important portion of capital formation in these economies. Motivated by the concerns of global decline in FDI distribution, this study examined the impact of foreign direct investment on economic growth in South Africa, using time series annual data for the period 1985 to 2019. The study employed a total of 170 observations of foreign direct investment, economic growth, inflation, real interest rate, and saving rate. Co-integration methods, ARDL and ECM were used to analyse the data. To avoid spurious regression results on time series data, the researcher tested for stationarity of the data by using Augmented Dickey-Fuller test and Phillips-Perron unit root tests. The unit root analysis was conducted on the variables and the results show that GDP and FDI do not exhibit any trends suggesting that they are integrated of order zero. Trends, however, are noticeable in the rest of the variables - interest rate, inflation and saving rate. This implies that the variables are not stationary at level form. After first differencing, all variables are stationary as none of them exhibit any trend. This implies that the variables used in this study are integrated to order I(0) and I(1). The cointegration test results show that the null hypothesis of no cointegration was rejected to conclude that a long-run relationship exists between economic growth, foreign direct investment, inflation, interest rate and saving rate. ARDL-ECM model regression results of the long run model show a negative relationship between foreign direct investment and economic growth whilst foreign direct investment was found to be insignificant in explaining short-term growth. The granger causality shows no causality between FDI and economic growth. The negative relationship between FDI and economic growth registers uncertainty on whether FDI has benefited the economic growth of South Africa. The researcher recommends that government should come with ways or strategies which would best attract foreign direct investment and ensure that the country's affairs are in order, for example, combat corruption and crime while also ensuring that there is political stability and well managed state-owned enterprises.

Keywords: Foreign direct investment, Economic growth, Real interest rate, Inflation rate, Saving rate, ARDL

ABBREVIATIONS

ADF	Augmented Dicky Fuller
ANC	African National Congress
ARDL	Autoregressive Lag Distribution
AsgiSA	Accelerated and Shared Growth Initiative for South Africa
CFI	Corporate Finance Institute
CPI	Consumer Price Index
ECM	Error Correction Model
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GEAR	Growth, Employment, and Redistribution
IDC	Industrial Development Corporation
ILO	International Labour Organization
INF	Inflation
LDCs	Less Developed Countries
MNC	Multinational Companies
NDP	National Development Plan
NGP	New Growth Path
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PP	Phillips-Perron
RIR	Real Interest Rate
SADC	Southern African Development Community
SR	Saving Rate
VAR	Vector Autoregressive

UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme

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CHAPTER 1

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

Foreign Direct Investment (FDI) has been recognized as a channel which aids in the sustainability and acceleration of the host country's economic growth (Sawalha, Elian & Suliman, 2016). According to Akonnor (2018), firms can access new technology, create cheaper production facilities, create new markets and market channels, and develop intensive skills because of FDIs. FDIs provide significant benefits to host countries through regulatory investment in companies, technological transfer, and a well-functioning state-wide regulatory system (Sharma, Umesh, Elangbam & Achintatya, 2012). Foreign and domestic investments are essential to a nation's expansion and prosperity. Policymakers should therefore concentrate on what can be done to make the two types of investment work together to provide the most advantages for the nation in order to maximise the potential of investment to support economic growth (Lerato & Lorainne, 2019).

Long-term high economic growth has remained a basic macroeconomic policy goal in many economies. The urgent need to address the country's social and economic problems has fuelled the ambitious goal of achieving strong economic growth for the long term. High levels of poverty, unemployment, and income disparities, among other socioeconomic issues, have plagued South Africa. As a result of these occurrences, the country's macroeconomic policy makers have implemented several policies aimed at stimulating economic growth. Foreign direct investment (FDI) is widely considered as one of the crucial tools for increasing a country's output and stimulating economic growth (de Abreu, 2017).

1.2 Background of the study

In South Africa, direct foreign investment has a long and varied history. Since Britain created the South African colony in the early nineteenth century, foreign firms have been present, which was manifested by the reliance in exports of farm produce destined for Europe until the 1870s, but the financial system was dominated by London-based institutions, however, the coming in of fresh FDI into the country significantly decreased in the early 1970s. With the overhaul of the global flows of

capital into long term investments, more significant was the fact that foreign investors in South Africa came under increasing political pressure from their home countries because of the escalating global campaign against apartheid. This campaign significantly escalated in intensity during the 1980s as political unrest in South Africa grew and the country's economy deteriorated (Gelb & Black, 2004). Between 1984 and 1988, roughly 225 US corporations and 20% of UK firms left South Africa as foreign direct investors. At the beginning of the 1990s, South Africa had a total foreign direct investment obligation of approximately eight billion Unites States dollars (in accordance with the latest currency rates), where eighty-five percent came from countries within the European Union while thirteen percent was from Northern American countries. The selling of 30% of the equity in Telkom, the state-owned telephone firm, to a strategic partner in 1997 was the single greatest foreign investment since 1994, however, the IPO of an additional 25% of the stock was put off for well over a year and did not take place until 2003 (Gelb & Black, 2004). Global FDI flows were predicted to reach a trough in 2021, recovering some lost ground with a 10–15% recovery. This would still put FDIs 25% below where they were in 2019 and more than 40% below where they peaked in 2016. Robust cross-border mergers & acquisition activities and large-scale state investment assistance, means that developed economies are likely to drive global FDI growth. Inflows of foreign direct investment into Asia will continue to be strong; the area has remained a popular destination for international investment throughout the pandemic. FDI to Africa, Latin America, and the Caribbean is unlikely to recover significantly in the foreseeable future. These areas have greater structural flaws and less budgetary room, and they rely more on greenfield investment, which was anticipated to remain low in 2021 (UNCTAD, 2021).

Olawumi and Olufemi (2016) assert that one of the most significant effects of globalization is the massive increase in foreign direct investment. FDI inflows have increased dramatically in many African countries during the last two decades, despite the fact that African countries are not among the world's top recipients of FDI (Agrawal & Khan, 2011; Ozturk, 2007). Foreign Direct Investments are becoming an essential driver of economic growth, development, and prosperity, particularly in developing countries; in developing nations they have the potential to impact both the host countries and the Multi-National Corporations (MNCs) or other entities wanting to

invest. FDIs deliver additional financial resources to host countries through investment and taxation (Asongu, Akpan & Isihak, 2018). Mazenda (2014) investigated the impact that cross-border investments have on the growth of a country's economy, paying special attention to the economy of South Africa, and came up with revelations that a potential positive connection of FDIs and the overall growth of the economy in South Africa exists.

Schnitzer (2002) argued that many African economies placed less emphasis on FDI until the late 1980s because many leaders feared "loss or dilution of political sovereignty," and other negative effects on domestic firms, such as bankruptcy, and general deterioration of environmental resources, especially, if investments were directed toward the natural resource sector. Chitambara (2016) pointed out that FDIs flows into Africa have increased significantly over the last few decades and they have primarily been targeted at the extractive industries in resource-rich countries. The role of FDI in Africa is extremely significant because it has been demonstrated that FDI can generate positive externalities, under certain circumstances (Kobrin, 2005).

Sukar, Ahmed and Hassan (2007) noted that despite the numerous incentives, FDI inflows to Africa are still limited in absolute terms, but they have a considerable effect on these economies. Asiedu (2002) argued that the slow growth of FDIs in African countries is due to the perception of these countries that they are extremely high risks; this is a major consideration that is keeping FDI away from the region. Investors are afraid of the consequences associated with the possibility of negative consequences. These perceived risks and pessimism, which are usually caused by war, famine, massive corruption, project failure, and poor governance, may have contagious effects. Africa received only a small amount of FDI, 10.3%, as compared to the Latin America's 29.1% and the Caribbean 60.5%, despite having a higher rate of return than other developing countries, (UNCTAD, 2010).

South Africa is Africa's most developed country and had the largest economy until 2014, when Nigeria overtook it (Trading Economics, 2021). South Africa has experienced a serious decline in economic growth in the past decade, due to a number of factors such as, weakness of state-owned enterprises, corruption, high unemployment rate, low saving rate, constraints on independent/ small business operators, coupled with the ease with which doing business within South Africa have

all contributed to this decrease in the gross domestic product. South Africa's GDP per annum was at its lowest in 2002 amounting to 115.75 billion dollars and it increased and reached its highest amount of 416.88 billion dollars in 2011; after that it has been drastically declining until it reached 317.58 billion dollars in 2015 (Statista, 2021).

According to international institutes, scholars, policymakers, and researchers, FDI is crucial to the economies of developing countries like South Africa (Sokang, 2018). Ali and Hussain (2017) reveal that when domestic savings are scarce, foreign direct investment plays a critical role in economic progress. It is now well acknowledged that FDI may greatly improve the economy of the host country, which may explain why governments in many countries throughout the world devise measures to attract foreign direct investment (Ali & Hussain, 2017). Falki (2009) maintains that Foreign Direct Investment (FDI) has risen to become the most prominent means of generating external resource flows to developing nations in recent years; it has become an important portion of capital formation in these economies, despite their tiny or even declining share of global FDI distribution. Despite all its efforts to attract large amounts of FDI, South Africa receives a very little amount of foreign money in the form of direct investment (Thomas & Leape, 2005).

Foreign enterprises have an impact on domestic welfare and growth, mainly, in five areas: capital markets and finance, international commerce, domestic products markets, technology, and labor markets and employment, according to theory. There are a variety of pathways in each of these categories, and their impacts might be favourable or harmful (Gelb & Black, 2004). Investments from foreign entities pave way for the growth of the economy where the business activities will be administered, for example through development in infrastructure (road and communication networks (World Bank, 2002). Given the numerous advantages of recruiting international business partners, and just like any other country in the developing phase, South Africa strives to create a climate that is conducive to attracting foreign investment (Tshepo, 2014).

In most cases, host nations (especially developing nations) can be constrained by local constraints, such as low levels in areas - of human capital, financial development, institutional quality, technology gap, the rate of economic growth, coupled with transparency in doing business. A common characteristic among investors is that they

tend to prefer countries which have reliable institutions where the rule of law is applied and effective governance. (Malikane & Chitambara, 2017). According to a study by Mlambo (2005), rampant corruption in public and private sectors among the Southern African Development countries has negatively affected or slowed down the rate at which foreign direct investments flow into the region.

Given the high incidence of unemployment, particularly among the youth, job development is clearly one of the most pressing issues facing South Africa. It is this scenario that has pushed the government in South Africa to adopt a number of policies and programs aimed at addressing the problem of unemployment. These programs include GEAR (Growth, Employment, and Redistribution), AsgiSA (Accelerated and Shared Growth Initiative for South Africa), NGP (New Growth Path), and the National Development Plan (NDP) currently in effect (The Presidency, 2011). Tshepo (2018) outlined that the need to recruit more foreign investors is embedded in these policies, with the goal of boosting economic growth, creating jobs, and supplementing domestic expenditure, with the latter accounting for a biggest share of overall government expenditure and investments.

Foreign Direct Investment (FDI) and its effect on economic growth is among the most contentious issues in development economics. According to the modernization hypothesis, the growth of a country's economy is aided through (FDIs) through providing external financial resources, which through growth, spreads its benefits throughout the economy; it is very crucial to have impacts of FDIs than to have them as just sources of investment. Furthermore, FDIs frequently bring innovative technology, and better management and organization; hence, they can be considered the other "engine" of growth in LDCs. In contrast to the modernization hypothesis, the dependence hypothesis maintains that while FDI flows may have a positive short-term influence on economic growth, they have a negative long-term impact, as evidenced by the negative connection between FDI stock and growth rate. Any increase in FDI, in the short run, allows for more investment and consumption, resulting in direct and immediate economic growth (Tsai, 1994).

Understanding the influence of foreign direct investment on economic growth is crucial, since the South African government has been working hard to attract FDI.

Based on the findings of this study, appropriate policies to attract FDI and boost economic growth may be developed.

1.3 Problem statement

One of the countries with and abundance of human and mineral resources in Africa is South Africa. According to the HCI findings, South Africans born today can expect to achieve 41% of their maximum potential in terms of health and education by the age of 18; South Africa is ranked in 126th place out of 157 countries studied (World Bank, 2018). These resources, however, have not been properly utilized due to activities such as increased corruption, gross mismanagement, and bad policies of successive administrations (Banda, Ngirande & Hogwe, 2016). Industrial Development Corporation (2013) reported that since the advent of democracy in South Africa, the economy has seen significant changes. It had an average annual rate of economic growth of 3.3 percent in real terms from 1994 to 2012, which is a significant improvement over the 1.4 percent average annual growth it had between 1980 and 1993. South Africa GDP growth rate for 2018 was 0.79%, a 0.63% decline from 2017; the GDP growth rate for 2019 was 0.15%, a 0.63% decline from 2018. The growth rate further declined in 2020 to -6.96% (World Bank, 2021). Economic growth has been fluctuating for the period under consideration - 1985 to 2019 - for the GDP growth rate have showed unstable trends. From the late 80s, GDP has been declining until the country experienced negative growth rate, from 2009 until 2019; the GDP has continuously declined with no signs of improvement. Tshepo (2014) came up with findings which showed that South Africa's ability to improve in terms of economic growth will be determined by its ability to attract foreign direct investment. Low-economic growth is the main concern which the study will address by considering selected factors or variables.

Increased global investments in emerging markets have benefited South Africa. The strong yields available in the domestic equities and bond markets have attracted considerable capital inflows, while significant interest rate differentials have enticed the "carry-trade" (Industrial Development Corporation, 2013). In comparison to other African countries, South Africa has a high attraction potential, however, its FDI attractiveness is relatively poor, mainly due to poor infrastructure investment possibilities. FDI inflows declined by 15.1 percent in 2019, hitting USD 4,6 billion, according to figures released in the UNCTAD's 2020 World Investment Report; this is

compared to a peak of USD 5,4 billion in 2018. FDI stocks grew to USD 151 billion in 2019, a significant increase from USD 127 billion in 2018. This tendency is linked to the government's articulated goal of attracting $100 billion in foreign direct investment by 2023 (Santander, 2021).

Foreign investors are responsible for job development and wealth generation, hence, the Ramaphosa-led ANC administration promotes them. European countries, (the United Kingdom, Netherlands, Belgium, Germany, and Luxembourg) as well as the United States, Japan, China, and Australia, have traditionally been active investors in South Africa, (Santander, 2021). Malikane and Chitambara (2017) stated that in Southern Africa, FDI has a favourable and considerable impact on economic growth. The metrics of democracy and FDI also have a positive link; this means that nations with strong democratic institutions will be better able to absorb FDI spill overs.

In the World Bank's Doing Business (2020) report, South Africa is ranked 84th out of 190 economies. Factors motivating investors, include the fact that - the country boasts a large population; a diversified, productive, and advanced economy; abundant natural resources; a transparent legal system, and a degree of political stability. The country, however, faces a high crime rate, rising social unrest (including strikes and demonstrations), high levels of corruption, and structural challenges with electricity and logistics. Investors are particularly concerned about a lack of transparency in policy and structural improvements (Santander, 2021). It might be argued that FDI, particularly in emerging and developing economies, has a significant role in economic growth over the long term. It is important to support initiatives to draw FDI to lower-middle-income emerging nations to supplement domestic investment (Dinh, Vo, The Vo, & Nguyen, 2019), This is supported by Ayenew (2022) that only over the long term does foreign direct investment have a favourable and significant impact.

One of the concerning aspects of the South African problem is the country's rapid drop in economic growth, hence, despite its desire and efforts to attract huge quantities of FDI, the country receives only a little amount of foreign money. It is, therefore, important to determine the impact of foreign direct investment on economic growth because there is no consensus regarding this impact. Kunle, Olowe and Oluwafolakemi (2014) and Trinh and Nguye (2015), for instance confirm a positive impact of FDI on economic growth, whereas Gul and Naseem (cited in de Abreu, 2016)

claim that foreign direct investment has a negative impact on economic growth supported by Lerato and Lorainne (2019) who observed a negative relationship between economic growth and FDI.

Mazenda (2014) contends that foreign direct investment does not have a consistent impact on economic growth, while Tshepo (2018) discovered that economic growth has a positive long-run relationship with both foreign direct investment and the real effective exchange rate, but a negative long-run relationship with government spending. Whilst Fedderke and Room (2006) maintain that foreign direct investment has a positive long-run spill over effect on capital and labour, and thus on output in South Africa. Results of Strauss (2015) are ambiguous, as there were no long-term effects between the variables, and FDI only has a short-term impact on economic growth which is in contradiction to theory. The results of studies are inconclusive thus, this study seeks to find conclusive evidence on the impact of FDI on economic growth using recommended methods from previous studies.

The main challenge confronting South Africa is to suggest policies that would assist to promote sustainable economic growth and attract foreign direct investment. It is paramount to identify and examine current policies and their consequences for South Africa in trying to attract foreign direct investment, boost employment and economic growth. The few preceding studies' various and inconclusive opinions on the impact of FDI on economic growth, indicate that more research is needed on the impact of foreign direct investment on economic growth in South Africa, which the current study intends to do.

1.4 Aim of the study

The aim of the study is to analyse the impact of foreign direct investment on economic growth in South Africa using data for the period, 1985 to 2019.

1.4.1 Objectives of the study

The following objectives will be used to operationalise the aim of the study:

- To analyse trends in foreign direct investment and economic growth in South Africa.
- To empirically examine the impact of foreign direct investment on economic growth in South Africa.

- To recommend policies that will promote foreign direct investment and subsequently, economic growth.

1.5 Research questions

- What are the trends of foreign direct investment and economic growth in South Africa?
- What is the impact of foreign direct investment on economic growth in South Africa?
- What are some policies that will promote foreign direct investment and subsequently, economic growth?

1.6 Hypothesis of the study

The following hypothesis will be tested in this study:

H_0: Foreign direct investment positively impacts economic growth.

H_1: Foreign direct investment does not positively impact economic growth.

1.7 Significance of the study

According to the researcher's preliminary research, in comparison to developed countries and other African countries, the impact of foreign direct investment on economic growth in South Africa has received less scholarly attention. The current study, which differs from Tshepo (2014), de Abreu (2017), Malikane and Chitambara (2017), and Marandu (2018), examines the impact of foreign direct investment on economic growth in South Africa (1985-2019). Instead of using three variables, such as gross domestic product, foreign direct investment, and employment, as Tshepo (2014) did, this study will add one new variable - real interest rate - as suggested by Malikane and Chitambara (2017) as well as two new variables - inflation rate and saving rate. This study will consider the apartheid and post-apartheid era of macroeconomic policy regime and use relatively larger samples as suggested by de Abreu (2017), thus, a time series analysis will be used for the period 1985 to 2019, on an annual basis. The study considers time series as suggested by Masiyandima (2015) and Dinh, Vo, The Vo, and Nguyen (2019) that longer time series may be more informative. This study will include omitted variables affecting both inflows of FDI and economic growth, due to data limitation as suggested by Olawumi and Adeyeye (2016), it will also identify the challenges of foreign direct investment in the host countries as suggested by Ayenew (2022).The researcher is of the opinion that this

study should be conducted because it is the first of its kind in terms of examining the influence of foreign direct investment on economic growth in South Africa while considering the specific factors indicated above.

Investment, especially foreign direct investment (FDI), is considered one of the most essential drivers to economic growth. This study seeks to investigate the impact of foreign direct investment on economic growth in South Africa so that proper and suitable policy recommendations can be made. For that purpose, the researcher will deliberate on selected macroeconomic aspects such as - inflation, saving rate, real interest rate and foreign direct investment – and their effects on economic growth in South Africa. Some of the motivation for this study are based on the unique features of the country. South Africa has a big domestic market; well-developed infrastructure; competitive economy; democracy is well-established in the country; the rule of law is upheld; it is the industrialized and technologically advanced; diverse economy and is regarded, on the African continent, as a production pole.

Many studies have found inconsistent results when it comes to the impact of FDI on economic growth. For example, Mazenda (2014) found that foreign direct investment has a mixed effect on economic growth in South Africa, while Sokang (2018) found that FDI had a positive impact on economic growth in Cambodia, and Uwubanmwen and Ogiemudia (2016) found that FDI had a negative and insignificant impact on the Nigerian economy. The empirical foundations of the effects of FDI on economic growth have been established, nevertheless, some studies have argued that more research should be done to fill in gaps, still existing. Malikane and Chitambara (2017), for example, have suggested a focus on analysing country-specific cases to allow for specific policy recommendations and the employing of more robust econometric models. The authors have advocated for more research to be done to see if there is a bi-directional connection between FDI and GDP growth. This will aid scholars to better understand the mechanisms that support economic growth in Southern Africa (Marandu, 2018).

It is crucial that the knowledge generated from this study should be used to formulate possible policies that will attract foreign direct investment so as to boost savings, employment, and economic growth. The South African government has been having discussions about foreign direct investment in the past years, hence, this study will,

with empirical date, enable policy makers to know the impacts of FDIs on economic growth. Researchers and scholars will be able to expand their knowledge through this study and it can be used as a referral point for those who will be interested in further researcher into the subject, therefore, the empirically verified ideas of the study, will add to the existing knowledge.

1.8 Delimitations of the study

This study strictly focused on the impact of foreign direct investment on economic growth in South Africa. The study used selected macroeconomic variables, namely, foreign direct investment, inflation rate, real interest rate, saving rate and economic growth. Investment is a vast subject matter, however, this study aimed only at foreign direct investment and its impact on economic growth in South Africa from 1985 to 2019, therefore the period of the study is restricted to 34 years. The study used South African data on the selected variables - inflation rate, saving rate, real interest rate and economic growth – on foreign direct investment. The time series data was collected from Organisation for Economic Co-operation, and Development (OECD)

1.9 Definitions of operational concepts

This section provides definitions for the study's operational concepts, which are as follows:

1.9.1 Foreign direct investment

Foreign direct investment (FDI) is defined as a financial investment made to buy or expand a business in a country other than the investor's own. It is a significant source of capital for the host nation's investment, job creation, economic growth, and poverty reduction (Ocaya, Ruranga & Kaberuka, 2013). FDI is an investment made into a company in another country by a person or an organization. The host country gains the potential for job growth, cutting-edge technology, a greater standard of life, infrastructure development, and general economic expansion (Vaidya, 2022). In other words, FDI is a situation in which an investor residing in his/her parent nation owns assets in another country, the host country, and seeks to manage these assets. Overseas foreign direct investment can be distinguished from portfolio investment, which focuses on foreign stocks, bonds, and other financial instruments, by the difference in management (Qi, 2011). FDIs are essential for augmenting domestic savings, creating jobs, and growing the economy; while the local economy is

integrated into the global economy, current technology is transferred, and local skills are enhanced (Majavu, 2015).

