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THE IMPACT OF FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH : EVIDENCE FOR SOUTH AFRICA

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Abstract: Foreign direct investment (FDI) is a crucial tool for attracting external flows and building capital in developing countries, sustaining, and accelerating economic growth. International institutes, scholars, policymakers, and researchers emphasize the importance of foreign direct investment (FDI) in the economies of developing nations like South Africa. This study investigated the impact of foreign direct investment (FDI) on economic growth in South Africa using annual time series data from 1985 to 2019. The study utilized the ARDL (Autoregressive Lag Distribution) method to examine the short-run and long-run relationship between foreign direct investment and economic growth. The model uses GDP as a dependent variable, while FDI, inflation (CPI), real interest rate, and saving rate are measured as independent variables The results of ARDL bounds test showed a negative long-run relationship between FDI and economic growth, while saving rate positively correlated with growth. Inflation and real interest rate also had negative long-run relationships. The study recommends the government implement strategies to attract foreign investment, maintain order, combat corruption, ensure political stability, and effectively manage state-owned enterprises for sustained economic growth.

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1. INTRODUCTION

Foreign Direct Investment (FDI) has been identified as an instrument that contributes to the host country's economic growth's sustainability and acceleration (Sawalha, Elian, & Suliman, 2016). Firms can access new technology, establish cheaper manufacturing facilities, create new markets, and market channels, and gain intensive skills because of FDIs, according to Akonnor (2018). Through regulatory investment in enterprises, technological transfer, and a well-functioning state-wide regulatory system, FDIs bring enormous benefits to host countries (Sharma, Umesh, Elangbam, & Achintatya, 2012). Investments from both domestic and foreign sources are necessary for a country to grow and develop. To optimise the potential of investment to assist economic growth, policymakers should focus on what can be done to make the two types of investment work together to give the most benefits for the country (Lerato & Lorainne, 2019). Mallampally and Sauvant (1999) backed this up by pointing out that FDI is essential for developing nations as it helps to create capital, investible resources, and the transfer of manufacturing technology, skills, and inventive ability across locales. Additionally, access to global marketing networks is made possible. FDI benefits businesses in international systems, and local companies can move assets to host economies. Productivity and competitiveness are both increased by stronger supply and distribution relationships.

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 most important tools for increasing a country's output and stimulating economic growth (de Abreu,2017). Globalization has led to a significant increase in foreign direct investment (FDI) in several African countries over the past 20 years, despite not being the top global recipients(Olawumi & Olufemi, 2016; Agrawal & Khan, 2011; Ozturk,2007). FDI is a key driver of economic growth, especially in developing

countries, affecting host countries and multinational corporations by providing additional financial resources through investment and taxation (Asongu, Akpan & Isihak, 2018).

International institutions, academics, researchers, and politicians all agree that foreign direct investment significantly boosts the economic development of underdeveloped nations (Sokang, 2018). Mazenda (2014) found a positive correlation between foreign direct investment (FDI) and South Africa's economic growth, confirming the previous discovery. Ali and Hussain's study highlights the importance of foreign direct investment (FDI) in economic progress when domestic savings are scarce (Ali & Hussain, 2017). FDI has become a significant source of external resource flows to developing nations, contributing to capital formation (Falki, 2009). Despite efforts to attract large amounts of FDI, South Africa receives minimal foreign money in direct investment (Thomas & Leape, 2005). South Africa faces high unemployment rates, especially among young people, requiring urgent job creation measures. The government has implemented policies like GEAR, AsgiSA, NGP, and NDP to stimulate economic growth, create jobs, and boost domestic expenditure, which accounts for most government expenditure and investments (The Presidency, 2011; Tshepo, 2018).

Policymakers in developing countries argue that foreign direct investment (FDI) is crucial for economic growth, as it can create jobs, boost technological development, and improve overall economic conditions (Adewumi,2007). Foreign direct investment (FDI) is the inflow of investment from one country to another, driven by unique competitive advantages or economies of scale. FDI stimulates economic growth and is essential for development, but its impact varies across countries. It has mixed effects on developing economies (Siddique, Ansar, Naeem, & Yaqoob, 2017). The impact of foreign direct investment (FDI) on economic growth is a contentious issue in development economics. The modernization hypothesis suggests FDI promotes growth by providing external capital and bringing innovative technology. However, the dependence hypothesis suggests that FDI has a negative long-term impact, with short-term increases promoting investment and consumption, resulting in immediate economic growth (Tsai, 1994).

According to the Industrial Development Corporation (2013), the economy has seen major changes during South Africa's democratic transition. The average annual rate of real economic growth from 1994 to 2012 was 3.2%, compared to the average annual increase of 1.4 percent between 1980 and 1993. South Africa's GDP increased by 0.79% in 2018 compared to 2017. 2019 had 0.15% GDP growth, which was 0.63% less than in 2018. In 2020, the growth rate decreased even more, reaching -6.96% (World Bank, 2021). The study aims to address the low economic growth in South Africa, which has fluctuated from 1985 to 2019, focusing on factors such as foreign direct investment and the country's ability to improve its economic growth.
Many studies have been done on this topic. Among those who find that foreign direct investment has a positive impact on economic growth are (Kunle, Olowe & Oluwafolakemi ,2014; Trinh & Nguyen ,2015; Tshepo ,2018 ; Fedderke & Hall, 2006 ; Miteski & Stefanova , 2017 ; Sokang, 2018). Conversely, Gul and Naseem (cited in de Abreu, 2016) contend that FDI impedes economic growth. Uwubanmwen and Ogiemudia (2016) claim that foreign direct investment has a minimal and detrimental impact on Nigeria's economy. Mazenda (2014) and Strauss (2015) found conflicting impacts of FDI on growth, suggesting it has a short-term, theoretically contradictory influence on economic growth.

