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-RESEARCH ARTICLE-

AN EMPIRICAL ANALYSIS OF THE GROWTH IMPACT OF FOREIGN DIRECT INVESTMENT IN THE SOUTH AFRICAN ECONOMY

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─Abstract─

South Africa's economy is confronted by the triple threat of poverty, unemployment, and inequality, all of which have been exacerbated by the country's inability to maintain a positive growth rate. The rising globalisation of the world has increased the attractiveness of Foreign Direct Investment for emerging markets. To determine the success of FDI in improving economic growth in the South African economy, a modified Cobb-Douglas function was created using data from 1970 to 2019, with capital disaggregated into a foreign and a domestic component. Domestic investment had a positive and statistically significant effect on economic growth when an Autoregressive Distributed Lag model was used; however, FDI and labour productivity had a negative effect, with labour productivity being statistically significant. However, when the lagged values are analysed, FDI produces statistically significant results, demonstrating that foreign capital may take time to materialise completely. Additional application of the Toda-Yamamoto causality test demonstrates that one-way causation exists between FDI and economic growth. This suggests that while FDI has the potential to be a long-term solution to South Africa's stunted growth, the concerns of an untrained workforce and

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inadequate infrastructure must be addressed for FDI to be effectively utilised.

Keywords: Economic growth, Foreign Direct Investment, Technology spillover, Domestic investment, Crowding out effect.

1. INTRODUCTION

South Africa was able to reassert itself as one of Africa's largest developing markets and accelerate economic growth in the post-apartheid era throughout the early 2000s. A substantial portion of South Africa's post-apartheid prosperity has been attributed to the trade and trade liberalisation policies that accompanied its reintroduction to the rest of the world, notably a reduction in trade tariffs and obstacles prominent in the late 1980s early 1990s (Hviding, 2005). This may be seen in Figure I, which depicts the period 1999 to 2007:

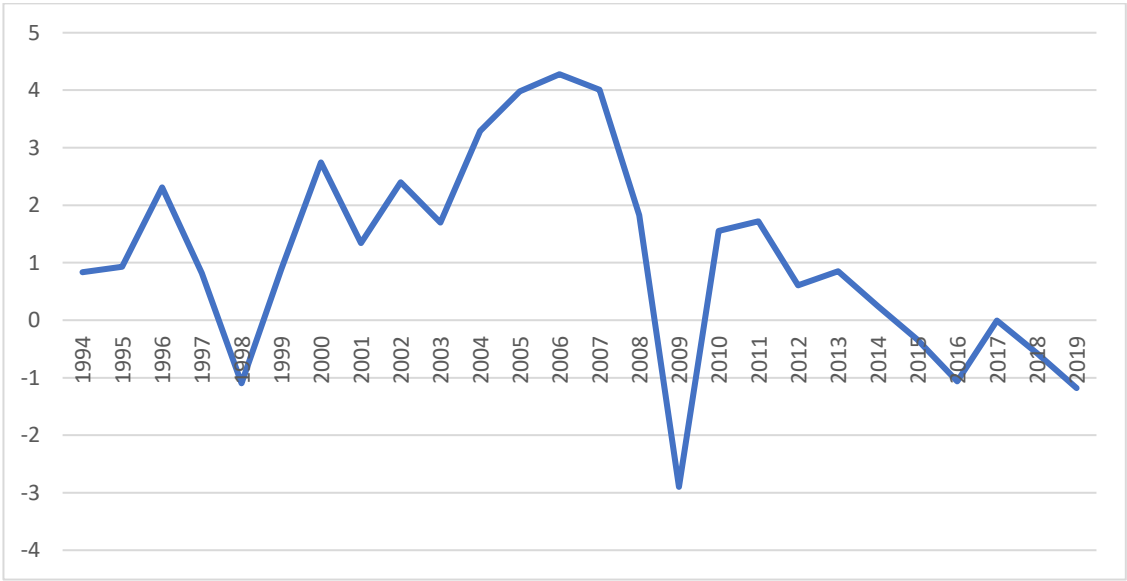

Figure I: GDP per capita growth rate in South Africa
Source: Author's figure, generated using data from Bank (2020).