1.9.2 Inflation rate

Inflation is defined as a change in the prices of a basket of goods and services that are typically purchased by certain groups of households, as measured by the consumer price index (CPI). The consumer price index is calculated as a collection of summary measurements of the proportional change in the prices of a fixed set of consumer products and services of constant quantity and characteristics purchased, utilized, or paid for by the reference population from one period to the next (OECD, 2021). Lower inflation levels due to "inflation targeting" have been accomplished at the expense of the real output growth rate in most developing market nations; as a result of this, foreign investors are less likely to enter the economy, resulting in a drop in overall FDI inflow into emerging countries (Brito & Bystedt, 2010).

1.9.3 Real interest rate

The real interest rate is the loan rate that has been adjusted for inflation using the GDP deflator, however, the terms and conditions related to lending rates vary in each country, making comparisons difficult (World Bank, 2021). An interest rate is the fee incurred by a borrower in order to have access to and use assets at the time of display rather than at a later date (Casu, Girardone & Molyneux, 2006). Luther (2014) discovered that interest rate volatility has a direct impact on exchange rates and market attractiveness, which in turn has a long-term impact on FDI.

1.9.4 Economic growth

Economic growth is an increase in the number and quality of economic commodities and services produced and consumed by a country. Growth is sometimes quantified as an increase in household income or inflation-adjusted GDP, but it is vital to remember that this is not the term’s definition, just as life expectancy is a measure of population health but not the definition (Max, 2013). Cornwall (2018) stated that economic growth is the process by which a country's wealth grows over time and although the term is frequently used in discussions of short-term economic performance, it generally refers to an increase in wealth over a long period of time in the context of economic theory. Economic growth is usually defined as an increase in the production of economic goods and services from one period of time to the next

(Potters, 2021). FDI and economic growth are mutually beneficial, according to Mawugnon and Qiang (2011). Large economic growth generates large profit margins, attracting more domestic and international direct investment. FDI, on the other hand, has a direct benefit on economic growth in the host countries due to its spill over effect.

1.9.5 Saving rate

Savings are calculated as the difference between final consumer expenditure and disposable income (adjusted for changes in employment-related pension entitlements). The saving rate represents savings as a percentage of GDP after depreciation (GDP) (OECD, 2022). Savings are a major contributor to economic growth and are essential for accomplishing investment goals and growth plans. Domestic savings-based growth rates are more resilient than growth rates acquired with borrowed money (Soylu, 2019). According to Jagadeesh (2015), savings lead to capital development, technical innovation and advancement, which support large-scale production economies, boost expertise, and raise labour productivity.

1.10 Organization of the study

This study is comprised of six chapters. This chapter one gives the introduction of the study, background of the study, problem statement, aim of the study, objectives of the study, hypothesis of the study, significance of the study, delimitations of the study, definition of operational concepts and organization of the study. Chapter two provides an overview of economic growth and foreign direct investment in South Africa. Chapter three offers a review of existing literature on foreign direct investment and economic growth which includes theories of foreign direct investment, economic growth, and empirical review on the relationship between foreign direct investment, real interest rate, saving rate, and economic growth. It also provides the summary of literature reviewed. Chapter four sketches out the methodology to be utilized in the study. It defines the research paradigm, research design, research method, sample and sampling technique, data collection, data analysis, model specification and definition of variables, priori expectations, sources of the data, estimation techniques and diagnostics tests, ethical consideration, and summary. Chapter five encompasses the presentation, interpretation and analysis of the collected data showing how they are contextualized in literature or how literature reinforces the findings gathered. Chapter six outlines the conclusion of the study, limitations and recommendations. Finally, appendices and references are placed at the end of the thesis.

1.11 Summary

This chapter established the topic by presenting information on the background of the study. It emphasised the problem statement, research objectives, research questions, hypothesis of the study, significance of the study, delimitation of the study and operational definitions.

CHAPTER 2

AN OVERVIEW OF ECONOMIC GROWTH AND FOREIGN DIRECT INVESTMENT IN SOUTH AFRICA

2.1 Introduction

This chapter's purpose is to provide an overview of the variables employed in the study's econometric model and trends relating to those variables. Trends in foreign direct investment, inflation, real interest rate and saving rate (independent variables) and economic growth (dependent variable) from 1985 to 2019 in South Africa will be analysed with their supporting figures.

2.2 Overview of economic growth in South Africa

Gross domestic product (GDP) is the accepted unit of measurement for the value added by the production of goods and services in a nation, over a specific time period. As a result, it also accounts for income generated from that output or total expenditure on finished goods and services (less imports). The GDP is the most crucial metric for measuring economic activity (OECD, 2022). Economic growth creates job opportunities, which lead to a greater demand for labour, the major, and frequently, the only asset of the poor. In turn, providing faster growth has depended heavily on growing employment (Dfid, 2008). Tshepo (2014) states that economic growth is driven by foreign direct investment in South Africa.

The South African economy's dropping growth rate, which was a standout characteristic of the 1970s; this phenomenon persisted into the 1980s to the point that, by the end of the decade, slow growth had been replaced by no growth (Jones & Inggs,1994). The democratic transition greatly enhanced South Africa's economic growth, which has remained relatively solid and stable ever since. From 1994 through 2012, the most recent full years for which data is available, the South African economy increased by an average of 3.2 percent, annually. The South African economy has changed, thereby, growing from a GDP of USD136 billion in 1994 to USD384 billion in 2012. (Meyiwa, Nkondo, Chitiga-Mabugu, Sithole & Nyamnjoh, 2014).

Between 1995 and 2004, inclusive, when measuring per capita growth, the average real GDP growth rate was 3,0 percent. This is a significant improvement over the average growth rate of 0.8% (or -1.3% in terms of per capita) for the previous ten years, 1985 – 1994. The country's growth record at that time, which was the poorest

since the Second World War, was so subpar that it does not seem appropriate to use it as a yardstick (Du Plessis & Smit, 2006). A disappointment according to many people's expectations, the 3 percent average growth rate for the first ten years after apartheid was also far below what was thought to be required to enable a stable transition to democracy in South Africa (GEAR, 1996).

After a decade of slow growth, the South African economy was already in a precarious state when the Covid -19 pandemic hit. The introduction and continuation of load shedding brought on by operational and financial issues at the energy utility, Eskom, has contributed to the economy's 0.1% growth in 2019 (World Bank, 2022). Ali and Hussain (2017) explain that when domestic savings are scarce, foreign direct investment plays a critical role in economic growth. It is now well acknowledged that FDI may greatly improve the economy of the host country, which may explain why governments in many countries throughout the world devise measures to attract foreign direct investment.

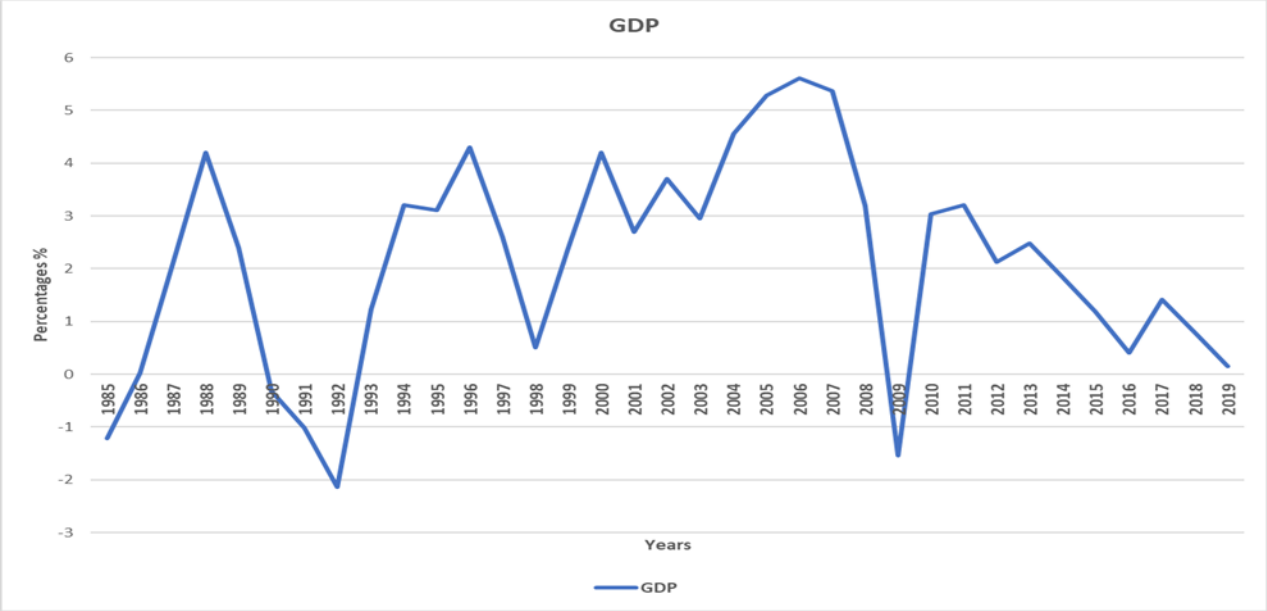


Figure 2.1: Economic growth trends in South Africa from 1985-2019

Source: own computation using data from OECD (2022)

Figure 2.1 shows the trends in GDP. In the 1980s the economy experienced slow growth as is evident in the above graph (Figure 2.1). GDP improved to 4.20% in 1988 and after that drastically decreased, from 1989 to 1992 where the economy experienced a negative growth. GDP started to rise again in 1993 to a positive growth of 1.23% before South Africa was a democratic state. In 1994 when South Africa

obtained democracy the economy continued to grow where it reached 3.2% growth rate.

The GDP growth rate improved dramatically from roughly 1.2 percent in 1993 to approximately 3.2 percent in 1994. Despite a modest drop to roughly 3.1 percent in 1995, the nation saw its GDP expand to a record-breaking 4.2 percent in 1996. This percentage did, however, later fall to 2.5 percent and 0.7 percent, respectively, in 1997 and 1998. A slight rebound in economic growth was sustained in 1999 and 2000 despite South Africa's declining economic development in the 1980s and 1990s (Odhiambo, 2010). The economy was stable from 1994 to 1997 with a positive annual growth rate in 1998 despite a GDP dropped of 0.5%. In the middle of 1997, following three years of GDP growth of around 3% annually, economic growth dropped to slightly over 1%. GDP growth for the first two quarters of 1998 was established at 0.5% and 0.2% (Ministry of Finance, 1998). In the 2000s the growth rate remained positive and stable, according to OECD (2002). The consistent growth of both the manufacturing and service sectors can be used to explain the growth performance of 2000.

When the nation was affected by the global financial crisis in 2008–2009, there was a recession that lasted for three quarters of the year (Stats SA, 2017), which explained the negative growth rate experienced in 2009 of -1.53%; since 2012 the growth rate has been very low. Fedderke and Mengisteab (2017) revealed that South Africa's growth is considerable low and appears to be stagnating over time rather than improving up. It is challenging to imagine the economy growing structurally at a rate exceeding 2 percent annually, even under the most optimistic assumptions.

2.3 Overview of foreign direct investment in South Africa

In South Africa, foreign direct investment has a lengthy and complicated history; since the early 19th century, when Britain founded the colony, there have been foreign firms operating there. The inflow of fresh FDI into South Africa significantly decreased starting in the early 1970s. The composition of international capital flows changed from direct to portfolio investment, but even more significant was the fact that foreign investors in South Africa came under increasing political pressure from their home countries as a result of the escalating global campaign against apartheid. This

campaign significantly escalated in intensity during the 1980s as political unrest in South Africa grew and economic situations deteriorated (Gelb & Black, 2004)

More recent FDI levels in the country have remained relatively low in comparison to other developing market countries, however, they have contributed significantly to the growth of South Africa's economy (Arvanitis, 2005). UNCTAD (2016) claims that South Africa is a significant source of FDI in Africa, being the third-largest recipient of FDI inflows in Africa, after Nigeria and Mozambique. The DTI (2018) stated that from 2003 to 2015, a record of 1 344 FDI projects were registered in South Africa resulting in a total of US$71.2 billion in capital being invested in South Africa's economy from these initiatives. Additionally, 189 724 jobs were added to the economy as a result of these developments.

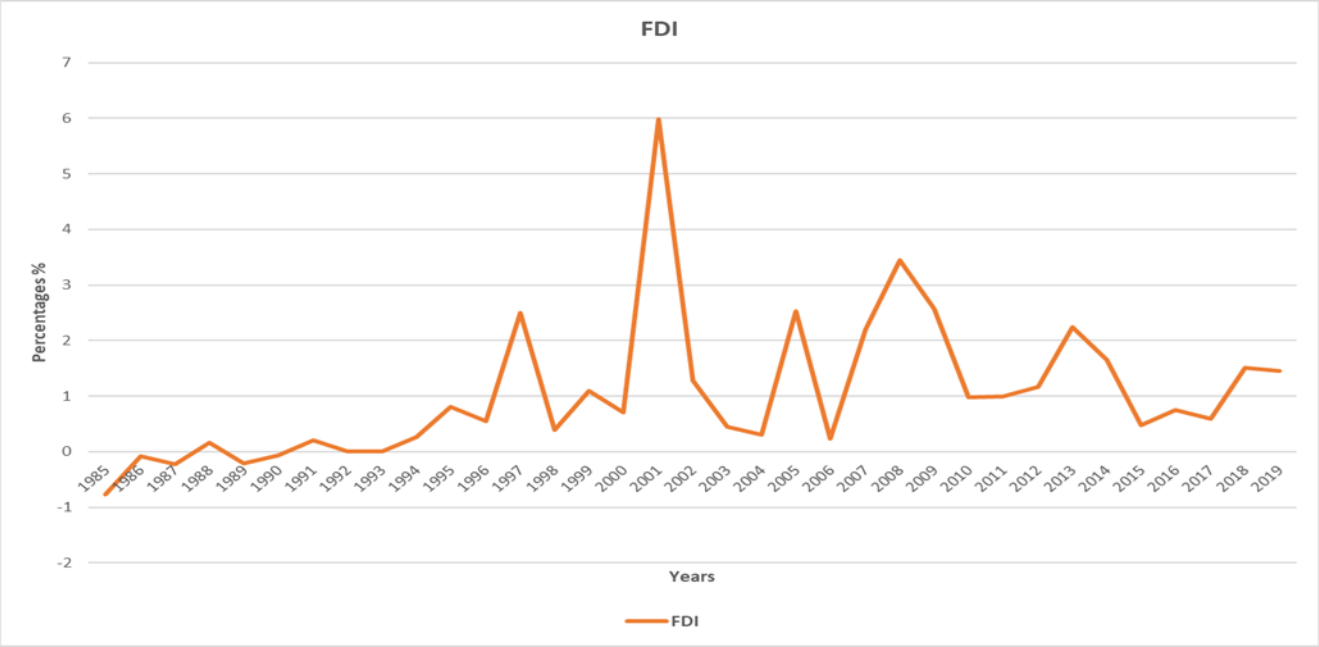


Figure 2.2: Foreign direct investment trend in South Africa from 1985-2019
Source: own computation using data from OECD (2022)

Figure 2.2 shows the trends of FDI, indicating that from 1985 to 1996, the annual FDI remained below 1%. South Africa has attracted very little international investment during the past 25 years. This was largely caused by the political climate at the time, which included the implementation of trade and financial sanctions in the middle of the 1980s, the subsequent financial crisis, the tightening of capital controls, and the declaration of a moratorium on payments to external creditors, which effectively cut South Africa off from the global capital markets. Between 1994 and 2002, South Africa

received an average of less than 1.2 percent of its GDP in FDI per year (Arvanitis, 2005). There are obstacles that are preventing the South African investment environment from fully achieving circumstances that are favourable for high-quality FDI; this situation is evident in the trends of FDI in the past years. The amount of FDI that entered South Africa decreased from US$4.6 billion in 2019 to US$2.5 billion in 2020 with the decrease being consistent with the global FDI decline of 42% (Faku, 2021).

2.4 Overview of real interest rate in South Africa

Real interest rates are lending interest rates that have been prorated for inflation as determined by the GDP deflator, however, the terms and circumstances that come with lending rates vary with each nation, limiting their comparability (World Bank, 2021). Interest rates in an economy have an impact on whether people and businesses choose to consume now or put off purchases till later, due to this, central banks can indirectly manage inflation and economic growth by altering interest rates (Bencik, 2009). The South African Reserve Bank's Monetary Policy Committee (MPC) decides on interest rates in the country. The repo rate is the accepted interest rate and is commonly displayed on an end-of-period basis (Trading economics, 2022).

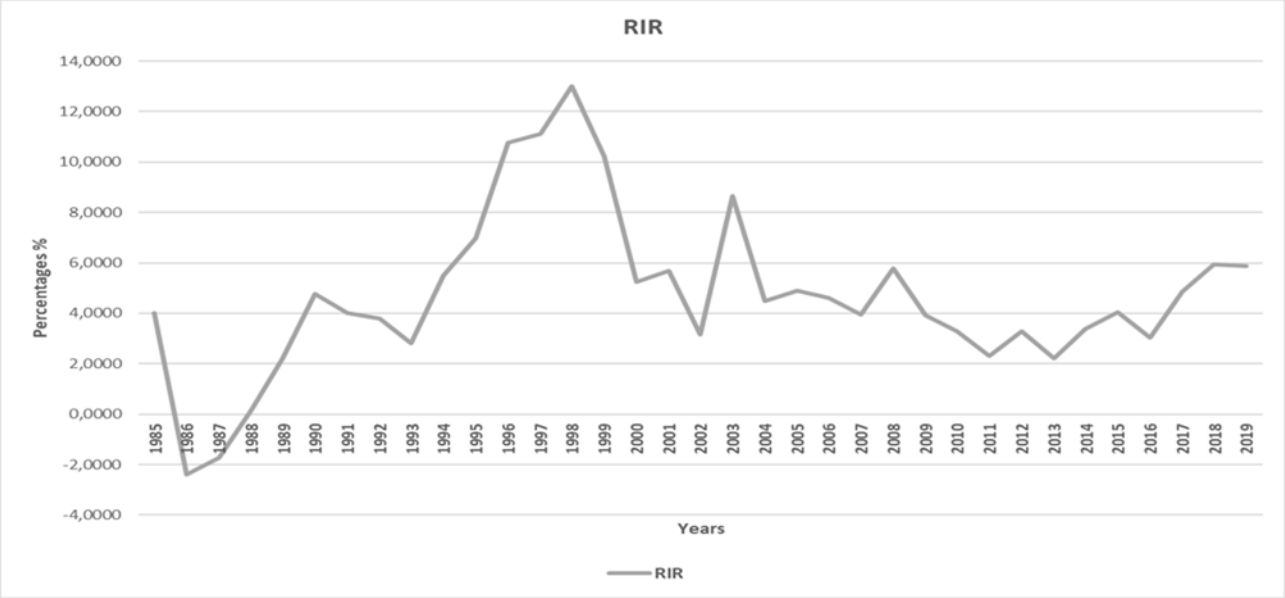


Figure 2.3: Real interest rate trends in South Africa from 1985-2019

Source: own computation using data from OECD(2022)

Figure 2.3 shows trends of real interest rate. Real Interest Rate data for South Africa indicated a per-annual value of 4.584 percent in 2017. This represents an

improvement over the prior figure of 3.451 percent for 2016. Real Interest Rate data for South Africa is updated yearly; there have been 57 observations, with an average annual growth rate of 3.728 percent. The data peaked in 1998 at 13.012 percent per year and hit a record low in 1980 of -12.315 percent per year (CEIC, 2022). In 2003 the real interest rate reached 8.66% which was the highest since 1998; from 2004 the real interest rate remained below 6% and it is still below 6% up to date.

2.5 Overview of inflation rate in South Africa

The pace of price growth over a specific time period is known as “inflation”. Inflation is often measured in broad terms, such as the general rise in prices or the rise in the cost of living in a nation, however, it can also be computed more precisely for some items, like food, or for services, like a haircut (Öner, 2012). The consumer price index (CPI) is the common index used in South Africa to determine the inflation rate (StatsSA, 2017). There are several ways to quantify inflation, including month-over-month from the previous year, month-over-month from the month before, quarterly average over previous quarterly average from the year before, and quarter-over-quarter from the year before. Before the implementation of inflation targeting in 2000, a number of methods to control inflation were tried, but with little effectiveness. The adoption of inflation targeting is what started a heated discussion in South Africa over the link between price stability and economic growth (Mandeya & Ho, 2022).

The inflation rate in South Africa has been very consistent during the previous few years, hovering between 3.2 and 6.3 percent; in fact, it is predicted to settle at about 4.5 percent in the coming years. South Africa has a diverse economy, with the services sector, particularly tourism, accounting for the majority of its GDP, however, poverty and unemployment are major issues in the nation (O’Neill, 2022).

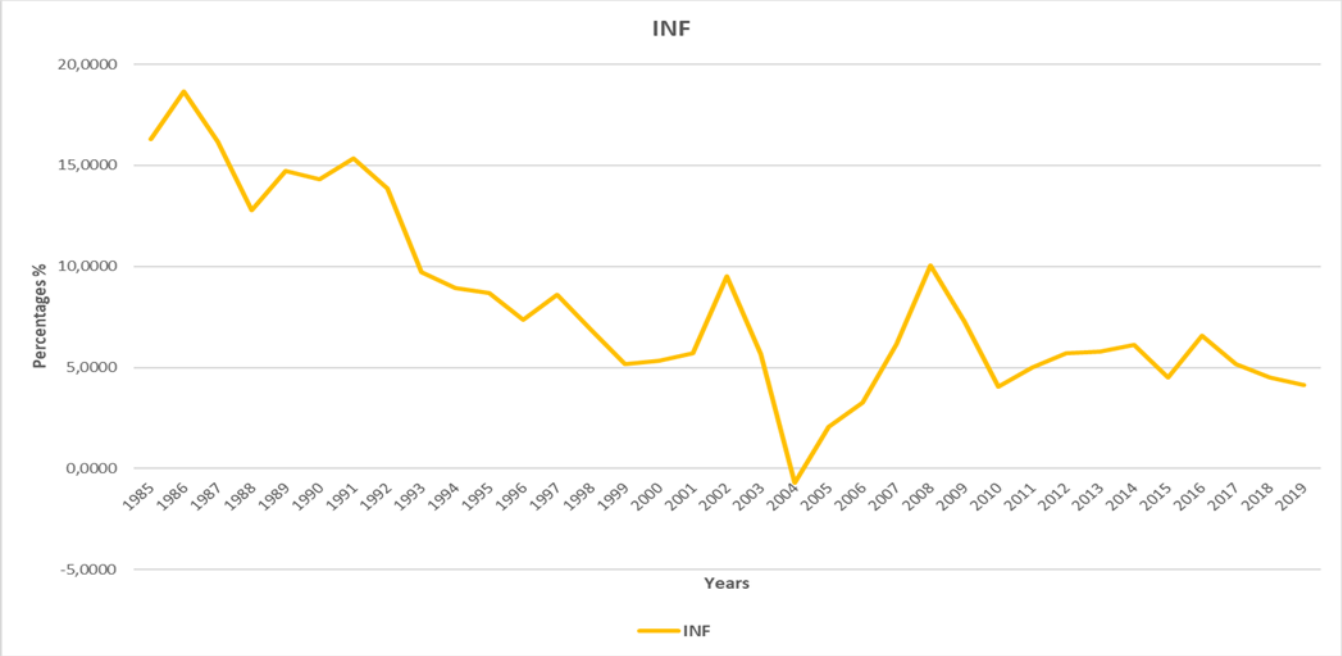


Figure 2.4: Inflation rate trends in South Africa from 1985-2019

Source: own computation using data from OECD (2022)

Figure 2.4 shows trends in inflation rates. Prior to the implementation of inflation targeting, the rate of inflation was high, averaging 9.415 percent, whereas during inflation targeting, the rate of inflation was 5.307 percent, according to the trends (Mandeya & Ho ,2022). The prognosis for pricing has been impacted by South Africa's nominal currency rate's rapid devaluation in 2001, particularly the prices of maize and other items like meat that require maize as an ingredient. Year-over-year CPIX inflation climbed from 5,8% in September to 6,5% in December 2001 after decreasing for the majority of last year (Parliament Services, & Association, 2018).

