

-RESEARCH ARTICLE-

THE RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT AND ECONOMIC GROWTH IN SOUTH AFRICA FROM 1970-2019: AN ECONOMETRIC APPROACH

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—Abstract—

This study explores the relationship between foreign direct investment and economic growth in South Africa for the period between 1970 to 2019. The primary objective of this study is to investigate into whether there is both, a short run and a long run relationship between foreign direct investment and economic growth in South Africa. The data used in this study is collected through secondary sources based online, that is, the South African Reserve Bank and Word Bank covering a range from 1970 to 2019. In this study, we discover a short run negative statistically significant relationship and long run negatively statistically insignificant relationship between foreign direct investment and economic growth in South Africa. One the policy implications emanating from this study is that policy makers and the South African government need to revise policies related to foreign direct investment inflow to boost economic growth and help resolve current macroeconomic challenges of high unemployment and low economic growth.

Keywords: *Foreign Direct Investment (FDI), Economic Growth, Autoregressive Distributed Lag (ARDL) Model, Error Correction Model, South Africa*

JEL Specifications: *C01, C22, E41, F15, F43*

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1. INTRODUCTION

The relationship between foreign direct investment and economic growth is of interest among policymakers, politicians, and academics. South Africa is one of the most mineral rich countries in the world, which means that it will be beneficial for multinational companies to come and invest in South Africa as it still lacks the technology and the technical knowhow needed to produce certain goods and services. [Gelb and Black \(2004\)](#) highlights that when it comes to skilled labour availability, greenfield businesses are generally pessimistic at the time of entrance, but opinions improved following increased exposure to the local market, with significant improvements in three out of four occupational groups.

South Africa faces several challenges, including, unemployment, inequality, and poverty. It is important to address and overcome these challenges because the economy of South Africa has been declining in the recent past. This paper will look at how foreign direct investment can reduce unemployment and increase economic growth in South Africa. Because of these challenges, it is important to investigate foreign direct investment in the public sector and in the private sector state owned enterprises (SOEs) and how they can reduce these challenges in the South African economy is facing. This study only covers the period from 1970 to 2019 due to the lack of data for foreign direct investment in 2020.

Overview of the study: Partial acquisitions with prior local knowledge moved in the other way, being most optimistic at entry but subsequently decreasing considerably in all four categories. Foreign investor recruitment must focus on sources that can create employment and enhance the South African economy ([Masipa, 2018](#)). It is possible that international firms coming through greenfield have low expectations based on their experience in other emerging economies, but investors forming partnerships with South African enterprises have high expectations based on their experience in established nations. Many scholars around the globe have advocated for an increase in foreign direct investment, calling for the establishment of policies that are designed to attract foreign direct investment as it boosts economic growth.

According to [Akinboade, Siebrits, and Roussot \(2006\)](#), “the Department of Trade and Industry (DTI) established the national investment promotion agency Investment South Africa in February 1997, demonstrating the importance of foreign direct investment in South Africa.” Literature on foreign direct investment and economic growth in South Africa remains controversial as some scholars found a positive relationship while other found a negative relationship between the two variables.

The South African economy has relied on foreign direct investment for far too long based on the belief that it boosts economic growth. From the early 19th century, many multinational companies have been making their way into South Africa to establish their businesses in the primary sectors of agriculture and mining and the secondary sector

with a view to building industries that can process raw materials before exporting them to developed countries where they are turned into final products as well as in the tertiary sector where they have been providing services that the indigenous people could not be able to provide due to lack of knowledge and skills.

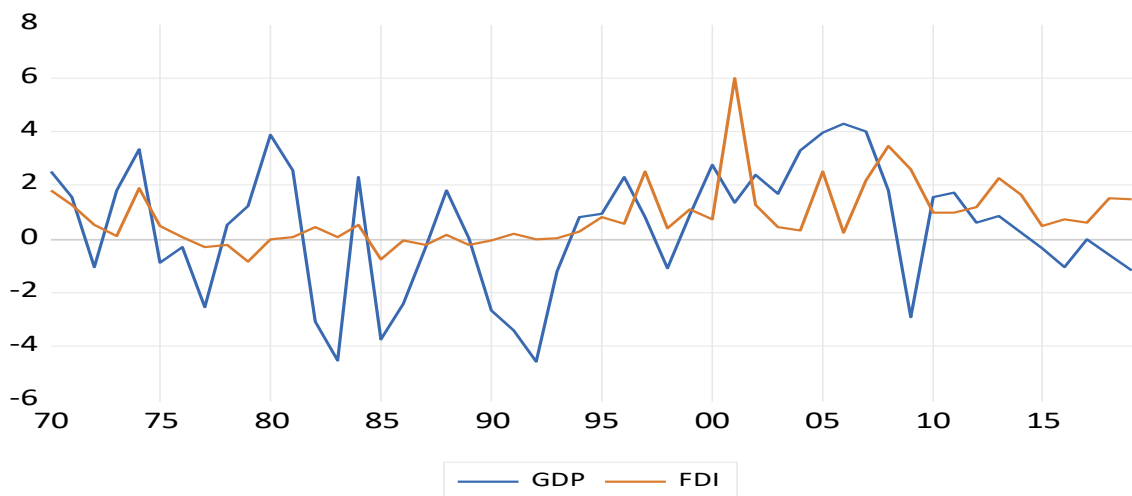


Figure 1: The Trend Between Economic Growth and Foreign Direct Investment From 1970 To 2019

Source: Author's own computation

The graph above shows the trend between foreign direct investment and economic growth in South Africa for the period spanning from 1970 to 2019. The gross domestic product per capita has been fluctuating throughout the whole period from 1970 to 2019. It has fluctuated to negative levels mainly during the periods between 1970 to 1997, as depicted by the blue line in [Figure 1](#) above. This means that economic growth has been positive but followed by longer periods in the negative level.