However, the 2008 financial crisis drastically slowed the South African market's growth rate, and the market has struggled to re-establish itself in the years since. The country's growth rates peaked at 1.2% in 2011 before dipping into negative territory in early 2015. (Bank., 2019). The government noted the lack of growth rates in its 2012 National Development Plan (NDP) and said that at least 5% must be attained by 2030. ((NPC), 2012).

As illustrated in Figure 1, economic growth remained much lower than the intended target of 5% in 2019, implying that the government has struggled to confront the triple threat of poverty, unemployment, and inequality (Kikulwe et al., 2020). Given South

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Africa's volatile currency rate and dwindling commodity prices, the country has struggled to boost economic growth through the primary sector (Bank, 2020). Given the success of Singapore and Hong Kong in transitioning from developing to developed countries via a substantial inflow of Foreign Direct Investment (FDI), the issue arises as to whether South Africa could benefit from a comparable large inflow of foreign investment (Briard et al., 2020).

Fedderke et al. (2006), M Tshepo (2014), and Mazenda (2014) have already examined the influence of FDI on growth in South Africa. Fedderke et al. (2006) and M Tshepo (2014) discovered that FDI was beneficial to economic growth, with a positive link between FDI and economic growth. Mazenda (2014) discovered that FDI was not as effective at stimulating economic growth in South Africa, with a negative association between FDI and economic growth in the country. Thus, the impacts of FDI on economic growth in South Africa remain debatable, with prior research yielding widely disparate outcomes (Duke et al., 2020).

The purpose of this study is to contribute to the current empirical literature on the effect of FDI on economic growth in the South African economy. The second section of this study will introduce the theoretical framework employed. Section 3 will review prior empirical research on the effect of foreign direct investment in fostering economic growth in the South African market. Section 4 of this study will detail the data, period, and models utilised to estimate the influence of FDI on growth in South Africa. Section 5 of this study will include the findings of these tests. Finally, Section 6 will discuss the study's findings and make policy recommendations in light of them.

1.1 Theoretical Framework

The study applies endogenous growth theory to understand better how capital accumulation can affect economic growth in the South African economy. Following the adoption of the Solow model, economists agreed that technological innovation is critical in allowing the economy's output to rise (Solow, 1956). According to (Fan, 2002), because technical advancements are exogenous, many governments have struggled to sustain policies utilised to boost economic growth in the host countries (Habanabakize, 2020). This shifted the focus of many economists to the role of indigenous technology within the country, which might be enhanced to boost economic growth in host countries (Borensztein et al., 1998).

Exogenous growth theories postulated that diminishing marginal returns on capital were factors in a country's capital accumulation. According to Frankel (1992) , the original Cobb-Douglas function may have overlooked the flexibility of inputs within a country or the influence of a country's fast rise in technology (Gudalov et al., 2020). These variables may enable the country to avoid the diminishing marginal returns normally associated with capital (Howitt, 2010) . This resulted in the development of the AK model, which is predicated on the following assumptions:

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- Capital can exhibit constant marginal returns.
- Labour is seen as a constant, which is shown by A.

The following equations for output and capital per capita growth could be obtained.

$Y_t = K_t{}^1 A$ .....(2.1)

$k_{t+1} - k_t = sAk_t - \delta k_t$ .....(2.2)

$\frac{k_{t+1}-k_t}{K_t} = SA - \delta$ .....(2.3)

According to the equations shown above, it is obvious that when capital has constant marginal returns, an economy should be able to grow its output per capita constantly by guaranteeing that the savings rate surpasses the country's depreciation (Sørensen, 2005). Following the development of the AK model, a secondary wave of endogenous growth theories was sparked by Paul Romer's ideas and coined the term "innovation-driven growth" (Howitt, 2010).