Due to decreasing food costs, South Africa's annual inflation rate in March 2013 was 5.9 percent, the same annual rate as that of February. Due to higher food costs, the annual inflation rate in South Africa marginally increased to 6.4 percent in August 2014 from 6.3 percent the previous month (Tradingeconomics, 2022). A clear sign that something was undermining the nation's economic foundation was the fact that South Africa's inflation rate peaked in 2016 at over 6.3 percent and the that country's gross domestic product and, consequently, economic growth suffered. The crisis resulted from low growth due to weak demand and an uncertain political future; the economy's was even downgraded by ratings agencies as a result of the alleged mismanagement

and unstable rule of the then-President, Jacob Zuma, who was also facing criminal accusations (O'Neill, 2022).

2.6 Overview of savings rate in South Africa

Over the past several decades, South Africa has seen a consistent decline in its national saving rate, which has been accompanied by a decrease in domestic investment. In the 1970s and 1980s, the national saving rate, which is calculated as the ratio of national saving to gross national disposable income (GNDI), was considerably over 20% and even temporarily went beyond 35% in 1979–1980, however, it later decreased to around 15% in 2001. Early in the 1990s, government savings hit a low point, but have subsequently recovered dramatically; personal, and corporate savings declined during the most of the 1990s, and gross private saving peaked in 2001 at roughly 13% of GNDI (Harjes & Ricci, 2005).

According to Statistics South Africa's (2018) data, South Africa is the most unequal of the five BRICS nations, with a Gini coefficient of 0.639, while all the others fell below 0.50, with the exception of Brazil, which had a value of 0.549. Through its impact on investment, savings have also become one of the main forces behind economic growth, however, as was mentioned earlier, South Africa faces issues with both low savings rates and slow economic growth. The country also showed a very low growth rate of 1.3 percent as of 2017 when compared to the other BRICS nations, with the exception of Brazil (van Wyk & Kapingura, 2021).

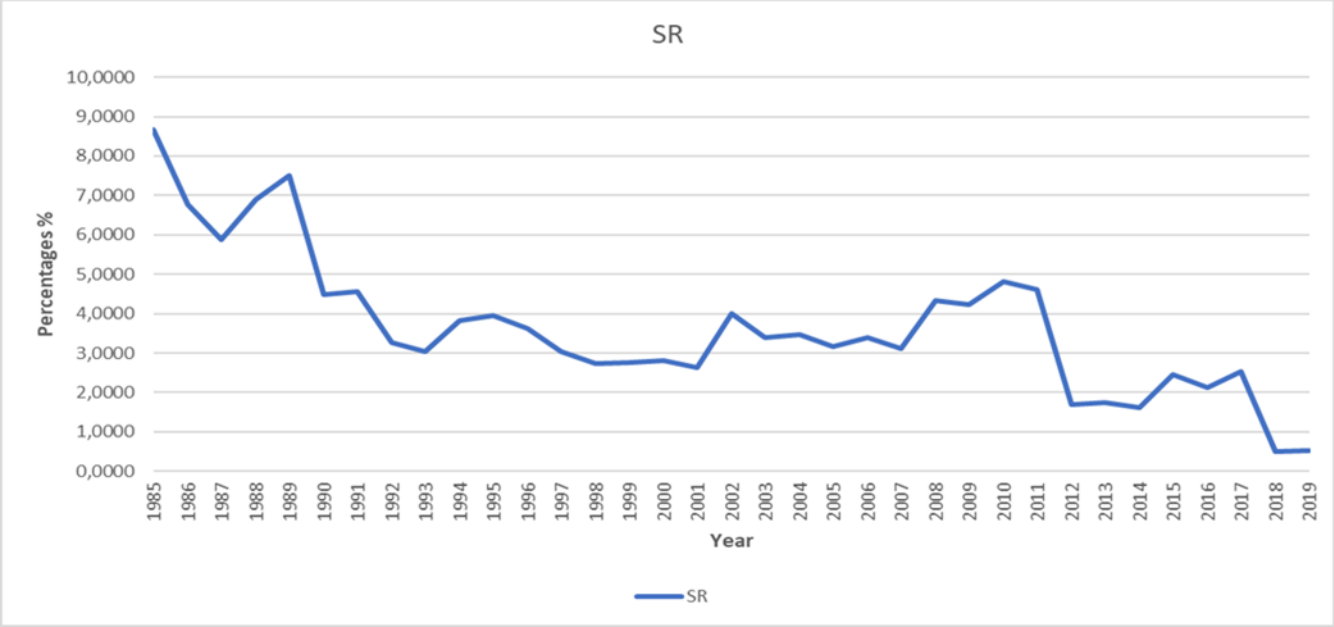


Figure 2.5: Savings rate trend in South Africa 1985-2019

Source: own computation using data from OECD (2022)

Figure 2.5 shows the trends of saving rate. Beginning in 1989, the gross savings ratio began a sharp decline and because of the drop in the government savings rate in the early 1980s, the gross savings rate fell (Aron & Muellbauer, 2000). In 1992, the gross savings ratio was 18.2%, falling below the 20% threshold. The savings to GDP ratio fluctuated between 14% and 18% from 1992 to 2015, averaging 16.5%. In 2012, the lowest gross savings ratio was 14.8% and the savings to GDP ratio stood at 16.4% in 2015 (SARB, 2018). In addition, compared to other growing economies, since the 1990s, South Africa's savings to GDP ratio have been low. In comparison to other emerging countries like Brazil (18%), Mexico (23.6%), Russia (27.5%), Thailand (31.0%), India (35%), and China (52.4%), South Africa's gross savings as a share of GDP in 2010 was only 16.5%; the country actually had the lowest amount of savings from 2001 to 2011 (Duncan, 2012; StatsSA, 2013). The country's national savings rate decreased from 2.7% to -0.1% between 1994 and 2011; this indicates that, as previously noted, people are currently spending more than they are making.

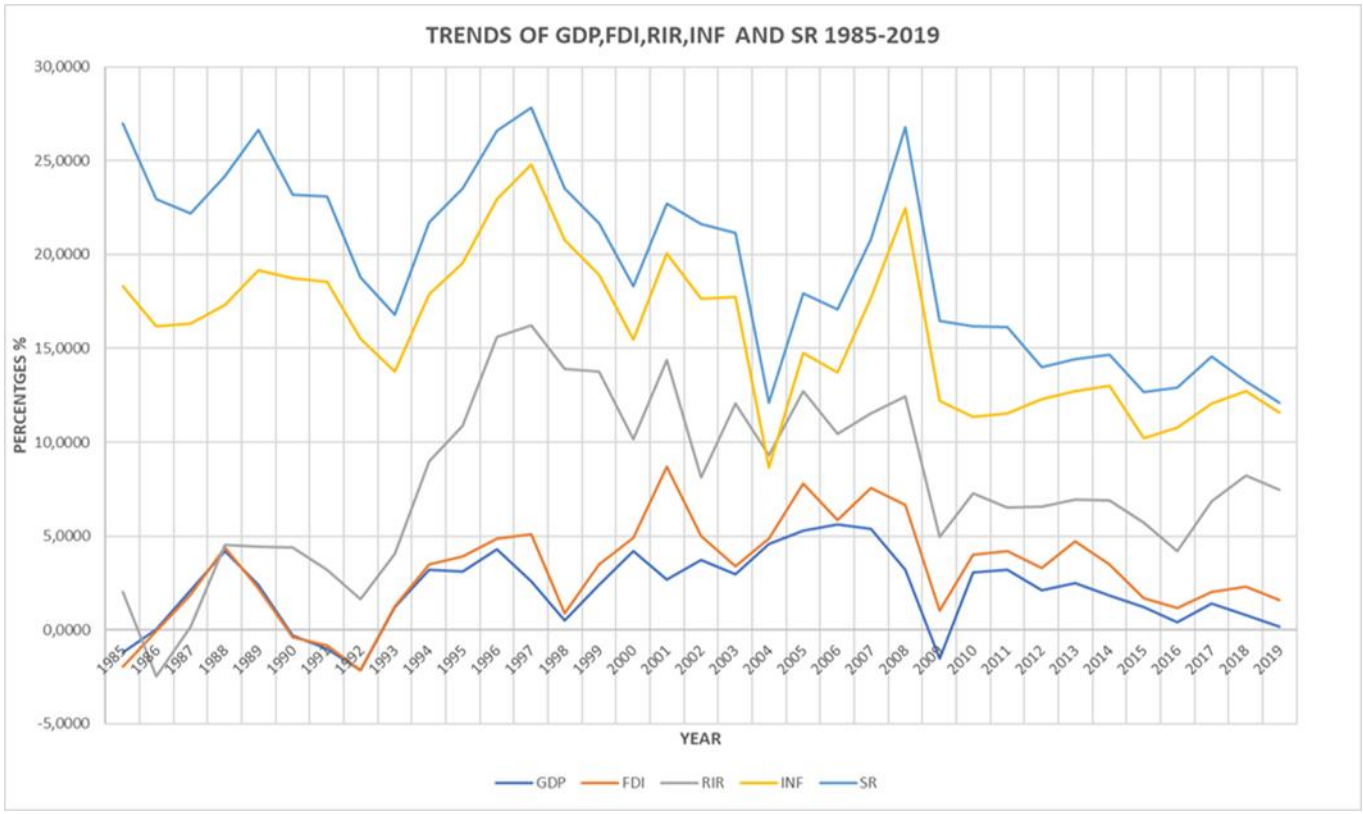


Figure 2.6: Trend of GDP, FDI, RIR, INF and SR from 1985-2019

Source: own computation using data from OECD (2022)

Figure 2.6 shows the trends in foreign direct investment, gross domestic product, real interest rate, saving rate and inflation in the past 34 years. In the early 80s, GDP was rising, starting from 1985 until 1989, when it drastically declined for the next four years and inflation was very high in relation to FDI. GDP started to rise again just before South Africa obtained democracy in 1993; it continued rising after the country became a democratic republic or state whilst FDI was very low in the 90s at less than 1%. GDP dropped in 1998 to 0.5% and FDI dropped to 0.39% whilst SR, RIR and INF were high. In 2000 GDP increased to 4.2% whilst all the other variables dropped - SR 2.80%, RIR 5.24%, INF 5.33% and FDI 0.71%. The trends from 2000 to 2009 showed that as GDP rose, RIR, INF, SR and FDI decreased, vice versa; from 2010 all variables were showing similar trends, thereby, indicating the possibility of a relationship.

2.7 Summary

This chapter provided an overview of trends in foreign direct investment, inflation, real interest rate and saving rate (independent variables) and economic growth (dependent variables) from 1985 to 2019 in South Africa. The trends showed that in 2009 all

variables went down by a significant amount and continued to fall for the period under consideration.

CHAPTER 3

LITERATURE REVIEW

3.1 Introduction

In this chapter is elaborated the theoretical foundations of the impact of foreign direct investment on economic growth. The consequent sections look at empirical evidence from various studies on the impacts of foreign direct investment on economic growth, concluding with a summary of the chapter.

3.2 Theoretical underpinnings the study

This study is based on theories of foreign direct investment and economic growth, which are briefly explained below.

3.2.1 Theories of foreign direct investment

There are numerous theories that have been developed on foreign direct investment. The following theories, however, were deemed relevant to this study - Production Cycle Theory of Vernon, Capital Market Theory, Internationalization Theory, Industrial Organization Theory, The Eclectic Paradigm, Entry Mode Theory and Investment Development Path Theory.

3.2.1.1 Production Cycle Theory of Vernon

Vernon's production cycle theory, developed in 1966, was used to explain certain types of foreign direct investment made by US firms in Western Europe after World War 2 in the manufacturing industry. Vernon considers the production cycle to have four stages: innovation, growth, maturity, and decline (Denisia, 2010).

Stage one: Innovation (new product): At this stage, local businesses develop new products primarily for domestic consumption and export the surplus to foreign markets. The product is not standardized in terms of costs and final specifications at this stage (Peltoniemi, 2011). Marandu and Ditshweu (2018) stated that at this early stage of the cycle, the innovating country has a comparative advantage because the "technological gap" between the innovating country and the others places, the former in a monopoly position.

Stage two: Growth products: At this stage, the volume of demand increases, products become more standardized, and the local market reaches saturation. As a result, local firms begin to expand their operations abroad to various locations where production

costs are low, thereby, competitiveness is enhanced for the products (Musabeh, 2018) and Chen, Lu and Zhu (2017) refer to them as ‘maturity products’. At this stage of the product’s lifecycle, its characteristics have become fully standardized, and price considerations play an important role in competition. As a result, the number of firms expanding abroad has increased, particularly, in countries that add value to their products. As a result, the firm's export position is jeopardized, and it is forced to produce goods in the host country via its foreign subsidiaries. The decline stage is characterized by concentration of production in emerging economies, therefore, the country that initiated the production now becomes a net importer of the product. As the product matures, comparative advantage shifts from one country to another, and so does FDI (Marandu & Ditshweu, 2018).

3.2.1.2 Capital market theory

This theory, also known as the “currency area theory,” is regarded as one of the earliest explanations of FDI (Makoni, 2015). FDI was the result of currency differences between the source and host countries (Nayak & Choudhury, 2014). The capital market theory is a subset of the portfolio investment theory and is regarded as one of the oldest theories explaining the concept of a firm’s expansion abroad. According to this viewpoint, FDI is primarily determined by interest rates and the value of the host country's currency (Musabeh, 2018). Aliber (1970) was one of the first to attempt to explain FDI in terms of currency strength. He presented his foreign investment theory based on the relative strength of various currencies and advanced his theory in terms of the differences in strength between the host and source countries’ currencies. Boddewyn (1985) stated that the capital market theory explains the reasons for firms' international investment, and he mentions three situations that encourage firms to expand their operations overseas. First, the host country's exchange rate is lower (undervalued), allowing for lower production costs. Second, in low-developed countries, there are no organized securities markets, which encourages FDI rather than stock purchases. Third, there is a lack of knowledge about these countries' securities markets (Boddewyn, 1985).

3.2.1.3 Internationalization theory

Buckley and Casson (1976) proposed that transnational companies organize their internal activities in order to develop specific advantages that can then be exploited. The theory is known as “internationalization” because the authors emphasized this

point in relation to the formation of multinational corporations. Denisia (2010) identified two major determinants that are essential in clarifying this theory - elimination of competition; and advantages that some companies have in a specific activity. Internationalization theory explains that MNCs organize their internal activities in order to create specific advantages that can then be exploited through these determinants. Hymer (1976) developed the concept of 'firm-specific advantages' and demonstrates that FDI occurs only when the benefits of exploiting firm-specific advantages outweigh the relative costs of operations abroad, thus, the MNE emerges due to market imperfections that result in a deviation from perfect competition in the final product market. Hymer (1976) addressed the issue of foreign firms' higher information costs when compared to domestic firms, as well as the disparity in government treatment and currency risk. Krugman and Obstfeld (2009) described the difficulties in selling or licensing technology - an economically useful knowledge – which can sometimes be embodied in the minds of a group of people and is impossible to put in writing or sell to third parties. Because of the difficulty in marketing and pricing certain know-how, MNCs establish foreign subsidiaries under their supervision.

3.2.1.4 Investment Development Path theory

Narula and Guimon (2010) claim that the investment development path model is based on two fundamental assumptions. First, there is a structured relationship between the host nations' economic structure and the type of suitable FDI activities as well as a structured relationship between the host nation's economic framework and the type of FDI activities. Second, there is an interactive relationship between multinational and local company ownership advantages and country locational advantages (Mohapatra & Gopalaswamy, 2016).

This theory divides the interactive relationship between countries into five stages of development. The first stage is primarily concerned with developing nations. At this stage, the amount of inward and outward investments is constrained because investors prefer to gain access to these nations through trade, and most foreign companies that expand into these countries are resource-seeking companies, particularly, when there is inadequate location-based advantage. At this point, the government should be helping to establish macroeconomic policies, improve necessary infrastructure, focus on human capital development, and remove some

strict market limits. As a result of countries' improved locational advantages, the pattern of FDI inflows has changed (Narula & Guimon, 2010).

3.2.2 Theories of growth

There are various economic growth theories; a few of these theories are outlined below.

3.2.2.1 Keynesian and post-Keynesian (neo-Keynesian) growth theories

John Maynard Keynes (1883-1946), Roy Harrod (1900-1978), Nicholas Kaldor (1908-1986), Evsey Domar (1914-1997), and others investigated both Keynesian and Post-Keynesian theories of growth. John Maynard Keynes created a theory known as "The General Theory of Employment, Interest, and Money," which served as the foundation for several growth theories. There are two main assumptions in all Keynesian models. The first is that increasing aggregate demand will boost economic growth. The second is that investment is a driver of economic growth, with higher investment resulting in higher income, hence, greater economic growth. Other manufacturing aspects, on the other hand, are not considered in the theory (Sharipov, 2015).

Keynes (1936) proposed a hypothesis claiming that the existence of effective aggregate demand can promote economic growth, thus, in times of recession, unemployment rises and people's income falls. As a result, consumption, savings, and investment will suffer, overall aggregate demand will fall, and economic activity will fall as well. Harrod (1939) contributed to the idea by stating that economic growth is based on income, investment, and savings, as well as on examination of entrepreneur expectations. In other words, the economy has the capacity to grow faster if the actual growth rate (rate of growth in labour and capital productivity) matches the predicted one.

3.2.2.2 Endogenous Growth model

Romer (1986, 1990 & 1994) and Lucas (1988) theorised that unlike neoclassical growth models, which presume exogenous technological advancement, new growth models postulate that economic growth is driven by two main issues: human capital and changes in technology. The new endogenous growth models consider long-run growth as a function of technological advancement, therefore, they provide a structure in which FDI can perpetually and significantly raise the rate of economic growth in the host nation through technology transfer, diffusion, and spill over effects (Nair-Reichert

& Weinhold, 2001). Herzer and Klasen (2008) contend that FDIs contribute significantly to the host country's economic growth by doubling the levels of investable capital and through technological spill over.

Sala-i-Martin and Barro (1995) argued that Multinational Corporations (MNCs) are anticipated to deliver research and innovation (R&D) as well as human capital accumulation, resulting in positive or negative externalities (growth spillovers) that directly impact the host nation's companies and economy. These growth factors, or FDI spillovers, are believed to result from expenditures on tangible capital, human capital, or R&D development. The two growth theories, as well as the FDI-economic growth depiction above, show that FDI can contribute to economic growth, both directly and indirectly (Mahembe & Odhiambo, 2014). According to the exogenous-growth theory, FDI can stimulate the host nation's economy through capital accumulation, the emergence of new goods and foreign technology, and also by increasing the host nation's stock of knowledge through skill transfer, (Elboiashi, 2011).

3.2.2.3 Integrative theory

The integrative theory underlines that the rate at which countries attract FDI is determined by the availability and suitability of concerned institutions (Matjekana, 2002). According to this idea, FDI is dispersed unevenly among countries due to the types and availability of institutions that promote FDI absorption. Integrative view emphasizes that institutional variables that are easily changed determine the level of FDIs. These variables are connected to four different institutions: governments, markets, education, and sociocultural context. Economic openness, meaning, minimum trade and exchange rate limitations, strong rule of law, and low corruption, are measures of a government's suitability. High trade volumes, low taxation, high urbanization, and readily available credit and energy are all indicators of market fitness. ‘Educational fitness’ is a term that refers to the degree of abilities and competitiveness that are closely linked to education and productivity. The more fit a country is, the more probable FDI will increase. Socio-cultural fitness refers to contributions made by people from other cultures, such as local attitudes and behaviours. Higher socio-cultural fitness leads to greater flexibility and an atmosphere that is more FDI-friendly. Ziyane (2008) detailed that all of these variables help

institutions to be more effective in supporting countries to attract and retain FDI, as well as absorb the investments, resulting in increased economic growth.

3.2.2.4 Neo-classical growth model

Solow (1956 and 1957) pioneered the exogenous-growth theory, also known as the "neo-classical growth model" or the "Solow-Swan growth model". According to the theory, economic growth is generated by the accumulation of exogenous factors of production, such as capital and labour stock (Mahembe & Odhiambo, 2014). Hicks (1932) described the Cobb-Douglas production function, also known as the "aggregate production function", is modelled against capital input (both domestic and international), labour input, and the level of technological progress, which varies over time. It has been demonstrated that, using this framework, capital accumulation directly contributes to economic growth in a ratio to capital's share of national output. Economic growth is dependent on labour force expansion and technological advancement. De Jager (2004) enlightened that if FDI brings new technology, which results in increased labour and capital efficiency, these will lead to more reliable returns on investment, and labour will expand exogenously.

According to this theory, FDI increases the host nation's capital stock, which has an impact on economic growth. The exogenous or neoclassical growth model has demonstrated that FDI can have a direct impact on economic growth through capital accumulation and the incorporation of new inputs and foreign technologies into the host nation's production activities. Based on the neoclassical growth model, FDI, thus, enhances economic growth by increasing the quantity and/or the effectiveness of investment in the host nation (Mahembe & Odhiambo, 2014). This study will adopt the neo-classical growth model to examine the impact of foreign direct investment on economic growth in South Africa.

3.3 Empirical literature review

In this section, the researcher will explore previous studies done on the impact of foreign direct investment on economic growth with concentration on international viewpoints followed by local circumstances. Various empirical contributions have uncovered the impacts of foreign direct investment on economic growth, however, the evidence demonstrates varied findings on the impacts of foreign direct investment on economic growth. Several relevant findings are clarified below.