During the same periods, the foreign direct investment is slightly below negative level and slightly above the positive level from 1970 to 1994. Starting from 1994, that is, after the elections, the foreign direct investment remains at a positive level until 2019 and after this period it does not fall into the negative level. This means South Africa has been receiving more foreign direct investment inflows. However, the gross domestic product has fallen dismally into the negative level during the 2007/8 period due to global financial crises, as depicted in [Figure 1](#) by the blue line. From 2014 onward, the gross domestic product per capita has been fluctuating below 0% and this may have been caused by issues such as drought and corruption. According to [StatsSA \(2019\)](#), "real gross domestic product measured by production decreased by 0,6% in the third quarter of 2019, following an increase of 3,2% in the second quarter of 2019."

This study is organised in the following format, section 1 includes the introduction to the study and an overview of foreign direct investment and economic growth in South Africa. Section 2 outlines the theoretical and empirical literature related to foreign direct investment and economic growth, whereafter section 3 details the methodology of Autoregressive Distributed Lag model, Error Correction Model and variable description used for the purposes of data analysis. Section 4 provides the empirical results while section 5 includes the conclusion and puts forth policy recommendations based on empirical evidence generated in the study.

2. LITERATURE REVIEW

This chapter includes a theoretical review as well as empirical review of foreign direct investment vis-a-vis economy growth in the context of various developed and developing country-contexts as well as in the context of South Africa. The theoretical review will focus on the theories of foreign direct investment and economic growth. The empirical review will highlight the work of different scholars and their findings as well as their implications for economic growth and development.

2.1 Theoretical Literature

The Currency Areas Hypothesis and the Effect of the Exchange Rate: According to [Moosa \(2002\)](#), the Currency Area Hypothesis and the Effect of Exchange Rate was developed by Aliber (1970,1971) where he understands foreign direct investment in terms of relative currencies. [Aliber \(1971\)](#) argues that firms in a strong currency country tend to invest abroad, while those in weak currency countries do not have the same tendency. Aliber argues that firms from strong currency countries are the sources of foreign direct investment while the recipients are the ones from weak currency countries. The theory is based on foreign exchange risk, capital market relationship and the market's preference for holding assets denominated in strong currencies.

According to Aliber, a multinational corporation from a hard currency territory may borrow at reduced rates in a soft currency zone due to its reputation. The key premise is that there is a bias in capital markets caused by an income stream situated in a nation with a weak currency, which is linked with foreign exchange risk. As a result, it is possible that a strong currency business will be more efficient in hedging foreign exchange risk. This may be experimentally examined by studying the relationship between currency value and flows of foreign direct investment. Currency overvaluation is linked with FDI outflows, whereas currency undervaluation is associated with FDI inflows. Exchange rates are seen as a viable alternative to exports.

The Industrial Organization Hypothesis: According to [Moosa \(2002\)](#) this theory was developed by Hymer (1976) and later extended by Kindleberger (1969), Caves (1982) and Dunning (1988). The authors argue that when a multinational corporation (MNC) establishes another subsidiary in another country, it faces disadvantages in terms of

language, culture, legal system, and inter-country differences. Multinational corporations must pay higher wages than local firms for example, because employment with them is regarded as risky.

Despite the disadvantages that accrue to an MNC, it has advantages in terms of having a well-known brand name, patent-protected technology, managerial skills, and certain firm-specific factors. Kindleberger argues that the benefits include capital, management, technology, marketing, access to raw materials, economies of scale and bargaining and political power. Aharoni (1966) argues that limitations to initial investment decision are commitment, information, and uncertainty.

2.2 Empirical Literature

Studies that found a positive relationship: Anwar and Nguyen (2010) conducted a panel data analysis to gauge the relationship between foreign direct investment and economic growth in Vietnam and discovered that foreign direct investment boosts economic growth for the year 1996 to 2005. Ndambendia and Njoupouognigni (2010) discovered a positive relationship between foreign direct investment and economic growth in 36 Sub-Saharan Africa countries by employing a panel model for the year spanning from 1980 to 2007 and recommended reliance on internal factors of foreign direct investment as compared to external factors.

Wan (2010) analysed the literature on foreign direct investment and economic growth in different countries and found that a considerable number of studies demonstrate a positive relationship between foreign direct investment and economic growth. Lean and Tan (2011) discovered a positive relationship between foreign direct investment and economic growth in Malaysia by employing a Vector Error Correction Model for the period spanning from 1970 to 2009. Mabule (2012) highlights that the South African government needs to encourage capital intensive foreign direct investment as it boosts economic growth through development of skilled labour force and capacity building.

Behname (2012) found a positive relationship between foreign direct investment and economic growth in Southern Asia by employing a panel data analysis for the period spanning from 1977 to 2009, recommending that the focus for policy makers should be on infrastructure and capital formation. Leitão and Rasekhi (2013) conducted a study on foreign direct investment and Portugal's economic growth and found a positive relationship by utilising a panel data analysis for the period spanning from 1995 to 2008. The researchers further called for the need to include exchange rate and budget deficit in the future analysis of the two variables.