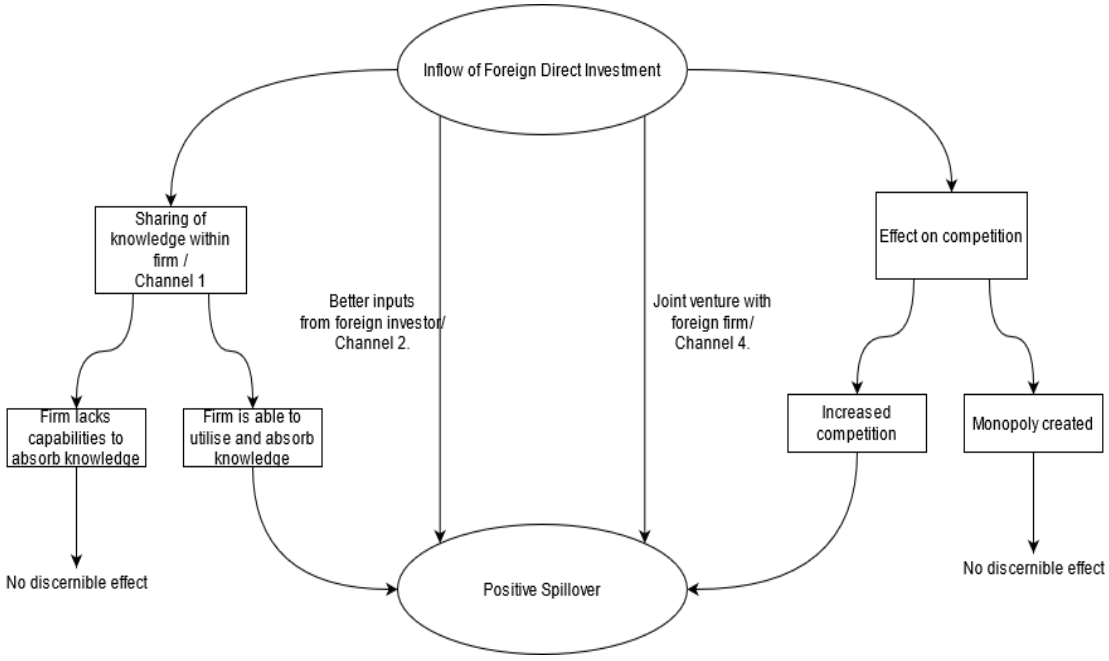

Figure II: various channels for technology spillover within the South African context
Source: Author's diagram.

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Technology diffusion will enable underdeveloped countries to catch up to rich ones (Dees, 1998). Numerous countries, notably in Africa and Asia that have been unable to incorporate technology advancements efficiently have struggled to maintain high development rates and remain developing economies (Sachs, 2002). Increasing technology within a country should consequently become a primary policy objective. Thus, the role of foreign specialists and the inflow of FDI from developed to developing markets has become a vital aspect of policymaking in less developed economies (de Mello, 1999). The following diagram illustrates four channels through which technology diffusion within a country results in increased economic growth and production:

Four channels can be used to demonstrate how developing countries might leverage FDI to strengthen their host country's domestic manufacturing capabilities (Kinoshita, 2000). To begin, by emulating the behaviour of foreign enterprises, one can refine manufacturing procedures and increase productivity. Second, overseas suppliers may be able to provide higher-quality intermediate goods, contributing to improving local goods' quality (Valencia, 2020). Thirdly, foreign enterprises entering the local market may spur local firms to innovate to survive and strengthen their local capabilities (Kamaly, 2014). Finally, if partnerships with foreign companies are formed, information transfer will help domestic industries enhance productivity (Kinoshita, 2000).

However, for channel 1 to be a viable alternative, the host country's enterprises must be capable of absorbing the information and technology given by international firms (Lim, 2001). This is referred to as a business's absorptive ability. The term "absorptive capacity" refers to a corporation's ability to leverage external information, research, and prospects presented by a foreign firm (Cohen, 1990). Assuring that indigenous enterprises can benefit from the information provided by foreign entities would have to become a priority for policymakers (Wallenius et al., 2020). The second and fourth channels depicted in Figure III should increase economic growth, as increasing quality suppliers and establishing long-term partnerships should logically result in higher local manufacturing and economic growth (Yoon et al., 2020).