This study will aid scholars in better understanding the mechanisms that support economic growth in southern Africa (Marandu, 2018). It is important that the knowledge generated be used to formulate possible policies that will attract foreign direct investment, boost savings, employment, and economic growth. The South African government has been having discussions about foreign direct investment in the past year. This study will enable policymakers to know the impacts of FDI on economic growth. Researchers and scholars will be able to expand their knowledge through this study, and it can be used as a referral in the future to those who will be interested in further research in this study. This paper contributes to the earlier literature by examining the FDI-growth relationship in the context of South Africa over the period 1985–2019. It has been stated that, despite relatively low levels of FDI inflows, the latter played a critical role in South Africa's economic success. Methodologically, we employ the ARDL Bounds to examine the relationship between FDI and economic growth in both the long and short run. The empirically verified ideas of the study will add to the existing knowledge.

This paper is organized as follows: Section 2 presents a brief review of the literature on the link between FDI and economic growth. Then Section 3 highlights the data used for modelling and some methodological aspects related to the estimations. Section 4 presents the results and discussion. Finally, we will finish this work with a conclusion and some policy implications.

2. LITERATURE REVIEW

Empirical research from various nations at different developmental stages has yielded inconclusive results on the impact of foreign direct investment on economic growth. Using the Ordinary Least Square method (OLS), Sylwester (2005) conducted a study on foreign direct investment, growth, and income inequality in 29 less-developed countries between 1970 and 1990. The findings indicated that FDI positively correlates with economic growth and that the application of three OLS adds to the body of data supporting this correlation. These findings show that FDI promotes economic growth, but there was no connection between FDI and changes in income disparity in terms of how income inequality is distributed. Which has been confirmed by Sokang (2018), who looked at the effect of foreign direct investment using data from the years 2006 to 2016 and the Two-stage Least Squares Method of Simultaneous Equations. His findings showed that foreign direct investment had a favourable impact on economic growth. In contrast to the other studies, Lerato and Lorainne (2019) found a negative association between economic growth and FDI.

Mohammad and Mahmoud (2013) examined numerous studies on the connection between FDI and economic growth from 1994 to 2012, concentrating on the outcomes. This validates arguments made by Mazenda (2014) that foreign direct investment has a mixed influence on economic growth. In some situations, they found a strong positive association between foreign direct investment and economic growth, but in others, they found a negative or no relationship. Akonnor (2018) conducted research spanning the years 2000 to 2015 to analyse the economic effects of foreign direct investment in East and Central Africa. According to the study, FDI positively and significantly affects economic growth in East Africa but not in Central Africa. Although inflation had a negative and statistically significant impact on economic growth in both regions, the population growth rate was shown to have a positive and statistically significant impact on economic growth in both places. While Gul and Naseem (quoted in De

Abreu, 2016) assert that FDI has a detrimental effect on economic growth, Lerato and Lorainne (2019) found a negative correlation between FDI and economic growth.

Ciobanu (2021) examined the effects of foreign direct investment on economic growth in the example of Romania from 1991 to 2018. The existence of a long-run relationship between FDI, trade, labour, and economic growth was investigated using the ARDL bound testing approach. The Granger causality test, which is based on error correction, was used to investigate the direction of causation between the variables. The findings showed that there was cointegration between the variables when real GDP and foreign direct investment were the dependent variables. Foreign direct investment, trade openness, and labour force make up the three primary elements that have an impact on economic growth over the long term in Romania. In addition, over time, expanding GDP, exports, imports, and the entire labour force stimulated foreign direct investment. Ayenew (2022) asserts that there is cointegration between economic growth and foreign direct investment. Tshepo (2018) examined the relationship between foreign direct investment (FDI) inflows and economic growth in South Africa using data from 1980 to 2014. In the study, the vector error correction model was utilised to determine and estimate the long-run relationship between the model's variables. Economic development had a favourable long-run association with both foreign direct investment and the real effective exchange rate, but a negative long-run relationship with government spending, according to the study. Falki (2009), on the other hand, discovered a negative and insignificant link between growth and FDI in Pakistan.

Makhoba and Zungu (2021) investigated the effect of foreign direct investment (FDI) on economic growth in South Africa. The study analysed annual time series data from the South African Reserve Bank from 1960 to 2019. The dynamic connections between foreign direct investment and South Africa's economic growth were investigated using impulse response functions and a VAR technique. The study discovered a positive relationship between foreign investment and increased economic activity, which is favourable to economic growth. South Africa's economy has increased dramatically in response to a favourable FDI shock. Similarly, rising GDP encouraged FDI inflows into South Africa. Similarly, Nketiah-Amponsah and Sarpong (2019) investigated the impact of infrastructure and foreign direct investment on

economic growth in SSA. According to their findings, foreign direct investment interacts with host-country infrastructure to have a positive impact on economic growth.