Almfraji and Almsafir (2014) found that foreign direct investment boosts economic growth through significant contributions by human capital, well-developed financial markets and free trade regimes focusing on the literature available from 1994 to 2012 across the globally. Cambazoglu and Karaalp (2014) by employing a Vector Error

Correction Model in Turkey for the period from 1980 to 2010 discovered benefits to economic growth with respect to inward foreign direct investment. Malaysia should focus on promoting exports and foreign direct investment after a positive relationship was discovered by employing an Autoregressive Distributed Lag model for the period spanning from 1971 to 2013 (Haseeb, Hartani, Bakar, Azam, & Hassan, 2014).

Omri and Kahouli (2014) highlighted that governments in the selected 65 countries need to encourage inflow of foreign direct investment as it boosts economic growth. Iamsiraroj and Ulubaşoğlu (2015) and Seyoum, Wu, and Lin (2015) encourages policy makers to focus on policies that attract foreign direct investment after a positive relationship was found between foreign direct investment and economic growth in 140 developed and emerging countries. Iamsiraroj (2016) advocates for the government to generate and maintain the availability of labour force, diminish trade barriers and creation of a good macroeconomic environment after discovering a positive relationship between foreign direct investment and economic growth in 124 countries.

By employing an Autoregressive Distributed Lag model for the period 1990 to 2014 and Error Correction model for the period 1975 to 2017, Sunde (2017) and Awunyo-Vitor and Sackey (2018) recommend that governments need to formulate policies that attract foreign direct investment as they can stimulate economic growth in South Africa and Ghana respectively. Osei and Kim (2020), Sohail and Mirza (2020) and Rautenbach (2021) highlight the need to focus on policies that attract foreign direct investment in 62 middle and high-income countries, including Pakistan and East African countries.

Through employing VECM and FMOLS models on developing countries from 2000 to 2014, Dinh, Vo, and Nguyen (2019) found that foreign direct investment boosts economic growth in the long run; although, in the short run, it is found to have a detrimental effect on the growth of this economies. The researchers recommend that policies that increase foreign direct investment in the long run must be encouraged as this increases economic growth of the economies. By employing a VECM in Southern American countries, Owusu-Nantwi and Erickson (2019) found that foreign direct investment increases economic growth and recommend that these countries must adopt policies that help increase foreign direct investment inflows as a way to increase economic growth.

By utilising order-invariant generalized forecast error variance decomposition (GFEVD) in the Caribbean countries for the period from 1975 to 2015, Onafowora and Owoye (2019) found a causality effect running from foreign direct investment to economic growth and recommend that capital inflows should be promoted to increase the growth of these economies. Anetor (2020) analyse the threshold on 28 Sub-Saharan Africa countries for the period from 1999 to 2017 and found that foreign direct investment significantly contributes positively on the growth of these economies and recommend

that these countries should build up their absorptive capacity to take advantage of foreign direct investment to increase economic growth.

By analysing a panel of 25 Sub-Saharan Africa countries using a generalized method of moments, [Asongu and Odhiambo \(2020\)](#) found that foreign direct investment contributes positively on the growth of these economies, as substantiated by internet and mobile phone penetration. The researchers further stress that ICT is important for improving the absorptive capacity of foreign investment and by extension, the relevance of foreign investment in driving economic prosperity.

By doing a sectoral analysis of foreign direct investment in Tanzania for the period 1988 to 2017, [Taylor \(2020\)](#) highlights that the quantity of foreign direct investment contributes to the growth of an economy. [Opoku, Ibrahim, and Sare \(2019\)](#) analyses foreign direct investment, sectoral effects and economic growth in Africa and found that foreign direct investment contributes positively to the growth of these economies.

[Arain et al. \(2021\)](#) study the relationship between foreign direct investment and economic growth in Pakistan for the period from 1997 to 2017 and found that foreign direct investment has a positive insignificant effect on economic growth. The researchers recommend that to close the foreign direct investment inflows gap between Pakistan and other developed countries, Pakistan must broaden its foreign investment policy framework. Through analysing the impact of foreign direct investment in 45 developing countries for the period from 1990 to 2014, [Sahu \(2020\)](#) found that foreign direct investment contributes positively to the growth of Asian and African economies.

Studies that found an inverse relationship: [Mazenda \(2014\)](#) employed a Vector Error Correction model and found that foreign direct investment is negatively related to economic growth in South Africa in the long run for the period spanning from 1980 to 2010. The researcher further recommends that, based on empirical evidence, foreign direct investment should be encouraged so it can significantly boost economic growth in the long run.

[Rahman \(2015\)](#) discover a detrimental effect of foreign direct investment on economic growth for the period from 1999 to 2013 in Bangladesh, recommending that the government should revise policies on foreign direct investment so it can boost economic growth. [Susilo \(2018\)](#) found that foreign direct investment is detrimental to economic growth in the United States of America for the period 2000 to 2017 and further review that economic growth in the United States of America is due to personal consumption.

[Khobai et al. \(2018\)](#) cautions about only attracting foreign direct investment but also focus on developing channels and strategies through which foreign direct investment can improve welfare in South Africa. After conducting a study on the impact of foreign direct investment on economic growth in India for the period from 2001 to 2019, [Sharma, Kaur, Sharma, and Sandhu \(2020\)](#) found that foreign direct investment insignificantly

contributes negatively on the growth of the economy. [Sokhanvar \(2019\)](#) analyses the trend of foreign direct investment and economic growth in five European countries and found that foreign direct investment negatively affects economic growth in these countries.