3.3.1 International evidence

Sylwester (2005) conducted a study on foreign direct investment, growth, and income inequality in 29 less-developed countries, from 1970 to 1990, using Ordinary Least Square method (OLS). The results showed that FDI has a positive relationship with economic growth and that the implementation of three OLS provides more evidence of a relationship between FDI and economic growth. These results demonstrate that FDI stimulates economic growth, however, in terms of income inequality distribution, there was no significant relationship found between FDI and changes in income inequality. Which is supported by Sokang (2018) who investigated the impact of foreign direct investment using the Two – stage Least Squares Method of simultaneous equations and data for the period, 2006 – 2016, his results revealed that foreign direct investment had a positive impact on economic growth. While Lerato and Lorainne (2019) observed a negative relationship between economic growth and FDI contrary to the other studies.

In their study, Mohammad and Mahmoud (2013) reviewed many studies on the relationship between foreign direct investment and economic growth, from 1994 to 2012, focusing on the effects. In some cases, they discovered a significant positive relationship between foreign direct investment and economic growth, while in others, they discovered a negative or no relationship, this supports claims made by Mazenda (2014) that foreign direct investment has a mixed effect on economic growth.

Kunle, Olowe and Oluwafolakemi (2014) investigated the impact of foreign direct investment on Nigeria economic growth over the period of 1999 to 2013. The results showed that economic growth is strongly associated with inflows of foreign direct investment, which are statistically significant at the 5% level; this implied that high economic performance is a favourable signal for inflows of foreign direct investment and that FDI is a driving force behind economic development. The study advocated that the Nigerian government liberalize the foreign sector, lowering all trade barriers such as arbitrary tariffs, import and export fees, and other levies to promote investors. A study by Noori (2019) on the impact of foreign direct investment on economic growth in Jordan for the period, 2000 to 2017, using the standard analytical approach. Confirms the results since the study discovered that foreign investment had a favourable effect on economic growth.

Istaiteyeh and Ismail (2015) examined the relationship between foreign direct investment, economic growth, and exports in Jordan using the co-integration test and the vector error correction model. The research was carried out using quarterly data from 2003 to 2013. Their findings supported the existence of a long-term relationship between the variables studied. The findings also revealed that export had a positive effect on GDP, but that foreign direct investment had no effect on GDP. In addition, the study revealed that foreign direct investment had a negative impact on economic growth. Which is partially sustained by Uwubanmwen and Ogiemudia (2016) who used the Error Correction Model and the Granger causality test to investigate the nature of the relationship between foreign direct investment and economic growth in Nigeria. Their research was based on annual secondary time series data spanning the years 1979 to 2013. Their empirical analysis revealed that in the short run, foreign direct investment had both an immediate and a time lag effect on the Nigerian economy. They also discovered that foreign direct investment had a negative but insignificant long-run effect on the Nigerian economy.

Akonnor (2018) examined the economic impact of foreign direct investment in East and Central Africa in a study that analysed data that spanned the years 2000 to 2015. The study revealed that FDI has a positive significant impact on economic growth in East Africa, but none in Central Africa. In both locations, the population growth rate was found to have a positive and statistically significant effect on economic growth, although, inflation had a negative and statistically significant influence on economic growth in both regions. Whereas Gul and Naseem (cited in de Abreu, 2016) claim that foreign direct investment has a negative impact on economic growth supported by Lerato and Lorainne (2019) who observed a negative relationship between economic growth and FDI.

Oumarou and Maiga (2019) investigated whether there was a causal relationship between trade, foreign direct investment and economic growth in Niger using annual data for the period 1980 to 2017. From the empirical analysis, all variables used in this study had a unit root, indicating that the variables were integrated of order one. The Johansen co-integration test analysis was used on this basis to arrive at a long-run equilibrium relationship between these variables. Ceteris paribus, the coefficients were found to be significant at the 5% level on average. Finally, we can conclude from the Granger causality test that there is a bilateral relationship between trade and

economic growth, as well as a unidirectional causal relationship between trade and foreign direct investment, with a direction from trade to foreign direct investment. Contrary Saqib, Masnoon, and Rafique (2013) study which suggested that the negative impact of FDI on economic growth.

Ciobanu (2021) explored the impact of FDI on economic growth in case of Romania for the period 1991 to 2018. The ARDL bound testing method was applied to study the existence of a long-run relationship between FDI, trade, labour, and economic growth. The direction of causation between the variables was next examined using the Granger causality test, which is based on error correction. The results demonstrated that when real GDP and foreign direct investment were the dependent variables, there was cointegration among the variables. The three main factors that affected Romania's economic growth over the long term were, foreign direct investment, trade openness, and labour force. Additionally, rising GDP, exports, imports, and labour force overall encouraged foreign direct investment over time. Ayenew (2022) provisions the claims that cointegration exists between economic growth and foreign direct investment.

Siddique, Ansar, Naeem, and Yaqoob (2017) investigated the nexus between foreign direct investment and economic growth for Pakistan for 1980 to 2016, utilising the Granger causality test and autoregressive distributed lag bounds co-integration. The findings of the ARDL bounds test demonstrated that FDI, trade, physical capital, and human capital were all co-integrated with economic growth. The findings showed a one-way causal relationship between economic growth and FDI, physical capital, and trade. The results also demonstrated the one-way causal relationship between labour force, physical capital, and human capital. Physical capital and FDI as well as physical capital and human capital were found to have a bidirectional causal relationship. Which is contrary to Bilas (2019) who reveal that there is no causal relationship between real GDP growth rate and any of the foreign direct investment series.

3.3.2 Local evidence

Fedderke and Room (2006) studied the growth impact and determinants of foreign direct investment into South Africa from 1956 to 2003 using the VECM methodology. The findings of the study showed that foreign direct investment had a positive impact on South Africa's growth. In addition, in the long run, foreign and domestic capital

complement each other, implying a positive technological spillover from foreign to domestic capital. While foreign direct investment does crowd out domestic investment, the impact was limited to the short run, thus, the estimation indicated that foreign direct investment had a positive long-run spillovers effect on capital, labor, and output in South Africa. The study discovered that foreign direct investment in South Africa has tended to be capital-intensive, implying that it has been horizontal rather than vertical. In a similar study, Jugurnath et al. (2016) look at the effect of FDI on economic growth in SSA for a panel of 32 countries from 2008 to 2014. Their GMM findings indicate that foreign direct investment significantly and favourably impacts economic growth. Nketiah-amponsah and Sarpong (2019) used the system GMM to analyse the effects of infrastructure and FDI on SSA's economic growth. Their findings demonstrate that foreign direct investment interacts with the infrastructure of the host country to have a positive impact on economic growth.

Dlamini and Fraser (2010) investigated the causal link between the inflow of FDI and exports as well as FDI inflows and the gross domestic product of the agriculture sector of South Africa over the period, 1994 to 2006. The unit roots test for stationarity was used in the study, which showed that the included variables were nonstationary at their levels but achieve stationarity after their first difference. The Engle-Granger cointegration test indicated that the variables were cointegrated, meaning that they had a long-run stable relationship. Due to the long-term relationship between the variables, the ECM must be used to determine the causal direction of the variables. The Granger causality test and ECM estimation results showed that FDI plays an crucial role in supplementing agricultural exports in South Africa, implying that the greater the FDI, the greater the number of agricultural exports, thus, economic growth. This indicates that agricultural exports have a massive effect on FDI locational choices in the South African agricultural sector, implying that increased agricultural exports could result in increased FDI inflows and vice versa.

The findings also showed that agricultural productivity in South Africa ‘Granger causes' FDI, implying that agribusiness multinationals choose to locate in South Africa due to the perceived rate of economic activity in the agricultural sector. Furthermore, such causality is unidirectional: it flows from GDP to FDI but not the other way around. This demonstrates that the agricultural sector's GDP had an impact on the locational inflows of FDI into South Africa's agricultural sector, thus, a growth in agricultural GDP is

expected to lead to a rise in FDI in South Africa's agricultural sector. Similar research was done by Nguyen (2020) on a particular country in Vietnam between 1997 and 2018, and the results demonstrate that foreign direct investment has a positive and considerable impact on economic growth.

Gray (2011) examined the internal determinants of foreign direct investment in South Africa. This study utilized a two-model approach to uncover the determinants of Foreign Direct Investment (FDI) into South Africa for the period 1961 to 2009. The findings showed that both ALSI volatility (which serves as a proxy for macroeconomic (in)stability) and exchange rate volatility are negative and statistically significant; this showed that investors dislike instability since it raises uncertainty and risk. What is notable about this result is that the estimates in the panel data model were more significant than in the time series model, implying that these factors had become increasingly essential in recent decades. Education, infrastructure, and labor productivity are among the other variables with statistically significant coefficient estimates, suggesting their importance. Finally, the model demonstrated that, merely by their nature, the mining and quarrying, manufacturing, banking, insurance, real estate and business services' sectors, attract the most FDI. A study which sustains the emphasizes by Makiela and Ouattara (2018) was based on a sample of industrialised and developing nations from 1970 to 2007. Their findings demonstrate that foreign direct investment helps the host countries' economies grow.

Mazenda (2014) probed the effect of foreign direct investment on economic growth evidence from South Africa. The period of study utilized was from 1980 to 2010. According to the findings, foreign direct investment did not have a consistent impact on economic growth; this was after considering the long-term outcomes. In the short run, foreign direct investment boosted economic growth while crowding out domestic investment. The findings imply that the government's policies and incentives may have had little impact on attracting foreign direct investment, which could have a significant impact on economic growth in the long run. This would, however, strongly support the Solow growth model, which contends that FDI allows host countries to achieve investments that exceed their own domestic savings and increases capital formation. According to this theory, FDI's potential positive impact on output growth is limited to the short-run. A comparable study done by Dinh et al. (2019) on developing countries from 2000 to 2014 by applying VECM and FMOLS. Their short-run result shows

foreign direct investment hurts economic growth, but it has a positive effect in the long run.

Tshepo (2014) conducted a study on the impact of foreign direct investment on economic growth and employment in South Africa for a period of 24 years - 1990 to 2013. The unit root, cointegration, and granger causality tests were used in the study. Several diagnostic tests were also used to assess the reliability of the results. According to the study's findings, there was evidence of a long-run relationship between foreign direct investment, economic growth as measured by GDP growth, and employment in South Africa for the period under consideration. The Granger-causality test also revealed that FDI was granger-caused by GDP growth and employment. This demonstrated that South Africa's ability to advance in terms of economic growth will be determined by the country's performance in attracting foreign direct investment. These results supported the hypothesis that FDI had a positive impact on GDP growth and employment in South Africa. Endorsed by Mohd and Muse (2021) used the VAR model to conduct a study in Ethiopia from 1981 to 2017. They concluded that both in the short and long terms, foreign direct investment has a favourable and significant impact on economic growth.

Strauss (2015) critically assessed existing theory on the nexus between FDI, absorptive capacity and economic growth using a time series analysis, from 1994 to 2013. The empirical outcomes were ambiguous, as there were no long-term effects between the variables, and FDI only had a short-term impact on economic growth. In contradiction of theory, the results suggested that a relatively high level of absorptive capacity of individual components was insufficient to achieve overall economic gains and progress. This was attributable, first and foremost, to substantial population group inequality as a result of past-dependent institutions and labor markets, which continue to exhibit apartheid characteristics. Second, the capital-intensive mining industry absorbed the majority of FDI inflows. Instead of promoting inclusive economic development, this supported extractive exports. Weak ties between other, more labour-intensive industries stifle job creation and human capital investment. While Khobai, Hamman, Mkhombo, Mhaka, Mavikela, and Phiri (2018) investigate the FDI-growth nexus in South Africa by covering a period 1970–2016 by employing quantile regressions. The findings reveal that foreign direct investment has a negative and

substantial effect at the lower extreme quantiles but has no significant influence at the higher quantiles.

Tshepo (2018) used data from 1980 to 2014, to examine the relationship between foreign direct investment (FDI) inflows and economic growth in South Africa. The vector error correction model was used in the study to determine and estimate the long-run relationship between the variables in the model. According to the study economic growth had a positive long-run relationship with both foreign direct investment and the real effective exchange rate, but a negative long-run relationship with government spending. Conflicting Falki (2009) who found a negative and insignificant relationship between growth and FDI in Pakistan.

Makhoba and Zungu (2021) probed the impact of foreign direct investment (FDI) on economic growth in the South African economy. The analysis used annual time series data from the South African Reserve Bank between the years 1960 to 2019. Impulse response functions and a VAR methodology was used to examine the dynamic interactions between foreign direct investment and South Africa's economic growth. The study found a positive association between foreign investment and an increase of economic activity conducive to economic growth. The economy of South Africa has expanded significantly in response to a positive FDI shock. Similar to this, an increase in GDP encouraged FDI inflows into South Africa. Similarly, the effect of infrastructure and foreign direct investment on economic growth in SSA was studied by Nketiah-amponsah and Sarpong (2019), According to their research, foreign direct investment interacts with the infrastructure of the host country to have a positive impact on economic growth.

Teunen, Nubong and Teunen (2022) made an empirical analysis of the growth impact of foreign direct investment in the South African economy. The study used a Cobb-Douglas function which was created using data from 1970 to 2019, with capital divided into a foreign and a domestic component. Autoregressive Distributed Lag model was employed, and the results showed that labor productivity was statistically significant in its negative relationship with FDI, however, when the lagged data were examined, FDI findings were statistically significant, proving that foreign capital may take some time to fully materialise. The Toda-Yamamoto causality test showed that FDI and economic growth are causally related in only one direction. Similarly,

Oumarou and Maiga (2019) discovered a bilateral relationship between trade and economic growth, as well as a unidirectional causal relationship between trade and foreign direct investment, with a direction from trade to foreign direct investment.

3.4 Assessment of literature reviewed

The literature reviewed revealed that foreign direct investment and economic growth have a relationship but the results of the previous studies in the literature shows that there is a positive and, in some cases, a negative relationship between foreign direct investment and economic growth, hence, the relationship is inconclusive. In the case of less-developed countries, particularly African countries, we get mixed results, similar to those from the Asian countries. Sylwester (2005) revealed that the implementation of the OLS provides more evidence of a relationship between FDI and economic growth, in case of less-developed countries. In the case of Africa, a conclusion can be made that the relationship between foreign direct investment and economic growth is affected by the stability and barriers of the host country, especially, in the long run. Kunle, Olowe and Oluwafolakemi (2014) recommended that government liberalize the foreign sector, lowering all trade barriers, such as arbitrary tariffs, import and export fees, and other levies to promote investors. In South Africa Rusike (2007) stated that increased openness and financial development will attract FDI.

With regards to the methodological aspect of the reviewed literature, the most used models to determine the relationship between foreign direct investment and economic growth were the ARDL, ECM, VECM and Granger causality test. All these models have been giving unconclusive results which encourage more studies to be conducted on this topic, hence, this study used the ARDL model to explore the relationship bet The current study seeks to provide clear insights and a conclusive finding on the impact of foreign direct investment on economic growth in South Africa as the previous studies have not provided consistent evidence on the topic at hand between FDI and economic growth.

3.5 Summary

This chapter explored the following theories of foreign direct investment - Production Cycle Theory of Vernon, Capital Market Theory, Investment Development Path Theory, Neo-classical Growth Model, Endogenous Growth Model, and Integrative

theory. Lastly, there were discussions of previous studies that had been done on the impact of foreign direct investment on economic growth, both from an international and local perspectives; these different studies produced various empirical findings.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Introduction

In this chapter is explained the research methodology to be pursued in conducting the current study. An explanation of the research design is deliberated upon in this chapter as well as, sampling techniques, data analysis procedure to be utilized, sources of data, estimation techniques, diagnostic tests, ethical considerations, and a summary is provided at the end.

4.2 Research design

A research design is the arranging of settings for data collection and analysis in such a way that it strives to combine relevance to the study's purpose with economy and procedure (Akhtar, 2016). Research design, therefore, refers to the plan, structure, method, and inquiry combined together to ensure that the search questions are answered, and variances controlled (Ahuja, 2010). They are several types of research design such as quantitative research design is the procedure of gathering and performing a numerical analysis. It can be used to identify trends and averages, formulate hypotheses, examine causality, and extrapolate findings to larger populations (Bhandari, 2022). Qualitative research design involves gathering and examining non-numerical data to understand concepts, views, or experiences (such as text, video, or audio). It might be employed to discover intricate details about an issue or come up with fresh study concepts (Bhandari, 2023). Experimental design goal is to prove the relationship between variables and their causes. Explanatory research design is a type of methodology that has this objective. The design of experimental research is centred on the data collection methods, much like survey research is. A researcher must be familiar with many types of variables, experiments, and groupings of an experiment in order to accomplish the goal of establishing cause and effect (Montgomery, 2017). According to Wilson and Joye (2016), correlational design is a type of research where the researcher examines the strength of the association (positive or negative) between two or more variables. Although qualitative research can sometimes be used for descriptive reasons, descriptive research is typically classified as a type of quantitative research. In order to produce valid and trustworthy results, the study design must be properly developed (McCombes, 2022).

This study will adopt quantitative research design for examining the impact of foreign direct investment on economic growth in South Africa. This study formulated a problem for more precise examination or to develop a hypothesis. When there are little or no previous research/studies to which references can be made for information, quantitative research design can be used. The aim of this study was to provide insights and knowledge in the subject area in order to do a more thorough inquiry.

4.3 Sample size

The period chosen for econometric analysis for this study was 1985 - 2019, a period of thirty-four years. A total of 170 observations per series were utilized in this study and the sample size was 170 observations. This period was chosen specifically because this is the period for which data was available for the selected variables. The period comprises of two different regimes in South African economy; prior to 1994 (9 years prior to the democratic regime), South Africa was restricted and not permitted to trade with other nations because of its apartheid regime, however, when the democratic administration took charge, South Africa started participating in international economies. The data gathered for the study consist of details on inflation, saving rate, economic growth, real interest rate and foreign direct investment. This data is available to the public and can be accessed from Organisation for Economic Co-operation and Development (OECD).

4.4 Data collection procedures

This study employed quantitative data collection method to link to item 4.3 above. The data for this study was downloaded from Organisation for Economic Co-operation and Development website, consequently, this study used secondary time series data; Secondary time series data is collected sequentially in time (Reinert, 2010). This study covered the period from 1985 to 2019, which is sufficient to describe a long run relationship between variables. All the data was annual.

4.5 Data analysis

The gathered data will be entered into EXCEL, a computer programme or spreadsheet, before being exported into a software to be used. The study used regression analysis to discover the impact of foreign direct investment on economic growth. Regression analysis assist in understanding the relationship between independent variables and dependent variable, more precisely it focuses on how

dependent variable changes in relation to changes in independent variables. The study used annual economic growth data (dependent variable) and this was regressed against foreign direct investment, real interest rate, inflation rate and saving rate. Economic growth as the dependent variable was regressed against foreign direct investment, real interest rate, inflation and saving rate; all variables used in this study were measured in real terms. For this study, E views software was utilized to assess the validity of the econometric procedures which were carried out in this study.

4.6 Model specification and definitions of variables

This study embraced a neo-classical growth theoretical framework. In accordance with the Neoclassical Growth Model, an economy's capital accumulation and human capital utilisation are key factors influencing economic growth. It further asserts that an economy's overall output is determined by the interaction between capital and labour. The theory contends that technology boosts labour's productivity, that is, raising overall output through improved labour productivity. As a result, the neoclassical growth model's production function can be used to gauge an economy's equilibrium and rate of economic growth (CFI, 2022). The neoclassical growth model's general production function has the following structure:

$$Y = AF\ (K, L) \quad \text{..... EQ (1)}$$

where:

Y = Gross Domestic Product

K = Capital

L = Labour

A = Determinant level of technology

Additionally, the production function of an economy is frequently restated as $Y = F\ (K, AF)$ due to the dynamic interaction between labour and technology (K, AL). According to this, technology augments labour and affects workers' productivity in varying degrees (CFI, 2022).

The study adopt the model by Bouchoucha and Ali (2019) which was utilised to examine the impact of foreign direct investment on economic growth in Tunisia; the researchers adopted two variables - foreign direct investment and economic growth -

and introduced new three variables - inflation rate, saving rate and interest rate. This is in accordance with Trin & Nguyen (2015), who maintained that neoclassical and endogenous growth models provide the foundation for most empirical work on the FDI-growth relationship.

The Model could be specified as:

$GDP = f(FDI, RIR, EXR, INF, SR)$.....EQ (2)

where:

GDP = Gross domestic product (economic growth)

FDI = Foreign direct investment

RIR = Real interest rate

INF= Inflation rate

SR= Saving rate

are all variables in this model and are measured in real terms.

Empirical model could be specified as:

$GDP_t = \beta_0 + \beta_1 FDI_t + \beta_2 RIR_t + \beta_3 INF_t + \beta_4 SR_t + \varepsilon_t$ .....EQ (3)

where:

GDP = growth domestic product (economic growth) in period t

FDI = Foreign direct investment in period t

RIR = Real interest rate in period t

INF = Inflation rate in period t

SR = Saving Rate in period t

$\beta_0 - \beta_4 =$ are coefficient parameters

$\varepsilon_t =$ error term.

Where GDP is the annual growth rate of GDP, FDI indicates the level of foreign direct

investment relative to GDP, Inflation rate (CPI) measured in terms of the annual growth rate, real interest rate as measured by GDP deflator, saving rate as per percentage of gross domestic product.

4.7 Definition of variables

This section provides definition of variables, of which two are the main variables, namely, FDI and economic growth. The other three are the controlled variables, namely, real interest rate, inflation rate and saving rate.

Foreign direct investment (FDI) is defined as a financial investment made to buy or expand a business in a country other than the investor's own. It is a significant source of capital for the host nation's - investment, job creation, economic growth, and poverty reduction (Ocaya, Ruranga & Kaberuka, 2013). Foreign Direct Investment, or FDI, happens when an investor, usually a company rather than a person, obtains control over the operation of a business in another country (Ngwenya, 2018), therefore, FDI flows are the value of cross-border transactions related to direct investment over a set period, usually a quarter or a year. These flows are calculated in US dollars and as a percentage of GDP and they connect economies in a stable and for long-term, (OECD, 2021).

Economic growth is defined as an annual rise in the value of material production, represented as a percentage of GDP or national income. Growth is possible since it does not alter the economy's developmental trajectory (Ivić, 2015). Economic growth is achieved through the optimal utilization of available resources and the expansion of a country's production capability; it makes income transfer between the population and society, easier (Haller, 2012).

Inflation is defined as a change in the prices of a basket of goods and services that are typically purchased by certain groups of households, as measured by the consumer price index (CPI). In other words, a consumer price index is calculated as a collection of summary measurements of the proportional change in the prices of a fixed set of consumer products and services of constant quantity and characteristics purchased, utilized, or paid for by the reference population from one period to the next (OECD, 2021).

The **real interest rate** is the loan rate that has been adjusted for inflation using the GDP deflator, however, the terms and conditions related to lending rates vary

according to each country, making comparisons difficult (World Bank, 2021). An interest rate is the fee incurred by a borrower to have access to and use assets at the time of display rather than later (Casu, Girardone and Molyneux, 2006).