Teunen, Nubong and Teunen (2022) conducted an empirical study of the impact of foreign direct investment on economic growth in South Africa. The Cobb-Douglas function was utilised in the study, which was constructed using data from 1970 to 2019, with capital separated into a foreign and a domestic component. The Autoregressive Distributed Lag model was used, and the results revealed that labour productivity was statistically significant in its negative relationship with FDI; however, when the lagged data were examined, FDI findings were statistically significant, demonstrating that foreign capital may take some time to fully materialise. According to the Toda-Yamamoto causality test, FDI and economic growth are only causally related in one way. Similarly, Oumarou and Maiga (2019) observed a bidirectional association between trade and economic growth, as well as a unidirectional causal relationship between trade and FDI, with a direction from trade to FDI. Mwitta (2022) analyzed the impact of foreign direct investment (FDI) on Tanzania's economic growth rate using the Vector Error Correction Model and time series annual data from 1990 to 2020. The study found a positive correlation between real GDP growth rate and FDI inflow to GDP ratio, and a negative correlation between gross fixed capital formation to GDP ratio and the real GDP growth rate.

3. METHODOLOGY

3.1 Research design

The study on the impact of FDI on economic growth in South Africa was conducted using quantitative analysis. The quantitative method will be analyzed to give empirical findings, so the testing of the hypothesized predictors with FDI and economic growth is required. The empirical findings were used to suggest some essential recommendations to the FDI as well as the host country, so they could identify the relationship between FDI and growth. The influence of foreign direct investment on South Africa's economic growth was evaluated using secondary data sources. The dependent variable in this study was economic growth, while the independent variables included in the analysis were foreign direct investment (FDI), inflation rates (CPI), saving rates (SR), and foreign exchange rates (EXR). Time series data from 1985 to 2019 were

used in the analysis. The data was sourced from the World Development Indicators (WDI) database.

3.2 Model specification

The researcher used the model developed by Bouchoucha and Ali (2019) to examine the impact of foreign direct investment on economic growth in Tunisia; the researchers used two variables - foreign direct investment and economic growth - and introduced three new variables - inflation rate, saving rate, and interest rate. This is consistent with Trin and 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:

$GDP=f(FDI,RIR,EXR,INF,SR)$……(1)

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:

$GDP_t = \beta_0 + \beta_1 FDI_t + \beta_2 RIR_t + \beta_3 INF_t + \beta_4 SR_t + \varepsilon_t$ …….. (2)

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

$\beta_0 - \beta_4 =$ 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. The prior expectations are : $\beta_1 > 0; \beta_2 < 0$; $\beta_3 < 0$, and $\beta_4 > 0$.

4. RESULTS AND DISCUSSION

Before proceeding with the ARDL estimation, we first examine the order of integration of the individual variables using unit root tests of ADF (Dickey and Fuller) and FP (Phillips and Perron). The variables are integrated of orders zero and one and therefore it makes the ARDL method applicable to estimate the growth model since the variables are integrated of orders zero and one.

4.1. Unit root test Results

The cointegration test (or limits test), which is a component of the ARDL technique, is based on the supposition that the variables must be integrated on a scale of zero or one; if the variables are integrated on a scale of two or more, this test is no longer relevant (Pesaran et al., 2001). As a result, we must use the unit root tests (ADF and PP) at the outset of our research to determine the degree of integration of the model variables. These tests are based on the non-stationarity hypothesis H0, which is the null hypothesis. The T-statistic of the various series must be greater than the critical value at the threshold level of 5% for us to agree on a unit root, which indicates that the series are non-stationary according to the ADF test and the PP test's guiding principle. The informal unit root test was used before ADF and PP tests, providing a graphical presentation of each variable in both level and first difference form(Figure 1 &2).

4.1.1. Informal unit root Test

Figures 1 and 2 provide a graphical presentation of each variable in both level and first difference form. In level form (Figure 1), GDP and FDI do not exhibit any trends suggesting that they are integrated of order zero. Consequently, trends are noticeable in the rest of the variables, i.e., interest rate, inflation, and saving rate. This implies that the variables are not stationary at level 1.After first differencing, as in figure 2, all variables are stationary, as none

of them exhibit any trend. This implies that the variables used in this study are integrated into orders I(0) and I(1).