By employing an Engle-Granger and ARDL approach, [Bilas \(2020\)](#) analyse the relationship between foreign direct investment and economic growth in Croatia from 2000 to 2019 and found out that green foreign direct investment contributes positively to the growth of Croatian economy, recommending that countries should focus their effort to attract green foreign direct investment.

Studies that found no relation and non-linear: [El-Wassal \(2012\)](#) emphasize the need to focus on the quality of foreign direct investment, reformatting of domestic financial market and macroeconomic policies among 16 Arabian countries after the researcher discovered no relation between foreign direct investment and economic growth in these countries. [Jahfer and Inoue \(2014\)](#) point that financial development is much important than foreign direct investment in Sri-Lanka as there is no relationship between the variables after employing a vector error correction model for the period spanning from 1996 to 2011.

[Yeboua \(2021\)](#) found a nonlinear relationship between foreign direct investment and economic growth in 27 African countries. The author further recommend that tax and subsidy policies aimed at attracting foreign direct investment should be aligned with policies aimed at upgrading African institutions. Based on an analysis of a VAR relationship between foreign direct investment and economic growth in Ecuador, Peru and Colombia for the period from 1996 to 2016, [Camacho and Bazaña \(2020\)](#) found a nonlinear contribution of foreign direct investment on the growth of these economies. [Amin, Anwar, and Liu \(2020\)](#) conducted a nonlinear ARDL approach on the relationship between foreign direct investment and economic growth in Romania and found that foreign direct investment contributes positively to the growth of this country.

3. METHODOLOGY

The study adopts an Autoregressive Distributed Lag (ARDL) model to estimate the long run relationship of foreign direct investment on economic growth in South Africa and an Error Correction Model (ECM) to estimate the importance of foreign direct investment on economic growth in the short run as well as the error correction term. The study further employs the Augmented Dickey-Fuller (ADF) test, Phillips-Perron (PP) test and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test to test for stationarity of the dataset. The ARDL bounding test is used to analyse the existence of cointegration. The diagnostic tests are performed to check for stability (CUSUM and RAMSEY), serial correlation, heteroskedasticity and histogram normality (Jarque-Bera).

Empirical model estimation: The adopted model employed in this study was used by Haseeb et al. (2014) and Sunde (2017). The econometric model can be specified as:

$$GDP_t = \beta_0 + \beta_1 FDI_t + \beta_2 INV_t + \beta_3 LR_t + \beta_4 BM_t + \varepsilon_t \dots \dots \dots (1)$$

Where:

GDP - gross domestic product per capita on annual percentages

FDI – foreign direct investment out flow as a percentage of GDP

INV – gross fixed capital formation as a percentage of GDP

LR – lending rate as a percentage

BM – broad money annual growth percentage

Estimation technique: The study employs the ARDL model proposed by Pesaran, Shin, and Smith (2001) to estimate the short run and long run relationship among the variables understudy. The ARDL model used in this study is adopted from Haseeb et al. (2014). This model requires the variables to stationary or integrated of I(0) or I(1) or a mixture of I(0) and I(1) but no variable should be stationary at second difference that is integrated of I(2).

Estimating long run relationship: After identification of cointegration in the model, the study therefore employs the ARDL levels equation that show long run relationship, as specified in the equation 2 to 6 below:

$$GDP_t = \beta_{01} + \sum_{i=1}^p k_{11} GDP_{t-i} + \sum_{i=0}^q k_{21} FDI_{t-i} + \sum_{i=0}^q k_{31} INV_{t-i} + \sum_{i=0}^q k_{41} LR_{t-i} + \sum_{i=0}^q k_{51} BM_{t-i} + \varepsilon_t \dots \dots \dots (2)$$

$$FDI_t = \beta_{02} + \sum_{i=1}^p k_{12} FDI_{t-i} + \sum_{i=0}^q k_{22} GDP_{t-i} + \sum_{i=0}^q k_{32} INV_{t-i} + \sum_{i=0}^q k_{42} LR_{t-i} + \sum_{i=0}^q k_{52} BM_{t-i} + \varepsilon_t \dots \dots \dots (3)$$

$$INV_t = \beta_{03} + \sum_{i=1}^p k_{13} INV_{t-i} + \sum_{i=0}^q k_{23} FDI_{t-i} + \sum_{i=0}^q k_{33} GDP_{t-i} + \sum_{i=0}^q k_{43} LR_{t-i} + \sum_{i=0}^q k_{53} BM_{t-i} + \varepsilon_t \dots \dots \dots (4)$$

$$LR_t = \beta_{04} + \sum_{i=1}^p k_{14} LR_{t-i} + \sum_{i=0}^q k_{24} INV_{t-i} + \sum_{i=0}^q k_{34} FDI_{t-i} + \sum_{i=0}^q k_{44} GDP_{t-i} + \sum_{i=0}^q k_{54} BM_{t-i} + \varepsilon_t \dots \dots \dots (5)$$

$$BM_t = \beta_{05} + \sum_{i=1}^p k_{15} BM_{t-i} + \sum_{i=0}^q k_{25} LR_{t-i} + \sum_{i=0}^q k_{35} INV_{t-i} + \sum_{i=0}^q k_{45} FDI_{t-i} + \sum_{i=0}^q k_{55} GDP_{t-i} + \varepsilon_t \quad (6)$$