Savings rate are calculated as the difference between final consumer expenditure and disposable income (adjusted for changes in employment-related pension entitlements). The saving rate represents savings as a percentage of GDP after depreciation (GDP) (OECD, 2022). Savings are a major contributor to economic growth and are essential for accomplishing investment goals and growth plans. Domestic savings-based growth rates are more resilient than growth rates acquired with borrowed money (Soylu, 2019).

4.8 Prior expectations

Foreign Direct Investment (FDI) will positively affect economic growth in South Africa. According to Hlongwane (2012), inward FDI has a positive influence on a host country's economic growth because of higher capital accumulation, access to superior technology, increased efficiency, increased competitiveness, and export. This means that foreign direct investment can boost the economy and increase economic growth. Tshepo (2014) confirmed that there is a positive relationship between FDI and economic growth - $(\beta_1 > 0)$. Theoretically, foreign direct investment is expected to have a positive impact on economic growth. It means that if FDI increases, economic growth will increase, and if it declines the opposite effect will occur. According to the neoclassical growth model, FDI enhances economic growth by increasing the quantity and/or the effectiveness of investment in the host nation (Mahembe & Odhiambo, 2014).

Inflation will negatively affect economic growth in South Africa; Ekinci, Tüzün and Ceylan (2020) discovered that there is a negative relationship between inflation and economic growth. This implies that an increase in inflation will lead to a decline in economic growth whilst a decline in inflation will cause a rise in economic growth. This is confirmed by Sodipe and Ogunrinola (2011), hence, $(\beta_2 < 0)$.

Real interest rate will be negatively related to economic growth. This implies that an increase in real interest rate will lead to a decrease in economic growth. Njie and Badjie (2021) confirmed a negative relationship between interest rate and economic growth, hence, $(\beta_4 < 0)$.

Savings rate will be positively related to economic growth. This implies that an increase in savings rate will lead to a rise in economic growth. This was confirmed by (Soylu, 2019) in a study which demonstrated that savings also contribute to economic growth and in order to achieve sustainable growth, the saving rate must also rise. Savings and other related policies can be used to generate sustainable growth, hence, $(\beta_5 > 0)$.

4.9 Sources of data

This study focuses on the impacts of foreign direct investment on economic growth in South Africa from 1985 to 2019. The data covered a varied selection of macroeconomic variables - economic growth, real interest rate, foreign direct investment, and saving rate. The study used annual time series secondary data for the period and all data was obtained from Organisation for Economic Co-operation and Development (OECD). This choice of data sources is based on the confidence that the Organisation provides accurate, relevant, and reliable data.

4.10 Estimation techniques

This section offers in detail the data analysis method used in the study.

4.10.1 Graphical analysis

Stationarity and unit root tests can be used to determine whether a time series is stationary; these tests can be formal or informal. Informal tests search for indications of trend in the mean, variance, autocorrelation, and seasonality when plotting time series data (Brooks, 2008). This method entails a subjective visual study of data in the form of graphs. The disadvantage of informal testing is that they do not provide information on the nature of the time series, therefore, a, proper unit root tests will be required as well.

4.10.2 Johansen co-integration approach

Co-integration is used to show if independent and dependent variables have a stationary linear combination, implying a long-term relationship. In the literature on financial time series, the Johansen Co-integration Approach is the most often used method for determining cointegration although, there are a few procedures that must be completed before this strategy can be used; the first of which is to test the order of integration of the variables under consideration. The ideal scenario is for variables to be integrated in the same sequence, however, this does not always happen. “There is

a potential that the two I(2) variables co-integrate down to an I(1) relationship, and then this connection may further co-integrate with one of the two I(1) variables to generate another cointegrating vector," for example, in a model with two I(1) and two I(2) variables (Asteriou & Hall, 2007). Measurement becomes difficult when variables are incorporated in diverse orders; to overcome this, it is necessary to establish the sequence of integration of the model by using the ADF and PP tests.

The next step would be to decide on an appropriate lag length after testing the integration order. A Vector Autoregressive (VAR) model with a large number of lags containing variables in level form can be estimated first, followed by re-estimations with less lags (Asteriou & Hall, 2007). The Akaike Information Criterion (AIC) and the Schwarz Bayesian Information Criterion (BIC) should be checked in each re-estimated model, and the model with the lowest AIC and BIC should be picked as this would be the one with the least number of lags possible (Asteriou & Hall, 2007).

A multivariate model can be expressed as an unrestricted VAR model with k number of lags using the Johansen approach, as follows:

$$Y_t = A_1 Z_{t-1} + A_2 Z_{t-2} + \cdots + A_k Z_{t-k} + u_t \quad \text{..... EQ (4)}$$

where,

Z_t = $(n\ x\ 1)$ vector of endogenous variables,

A = $(n\ x\ n)$ matrix of co-efficient,

u_t = $(n\ x\ 1)$ vector of white noise error terms (Asteriou & Hall, 2007).

In Johansen's methodology, the third stage is to select an acceptable model for determining components in a multivariate system and because economic time series are non-stationary, equation 4 must be converted into a Vector Error Correction Model (VECM), such as:

$$\Delta Z_t = \Gamma_1 \Delta Z_{t-1} + \cdots + \Gamma_{k-1} \Delta Z_{t-k-1} + a\left(\beta Z_{t-1 \mu_1 1 \delta_1 t}\right) + \mu_2 + \delta_2 t + u_t \quad \text{.....EQ (5)}$$

where Γ information on the short run dynamics is stored, and information on the long run dynamics is stored. In more detail:

$\Pi = \alpha\beta$ .....EQ (6)

where β is a matrix of cointegrating vectors that ensure the convergence of their long run steady state solutions and α reflects the speed of adjustment to disequilibrium (Asteriou & Hall, 2007). There are three alternative models for equation 8. In the long run model (the co-integrating equation (CE)), there may be a constant (with co-efficientμ_1) and/or a trend (with coefficient δ_1), while in the short run model (VAR model), there may be a constant (with co-efficient μ_2) and/or a trend (with coefficient δ_2) (Asteriou & Hall, 2007). All three models should be calculated and compared to trace statistics in order to identify which case is the most appropriate.

The matrix coefficients are compared to their eigenvalues to determine the presence of co-integration. The rank of matrix coefficients is determined in the fourth step of the Johansen approach. There are two techniques available, which can be described as follows:

$\lambda_{trace} = -T \sum_{i=r+1}^{g} ln(1 - \lambda_i)$ .....EQ (7)

and

$\lambda_{max}(r, r+1) = -T(\ln(1 - \lambda_{r+1})$ ..... EQ (8)

where,

r = number of co-integrating vectors,

λ_i = estimated value for íth ordered eigenvalue (Brooks,2008).

The maximum eigenvalue test tries the hypothesis that there are $r + 1$ co-integrating vectors against the hypothesis that there are r co-integrating vectors, whereas the trace test tests the hypothesis that there are, at most, r co-integrating vectors. As a result, the Johansen technique has the added benefit of being able to identify many co-integrating vectors, overcoming one of the major drawbacks of the Engle Granger method for estimating co-integrating relationships (Brooks, 2008).

Brooks (2008) contends that we - “Reject the null hypothesis that there are r co-integrating vectors in favour of the alternative that there are $r + 1$ (for λ_{trace}) for or more than r (for λ_{max})”. All of the co-integrating vectors in the model can be identified

this way. Following the estimation of these cointegrating vectors, the total number of cointegrating vectors can be specified to estimate a VECM model.

Testing for weak exogeneity is the fifth step in the Johansen technique; if a variable is found to be weakly exogenous, it can be deleted as an endogenous component of the multivariate system (Asteriou & Hall, 2007). Testing for linear limitations in the co-integrating vectors is the final stage in Johansen's technique. Estimates are produced using Johansen measurements α and β which are then evaluated for any constraints (Asteriou & Hall, 2007).

4.10.3 ARDL bounds testing for cointegration

The advantages of the ARDL method over other cointegration methods, such as the residual-based strategy (Engle & Granger, 1987) and the maximum likelihood test (Johansen, 1988, 1991; Johansen & Juselius, 1990), which have both been thoroughly examined in this study, are the reasons it is used (Nyasha & Odhiambo, 2015; Ozturk & Acaravci, 2010; 2011; Tang & Shahbaz, 2011; Vlahinic & Jakovac, 2014). The ARDL approach, for instance, can be used to investigate cointegration connections regardless of the series' integration order, I(0), I(1), or a combination of both. The ARDL approach is superior for confirming that a cointegrating connection exists in small samples, in contrast to residual-based techniques like the Johansen cointegration technique, which need a big sample size for validity.

The ARDL method also enables the variables to have various optimal lags, in contrast to other standard cointegration techniques. Also, while other traditional cointegration techniques use system equations to estimate long-term relationships, the ARDL technique employs a single threshold regression equation to estimate both the long-run and short-run parameters for the model. The alternative hypothesis that cointegration occurs, is tested against the null hypothesis that cointegration does not exist using the ARDL limits' test. Comparisons are made between the estimated F-statistic and the crucial values given by Pesaran et al., (2001) and Narayan (2005). The use of Narayan's (2005) critical values is required because the critical values of Pesaran et al., (2001) are inapplicable for small samples.

We reject the null hypothesis that there is no cointegration between the series when the estimated F-statistic exceeds the upper bound (I(1)). We accept the null hypothesis that there is no cointegration between the series if the F-statistic is less than the lower

bound (I(0)). Furthermore, our inference would be unconvincing if the F-statistic falls between I(0) and I(1).

4.10.4 The error-correction model (ECM)

The error correction model (ECM), a type of time series regression model, is based on the behavioural supposition that there exists an equilibrium relationship between two or more time series that govern both short- and long-term behaviours (Davidson, 1978). Cointegrated time series are effectively described by an error correction model, as Robert F. Engle and Clive W. J. Granger showed in 1987, since then, cointegrated time series have come to be identified with the ECM. The ECM is a general modification of an autoregressive distributed lag (ADRL) model, which is crucial to keep in mind. The ARDL model can be rebuilt as an ECM specifically so that the ADL parameters are not constrained by the ECM representation, thus, stationary time series and cointegrated time series equilibrium relationships can both be modelled using the ECM (Engle & Granger, 1987).

The error correction version of the ARDL model is given as follows:

$$\Delta 1GDP_t = \propto + \sum_{i=1}^{4} \propto \Delta 1GDP_{t-1} + \sum_{i=1}^{4} \propto \Delta 1FDI_{t-1} + \sum_{i=1}^{4} \propto \Delta 1INF_{t-1} + \sum_{i=1}^{4} \propto \Delta 1RIR_{t-1}$$
$$+ \sum_{i=1}^{4} \propto \Delta 1SR_{t-1} + \delta_1 1GDP_{t-1} + \delta_2 1FDI_{t-1} + \delta_3 1INF_{t-1} + \delta_4 1RIR_{t-1} +$$
$$\delta_5 1SR_{t-1} + e_t \quad \text{.....EQ (9)}$$

$$\Delta 1FDI_t = \propto + \sum_{i=1}^{4} \propto \Delta 1FDI_{t-1} + \sum_{i=1}^{4} \propto \Delta 1GDP_{t-1} \sum_{i=1}^{4} \propto \Delta 1INF_{t-1} + \sum_{i=1}^{4} \propto \Delta 1RIR_{t-1}$$
$$+ \sum_{i=1}^{4} \propto \Delta 1SR_{t-1} + \delta_1 1FDI_{t-1} + \delta_2 1GDP_{t-1} + \delta_3 1INF_{t-1} + \delta_4 1RIR_{t-1} +$$
$$\delta_5 1SR_{t-1} + e_t \quad \text{.....EQ (10)}$$

$$\Delta 1INF_t = \propto + \sum_{i=1}^{4} \propto \Delta 1INF_{t-1} + \sum_{i=1}^{4} \propto \Delta 1FDI_{t-1} + \sum_{i=1}^{4} \propto \Delta 1GDP_{t-1} + \sum_{i=1}^{4} \propto \Delta 1RIR_{t-1}$$
$$+ \sum_{i=1}^{4} \propto \Delta 1SR_{t-1} + \delta_1 1INF_{t-1} + \delta_2 1FDI_{t-1} + \delta_3 1GDP_{t-1} + \delta_4 1RIR_{t-1} +$$
$$\delta_5 1SR_{t-1} + e_t \quad \text{.....EQ (11)}$$

$$\Delta 1RIR_t = \propto + \sum_{i=1}^{4} \propto \Delta 1RIR_{t-1} + \sum_{i=1}^{4} \propto \Delta 1FDI_{t-1} + \sum_{i=1}^{4} \propto \Delta 1INF_{t-1} + \sum_{i=1}^{4} \propto \Delta 1GDP_{t-1}$$
$$+ \sum_{i=1}^{4} \propto \Delta 1SR_{t-1} + \delta_1 1RIR_{t-1} + \delta_2 1FDI_{t-1} + \delta_3 1INF_{t-1} + \delta_4 1GDP_{t-1} +$$

$\delta_5 1SR_{t-1} + e_t$ .....EQ (12)

$$\Delta 1SR_t = \propto + \sum_{i=1}^{4} \propto \Delta SR_{t-1} + \sum_{i=1}^{4} \propto \Delta 1FDI_{t-1} + \sum_{i=1}^{4} \propto \Delta 1INF_{t-1} + \sum_{i=1}^{4} \propto \Delta 1RIR_{t-1}$$

$$+ \sum_{i=1}^{4} \propto \Delta 1GDP_{t-1} + \delta_1 1SR_{t-1} + \delta_2 1FDI_{t-1} + \delta_3 1INF_{t-1} + \delta_4 1RIR_{t-1} +$$

$\delta_5 1GDP_{t-1} + e_t$ .....EQ (13)

4.10.5 Augmented-Dickey Fuller (DF) test

According to Ramanathan (1998), the above-mentioned shortcoming of the DF test stems from the assumption that the error term is uncorrelated; if the error term is correlated, the model should be corrected by including a lagged dependent variable. This is the idea underlying the invention of ADF, as this version of the test adds lagged values of the dependant variable to the DF equations. The ADF test can be demonstrated using the following equation:

$\Delta Y_t = \beta_1 + \beta_{2t} + \delta Y_{t-1} + \sum_{i=1}^{m} a_i \Delta Y_{t-1} + \varepsilon_t$ .....EQ (14)

where,

ε_t = white noise error term,

ΔY_{t-1} = $(Y_{t-1} - Y_{t-2})$

ΔY_{t-2} = $(Y_{t-2} - Y_{t-3})$, etc (Gujarati & Porter, 2009).

For the time series to be considered stationary, the null hypothesis of the presence of a unit root must be rejected, just like the DF test. If the ADF tests found a unit root in the series, it would be essential to compute how many times the series would need to be differenced to make it stationary (Brooks, 2008). The regression can then be conducted in differenced form once the level of differencing has been established, however, because the time series is steady, no differencing is required, if no unit roots are detected.

4.10.6 Phillips-Perron test

Phillips-Perron tests (PP) are equivalent to ADFs, but they change the approach to account for auto-correlated residuals (Gujarati & Porter, 2009). The PP tests are developed based on the hypotheses made in the DF tests - that the presence of a unit

root indicates that the time series is non-stationary. Before running the regression, the level of differencing may need to be specified once more. The ADF and PP tests were both used in this investigation.

4.10.7 Granger causality test

The Granger causality test, initially developed in 1969, is a statistical hypothesis test for detecting if one time series is useful in forecasting another. Granger causality is a statistical concept of causation based on prediction; according to this, if a signal *X1* "Granger-causes" (or "G-causes") or *X2,* past values of *X1* may contain information that helps forecast *X2* beyond the information contained in past values of *X2* alone. While cointegration indicates the presence of a long-term link, causality indicates the direction in which two variables are related (Seth, 2007).

It is possible for the relationship to be unidirectional or bidirectional. When one variable affects the other without the other impacting the former, this is known as a unidirectional relationship. Unidirectional causality occurs when "x" causes "y," but "y" does not cause "x." Bidirectional causality, on the other hand, occurs when both variables have an effect on each other. The presence of Granger causality in at least one direction is implied by cointegration between two-time series, that is, at least one of two Granger-series is responsible for the other. To be cointegrated, the series must be "connected" (particularly, in the sense of Granger-causality) (Seth, 2007).

The Granger causality was utilized to test for causation. If the probability value is less than a certain threshold, the hypothesis is rejected at that threshold. If the p-value is less than 0.05 when testing at the 5% level of significance, we reject the null hypothesis that "y" does not cause "x" or "x" causes "y." If the p-value is less than 0.05, however, we fail to reject the null hypothesis and infer that the variables have no causal association (Seth, 2007).

4.10.8 Impulse response analysis

The study of a dependent variable's response to shocks in error terms is known as “impulse response analysis” (Asteriou & Hall, 2007). As a result, impulse response functions depict the amplitude and persistence of shocks throughout time and because one must allow for interdependent dynamics and (ii) one must identify the correct shock from unobservable data, an identification challenge in impulse response

analysis arises (Hill, Griffiths & Lim, 2012). The Choleski approach was used to apply impulse response analysis to the VECM model, in this work.

4.10.9 Variance decomposition

While impulse response analysis tracks the dependent variable's sensitivity to shocks, variance decomposition analysis reveals the relative importance of each shock to the system (Enders, 1995). The Choleski technique was used, same as the impulse response analysis.

4.11 Diagnostic tests

It is critical to examine each model's behaviour in order to assess the degree to which the predicted findings can be trusted. Serial correlation, heteroscedasticity and normality test are the diagnostic tests that were judged useful for this investigation.

4.11.1 Serial correlation

According to Gujarati and Porter (2010), the LM-ARCH test is a method for detecting autocorrelation using the Ordinary Least Squares (OLS) methodology, which requires that the error terms in a time series be uncorrelated. If autocorrelation exists, OLS and standard regression procedures like the t and F tests will be unreliable.

4.11.2 White heteroscedasticity test

The presence of homoscedasticity, which means that the variance of the error terms is constant, is another assumption of the traditional regression model (Brooks, 2008). Heteroscedasticity is assumed to exist if the variance is not constant. Ordinary regression approaches would be incompatible in this situation. Although it is possible to visually plot the residuals to see if a pattern exists, formal testing would be more accurate than depending on visual observations.

The White test is one of the ways for detecting the existence of homoscedasticity. White's test's null hypothesis is that the error terms are homoscedastic, whereas the alternative hypothesis is that they are heteroscedastic (Brooks, 2008). The White test is a more widely used measure of homoscedasticity, and was employed in this study.

4.11.3 Residual normality test

To determine if the error terms are normally distributed, a normality test is used. The Jarque Bera (JB) test determines if the co-efficient of skewness and excess kurtosis are both zero (Brooks, 2008). The distribution of time series data is deemed normal if

both skewness (S) and kurtosis (K-3) are equal to zero. The following equation can be used to describe this test:

$$JB = \frac{n}{6}[S^2 + \frac{(k-3)^2}{4}] \quad \text{.....EQ (15)}$$

where,

n = sample size

S = skewness,

K = kurtosis (Gujarati & Potter, 2010).

Should skewness or kurtosis be more than zero, the JB statistic's value will begin to rise. If the JB statistic measure is greater than the crucial value of two degrees of freedom, the null hypothesis of normalcy should be rejected (Gujarati & Porter, 2010). The distribution is not regarded as typical in this scenario.

4.11.4 Stability test

The cumulative sum of recursive residuals (CUSUM) test and the CUSUM of Squares (CUSUMSQ) test were conducted to assess whether, or not, the model residuals are stable. The CUSUM test uses cumulative sums of recursive errors based on initial observations to test for stability. These are updated recursively and plotted against the break point. It is employed to detect dynamic changes in regression parameters. The CUSUMSQ follows a similar procedure but using squared recursive residuals. Plots of the two tests should remain within the critical bounds as a confirmation that the estimated parameters are stable, however, should the plot fluctuate beyond the critical bounds represented by the dotted parallel lines, then the null hypothesis which states that the parameter estimates are stable, is rejected at the significance level of 5 percent (Gujarati, 2004).

4.12 Ethical considerations

This research project was examined by an independent ethical committee of experts who assessed the study protocol's appropriateness in an impartial and objective manner (Acevedo, Rapiman, Cáneo, & Rueda, 2017). According to Akaranga and

Makau (2016), norms help researchers achieve their goals, which include information sharing, reporting, or telling the truth, and finally, the need to correct mistakes. The development and approval of a research proposal is the first stage in the process, before the commencement of the actual research investigation. A researcher must choose the proper methodology to use, as well as applicable methods of data collection, present the research findings and interpret them appropriately, resulting in the presentation of information in a logical order.

To avoid plagiarism, when using secondary sources of data, the researcher made sure that the sources were acknowledged. To answer the crucial research questions, existing data, such as the time series data freely available to the public from Statistics South Africa (STATSSA), the Organisation for Economic Co-operation and Development (OECD), the South African Reserve Bank (SARB), and the World Bank online database can be exploited. This study used secondary data in the form of time series data from 1985 to 2019 to investigate the impact of foreign direct investment on economic growth in South Africa. The researcher applied for an approval from the University of Venda Research Ethic Committee to conduct the study, ethical clearance no: FSEA/22/ECO/01/050. To avoid drawing incorrect findings and inadvertently influencing future study, data was analysed in its naturalistic context. Using checklists, the researcher attempted to convey the findings and interpretations, honestly and objectively.

4.13 Summary

This chapter briefly discussed the research design and the empirical model that was used in this study. It also assessed numerous diagnostic tests including - serial correlation, white heteroscedasticity test, residual normality test and stability test - that were utilized in the study.

CHAPTER 5

ESTIMATIONS AND ANALYSIS OF RESULTS

5.1 Introduction

This chapter focuses on the analysis of the empirical results obtained in this research. The chapter elaborates on key estimation methods adopted and the diagnostic tests employed to ensure a statistically-sound econometric model was obtained. The findings are also married to this study's objectives, questions, and hypothesis.

5.2 Unit Root test Results

Before performing any model investigations, it is essential to inspect and determine the nature of the data that was used in regression. The study employed three methods to check for the existence of a unit root in the time series. These are - the graphical method, the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test. Unit root tests address the null hypothesis that a unit root exists in the time series (non-stationarity) against an alternative hypothesis that the time series are stationary. As suggested by Granger and Newbold (1974), the use of macroeconomic data characterized by a unit root in econometric modelling, may result in spurious regression and fabricated results, therefore, it is necessary to test for the stationarity of the time series.

5.2.1 Informal unit root Test

Figures 5.1 and 5.2 provide a graphical presentation of each variable in both level and first difference form. In level form (Figure 5.1), GDP and FDI do not exhibit any trends suggesting that they are integrated of order zero, although, trends are noticeable in the rest of the variables - interest rate, inflation and saving rate. This implies that the variables are not stationary at level form. After first differencing, all variables are stationary as none of them exhibit any trend. This implies that the variables used in this study are integrated to order I(0) and I(1).