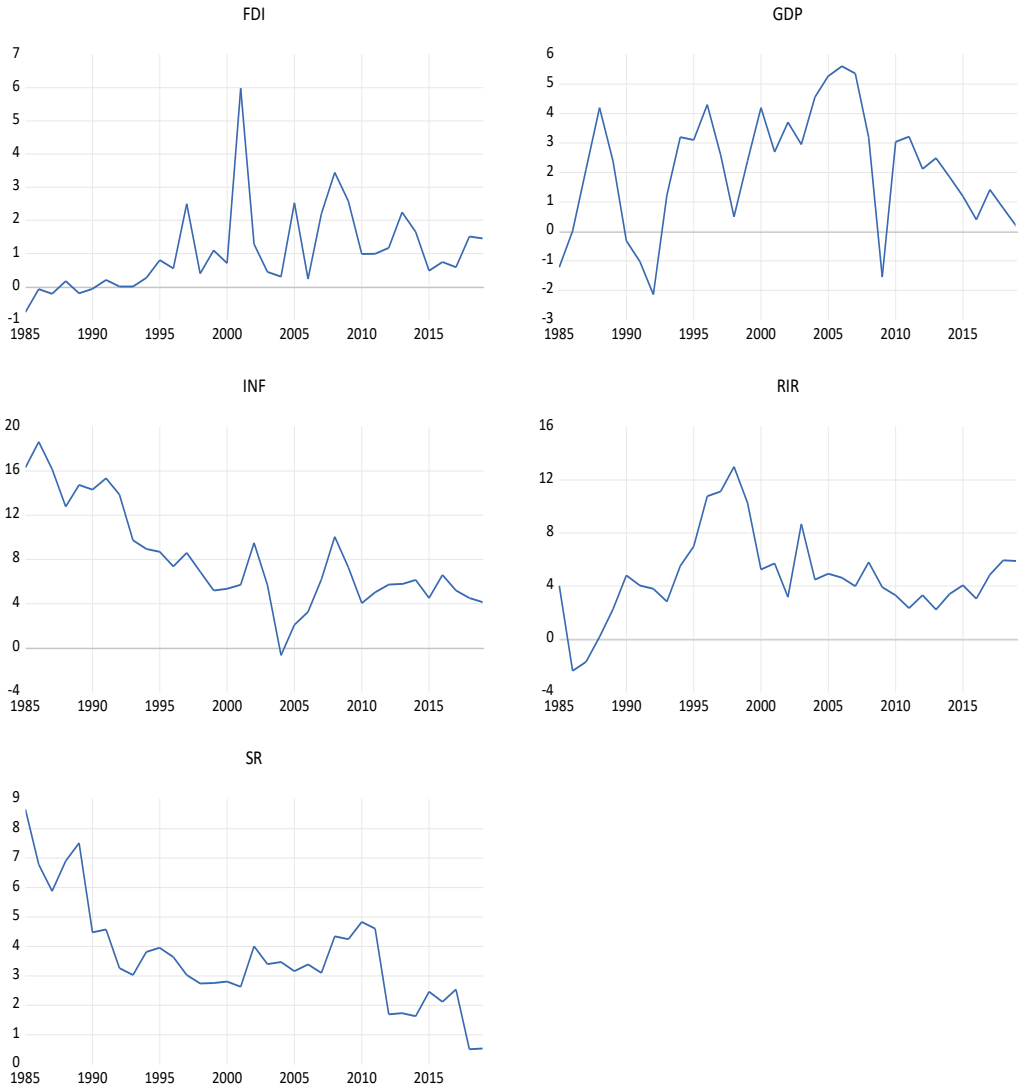

Figure 1: Graphical analysis of unit root at levels

Source: Author (compiled from E-views)