Short run relationship: The short run relationship dynamic ARDL error correction model can therefore be derived from the above ARDL models while estimating the long run relationship through a simple linear transformation as indicated by Pesaran et al. (2001). An unrestricted ARDL error correction model with an ECT_{t-1} , an error correction term that should be negative and statistically significant incorporates dynamic short run with long run equilibrium. Δ represents a differenced variable and ε_t is an error term. The unrestricted ARDL error correction model is therefore specified as given in equation 7 to 11 below:

$$\Delta GDP_t = \beta_{01} + \sum_{i=1}^p \alpha_{11} \Delta GDP_{t-i} + \sum_{i=0}^q \alpha_{21} \Delta FDI_{t-i} + \sum_{i=0}^q \alpha_{31} \Delta INV_{t-i} + \sum_{i=0}^q \alpha_{41} \Delta LR_{t-i} + \sum_{i=0}^q \alpha_{51} \Delta BM_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad (7)$$

$$\Delta FDI_t = \beta_{02} + \sum_{i=1}^p \alpha_{12} \Delta FDI_{t-i} + \sum_{i=0}^q \alpha_{22} \Delta GDP_{t-i} + \sum_{i=0}^q \alpha_{32} \Delta INV_{t-i} + \sum_{i=0}^q \alpha_{42} \Delta LR_{t-i} + \sum_{i=0}^q \alpha_{52} \Delta BM_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad (8)$$

$$\Delta INV_t = \beta_{03} + \sum_{i=1}^p \alpha_{13} \Delta INV_{t-i} + \sum_{i=0}^q \alpha_{23} \Delta FDI_{t-i} + \sum_{i=0}^q \alpha_{33} \Delta GDP_{t-i} + \sum_{i=0}^q \alpha_{43} \Delta LR_{t-i} + \sum_{i=0}^q \alpha_{53} \Delta BM_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad (9)$$

$$\Delta LR_t = \beta_{04} + \sum_{i=1}^p \alpha_{14} \Delta LR_{t-i} + \sum_{i=0}^q \alpha_{24} \Delta INV_{t-i} + \sum_{i=0}^q \alpha_{34} \Delta FDI_{t-i} + \sum_{i=0}^q \alpha_{44} \Delta GDP_{t-i} + \sum_{i=0}^q \alpha_{54} \Delta BM_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad (10)$$

$$\Delta BM_t = \beta_{05} + \sum_{i=1}^p \alpha_{15} \Delta BM_{t-i} + \sum_{i=0}^q \alpha_{25} \Delta LR_{t-i} + \sum_{i=0}^q \alpha_{35} \Delta INV_{t-i} + \sum_{i=0}^q \alpha_{45} \Delta FDI_{t-i} + \sum_{i=0}^q \alpha_{55} \Delta GDP_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad (11)$$

Data issues: The study employs annual time series data to investigate the relationship between foreign direct investment and economic growth in South Africa. The data was sourced from secondary sources such as the South African Reserve Bank (SARB) and the World Bank. The variables were mined in the percentage form. The ADF and PP are performed and the results for stationarity are depicted in Table 1 below:

Table 1: ADF and PP Unit Root Test

Variables	ADF unit root test				PP unit root test			
	Constant		Trend & Intercept		Constant		Trend& Intercept	
	Level	I(1)	Level	I(1)	Level	I(1)	Level	I(1)
GDP	-4.3613 ***	-7.3182 ***	-4.3675 ***	-7.2328 ***	-4.3468 ***	-21.4652 ***	-4.3477 ***	-21.0827 ***
FDI	-1.5109	-8.7410 ***	-5.8559 ***	-8.6421 ***	-4.9706 ***	-19.0305 ***	-5.8592 ***	-19.1791 ***
INV	-1.6881	-7.3452 ***	-2.1660	-7.3083 ***	-1.4998	-7.8782 ***	-2.0654	-8.5716 ***
LR	-2.6368 *	-6.2387 ***	-2.7751	-6.3662 ***	-2.0170	-5.7188 ***	-2.0464	-8.6820 ***
BM	-3.8274 ***	-7.5329 ***	-4.4797 ***	-7.4667 ***	-3.8178 ***	-12.4886 ***	-4.2504 ***	-17.0140 ***

Source: Author's Own Computation (*), (**), (***), Significance at 10%, 5% and 1% Respectively

The results of the ADF and PP unit root test are given in [Table 1](#) above which show that the variables are mainly stationary at first difference or integrated of I (1) except for GDP and BM which are stationary at level and first difference using the ADF and PP unit root test. This means it is suitable to employ the ARDL model in the study to analyse the relationship between foreign direct investment and economic growth in South Africa for the period from 1970 to 2019. The study carries an optimal lag length criterion as given in [Table 3](#) below in order to determine the optimal lags to be used in the model.

4. RESULTS

The ADF, PP and KPSS confirm that the data is stationary at first difference except for gross domestic product that is stationary at the level form. The leg length criterion is performed to determine the optimal lags to use for the study. The results shown in [Table 3](#) below show that the optimal leg that can be used for the study is 2 lags as selected by the LR, FPE and HQ criterion.