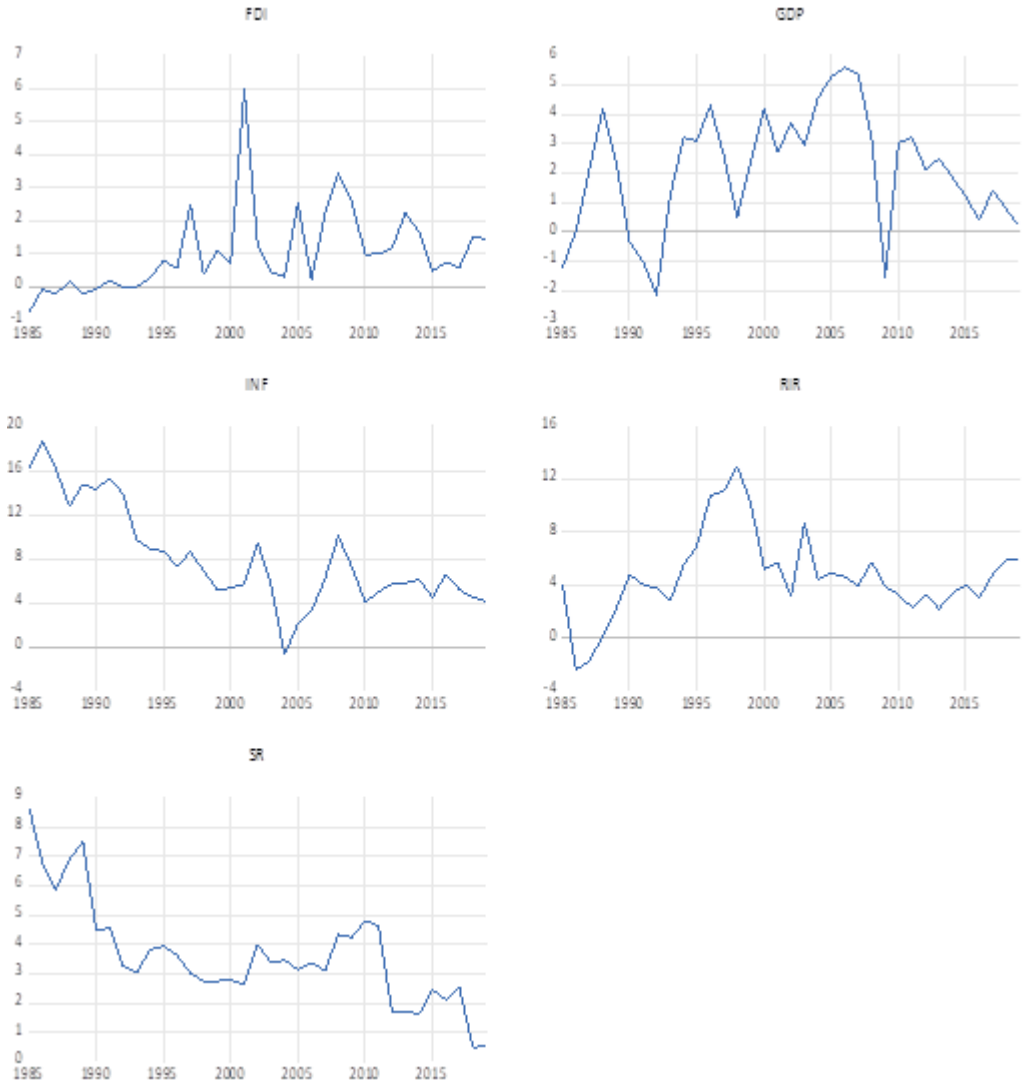


Figure 5.1: Graphical analysis of unit root at levels

Source: Author (compiled from E-views)

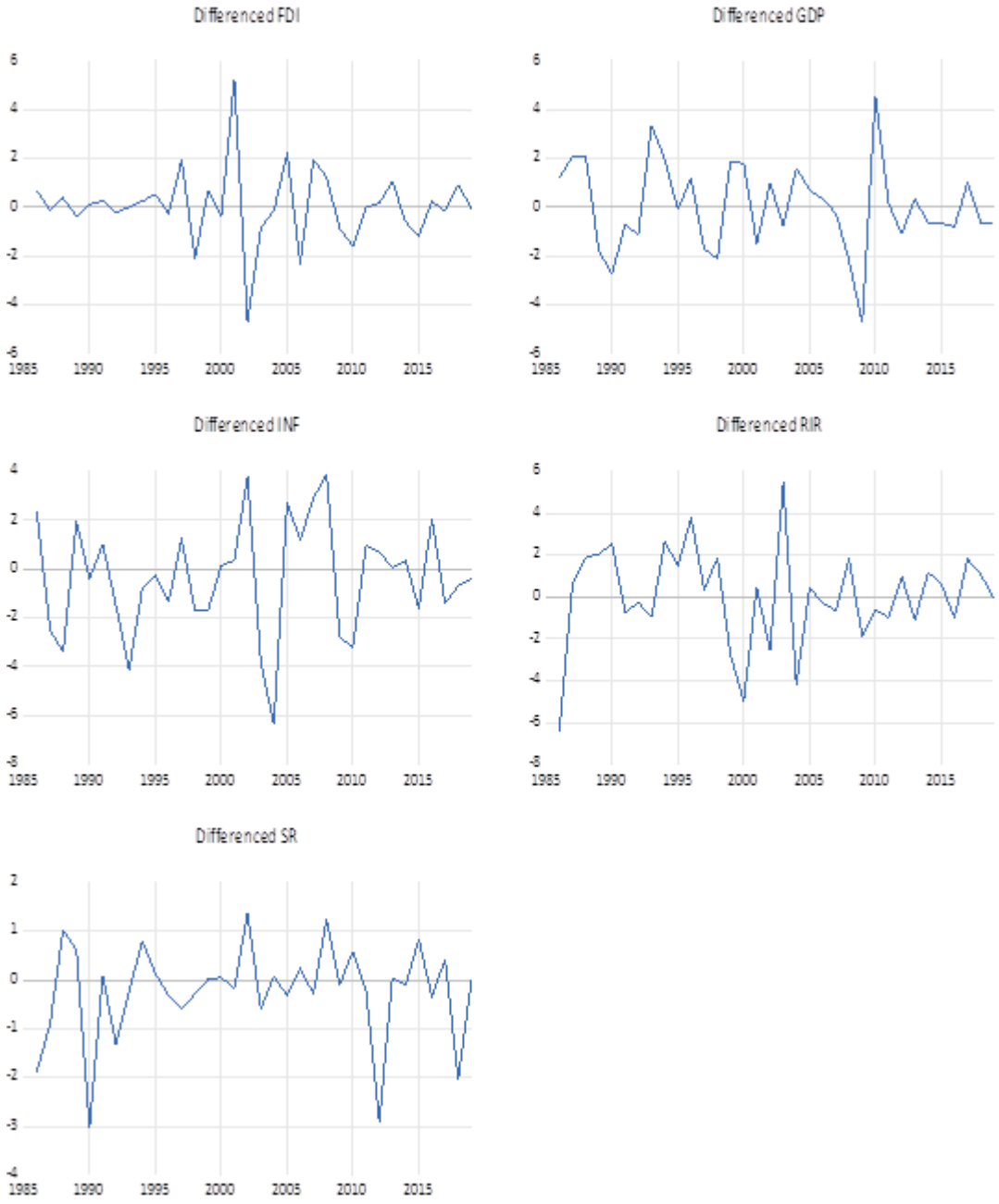


Figure 5.2: Graphical analysis of unit root at first difference

Source: Author (compiled from E-views)

5.2.2 Formal unit root Test

For a more detailed analysis of the nature of the time series, more formal tests such as the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were done, and the results are presented in Table 5.3 and Table 5.4 below. The results show that most variables failed to pass both the ADF and P-P tests when they are in level.

Table 5.1: Augmented Dicky Fuller (ADF)

Order of integration	Variable	Test statistic	Critical value	P-value	Implication
Level	GDP	-3.183	-2.951	0.0299	Stationary
1st difference	dGDP	-5.146	-2.957	0.0002	Stationary
Level	FDI	-5.085	-3.548	0.0012	Stationary
1st difference	dFDI	-7.260	-3.562	0.0000	Stationary
Level	INF	-2.479	-3.548	0.3356	Non-Stationary
1st difference	dINF	-6.244	-3.568	0.0001	Stationary
Level	RIR	-2.224	-2.951	0.2016	Non-Stationary
1st difference	dRIR	-7.300	-2.954	0.0000	Stationary
Level	SR	-3.286	-3.548	0.0857	Non-Stationary
1st difference	dSR	-6.558	-3.553	0,0000	Stationary

Source: Author (compiled from E-views)

Table 5.2: Phillips-Perron (PP)

Order of integration	Variable	Test statistic	Critical value	P-value	Implication
Level	GDP	-3.245	-2.951	0.0259	Stationary
1st difference	dGDP	-7.446	-2.954	0.0000	Stationary
Level	FDI	-5.086	-3.548	0.0012	Stationary
1st difference	dFDI	-19.160	-3.552	0.0000	Stationary
Level	INF	-2.216	-3.548	0.4661	Non-Stationary
1st difference	dINF	-12.213	-3.552	0.0000	Stationary
Level	RIR	-2.323	-2.951	0.1708	Non-Stationary
1st difference	dRIR	-7.232	-2.954	0.0000	Stationary
Level	SR	-3.232	-3.548	0.0953	Non-Stationary
1st difference	Dsr	-7.153	-3.553	0.0000	Stationary

Source: Author (compiled from E-views)

Results for the ADF test are presented in Table 5.1. At level form, GDP is stationary as shown by its t statistic -3.245 which is less than the critical value -2.951. This is confirmed by the p-value 0.0299 which is less than 0.05 leading to the rejection of the null hypothesis that there is a unit root in the series. Similarly, FDI is also stationary at level form with a t – value of -5.086 which is less than the critical value -3.548. The p-

value of 0.0012 is below 0.05 which validates the rejection of the null hypothesis that a unit root exists and conclude that FDI is stationary at level form.

On the other hand, INF is non-stationary at level form as indicated by its t-value -2.216 which is greater than the critical value -3.548, with a probability value of 0.3356 which is higher than 0.05, however, the series becomes stationary after first differencing with a p-value of 0.001 which less than 0.05. The same can be said for RIR and SR which are both non-stationary at level form as evidenced by their p-values of 0.2016 and 0.0857 respectively, which are greater than 0.05. After first differencing, however, both became stationary with p-values of 0.000 which is less than 0.05.

These outcomes are confirmed by the PP test which also found GDP and FDI stationary at level of form as revealed by the -3.245 for GDP and -5.086 for FDI, which are both less than their critical values of -2.951 and -3.548. INF, RIR and SR are non-stationary at level form as revealed by their respective p-values of 0.4661, 0.1704 and .0953 which are higher than 0.05. They, however become stationary after first differencing with all three variables (INF, RIR and SR) having a common p – value of 0.0000 which is below 0.05, leading to the conclusion that there is no unit root after first differencing. GDP and FDI, therefore, are integrated to order zero whilst INF, RIR and SR are integrated to order one. This makes the ARDL method applicable to estimate the growth model since the variables are integrated of orders zero and one.

5.3 Lag order selection criteria

Determining the optimal lag length of an autoregressive process is a crucial econometric exercise in regression. This study went on to determine the appropriate lag length and vector autoregressive (VAR) order. The optimal lag selected for the study was 2 out of the possible 3 as shown in Table 5.3. According to Liew (2004) the number of lags to be used in the regression depends on the nature of the variables under investigation and most importantly the number of observations included in the models being estimated. In his study, Liew (2004) found, the Aikake Information Criterion (AIC) and the Final Prediction Error (FPE), superior to other criteria when dealing with sample sizes with 60 observations or less. According to Granger (1986) the easiest way to select the best criterion, however, is to identify the one with the lowest value. Based on these assumptions, the FPE was selected since it has the lowest value of 2.32 as compared to AIC's 3.97 as shown in Table 5.3.

Table 5.3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-56.94919	NA	2.819411	3.871824	4.100845	3.947738
1	-53.11044	6.237965*	2.365560	3.694402	3.969228*	3.785499
2	-51.78855	2.065454	**2.324705***	3.674284*	3.994914	3.780564*
3	-51.23890	0.824477	2.399786	3.702431	4.068865	3.823894

Source: Author (compiled from E-views)

5.4 Cointegration Test

The Bounds Testing technique of the ARDL method was used to detect co-integration among variables and the results obtained are highlighted in Table 5.4.

Table 5.4: Bounds test for Co-integration results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	9.588375	10%	3.03	4.06
k	4	5%	3.47	4.57
		2.5%	3.89	5.07
		1%	4.4	5.72

Source: Author (compiled from E-views)

The bounds cointegration test was employed to test whether a long-term association exists between economic growth and its explanatory variables - foreign direct investment, inflation, interest rate and saving rate. The null hypothesis of no long-term interaction between variables was tested. Table 5.4 shows that the estimated F-statistic 9.59 is greater than the upper bounds critical values 5.72, 4.57 and 4.06 at 1%, 5% and 10% levels of significance, respectively. The null hypothesis of no cointegration, thus, was rejected to conclude that a long-run relationship exists between economic growth, foreign direct investment, inflation, interest rate and saving rate. The study proceeded with the ARDL analysis.

5.5 ARDL-ECM model regression results

5.5.1 Long-run estimates

Table 5.5 depicts the long-run estimates for the growth model (see APPENDIX D).

Table 5.5: ARDL Model results

Variable	Coefficient	Standard Error	t-Statistic	Probability
FDI	-0.2193	0.2584	-0.8488	0.4052
INF	-0.8596	0.1583	-5.4312	0.0000
RIR	-0.3145	0.1387	-2.2674	0.0335
SR	0.2503	0.3458	0.7239	0.4768

Source: Author (compiled from E-views)

The impact of the independent variables (FDI, INF, RIR, and SR) on GDP in the long run, as reported in Table 5.5 is demonstrated in the following equation:

GDP = -0.2193FDI - 0.8596INF - 0.3145RIR + 0.2503SR …… (EQ 16)

Equation 16 reflects that FDI, INF and RIR have a negative long-run relationship with economic growth., while SR is positively related to economic growth. It is worth mentioning that INF and RIR are statistically significant as displayed above in explaining economic growth. This is because their p values 0.0000 for INF and 0.0335 for RIR are less than 0.05.

The coefficients for FDI, INF and RIR indicate a negative relationship with growth whilst SR tends to be positively related to growth. The results, therefore, suggest that a one percent unit increase in FDI results in GDP falling by 21.9 per cent. The negative relationship between FDI and GDP, in the long run, contradicts the Modernization Theory which suggests that a rise in FDI should ultimately lead to an increase in GDP signifying a positive association between the two macroeconomic variables. These results, however, agree with the Dependency Theory which posits that foreign direct investment has a negative effect on the economic growth of the host country.

Brecher and Diaz-Alejandro (1977) support the Dependency Theory and argue that FDI may negatively affect economic growth of the recipient country if multinational

companies repatriate enormous profits to their parent countries. In a similar study, Herzer (2010) found that FDI negatively impacts economic growth in developing countries as it reduces capital accumulation by claiming scarce resources, thereby, crowding out domestic investment. Similar results were obtained by Saqib, Masnoon, & Rafique, (2013) who suggested that the negative impact of FDI on economic growth was due to poor economic policies in Pakistan. Woldemedhin (2021) indicated that in the empirical research, a negative correlation between FDI and economic growth is not unusual. In actual fact, this is consistent with the notion that the connection between FDI and economic growth is ambiguous. For Ethiopia , Melak (2018) demonstrated that there is a short-term negative relationship between FDI and economic development. In addition, FDI in Nigeria has been shown by Ayanwale (2007) and Simionescu (2016) to have a detrimental effect on the expansion of the manufacturing sector, which in turn has a negative effect on the economic growth of the nation. In South Africa, there are possible factors which might have led to negative relationship between FDI and economic growth, such as - corruption, mismanagement of funds, weak or collapsed state-owned enterprises and political instability. This is contrary to our prior expectation of a positive relationship between FDI and economic growth, thus indicating that this relationship is bidirectional because other studies support the hypothesis that there is a positive relationship between FDI and economic growth; the study by Tshepo (2014) confirmed that there is a positive relationship between FDI and economic growth in South Africa.

Table 5.5 also reveals that inflation has a negative influence on growth. An increase in inflation by a single unit will lead to a decrease in GDP by 85.9 per cent. These results concur with the prior expectations discussed in Chapter 4. The result is supported by the works of Adaramola and Dada (2020), Ramzan (2021) and Tien (2021) who posit an FDI-GDP nexus in Nigeria, Pakistan and Vietnam, respectively; it also corresponds with the structuralists' view. This result implies that inflation discourages long-term growth in an economy as it reduces the purchasing power of money, thereby undermining consumer expenditure and investment, which could have induced growth prospects for the economy.

RIR negatively affects GDP which is in line with theoretical expectations. Results in Table 5.5 show that a unit increase in RIR causes a decline in GDP by 31,5 per cent. In theory, high interest rates make saving more attractive to consumers, thereby

reducing consumption. A rise in interest rates also increases the cost of borrowing, which discourages investments. Since consumption and investment are major components of aggregate demand, their decline causes GDP to fall. These results correspond with the works of Hatmanu, Cautisanu, & Ifrim (2020), Iorember, Jelilov, Alymkulova & Yua (2022) and Tajudeen, Olusola & Ademola (2017) who obtained similar results in Romania, Nigeria and Sub-Saharan African economies.

SR is the only variable exerting a positive influence on GDP in the model. An increase in the saving rate by one unit causes a 25 per cent increase in GDP. The rationale is that high rates of savings increase the amount of capital available for investment which leads to higher GDP growth. Rosado and Sanchez (2017) found similar results in Ecuador as well as Coskuner and Olasehinde-Williams (2017) who used panel data for 20 countries.

As depicted in Table 5.5, the coefficients for FDI and SR are, however, statistically insignificant in explaining growth, since their probability values are greater than 0.05. It can, hence, be concluded that FDI and SR have no significant influence on long-term growth, whereas INF and RIR have a significant negative influence on long-term GDP. This corresponds with findings by John (2019) who concluded that FDI is insignificant in influencing growth in Kenya's agricultural and manufacturing sectors. Similarly, Gunby (2017), while investigating the FDI-growth nexus in China found that the estimated impact of FDI on Chinese economic growth is statistically insignificant, however, the current contradicts results obtained by Mazenda (2012) who conducted a similar study and found that FDI significantly affects GDP in South Africa.

55.5.2 Short-run estimates

Table 5.6 highlights the parameter estimates obtained for short-run error correction coefficients of the growth model (see APPENDIX D).

Table 5.6: Short-run estimates

	CointEq (-1)	D(FDI)	D(INF)	D(RIR)	D(SR)
Coefficient	-0.7782	-	-0.3174	0.0128	0.505531
P – value	0.0000	-	0.0003	0.8834	0.0095

Source: Author (compiled from E-views)

The cointEq (-1) coefficient is an error correction term which reveals the speed at which equilibrium is restored in the growth model. In other words, it indicates the rate at which a disequilibrium in the past period is resolved. A negative coefficient signifies convergence, whilst a positive coefficient shows divergence, therefore, the cointEq (-1) is said to be significant when it is negative in value and less than one, with its probability value below the selected 5% significance level (Nkoro and Uko, 2016). Results in Table 5.6 show a significant cointEq (-1) value of -0.7782 which means that the speed of adjustment is approximately 77.8 per cent. This implies that there is a high speed of adjustment from the short run deviation to the long-run equilibrium whenever there is a disturbance in the model.

RIR and SR were found to be positively related to short term growth whilst INF exerts a negative impact on short term GDP while FDI and RIR were found to be insignificant in explaining short-term growth. The study concludes that only INF and SR have significant impact on growth in the short run.

5.6 Granger Causality Tests

Table 5.7: Granger causality test results

Null Hypothesis:	Obs	F-Statistic	Prob.
FDI does not Granger Cause GDP	33	0.20716	0.8141
GDP does not Granger Cause FDI		3.26197	0.0533
RIR does not Granger Cause GDP	33	0.68985	0.5100
GDP does not Granger Cause RIR		0.88675	0.4232
INF does not Granger Cause GDP	33	3.51883	0.0433
GDP does not Granger Cause INF		2.04214	0.1486
SR does not Granger Cause GDP	33	0.61217	0.5493
GDP does not Granger Cause SR		0.22429	0.8005
RIR does not Granger Cause FDI	33	2.16994	0.1330
FDI does not Granger Cause RIR		0.60780	0.5516
INF does not Granger Cause FDI	33	4.17894	0.0258
FDI does not Granger Cause INF		3.69358	0.0377
SR does not Granger Cause FDI	33	1.62079	0.2157
FDI does not Granger Cause SR		1.39098	0.2655
INF does not Granger Cause RIR	33	0.81771	0.4517
RIR does not Granger Cause INF		0.72966	0.4910
SR does not Granger Cause RIR	33	1.15238	0.3304
RIR does not Granger Cause SR		0.21948	0.8043
SR does not Granger Cause INF	33	1.32754	0.2813
INF does not Granger Cause SR		1.04188	0.3661

Source: Author (compiled from E-views)

To understand the causality relationship between GDP and the independent variables (FDI, INF, SR and RIR), Granger Causality analysis was conducted, and the results in Table 5.7 were obtained. The results in Table 5.7 suggest no causality relationship between the FDI and GDP and since the p-value is greater than 0.05 we failed to reject the null hypothesis that FDI does not granger cause GDP, nonetheless, INF tends to granger cause both GDP and FDI as depicted in Table 5.7.

5.7 Impulse Response Results

The impulse response function is a good tool to complement results obtained in the ARDL-ECM model as it provides an understanding of how shocks in the growth model will behave. Results of the Impulse Response Analysis are presented in Figure 5.2a-d. The blue (continuous) lines represent the impulse response function, and the red (broken) lines represent the 95 per cent confidence intervals. The results of the

impulse response analysis are significant since the impulse response function lies between the confidence intervals in all four cases.

The response of GDP to FDI is highlighted in Figure 5.2a. A one standard deviation shock (innovation) to FDI initially increases the growth rate until the 4th period, where it begins to decline. This negative response persists up to the 7th period where it hits its steady state value from where it remains in the negative region increasing gradually up to the 10th period where it reaches zero, although, with increasing tendencies. This means shocks to FDI will have a positive impact on GDP both in the short-run and long-run.