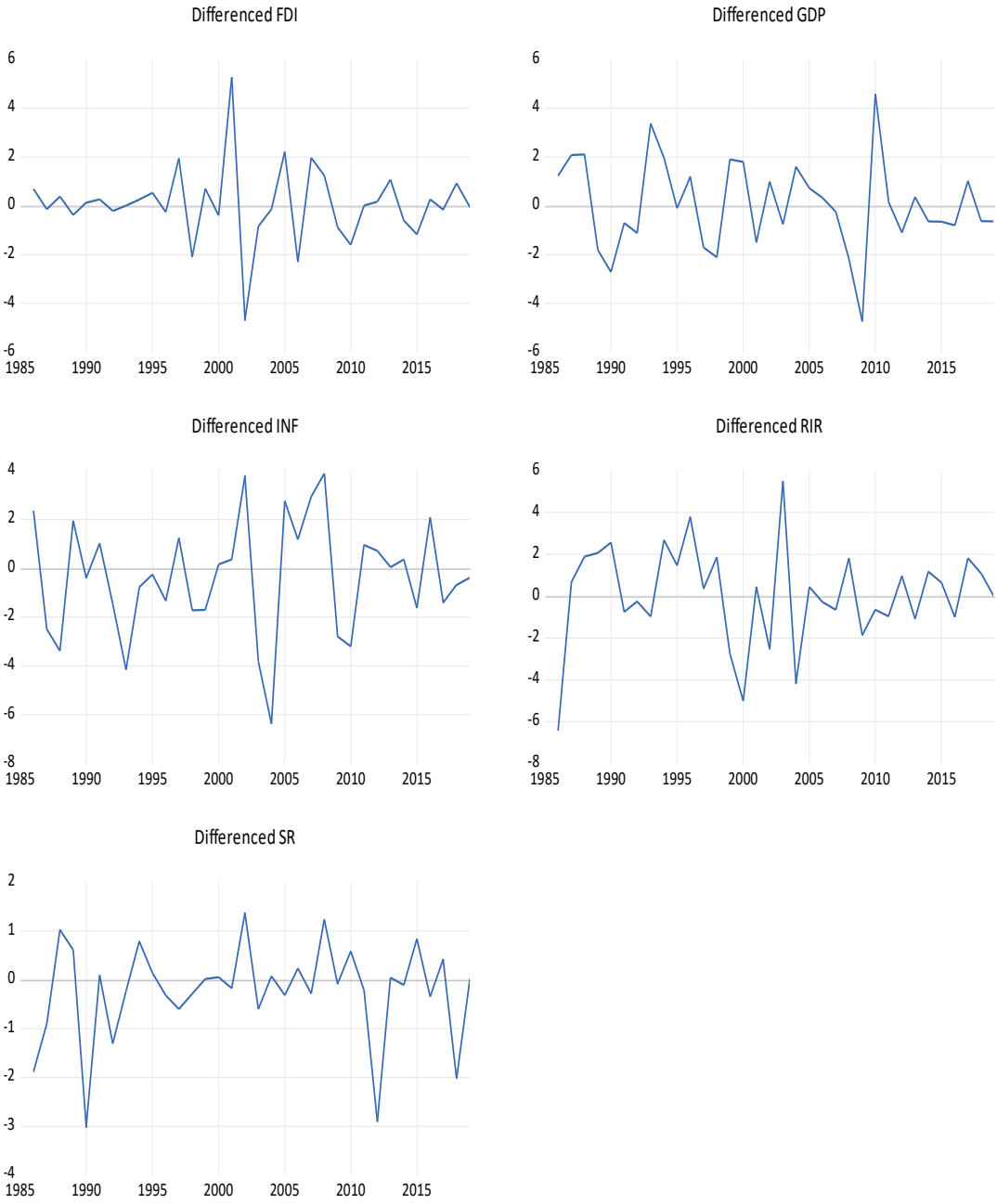

Figure 2: Graphical analysis of unit root at first difference

Source: Author (compiled from E-views)

4.1.2. 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 1 and Table 2 below. The results show that most variables failed to pass both the ADF and P-P tests when they were at the same level.

Table 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 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 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.

4.2. Lag order selection criteria

An essential econometric exercise in regression is figuring out the ideal lag time for an autoregressive process. The suitable lag length and vector autoregressive (VAR) order were then determined in this investigation. According to Table 3, the study's ideal latency was 2 out of a possible 3. The type of variables under inquiry and, most significantly, the quantity of observations contained in the models being estimated are what determine the amount of lags to be utilised in the regression, according to Liew (2004). When analysing sample sizes with 60

or less observations, Liew (2004) discovered that the Aikake Information Criterion (AIC) and the Final Prediction Error (FPE) were superior to other criteria. Granger (1986) asserts that finding the criterion with the lowest value is the simplest method for choosing the best one. Based on these presumptions, the FPE was chosen since, as shown in Table 3, it has the lowest value of 2.32 compared to the AIC's 3.97.

Table 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
		6.237965			3.969228	
1	-53.11044	*	2.365560	3.694402	*	3.785499
			2.324705	3.674284		3.780564
2	-51.78855	2.065454	*	*	3.994914	*
3	-51.23890	0.824477	2.399786	3.702431	4.068865	3.823894

Source: Author (compiled from E-views)

4.3. Results of Cointegration Test : Bounds Test

Table 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)

We employed the bounds cointegration test to determine whether there is a long-term relationship between economic growth and its explanatory factors, which include foreign direct investment, inflation, interest rate, and saving rate. The null hypothesis, which states that there is no long-term interaction between factors, was examined. Table 4 demonstrates that the

estimated F-statistic of 9.59 is greater than the upper bounds critical values of 5.72, 4.57, and 4.06, respectively, at 1%, 5%, and 10% levels of significance. As a result, the null hypothesis of no cointegration was rejected, leading to the conclusion that there is a long-run relationship between economic growth, foreign direct investment, inflation, interest rate, and saving rate. The ARDL analysis was carried out as part of the investigation.

4.4. ARDL model regression results

4.4.1. Long – run estimates

Table 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 is demonstrated in the following equation:

GDP = -0.2193FDI - 0.8596INF - 0.3145RIR + 0.2503SR …….....(2)

Equation 2 shows that FDI, INF, and RIR have a negative long-run relationship with economic growth, whereas SR has a positive relationship with economic growth. It is worth noting that INF and RIR are statistically significant in explaining economic growth, as shown above, because their p values of 0.0000 for INF and 0.0335 for RIR are less than 0.05.