Table 3: Optimal Leg Length Criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-569.7375	NA	48983.32	24.98859	25.18735	25.06304
1	-463.5597	184.6570	1446.939	21.45912	22.65171*	21.90587
2	-426.6456	56.17367*	896.8943*	20.94111	23.12753	21.76016*
3	-401.0673	33.36299	970.6903	20.91597*	24.09621	22.10731
4	-379.9687	22.93323	1422.366	21.08560	25.25967	22.64923

Source: Author's Own Computation

Upon determining that the optimal lags to be used in the model are 2 legs, the study continues to perform the ARDL bounding test to cointegration as given in [Table 4](#) below.

Table 4: ARDL Bound Test

F-Bounds Test relationship			Null Hypothesis: No levels	
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	9.122089	10%	2.2	3.09
	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Author's own computation

The results of the ARDL bound test are given in [Table 4](#) above which confirm the presence of cointegration among the variables in the model. [Table 4](#) above has an F-statistic of 9.122089 that is greater than the I(0) and I(1) bound value at 1%, 2.5%, 5%

and 10% level of significance which confirms the rejection of the null hypothesis (Ho) of there being no long run relationship, leading us to the conclusion that there, in fact, exists a long run relationship among the variables in the model. This means that the study will estimate both short run and long run relationships by utilising the regressions given in equations 2 to 1 in section 3 above. The study therefore continues to estimate long run relationship as given in [Table 5](#) below.

Table 5: ARDL and Long Run Relationship

ARDL Levels Equation and Long run relationship				
Variable	Coefficient	Std. Error	t-Statistic	Prob
FDI(-2)	-1.316174	0.823401	-1.598461	0.1187
INV(-2)	0.500123	0.261213	1.914613	0.0635
LR(-2)	-1.018680	0.447617	-2.275787	0.0289
BM(-2)	0.491056	0.247604	1.983235	0.0550
C	0.532185	0.441342	1.205832	0.2357

Source: Author's own computation (*), (**), (***), significance at 10%, 5% and 1% respectively

From the results given in [Table 5](#) above, it can be shown that there is a negative statistically insignificant long run relationship between foreign direct investment and economic growth in South Africa. A 1% increase in foreign direct investment in the long run in South Africa will insignificantly result in economic growth declining by 1.32%, ceteris paribus. These results are consistent with the study carried by [Mazenda \(2014\)](#), [Rahman \(2015\)](#), [Susilo \(2018\)](#) and [Khobai et al. \(2018\)](#) that found foreign direct investment and economic growth to have a negative relationship in the long run. Though the results are insignificant in the long run, the negative impact of foreign direct investment on economic growth mean that in the long run, foreign direct investment is not good for the growth of South African economy. This means that policy makers and stakeholders in the South African government must implement policies that limit foreign direct investment in the long run to increase economic growth.

Furthermore, there is a positive statistically significant long run relationship between domestic investment and economic growth in South Africa. A 1% increase in domestic investment in the long run in South Africa will significantly result in economic growth increasing by 0.50%, ceteris paribus. These results mean that domestic investment plays an important role on the growth of South African economy in the long run. This means that policies that favour domestic investment in South Africa in the long run must be prioritised as this will help increase economic growth.

There is a negative statistically significant long run relationship between lending rates and economic growth in South Africa, as given in [Table 5](#) above. A 1% increase in lending rates in the long run in South Africa will significantly result in economic growth

declining by 1.02%, *ceteris paribus*. These results mean that an increase in lending rates is not good for the growth of economic growth in South Africa in the long run. Policies that keep lending rates low in the long run must be prioritised to increase economic growth in South Africa.

Moreover, there is a positive statistically significant long run relationship between broad money and economic growth in South Africa. A 1% increase in broad money in the long run in South Africa will significantly result in economic growth increasing by 0.49%, *ceteris paribus*. These results mean that broad money plays an important role in terms of the growth of South African economy in the long run. Therefore, policies that favour an increase in broad money in the long run in South Africa must be promoted in order to increase economic growth.

Table 6: ECM and Short Run Relationship

ARDL Error Correction Regression and short run relationship				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-2))	-0.246242	0.084455	-2.915649	0.0061
D(FDI(-2))	-0.197490	0.095972	-2.057786	0.0469
D(LR(-2))	0.094860	0.073802	1.285332	0.2069
D(BM(-2))	0.078906	0.023422	3.368833	0.0018
D(INV(-2))	0.225554	0.115701	1.949450	0.0591
CointEq(-1)*	-0.450997	0.057123	-7.895206	0.0000
R-squared	0.765638			
Adjusted R-squared	0.737057			
Durbin-Watson stat	2.238232			

Source: Author's own computation Significance level: (***),(**),and (*) 10%, 5%, and 1% respectively

Cointegrating Equation:

$$D(GDP) = -0.450997349894*(GDP(-1)) - (-1.31617361*D(FDI(-1)) + 0.50012263*D(INV) - 1.01868033*D(LR(-1)) + 0.49105621*D(BM(-1)) + 0.53218463))$$

The results of the short run relationships are given in [Table 6](#) above. There is a negative statistically significant short run relationship between foreign direct investment and economic growth in South Africa. A 1% increase in foreign direct investment in the short run in South Africa will significantly result in economic growth declining by 0.20%, *ceteris paribus*. These results are consistent with the study carried by [Khobai et al. \(2018\)](#) and contradicts the study by [Sunde \(2017\)](#). These results mean that foreign direct investment is not good for economic growth in South Africa in the short run. It can, therefore, be suggested that policies that reduce foreign direct investment in South Africa in the short run must be prioritised to increase economic growth.