GDP's response to INF is shown in Figure 5.2b. A one standard deviation shock (innovation) to INF causes a sharp decline in GDP in the early stages - periods 1 and 2. This is followed by an increase in GDP to a stable state in period 5 where it continues in a more stable and linear way, thus, shocks to INF have a negative impact on GDP in the short run. As revealed in Figure 5.2c, a one standard deviation shock (innovation) to RIR yields an outcome similar to that of INF. Initially, the shock causes a decline in GDP followed by a steady rise from period 2 onwards and achieves a stable state from period 4 to 10.

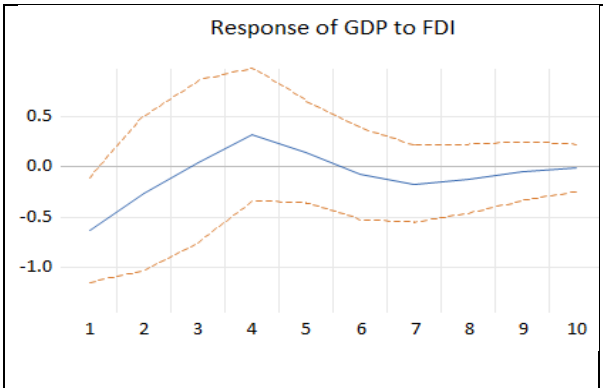


Figure 5.2a Response of GDP to FDI

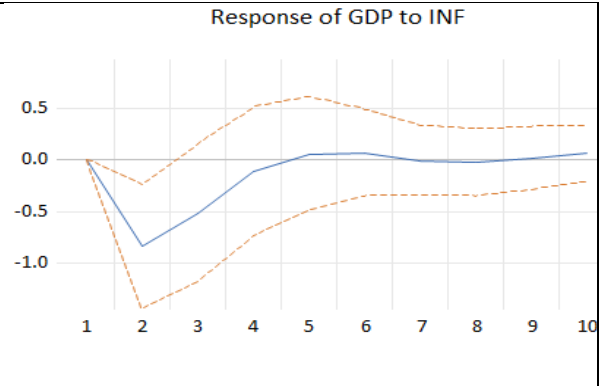


Figure 5.2b Response of GDP to INF

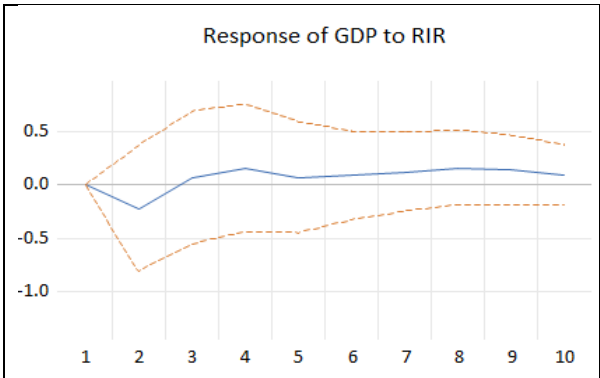


Figure 5.2c Response of GDP to RIR

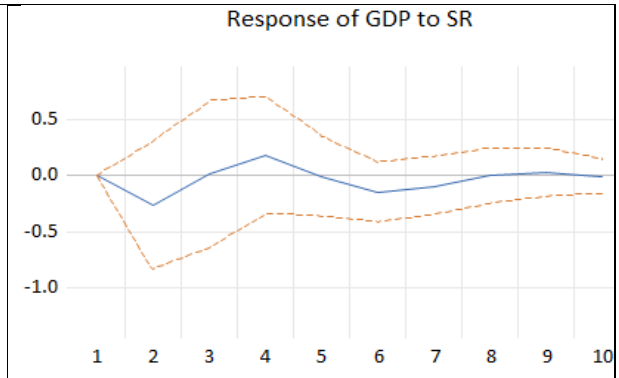


Figure 5.2d Response of GDP to SR

Source: Author (compiled from E-views)

5.8 Variance Decomposition Analysis

Table 5.8 Variance Decomposition

Variance Decomposition of GDP: Period	S.E.	GDP	FDI	INF	RIR	SR
1	1.544563	100.0000	0.000000	0.000000	0.000000	0.000000
2	2.117876	81.03342	0.961645	15.40725	1.082975	1.514708
3	2.201589	76.39864	1.475728	19.62218	1.099264	1.404189
4	2.239771	73.97155	3.290749	19.20282	1.532752	2.002133
5	2.255826	73.26378	4.164329	18.99883	1.597004	1.976057
6	2.287638	73.26746	4.143822	18.55176	1.696145	2.340821
7	2.314801	73.41614	4.083770	18.11945	1.923773	2.456863
8	2.328653	73.22097	4.084231	17.91882	2.348253	2.427721
9	2.334998	73.00230	4.062949	17.82658	2.680840	2.427331
10	2.339340	72.85662	4.056485	17.83040	2.837162	2.419335

Variance Decomposition of FDI: Period	S.E.	GDP	FDI	INF	RIR	SR
1	1.098089	16.68648	83.31352	0.000000	0.000000	0.000000
2	1.240095	20.74559	65.40674	1.148371	7.335957	5.363349
3	1.320149	22.81833	57.97004	2.919863	10.54699	5.744776
4	1.352797	22.44958	56.18366	4.853764	10.87668	5.636311
5	1.371545	22.01964	54.75313	5.116662	12.55495	5.555616
6	1.374837	21.94842	54.53270	5.127203	12.78004	5.611634
7	1.380270	21.83633	54.10438	5.131477	12.98871	5.939102
8	1.386260	21.83202	53.90284	5.092111	13.11411	6.058918
9	1.391003	21.69395	53.75066	5.100246	13.42944	6.025702
10	1.393486	21.64928	53.63582	5.091570	13.61840	6.004929

Variance Decomposition of INF:

Period	S.E.	GDP	FDI	INF	RIR	SR
1	2.049389	10.78718	0.034631	89.17819	0.000000	0.000000
2	2.594401	6.864448	1.496791	88.77035	2.469405	0.399009
3	2.852274	13.22190	2.271414	78.57878	5.592040	0.335863
4	2.943773	16.25357	2.309404	74.74390	5.733019	0.960108
5	3.006371	16.13656	2.505608	72.29133	6.534491	2.532012
6	3.078792	15.64300	3.823505	69.96808	7.430019	3.135397
7	3.153480	15.94883	4.738123	67.73661	8.470301	3.106144
8	3.214526	17.21964	5.083856	65.66203	9.006074	3.028394
9	3.258870	18.51626	5.207581	64.04243	9.181501	3.052220
10	3.291277	19.34340	5.408267	62.89379	9.190754	3.163792

Variance Decomposition of RIR:

Period	S.E.	GDP	FDI	INF	RIR	SR
1	1.950441	0.040905	3.958897	0.091558	95.90864	0.000000
2	2.592104	4.560254	9.942243	7.496186	77.99456	0.006756
3	2.916878	7.643689	8.328516	8.947548	73.49671	1.583541
4	3.105251	10.34873	9.539447	8.933603	68.22494	2.953279
5	3.214495	10.46820	10.22320	8.677480	67.67222	2.958898
6	3.266828	10.26256	10.78362	8.626137	67.46255	2.865132
7	3.294317	10.10053	10.80085	8.783606	67.49434	2.820674
8	3.308489	10.04027	10.82258	9.009362	67.28438	2.843410
9	3.317459	10.02851	10.87042	9.105533	67.11701	2.878518
10	3.322556	10.02126	10.95713	9.119655	67.02275	2.879204

Variance Decomposition of SR:

Period	S.E.	GDP	FDI	INF	RIR	SR
1	0.817451	17.50462	0.028119	4.254718	3.732343	74.48020
2	1.073473	26.62619	16.21552	2.924219	6.522827	47.71124
3	1.250810	31.30714	19.86464	3.036348	10.54617	35.24571
4	1.356031	34.10326	21.67395	3.535702	10.69802	29.98907
5	1.429190	38.71527	20.35662	3.382773	10.34276	27.20258
6	1.482131	41.74764	19.65013	3.295506	9.632217	25.67450
7	1.524969	43.48638	19.43469	3.478977	9.122492	24.47746
8	1.563792	44.79871	19.32976	3.856662	8.693084	23.32178
9	1.598992	46.25660	18.92081	4.181825	8.325424	22.31534
10	1.628242	47.59730	18.46595	4.370164	8.029543	21.53705

Cholesky Ordering: GDP FDI INF RIR SR

Source: Author (compiled from E-views)

The variance decomposition analysis reveals the proportion of the forecast error variance for each variable that is attributable to its shocks and shocks in the other explanatory variables in the system. The results of the variance decomposition analysis are depicted in Table 5.8.

The variance decomposition analysis in Table 5.8 covers a period of up to ten years in order to analyze the impact of the variables when allowed to affect GDP over a

relatively long period of time. In the first year, a 100 percent forecast error variance in GDP is explained by its own shocks; other variables do not have influence on GDP. In Period 2 onwards, the variance contribution rate of other variables increases steadily in each period up to the tenth year, whilst that of GDP on itself gradually decreases.

For FDI, about 83.31 percent of forecast error variance is explained by its own shocks whilst the remaining 16.69 percent is explained by GDP as shown in Table 5.11. From the second period onwards, the variance contribution rate of other variables increases steadily in each period up to the tenth year, whilst that of FDI on itself significantly decreases. GDP's influence steadily increases with time reaching a peak of 22.82 in the third year and slightly decreasing to 21.65 percent after ten years. The influence of the other three variables (INF, RIR and SR) increases also with time.

A similar trend can be observed for INF, RIR and SR. During the first period, the three variables have a forecast variance error of 89.17 percent, 95.91 percent and 74.48 percent, respectively; this is explained by their own shocks, whilst the remaining fraction is contributed by other variables. Thereafter, the variance contribution rate of the variable under investigation decreases while that of other variables increases disproportionately (see Table 5.11). These results are consistent with economic theory which suggests that a considerable fraction of the variation in GDP must be explained by shocks to the explanatory variables. The outcome is also compatible with results from the impulse response analysis.

5.9 Diagnostic tests

Table 5.9 indicates the probability values for four diagnostic tests conducted on the growth model to ensure the results obtained are valid. The LM test was applied to test for serial correlation with the null hypothesis that no serial correlation exists in the models at 5% significance level. The P-value 0.2646 is greater than 0.05 which means that the null hypothesis will not be rejected. This means that no serial correlation exists in the model. The BPG test for heteroscedasticity also revealed that the model is homoscedastic as confirmed by the probability value of 0.8665, which is greater than 5% level of significance. The p-values for the Jarque-Bera normality test 0.3911 were also greater than 5 percent, hence, the test reveals that the series are normally distributed. In all the three residual tests performed, the probability values were greater than 5% meaning we can accept the null hypothesis of no serial correlation, no

heteroscedasticity, and normally distributed data set. We can, thus, conclude that the data sets are homoscedastic, normally distributed and not serially correlated. Based on this, we can say that the model is good for analysis and policy implementation.

Table 5.9: Diagnostic tests

	Null hypothesis	P-value
LM test	No Serial correlation	0.2646
BPG test	No conditional heteroscedasticity	0.8665
JB test	There is a normal distribution	0.3911

Source: Author (compiled from E-views)

Figure 5.3a CUSUM test and Figure 5.3.b CUSUMQ test

In terms of model stability, the results below show the cumulative sum of square curves trending within the confines of the 5% boundary, indicative of a stable model.

Figure 5.3a: CUSUM test

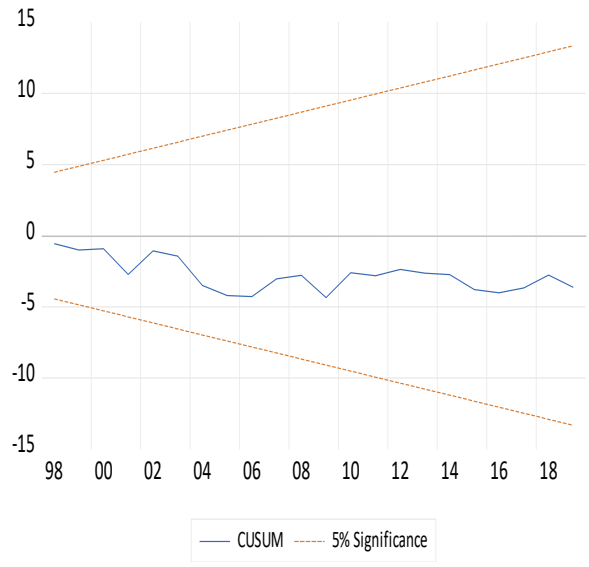
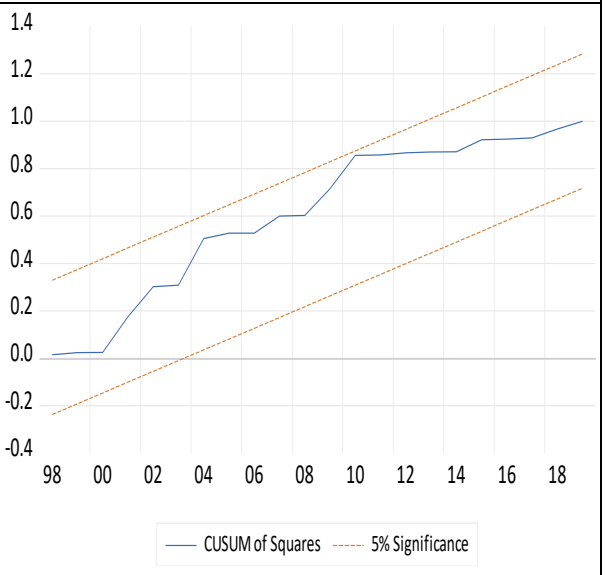


Figure 5.3b: CUSUMSQ test



Source: Author (compiled from E-views)

5.10 Summary

This chapter focused on the quantitative analysis of the effect of foreign direct investment on economic growth in South Africa. It covered the unit root test, lag order selection, bound test for co-integration and the estimation of the ARDL-ECM model. In addition, various statistical diagnostics were conducted to ensure that a robust and statistically sound model was obtained. The succeeding chapter gives the summary of the study as whole, policy recommendations, limitations of the study as well as recommendations for future study.

CHAPTER 6

CONCLUSION AND POLICY RECOMMENDATIONS

6.1 Introduction

The focus of the study was to assess the impact of foreign direct investment on economic growth in South Africa. This chapter summarises the study, gives corresponding conclusions as well as policy recommendations from the study.

6.2 Summary of the study

The aim of the study was to evaluate the impact of foreign direct investment on economic growth in South Africa. To accomplish this, the study was guided by the objective to analyse the impact of foreign direct investment on economic growth in South Africa. The study is divided into six chapters. Chapter one presented the introduction and the background of the study, and the South African economy. The focus was on the impact of foreign growth on economic growth. Low economic growth rate is a concern because it has remained very low, while showing a continuous downwards trends for the period under consideration - 1985 to 2019. The current government has made efforts to attract foreign direct investment to improve economic growth, but economic growth has remained very low, in the past decades in South Africa.

Chapter Two examined the trends in - foreign direct investment, inflation rate, real interest rate, saving rate (independent variables) and economic growth (dependent variable). The variables showed different trends in the years under consideration and showed a possibility of a relationship at some point. In the apartheid era, economic growth was unstable and showed a continuous decline from 1988 to 1992, however, in the post-apartheid era, economic growth started to improve and showed an increase from 1994 even though it was low in 1998 it remained stable with a slight increase from 1999 to 2009 where it declined during the great recession. In 2010 economic growth increased because of FIFA world cup and it started declining from 2012 up to now. Whilst foreign direct investment was very low in the apartheid era -1985 to 1993 - this might have been caused by sanctions and bans. From 1994 there was a slight increase in FDI and it continued to rise, reaching its highest in 2001 and although, it was fluctuating it was high with a considerable amount, however, it started declining in 2013; this has continued so that currently, FDI is low.

Chapter Three clarified the theories underpinning the study (theories of economic growth and foreign direct investment) while also reviewing the existing literature on the impact of foreign direct investment locally (in South Africa) and internationally. Chapter Four provided the research methodology of the study and all the data analysis' techniques used in the study, were explained. The models utilized were specified and variables were defined followed by prior expectations, data sources and estimation techniques. Chapter Five reports on the data analysis, interpretation of results, followed by discussions. The current chapter, six, provides the conclusion and policy recommendations.

6.3 Literature finding and conclusion of the study

Numerous inferences can be drawn from the literature and the results of the study. Short-run and long-run dynamics were discovered, and the literature reviewed illustrated various implications between foreign direct investment and economic growth. In the short run, the literature revealed that foreign direct investment has a positive impact on economic growth as opposed to long-run dynamics. In the long run, foreign direct investment was found to have a negative relationship on economic growth, however the results of the study revealed that foreign direct investment is insignificant in explaining the short-term growth in the short run. The study discovered that there is a negative relationship between foreign direct investment and economic growth in the long run. The current study, thus, concludes that foreign direct investment, amongst other variables, influences economic growth negatively in the short-run and long-run terms in South Africa.

6.4 Policy prescripts and recommendations

The results from the study revealed several outcomes which can be used for policy recommendations in South Africa.

- Foreign direct investment

Foreign direct investment was found to contribute negatively to economic growth in South Africa, however, foreign direct investment is also influenced by a lot of factors which might indirectly and negatively affect growth. The researcher, therefore, recommends that the South African government should come with ways or strategies which would best attract foreign direct investment. The government should also ensure that the country's affairs are in order, for example, combat corruption and crime while

also ensuring that there is political stability and well managed state-owned enterprises. The state of a country is considered by investors and with a conducive atmosphere, state-run foreign direct investment can positively contribute to economic growth.

- Inflation rate

Inflation rate was found to contribute negatively to economic growth in South Africa. The researcher, thus recommends that the government manage and control inflation and keep it within the targets range of 3 to 6 %, in South Africa. If inflation rate is properly managed, economic growth will tend to increase since the purchasing power will be high. The researcher also recommends that inflation rate should be prioritised as a factor which negatively affects economic growth in South Africa.

- Real interest rate

Real interest rate was found to contribute negatively to economic growth in South Africa. The author recommends that the government/ SARB should keep the real interest rate low because people are more inclined to borrow money to finance large purchases like homes or cars when the interest rate is low. When customers pay less interest, they have more money to spend, which can lead to an increase in consumption across the economy, consequently, increase economic growth.

- Saving rate

Saving rate was found to contribute positively to economic growth in South Africa. The researcher therefore recommends that the government expands its industrial base and build vital infrastructure, which in turn would leads to more job opportunities and high economic growth.

6.5 Limitation of the study and recommendations for future research

This study is limited to annual data captured during the period, 1985 to 2019, in South Africa. The researcher excluded some of the variables due to unavailability of data and focused on only five variables, namely, - economic growth, foreign direct investment, inflation rate, real interest rate and saving rate. The author recommends that future studies focus on specific international companies which are fully operational in South Africa to assess the impact of foreign direct investment on economic growth in South Africa. The researcher also suggests future studies to include variables which affect the state of the economy, such as corruption and crime.

6.6 Conclusion

The null hypothesis presented in this study was that foreign direct investment positively impact economic growth in South Africa. Given the regression results, we reject the null hypothesis. This is supported by Istaiteyeh and Ismail (2015) that FDI has a negative relationship with economic growth and Woldemedhin (2021) who concluded that a negative correlation existing between FDI and economic growth is not unusual. This is consistent with the notion that the connection between FDI and economic growth is ambiguous; this in case of South Africa might be caused by corruption, failed state-owned enterprises, risk of political changes, and exposing the country to foreign political influence.