The coefficients for FDI, INF, and RIR show a negative association with growth, whereas SR shows a positive relationship with growth. As a result of the findings, a 1% increase in FDI resulted in a 21.9 percent decrease in GDP. In the long run, the negative relationship between FDI and GDP contradicts the Modernization Theory, which states that an increase in FDI should eventually lead to an increase in GDP, indicating a positive link between the two macroeconomic variables. These findings, however, support the Dependency Theory, which

holds that foreign direct investment has a detrimental impact on the host country's economic growth. Brecher and Diaz-Alejandro (1977) support the Dependency Theory and claim that FDI may have a negative impact on the receiving country's economic growth if multinational corporations return large profits to their parent countries. Herzer (2012) discovered in a similar study that FDI has a negative influence on economic growth in poor nations because it limits capital accumulation by claiming scarce resources, crowding out domestic investment. Similar findings were reached by Saqib, Masnoon and Rafique (2013), who proposed that the negative impact of FDI on economic growth was attributable to Pakistan's inadequate economic policies. Woldemedhin (2021) indicated that a negative relationship between FDI and economic growth is not uncommon in empirical study. In fact, this is consistent with the view that the relationship between FDI and economic growth is equivocal. Melak (2018) shown in Ethiopia that there is a short-term detrimental link between FDI and economic development. Furthermore, Ayanwale (2007) and Simionescu (2016) have shown that FDI in Nigeria has a negative impact on the expansion of the manufacturing sector, which in turn has a negative impact on the nation's economic growth.

In South Africa, factors such as corruption, mishandling of funds, weak or collapsed state-owned firms, and political instability may have contributed to a negative association between FDI and economic growth. This is contrary to our prior expectation of a positive relationship between FDI and economic growth, 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 further shows that inflation has a negative impact on growth. A one-unit increase in inflation results in an 85.9% drop in GDP. These findings are consistent with the earlier predictions. The result is corroborated by the works of Adaramola and Dada (2020), Ramzan (2021), and Tien (2021), who argue for an FDI-GDP link in Nigeria, Pakistan, and Vietnam, respectively; it also aligns with structuralists' views. This result shows that inflation discourages long-term growth in an economy because it diminishes the purchase power of money, hurting consumer consumption and investment, which could have induced growth prospects for the country.

RIR has a negative impact on GDP, which is consistent with theoretical predictions. Table 5 shows that a unit increase in RIR generates a 31.5 percent decrease in GDP. High interest rates, in principle, make saving more appealing to consumers, limiting spending. A rise in interest rates raises the cost of borrowing, discouraging investment. Consumption and investment are important components of aggregate demand, therefore when they fall, GDP falls. These findings are consistent with those found by Hatmanu, Cautisanu and Ifrim (2020), Iorember, Jelilov, Alymkulova, and Yua (2022), and Tajudeen, Olusola and Ademola (2017) in Romania, Nigeria, and Sub-Saharan African economies.

In the model, SR is the only variable that has a positive effect on GDP. A one-unit rise in the saving rate results in a 25% increase in GDP. The reasoning is that high savings rates enhance the quantity of capital available for investment, resulting in faster GDP growth. Rosado and Rosado and Sanchez (2017) discovered comparable findings in Ecuador, as did Coskuner and Olasehinde-Williams (2017), who examined panel data from 20 countries. The coefficients for FDI and SR, as shown in Table 5, are statistically insignificant in explaining growth because their probability values are greater than 0.05. As a result, it is possible to conclude that FDI and SR have no major impact on long-term growth, whereas INF and RIR have a considerable negative impact on long-term GDP. This is consistent with the findings of John (2019), who determined that FDI has little influence on growth in Kenya's agricultural and manufacturing sectors. Similarly, Gunby (2017) discovered that the estimated impact of FDI on Chinese economic growth is statistically insignificant, contradicting the findings of Mazenda (2014), who conducted a similar study and discovered that FDI has a significant impact on GDP in South Africa.

4.4.2. Short – run estimates

Table 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 component that displays the rate at which equilibrium in the growth model is regained. In other words, it represents the rate at which a previous period's disequilibrium is resolved. A negative coefficient indicates convergence, whereas a positive coefficient indicates divergence; thus, the cointEq (-1) is said to be significant when its value is negative and less than one, and its probability value is less than the chosen 5% significance level (Nkoro & Uko, 2016). Table 6 results show a large cointEq (-1) value of -0.7782, indicating that the speed of adjustment is around 77.8 percent. This means that anytime there is a disturbance in the model, the adjustment from the short run deviation to the long run equilibrium happens quickly.

RIR and SR were seen to be favourably associated to short-term growth, whereas INF was discovered to be negatively related to short-term GDP, and FDI and RIR were discovered to be unimportant in explaining short-term growth. According to the study, only INF and SR have a substantial impact on growth in the short run.

4.5. Granger Causality test results

Table 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)

Granger Causality analysis was performed to better understand the causative link between GDP and the independent variables (FDI, INF, SR, and RIR), and the findings are shown in Table 7. The results in Table 7 indicate no causation association between FDI and GDP, and because the p-value is greater than 0.05, we failed to reject the null hypothesis that FDI does not granger cause GDP. However, as shown in Table 7, INF tends to granger cause both GDP and FDI.

4.6. Impulse response results

The impulse response function is a useful tool for supplementing results from the ARDL-ECM model since it explains how shocks in the growth model will respond. Figure 1a-d depicts the

Impulse Response Analysis results. The blue (continuous) lines show the impulse response function, while the red (broken) lines provide the 95% confidence intervals. The impulse response analysis results are important since the impulse response function is between the confidence intervals in all four cases.