Furthermore, there is a statistically insignificant short run relationship between lending rates and economic growth in South Africa. A 1% increase in lending rates in the short run in South Africa will insignificantly result in economic growth increasing by 0.09%, *ceteris paribus*. Though the results are insignificant, the positive contribution of lending rates on economic growth in South Africa in the short run means that the lending rates play an important role in promoting the growth of the economy. This means that policies that favour increase in lending rates in the short run must be prioritised as this results in an increase in the growth of the South African economy.

There is a positive statistically significant short run relationship between broad money and economic growth in the short run in South Africa. A 1% increase in broad money in the short run in South Africa will significantly result in economic growth increasing by 0.08%, *ceteris paribus*. These results mean that broad money plays an important role in stirring the growth of the South African economy in the short run. This means that policies that favour an increase in broad money in the short run must be prioritised as this will result in increased economic growth in South Africa.

There is a positive statistically significant short run relationship between domestic investment and economic growth in South Africa. A 1% increase in domestic investment in the short run in South Africa will significantly result in economic growth increasing by 0.23%, *ceteris paribus*. These results mean that domestic investment plays an important role vis-a-vis the growth of South African economy in the short run. This means that policies that favour increase in investment in the short run must be prioritised to increase economic growth in South Africa.

The result of the ECM shows that the error correction term is negative and statistically significant in South Africa, as given in [Table 6](#) above. The CointEq(-1) coefficient is -0.45 and it is statistically significant with a p-value of 0.0000 and this suggests that 45% of the error in economic growth is corrected within a year towards long run equilibrium. The study carries the granger causality test as shown in [Table 7](#) below to confirm the causal effect between the variables in the model.

The study further employs Granger causality test with 2 lags to test for causal effects among the variables. The results depicted in [Table 7](#) above show the following: There is one-way causality that runs from economic growth to foreign direct investment which means that in South Africa, foreign direct investment is as a result of economic growth. Therefore, it is essential to stir economic growth as a way of attracting foreign direct investment.

There is one-way causality running from economic growth to domestic investment which means that an increase in economic growth will result in domestic investment increasing in South Africa. There is one-way causality from domestic investment to foreign direct investment meaning that domestic investment is particularly important as it causes foreign direct investment. There is a one-way causality from foreign direct

investment to lending rates which means foreign direct investment is a key factor in determining lending rates as it has a causal effect. There is a one-way causality from broad money to domestic investment meaning that the more the broad money in South Africa, the more domestic investment increases.

Table 7: Granger Causality Test

Null Hypothesis	F-Statistic	Probability
FDI does not Granger Cause GDP	0.54223	0.5854
GDP does not Granger Cause FDI	3.21151	0.0501
INV does not Granger Cause GDP	1.52636	0.2289
GDP does not Granger Cause INV	3.67200	0.0337
LR does not Granger Cause GDP	16.6421	4.0000
GDP does not Granger Cause LR	2.08834	0.1363
BM does not Granger Cause GDP	1.82072	0.1742
GDP does not Granger Cause BM	0.78813	0.4612
INV does not Granger Cause FDI	2.83556	0.0697
FDI does not Granger Cause INV	0.34107	0.7129
LR does not Granger Cause FDI	1.15302	0.3252
FDI does not Granger Cause LR	2.74330	0.0756
BM does not Granger Cause FDI	0.34407	0.7108
FDI does not Granger Cause BM	1.58353	0.2170
LR does not Granger Cause INV	3.85629	0.0288
INV does not Granger Cause LR	5.31089	0.0087
BM does not Granger Cause INV	4.75633	0.0136
INV does not Granger Cause BM	0.62507	0.5400
BM does not Granger Cause LR	5.94920	0.0052
LR does not Granger Cause BM	3.45011	0.0408

Source: Author's own computation

Furthermore, there is bidirectional causality that runs from lending rates to investment meaning that investment and lending rates granger causes each other. Therefore, policies that affect lending rates will also affect investment and vice versa. There is a bidirectional causality that runs from broad money to lending rates, meaning that any policies or actions that affect lending rates will also affect broad money as they granger cause each other. The study performs residual diagnostic tests as given in [Table 8](#) below.

The results of heteroskedasticity test given in [Table 8](#) above show that the Breusch-Pagan-Godfrey, Harvey, Glesjer and ARCH has a probability that is greater than 0.05 meaning that the study fail to reject the null hypothesis (H0) that the residuals are homoscedastic. We can therefore conclude that there is no heteroskedasticity present in the residuals from the study. The probability of the Jarque-Berra is 0.352783 that is above 0.05 the critical value. This means that we fail to reject the null hypothesis (H0)

that the residuals are normally distributed. The study carries the serial correlation test as shown in [Table 9](#) below.

Table 8: Heteroskedasticity Test

TEST	P-VALUE	DECISION
Breusch-Pagan-Godfrey	0.5050	Fail to reject Ho
Harvey	0.7488	Fail to reject Ho
Glesjer	0.4036	Fail to reject Ho
ARCH	0.9839	Fail to reject Ho
Jarque-Berra	0.352783	Fail to reject Ho

Source: Author's own computation

Table 9: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	1.295305	Probability F(2,34)	0.2870
Obs*R-squared	3.327594	Probability Chi-Square	0.1894

Source: Author's own computation

The result of serial correlation confirms that the residuals do not suffer from serial since the probability value of 0.1894 that exceeds 5% implies failure to reject the null hypothesis (Ho) that there is no serial correlation up to 2 lags selected in our model, as shown in [Table 9](#) above. We can therefore conclude that the residuals do not suffer from serial correlation.