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APPENDICES

Appendix A: Data

YEAR	GDP	FDI	RIR	INF	SR
1985	-1.2115	-0.7661	4.0104	16.2942	8.6607
1986	0.0178	-0.0748	-2.4062	18.6549	6.7763
1987	2.1007	-0.2164	-1.7287	16.1605	5.8773
1988	4.2001	0.1665	0.1598	12.7795	6.9012
1989	2.3948	-0.2032	2.2254	14.7308	7.5083
1990	-0.3178	-0.0655	4.7826	14.3209	4.4753
1991	-1.0182	0.2050	4.0298	15.3347	4.5684
1992	-2.1371	0.0025	3.7864	13.8747	3.2591
1993	1.2335	0.0084	2.8117	9.7174	3.0286
1994	3.2	0.2679	5.4967	8.9385	3.8168
1995	3.1	0.8031	6.9704	8.6804	3.9529
1996	4.3	0.5531	10.7641	7.3541	3.6326
1997	2.6	2.4973	11.1241	8.5977	3.0272
1998	0.5	0.3994	12.9929	6.8805	2.7369
1999	2.4	1.1003	10.2425	5.1814	2.7522
2000	4.2	0.7105	5.2425	5.3389	2.8045
2001	2.7	5.9831	5.6938	5.7019	2.6289
2002	3.7004	1.2814	3.1591	9.4947	4.0045
2003	2.9491	0.4469	8.6628	5.6794	3.3986

2004	4.5546	0.3068	4.4727	-0.692	3.4706
2005	5.2771	2.5302	4.9084	2.0628	3.1555
2006	5.6038	0.2295	4.6222	3.2439	3.3864
2007	5.3605	2.1999	3.9662	6.1778	3.1021
2008	3.1910	3.4470	5.7827	10.0552	4.3366
2009	-1.5381	2.5764	3.9103	7.2645	4.2412
2010	3.0397	0.9840	3.2743	4.0635	4.8244
2011	3.2134	0.9940	2.3164	5.0171	4.6080
2012	2.1234	1.1672	3.2932	5.7239	1.6953
2013	2.4852	2.2442	2.2087	5.7764	1.7332
2014	1.8470	1.6505	3.3899	6.1360	1.6241
2015	1.1937	0.4789	4.0372	4.5092	2.4626
2016	0.3991	0.7475	3.0333	6.5946	2.1144
2017	1.4145	0.5889	4.8519	5.1810	2.5388
2018	0.7871	1.5123	5.9343	4.5045	0.5119
2019	0.1526	1.4558	5.8678	4.1243	0.5288

Source: (OECD)

Appendix B Unit Root Test

FDI

Augmented Dickey Fuller

Null Hypothesis: FDI has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.085061	0.0012

Test critical values:	1% level	-4.252879
	5% level	-3.548490
	10% level	-3.207094

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 08/28/22 Time: 12:20
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.902173	0.177416	-5.085061	0.0000
C	0.249744	0.424608	0.588175	0.5607
@TREND("1985")	0.042163	0.023293	1.810150	0.0800

R-squared	0.455944	Mean dependent var	0.065350
Adjusted R-squared	0.420844	S.D. dependent var	1.590393
S.E. of regression	1.210326	Akaike info criterion	3.303754
Sum squared residue	45.41157	Schwarz criterion	3.438433
Log likelihood	-53.16382	Hannan-Quinn criteria.	3.349683
F-statistic	12.98972	Durbin-Watson stat	2.006615
Prob(F-statistic)	0.000080		

Null Hypothesis: FDI has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.085061	0.0012
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 08/28/22 Time: 12:20
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.902173	0.177416	-5.085061	0.0000
C	0.249744	0.424608	0.588175	0.5607
@TREND("1985")	0.042163	0.023293	1.810150	0.0800

R-squared	0.455944	Mean dependent var	0.065350
Adjusted R-squared	0.420844	S.D. dependent var	1.590393
S.E. of regression	1.210326	Akaike info criterion	3.303754
Sum squared residue	45.41157	Schwarz criterion	3.438433
Log likelihood	-53.16382	Hannan-Quinn criteria	3.349683

F-statistic	12.98972	Durbin-Watson stat	2.006615
Prob(F-statistic)	0.000080		

Null Hypothesis: FDI has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.085061	0.0012
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Phillips-Perron

Phillips-Perron Test Equation
Dependent Variable: D(FDI,2)
Method: Least Squares
Date: 08/28/22 Time: 12:55
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-1.446690	0.162996	-8.875631	0.0000
C	0.217761	0.554763	0.392530	0.6974
@TREND("1985")	-0.007808	0.027222	-0.286818	0.7762

R-squared	0.724234	Mean dependent var	-0.022661
Adjusted R-squared	0.705850	S.D. dependent var	2.742769
S.E. of regression	1.487558	Akaike info criterion	3.718656
Sum squared residue	66.38484	Schwarz criterion	3.854703
Log likelihood	-58.35783	Hannan-Quinn criteria.	3.764432
F-statistic	39.39396	Durbin-Watson stat	2.216403
Prob(F-statistic)	0.000000		

Null Hypothesis: FDI has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.084500	0.0012
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	1.335634
HAC corrected variance (Bartlett kernel)	1.333410

Phillips-Perron Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 08/28/22 Time: 12:55
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.902173	0.177416	-5.085061	0.0000
C	0.249744	0.424608	0.588175	0.5607
@TREND("1985")	0.042163	0.023293	1.810150	0.0800

R-squared	0.455944	Mean dependent var	0.065350
Adjusted R-squared	0.420844	S.D. dependent var	1.590393
S.E. of regression	1.210326	Akaike info criterion	3.303754
Sum squared residue	45.41157	Schwarz criterion	3.438433
Log likelihood	-53.16382	Hannan-Quinn criteria.	3.349683
F-statistic	12.98972	Durbin-Watson stat	2.006615
Prob(F-statistic)	0.000080		

GDP

Augmented Dickey Fuller

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.146148	0.0002
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 08/28/22 Time: 12:18
Sample (adjusted): 1988 2019
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.291193	0.250905	-5.146148	0.0000
D(GDP(-1),2)	0.249507	0.175433	1.422234	0.1656
C	-0.039401	0.328764	-0.119845	0.9054

R-squared	0.558544	Mean dependent var	-0.084919
Adjusted R-squared	0.528099	S.D. dependent var	2.704437
S.E. of regression	1.857814	Akaike info criterion	4.165738
Sum squared residue	100.0927	Schwarz criterion	4.303151

Log likelihood	-63.65181	Hannan-Quinn criteria.	4.211286
F-statistic	18.34588	Durbin-Watson stat	2.118612
Prob(F-statistic)	0.000007		

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.182661	0.0299
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 08/28/22 Time: 12:17
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.451250	0.141784	-3.182661	0.0032
C	1.020445	0.416969	2.447292	0.0201

R-squared	0.240434	Mean dependent var	0.040121
Adjusted R-squared	0.216698	S.D. dependent var	1.851620
S.E. of regression	1.638764	Akaike info criterion	3.882785
Sum squared residue	85.93756	Schwarz criterion	3.972571
Log likelihood	-64.00734	Hannan-Quinn criteria.	3.913404
F-statistic	10.12933	Durbin-Watson stat	1.715358
Prob(F-statistic)	0.003240		

Phillips-Perron

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Bandwidth: 17 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.446568	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	3.383642
HAC corrected variance (Bartlett kernel)	0.711728

Phillips-Perron Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 08/28/22 Time: 12:57
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.014345	0.178797	-5.673152	0.0000
C	0.004954	0.330556	0.014986	0.9881

R-squared	0.509375	Mean dependent var	-0.056479
Adjusted R-squared	0.493548	S.D. dependent var	2.666853
S.E. of regression	1.897878	Akaike info criterion	4.178042
Sum squared residue	111.6602	Schwarz criterion	4.268739
Log likelihood	-66.93769	Hannan-Quinn criteria.	4.208559
F-statistic	32.18465	Durbin-Watson stat	2.010083
Prob(F-statistic)	0.000003		

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.244598	0.0259
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	2.527575
HAC corrected variance (Bartlett kernel)	2.736781

Phillips-Perron Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 08/28/22 Time: 12:57
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.451250	0.141784	-3.182661	0.0032
C	1.020445	0.416969	2.447292	0.0201

R-squared	0.240434	Mean dependent var	0.040121
Adjusted R-squared	0.216698	S.D. dependent var	1.851620
S.E. of regression	1.638764	Akaike info criterion	3.882785
Sum squared residue	85.93756	Schwarz criterion	3.972571
Log likelihood	-64.00734	Hannan-Quinn criteria.	3.913404
F-statistic	10.12933	Durbin-Watson stat	1.715358
Prob(F-statistic)	0.003240		

INFLATION

Augmented Dickey Fuller

Null Hypothesis: D(INF) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.750527	0.0002
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 08/28/22 Time: 12:25
Sample (adjusted): 1988 2019
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-1.397184	0.242966	-5.750527	0.0000
D(INF(-1),2)	0.390194	0.167020	2.336204	0.0269
C	-1.315277	0.930392	-1.413680	0.1685
@TREND("1985")	0.043273	0.044085	0.981567	0.3347

R-squared	0.582722	Mean dependent var	0.066069
Adjusted R-squared	0.538014	S.D. dependent var	3.315391
S.E. of regression	2.253457	Akaike info criterion	4.579277
Sum squared residue	142.1860	Schwarz criterion	4.762494
Log likelihood	-69.26843	Hannan-Quinn criteria.	4.640008
F-statistic	13.03385	Durbin-Watson stat	2.136379
Prob(F-statistic)	0.000016		

Null Hypothesis: INF has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.479299	0.3356
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 08/28/22 Time: 12:24

Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.326725	0.131781	-2.479299	0.0188
C	3.950849	2.050644	1.926638	0.0632
@TREND("1985")	-0.092829	0.060591	-1.532060	0.1357

R-squared	0.173014	Mean dependent var	-0.357938
Adjusted R-squared	0.119660	S.D. dependent var	2.365107
S.E. of regression	2.219096	Akaike info criterion	4.516174
Sum squared residue	152.6560	Schwarz criterion	4.650853
Log likelihood	-73.77496	Hannan-Quinn criteria.	4.562103
F-statistic	3.242750	Durbin-Watson stat	1.721662
Prob(F-statistic)	0.052629		

Phillips-Perron

Null Hypothesis: D(INF) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 32 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-12.21345	0.0000
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	5.213849
HAC corrected variance (Bartlett kernel)	0.353440

Phillips-Perron Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 08/28/22 Time: 13:23
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-1.023582	0.177152	-5.777981	0.0000
C	-1.181703	0.902850	-1.308858	0.2005
@TREND("1985")	0.040720	0.044002	0.925407	0.3621

R-squared	0.527615	Mean dependent var	-0.083058
Adjusted R-squared	0.496123	S.D. dependent var	3.373752
S.E. of regression	2.394835	Akaike info criterion	4.671014
Sum squared residue	172.0570	Schwarz criterion	4.807060
Log likelihood	-74.07172	Hannan-Quinn criteria.	4.716789
F-statistic	16.75375	Durbin-Watson stat	1.952833
Prob(F-statistic)	0.000013		

Null Hypothesis: INF has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.215857	0.4661
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	4.489882
HAC corrected variance (Bartlett kernel)	3.232088

Phillips-Perron Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 08/28/22 Time: 13:22
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.326725	0.131781	-2.479299	0.0188
C	3.950849	2.050644	1.926638	0.0632
@TREND("1985")	-0.092829	0.060591	-1.532060	0.1357

R-squared	0.173014	Mean dependent var	-0.357938
Adjusted R-squared	0.119660	S.D. dependent var	2.365107
S.E. of regression	2.219096	Akaike info criterion	4.516174
Sum squared residue	152.6560	Schwarz criterion	4.650853
Log likelihood	-73.77496	Hannan-Quinn criteria.	4.562103
F-statistic	3.242750	Durbin-Watson stat	1.721662
Prob(F-statistic)	0.052629		

INTEREST

Augmented Dickey Fuller

Null Hypothesis: D(RIR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.300455	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RIR,2)

Method: Least Squares
Date: 08/28/22 Time: 12:26
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RIR(-1))	-1.138554	0.155957	-7.300455	0.0000
C	0.258805	0.374490	0.691087	0.4947

R-squared	0.632251	Mean dependent var	0.192427
Adjusted R-squared	0.620388	S.D. dependent var	3.490591
S.E. of regression	2.150645	Akaike info criterion	4.428105
Sum squared residue	143.3835	Schwarz criterion	4.518802
Log likelihood	-71.06373	Hannan-Quinn criteria.	4.458622
F-statistic	53.29665	Durbin-Watson stat	1.997383
Prob(F-statistic)	0.000000		

Null Hypothesis: RIR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.224689	0.2016
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RIR)
Method: Least Squares
Date: 08/28/22 Time: 12:26
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RIR(-1)	-0.269283	0.121043	-2.224689	0.0333
C	1.306177	0.684011	1.909584	0.0652

R-squared	0.133947	Mean dependent var	0.054629
Adjusted R-squared	0.106883	S.D. dependent var	2.400631
S.E. of regression	2.268713	Akaike info criterion	4.533325
Sum squared residue	164.7059	Schwarz criterion	4.623111
Log likelihood	-75.06653	Hannan-Quinn criteria.	4.563945
F-statistic	4.949242	Durbin-Watson stat	1.751653
Prob(F-statistic)	0.033278		

Phillips -Perron

Null Hypothesis: D(RIR) has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-7.232505	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	4.344955
HAC corrected variance (Bartlett kernel)	4.621832

Phillips-Perron Test Equation
Dependent Variable: D(RIR,2)
Method: Least Squares
Date: 08/28/22 Time: 13:21
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RIR(-1))	-1.138554	0.155957	-7.300455	0.0000
C	0.258805	0.374490	0.691087	0.4947

R-squared	0.632251	Mean dependent var	0.192427
Adjusted R-squared	0.620388	S.D. dependent var	3.490591
S.E. of regression	2.150645	Akaike info criterion	4.428105
Sum squared residue	143.3835	Schwarz criterion	4.518802
Log likelihood	-71.06373	Hannan-Quinn criteria.	4.458622
F-statistic	53.29665	Durbin-Watson stat	1.997383
Prob(F-statistic)	0.000000		

Null Hypothesis: RIR has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.323178	0.1708
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	4.844291
HAC corrected variance (Bartlett kernel)	5.395242

Phillips-Perron Test Equation
Dependent Variable: D(RIR)
Method: Least Squares
Date: 08/28/22 Time: 13:20
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RIR(-1)	-0.269283	0.121043	-2.224689	0.0333
C	1.306177	0.684011	1.909584	0.0652

R-squared	0.133947	Mean dependent var	0.054629
Adjusted R-squared	0.106883	S.D. dependent var	2.400631
S.E. of regression	2.268713	Akaike info criterion	4.533325
Sum squared residue	164.7059	Schwarz criterion	4.623111
Log likelihood	-75.06653	Hannan-Quinn criteria.	4.563945
F-statistic	4.949242	Durbin-Watson stat	1.751653
Prob(F-statistic)	0.033278		

SAVINGS

Augmented Dickey Fuller

Null Hypothesis: D(SR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.557807	0.0000
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SR,2)
Method: Least Squares
Date: 08/28/22 Time: 12:29
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SR(-1))	-1.140450	0.173907	-6.557807	0.0000
C	-0.276216	0.382920	-0.721342	0.4763
@TREND("1985")	0.002901	0.018537	0.156498	0.8767

R-squared	0.590094	Mean dependent var	0.057616
Adjusted R-squared	0.562767	S.D. dependent var	1.527354
S.E. of regression	1.009941	Akaike info criterion	2.944169
Sum squared residue	30.59944	Schwarz criterion	3.080216
Log likelihood	-45.57879	Hannan-Quinn criteria.	2.989945
F-statistic	21.59379	Durbin-Watson stat	2.099829
Prob(F-statistic)	0.000002		

Phillips-Perron

Null Hypothesis: D(SR) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.153385	0.0000
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.927256
HAC corrected variance (Bartlett kernel)	0.519669

Phillips-Perron Test Equation
Dependent Variable: D(SR,2)
Method: Least Squares
Date: 08/28/22 Time: 13:28
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SR(-1))	-1.140450	0.173907	-6.557807	0.0000
C	-0.276216	0.382920	-0.721342	0.4763
@TREND("1985")	0.002901	0.018537	0.156498	0.8767

R-squared	0.590094	Mean dependent var	0.057616
Adjusted R-squared	0.562767	S.D. dependent var	1.527354
S.E. of regression	1.009941	Akaike info criterion	2.944169
Sum squared residue	30.59944	Schwarz criterion	3.080216
Log likelihood	-45.57879	Hannan-Quinn criteria.	2.989945
F-statistic	21.59379	Durbin-Watson stat	2.099829
Prob(F-statistic)	0.000002		

Null Hypothesis: SR has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.231964	0.0953
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.735886
HAC corrected variance (Bartlett kernel)	0.637328

Phillips-Perron Test Equation
Dependent Variable: D(SR)
Method: Least Squares
Date: 08/28/22 Time: 13:24

Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SR(-1)	-0.420479	0.127962	-3.285955	0.0025
C	2.092035	0.825138	2.535377	0.0165
@TREND("1985")	-0.043028	0.022514	-1.911128	0.0653

R-squared	0.265431	Mean dependent var	-0.239173
Adjusted R-squared	0.218040	S.D. dependent var	1.015948
S.E. of regression	0.898388	Akaike info criterion	2.707667
Sum squared residue	25.02012	Schwarz criterion	2.842346
Log likelihood	-43.03034	Hannan-Quinn criteria.	2.753597
F-statistic	5.600821	Durbin-Watson stat	1.923550
Prob(F-statistic)	0.008385		

Appendix C: Bounds Test

ARDL Long Run Form and Bounds Test
Dependent Variable: D(GDP)
Selected Model: ARDL(1, 0, 1, 1, 2)
Case 5: Unrestricted Constant and Unrestricted Trend
Date: 09/01/22 Time: 05:26
Sample: 1985 2019
Included observations: 33

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.93220	2.242338	4.875359	0.0001
@TREND	-0.183823	0.043238	-4.251403	0.0003
GDP(-1)*	-0.778214	0.165577	-4.700012	0.0001
FDI**	-0.170687	0.185278	-0.921252	0.3669
INF(-1)	-0.668942	0.110492	-6.054199	0.0000
RIR(-1)	-0.244736	0.090259	-2.711492	0.0127
SR(-1)	0.194801	0.281778	0.691327	0.4966
D(INF)	-0.317368	0.100604	-3.154633	0.0046
D(RIR)	0.012812	0.115454	0.110973	0.9126
D(SR)	0.505531	0.233518	2.164849	0.0415
D(SR(-1))	-0.273729	0.227799	-1.201623	0.2423

* p-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z(-1) + D(Z).

Levels Equation
Case 5: Unrestricted Constant and Unrestricted Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	-0.219332	0.258432	-0.848704	0.4052
INF	-0.859586	0.158267	-5.431224	0.0000
RIR	-0.314485	0.138699	-2.267397	0.0335
SR	0.250318	0.345813	0.723853	0.4768

EC = GDP - (-0.2193*FDI -0.8596*INF -0.3145*RIR + 0.2503*SR)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	9.588375	10%	3.03	4.06
k	4	5%	3.47	4.57
		2.5%	3.89	5.07
		1%	4.4	5.72
Actual Sample Size	33	Finite Sample: n=35		
		10%	3.374	4.512
		5%	4.036	5.304
		1%	5.604	7.172
		Finite Sample: n=30		
		10%	3.43	4.624
		5%	4.154	5.54
		1%	5.856	7.578

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-4.700012	10%	-3.13	-4.04
		5%	-3.41	-4.36
		2.5%	-3.65	-4.62
		1%	-3.96	-4.96

Appendix D: ARDL – ECM Regression

ARDL Error Correction Regression
Dependent Variable: D(GDP)
Selected Model: ARDL(1, 0, 1, 1, 2)
Case 5: Unrestricted Constant and Unrestricted Trend
Date: 09/01/22 Time: 05:24
Sample: 1985 2019
Included observations: 33

ECM Regression
Case 5: Unrestricted Constant and Unrestricted Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.93220	1.476702	7.403118	0.0000
@TREND	-0.183823	0.028913	-6.357860	0.0000
D(INF)	-0.317368	0.074809	-4.242393	0.0003
D(RIR)	0.012812	0.086387	0.148314	0.8834
D(SR)	0.505531	0.177860	2.842300	0.0095
D(SR(-1))	-0.273729	0.174284	-1.570591	0.1305
CointEq(-1)*	-0.778214	0.103387	-7.527189	0.0000

R-squared	0.781095	Mean dependent var	0.004085
Adjusted R-squared	0.730579	S.D. dependent var	1.868182
S.E. of regression	0.969695	Akaike info criterion	2.962160
Sum squared resid	24.44800	Schwarz criterion	3.279601
Log likelihood	-41.87565	Hannan-Quinn criter.	3.068970
F-statistic	15.46220	Durbin-Watson stat	1.951349
Prob(F-statistic)	0.000000		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	9.588375	10%	3.03	4.06
k	4	5%	3.47	4.57
		2.5%	3.89	5.07
		1%	4.4	5.72

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-7.527189	10%	-3.13	-4.04
		5%	-3.41	-4.36
		2.5%	-3.65	-4.62
		1%	-3.96	-4.96

Appendix E: Breusch-Pagan-Godfrey Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.507672	Prob. F(10,22)	0.8665
Obs*R-squared	6.187294	Prob. Chi-Square(10)	0.7993
Scaled explained SS	1.213126	Prob. Chi-Square(10)	0.9996

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/02/22 Time: 05:15
Sample: 1987 2019
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.048321	1.634135	-0.641515	0.5278
GDP(-1)	-0.001264	0.120667	-0.010475	0.9917
FDI	0.095120	0.135024	0.704470	0.4885
INF	0.053701	0.073316	0.732449	0.4716
INF(-1)	-0.032573	0.090694	-0.359154	0.7229
RIR	0.005139	0.084139	0.061083	0.9518
RIR(-1)	0.082846	0.081139	1.021038	0.3183
SR	0.120685	0.170179	0.709164	0.4857
SR(-1)	0.009739	0.198283	0.049117	0.9613
SR(-2)	0.117062	0.166012	0.705141	0.4881
@TREND	0.012800	0.031510	0.406211	0.6885

R-squared	0.187494	Mean dependent var	0.740848
Adjusted R-squared	-0.181827	S.D. dependent var	0.706676
S.E. of regression	0.768240	Akaike info criterion	2.571773
Sum squared resid	12.98425	Schwarz criterion	3.070609
Log likelihood	-31.43426	Hannan-Quinn criter.	2.739617
F-statistic	0.507672	Durbin-Watson stat	2.654601
Prob(F-statistic)	0.866467		

Appendix F: Breusch-Godfrey LM Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

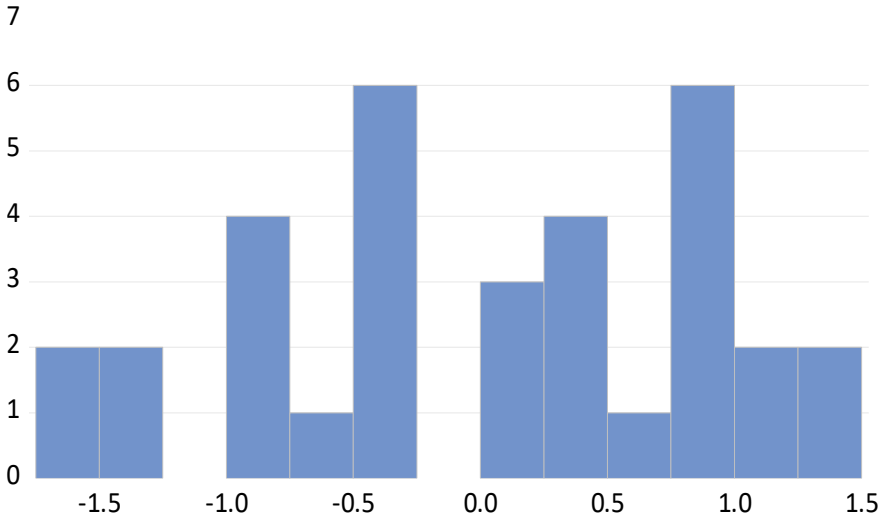
F-statistic	1.422076	Prob. F(2,20)	0.2646
Obs*R-squared	4.108580	Prob. Chi-Square(2)	0.1282

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 09/02/22 Time: 05:14
Sample: 1987 2019
Included observations: 33
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.045936	0.193581	0.237296	0.8148
FDI	0.092289	0.199189	0.463324	0.6481
INF	-0.021099	0.101829	-0.207201	0.8379
INF(-1)	0.061132	0.146300	0.417856	0.6805
RIR	0.007038	0.114188	0.061635	0.9515
RIR(-1)	0.036253	0.111360	0.325546	0.7481
SR	0.062850	0.239047	0.262918	0.7953
SR(-1)	0.055470	0.291007	0.190613	0.8508
SR(-2)	-0.004472	0.228507	-0.019570	0.9846
C	-1.511785	2.579785	-0.586012	0.5644
@TREND	0.020831	0.046392	0.449035	0.6582
RESID(-1)	-0.123070	0.308455	-0.398989	0.6941
RESID(-2)	-0.402845	0.239496	-1.682057	0.1081

R-squared	0.124502	Mean dependent var	-4.31E-16
Adjusted R-squared	-0.400796	S.D. dependent var	0.874071
S.E. of regression	1.034509	Akaike info criterion	3.192834
Sum squared resid	21.40417	Schwarz criterion	3.782367
Log likelihood	-39.68176	Hannan-Quinn criter.	3.391194
F-statistic	0.237013	Durbin-Watson stat	1.923718
Prob(F-statistic)	0.993173		

Appendix G: JB Normality Test



Series: Residuals	
Sample 1987 2019	
Observations 33	
Mean	-4.31e-16
Median	0.130950
Maximum	1.393063
Minimum	-1.553560
Std. Dev.	0.874071
Skewness	-0.170467
Kurtosis	1.882302
Jarque-Bera	1.877540
Probability	0.391109