Figure 1a depicts the relationship of GDP to FDI. A one standard deviation shock (innovation) to FDI initially boosts GDP until the fourth period, when it begins to fall. This negative response endures until the seventh period, when it reaches its steady-state value, after which it steadily increases up to the tenth period, when it reaches zero, albeit with growing inclinations. This suggests that FDI shocks will have a beneficial influence on GDP in both the short and long run. Figure 1b depicts GDP's reaction to INF. In the early stages - periods 1 and 2 - a one standard deviation shock (innovation) to INF induces a substantial decrease in GDP. This is followed by an increase in GDP to a stable state in period 5, where it continues in a more stable and linear manner, implying that INF shocks have a negative influence on GDP in the short run. As seen in Figure 1c, a one standard deviation shock (innovation) to RIR produces results comparable to INF. The shock initially produces a decrease in GDP, followed by a steady rise from period 2 onwards, before reaching a stable condition from period 4 to 10.

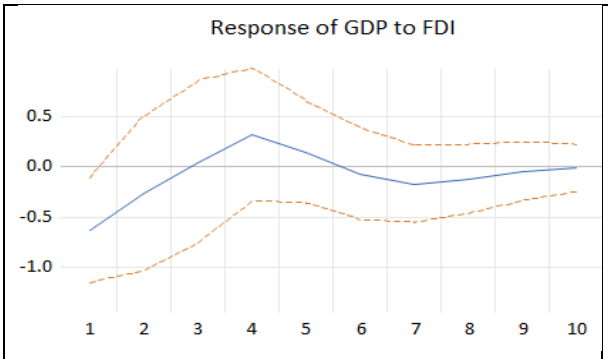

Figure 1 a Response of GDP to FDI

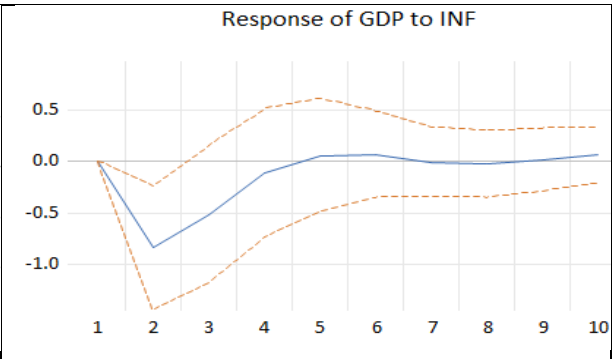

Figure 1b Response of GDP to INF

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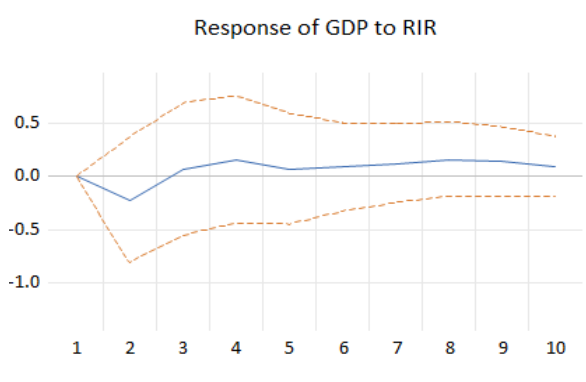


Figure 1c Response of GDP to RIR

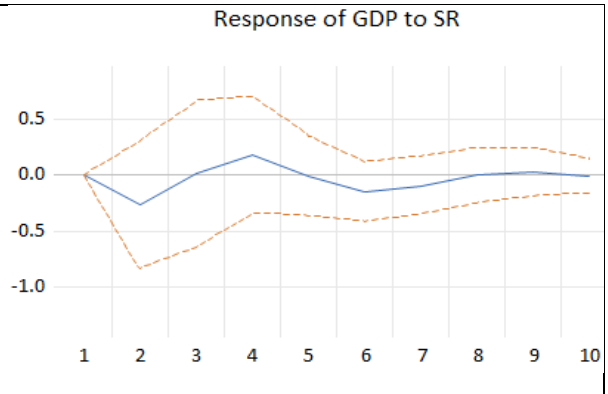


Figure 1d Response of GDP to SR

Source : Author (compiled from E-views)

4.7. Variance decomposition analysis

Table 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 indicates the fraction of the forecast error variance owing to each variable's shocks and shocks in the system's other explanatory variables. Table 8 shows the findings of the variance decomposition analysis. The variance decomposition analysis in Table 8 spans up to ten years to examine the impact of factors on GDP over a rather long period of time. A 100 percent forecast error variation in GDP in the first year is explained by its own shocks; other variables have no influence on GDP. From Period 2 onwards, the variance contribution rate of other variables consistently grows in each period up to the tenth year, whereas GDP gradually drops.

As indicated in Table 8, FDI accounts for approximately 83.31 percent of projection error variation, while GDP accounts for the remaining 16.69 percent. From the second period onwards, the variance contribution rate of other variables progressively grows in each period up to the tenth year, whilst that of FDI dramatically drops. GDP's effect grows consistently over time, peaking at 22.82 percent in the third year and gradually declining to 21.65 percent after 10 years. The importance of the other three variables (INF, RIR, and SR) grows over time. A similar pattern may be seen for INF, RIR, and SR. During the first period, the forecast variance error for the three variables is 89.17 percent, 95.91 percent, and 74.48 percent, respectively; this is explained by their own shocks, with the remainder supplied by other factors. Following that, the variance contribution rate of the variable under examination drops while the variance contribution rate of other variables increases disproportionately (see Table 8). These findings are consistent with economic theory, which indicates that shocks to the explanatory variables must explain a significant portion of the variation in GDP. The outcome is also consistent with the findings of the impulse response analysis.