Table 10: Ramsey Test

	Value	df	Probability
t-statistic	0.516488	35	0.6088
F-statistic	0.266760	(1, 35)	0.6088
Likelihood ratio	0.356863	1	0.5503

Source: Author's own computation

The results of RAMSEY RESET test given in [Table 10](#) above. The probability of F-statistic is 0.6088 that is greater than 0.05 - the critical value implying failure to reject the null hypothesis (H0) that the model does not suffer from misspecification. Therefore, we can conclude that the model is correctly specified and is a linear model.

The results of the CUSUM and CUSUM squares are given in [Figure 1](#) and [2](#) above. The blue line drifts upwards and downwards without overshooting the 5% critical region (red lines) implying that the model is stable throughout the period from 1970 to 2019 except for the year 2004 where the trendline drifts towards the upper boundary as shown on the CUSUM sum of squares.

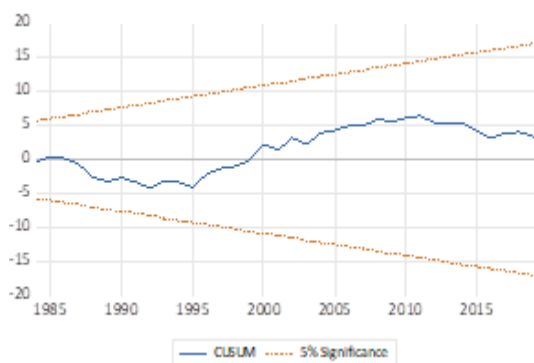


Figure 1: CUSUM

Source: Author's own computation

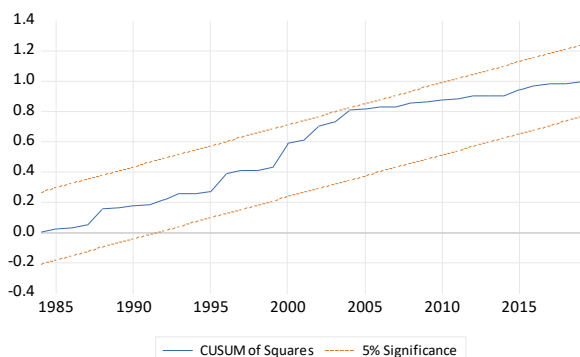


Figure 2: CUSUM of Squares

Source: Author's own computation

5. CONCLUSION AND RECOMMENDATION

The study examines the relationship between foreign direct investment and economic growth in South Africa using time series data from 1970 to 2019. The analysis to determine the impact of foreign direct investment and economic growth in South Africa was conducted by employing an Autoregressive Distributed Lag model. The study has put forth several policy implications which were undertaken to be discussed. Initially, there is sufficient evidence that suggests that foreign direct investment is detrimental for economic growth in South Africa. The relationship between foreign direct investment and economic growth as it is negative both in the short run and long run although in the long run it is not found to be statistically significant. These statistical results review that *ceteris paribus*, an increase in foreign direct investment inflows will result in economic growth declining both in the short and long run. The policy implication of these results are as follows:

Firstly, there is a negative relationship between foreign direct investment and economic growth both in the short run and long run except that in the short run the relationship is insignificant and in the long run, the relationship is statistically significant. In the short run, the government must develop feasible incentives and policies to attract foreign direct investment. In the long run, the government must bring business confidence within the private sector and conducive market conditions. These results call for policy makers to review policies on foreign direct investment in order to boost economic growth in both short and long run period in South Africa.

Secondly, there is a positive statistically significant relationship between domestic investment and economic growth in South Africa both in the short run and the long run period. This means that domestic investment plays an important role in the growth of South African economy. The government therefore must promote policies that increase domestic investment in manufacturing in the short run-in order to increase economic growth in South Africa. One of the areas that the government should increase investment

in is infrastructure as this has been contributing positively on the growth of other developing countries. In the long run, the government must incentivise labour-intensive projects and focus on improving technology.

Thirdly, there is a negative relationship between lending rates and economic growth in the long run in South Africa. This means that the government and commercial banks must promote policies that reduce lending rates in the long run as this will promote economic growth in South Africa. In the short run, the relationship between lending rates and economic growth is positive which means that in the short run, policy makers must increase lending rates to increase economic growth. The government must categorise different interest rates for different sectors in the economy. For instance, if you are investing in infrastructure, you must set a different rate to the one when you are investing in the banking sector.

Fourthly, there is a positive and statistically significant relationship between broad money and economic growth both, in the short run and the long run in South Africa. This call for policy makers and public sector regulators to create an environment that increases broad money in South Africa as this will significantly increase economic growth. Business and households must be encouraged to borrow broad money in South Africa as this increases economic growth.

Based on this study, it is suggested that researchers in the future should consider including variables such as foreign direct investment in their research models to formulate responsive and suitable policies more effectively for the South African economy.

In conclusion, the study analysed the relationship between foreign direct investment and economic growth in South Africa from 1970 to 2019 and has found that foreign direct invest contributes negatively on economic growth while other variables contribute positively to economic growth. Foreign direct investment has been increasing in the case of infrastructure for throughout the period understudy on average more than economic growth, but it has not resulted in increase in economic growth, reducing unemployment and poverty hence we need foreign direct investment that can specifically lead to and facilitate the process of economic growth in the future.

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