4.8. Diagnostic tests

Table 9: Diagnostic tests

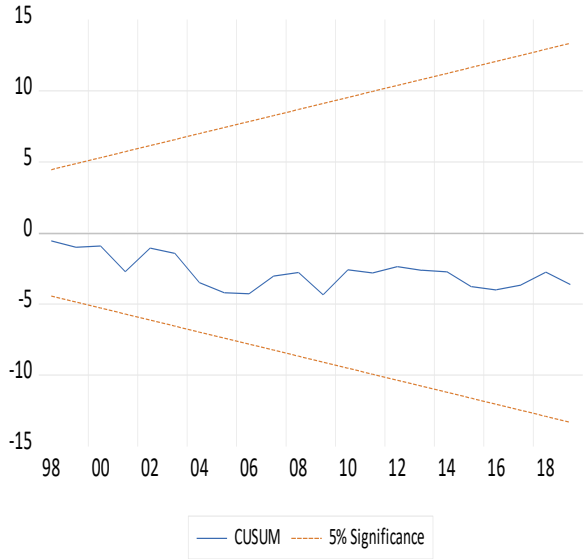
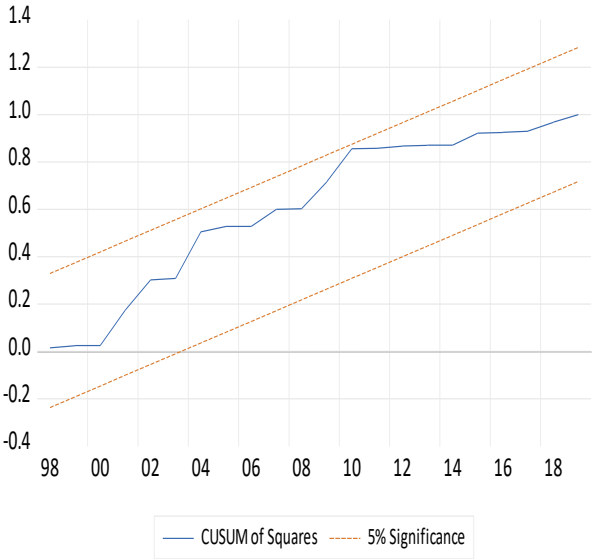
	Null hypothesis	P-value
LM test	No Serial correlation	0.2646
BPG test	No conditional heteroscedasticity	0.8665
JB test	There is a normal distribution	0.3911

Source: Author (compiled from E-views)

Table 9 shows the probability values for four diagnostic tests performed on the growth model to confirm the validity of the results. At 5% significance level, the LM test was used to test for serial correlation with the null hypothesis that no serial correlation occurs in the models. Because the P-value is more than 0.05, the null hypothesis will not be rejected. This signifies that there is no serial correlation in the model. The BPG test for heteroscedasticity found that the model is homoscedastic, as evidenced by a probability value of 0.8665, which is larger than 5%.

Figure 2a CUSUM test and Figure 2b 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 2a : CUSUM test	Figure 2b: CUSUMSQ test
	

Source: Author (compiled from E-views)

5. CONCLUSION

The objective of this paper is to study the impact of foreign direct investment on economic growth in south Africa over the period 1985 to 2019. To accomplish this goal, we used the ARDL Bounds to examine the short-term and long-term relationship between the variables under consideration. The long run model results indicate a negative association between foreign direct investment and economic growth, although foreign direct investment was shown to be unimportant in explaining short-term growth. Granger causality reveals no relationship between FDI and economic growth. The negative association between FDI and economic development indicates scepticism over whether FDI has benefitted South Africa's economic growth.

The null hypothesis given in this study was that foreign direct investment has a beneficial impact on South African economic growth. We reject the null hypothesis based on the regression results. This is corroborated by Istaiteyeh and Ismail (2015), who determined that FDI has a negative link with economic growth, as well as Woldemedhin (2021), who stated that

a negative correlation between FDI and economic growth is not uncommon. This is consistent with the view that the relationship between FDI and economic growth is equivocal; in the instance of South Africa, this could be due to corruption, failed state-owned companies, political risk, and exposing the country to foreign political interference. The researcher suggests that the government devise methods or strategies to attract foreign direct investment and ensure that the country's affairs are in order, such as combating corruption and crime while also ensuring political stability and well-managed state-owned enterprises. The researcher recommends that the future study focuses on specific international companies which are fully operationally in South Africa to assess the impact of foreign direct investment on economic growth in South Africa. The researcher also suggest that the future study include variables which affects the state of the economy such as corruption and crime.

CONFLICTS OF INTEREST AND PLAGIARISM

The authors declare no conflict of interest and plagiarism.

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