The third route described by Kinoshita (2000) focuses on how an inflow of FDI can rise in competitors' productivity. This is based on the concept of externalities, where a third party benefits from the acts of another party (Black, 2011). As a result, when foreign enterprises enter the market and conduct business, their actions may result in unexpected benefits for domestic firms, such as access to new resources or the arrival of new suppliers (Matthews et al., 2020). Additionally, non-competitive markets, in some cases monopolies, are granted less market power, resulting in social waste as a result of the decreased amount produced and higher prices connected with these market arrangements (Fourie, 2015). As a result, ensuring competitive practices should remain a critical component of South African policymaking.

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Thus, FDI inflows can greatly enhance productivity inside a country when enterprises have the necessary skills to use these inflows and when FDI inflows result in an increase in innovation within the country. Numerous commentators have noted that an excessive influx of FDI may hinder indigenous investment (De Backer et al., 2003). A simple definition of a country's investment levels can be found in equation 2.4 below:

$$I = I_D + I_F \quad \ldots\ldots(2.4)$$

I mean total investment within an area, ID denotes domestic investment, and IF denotes foreign investment within a country (Jan Mišun, 2002). The IF in this model will be based on the assumption that all levels of FDI will increase stock levels within the country and may be classified as investment in the expenditure method's investment portion. Domestic investment is crowded out when an increase in FDI results in a proportionately lesser rise in overall domestic investment (Agosin et al., 2005). Therefore, if domestic investors are deterred from participating in the domestic market, the rise in FDI may be less successful than previously demonstrated through the routes mentioned in the study. Understanding the relationship between domestic investment and FDI in the domestic market will be critical as the study progresses into sections 3 and 4.

2. LITERATURE REVIEW

Section 3 of this study will conduct an empirical evaluation of the literature on the influence of foreign direct investment on economic growth in the South African market. Fedderke and Romm conducted one of South Africa's post-apartheid Fedderke et al. (2006). The primary objective of this study was to ascertain whether a spillover effect existed inside the domestic South African market and whether local investors would be displaced within the domestic South African market. The study used GDP as the dependent variable and FDI, fixed capital, and employment rate as independent variables within South Africa to develop a vector error correction model (VECM) utilising data from 1956 to 2003. (Fedderke et al., 2006).

This study discovered that the positive spillovers outlined in Section 2 were evident in South Africa, implying a favourable relationship between FDI and economic growth (Fedderke et al., 2006). Additionally, the study discovered that a rise in FDI would result in a minor crowding out of domestic investment within the domestic market but would be eliminated over time, increasing economic growth (Fedderke et al., 2006).

M Tshepo (2014) followed up with a similar study in which he used the Johansen cointegration approach to determine the relationship between FDI, unemployment, and economic growth in the South African context. Using data collected between 1990 and 2013, the study also conducted Granger causality tests to ascertain any causal relationship between the various factors (Masipa Tshepo, 2014). As with Fedderke et al. (2006) findings, the study discovered a long-run positive link between FDI and

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economic growth. This was confirmed by Granger causality tests, which revealed a one-way correlation between FDI and economic growth, implying that FDI may contribute to growth rather than merely being attracted to it within South Africa (Masipa Tshepo, 2014).

The findings of Masipa Tshepo (2014) and Fedderke et al. (2006) indicate that FDI can greatly boost economic growth in South Africa and potentially aid in addressing the country's triple challenges of poverty, unemployment, and inequality. Following the conclusion of these investigations, Mazenda (2014) undertook a follow-up study to ascertain the influence of FDI on economic growth in South Africa. The study used the Johansen cointegration approach and a vector error correction model on data collected from 1980 to 2010 to determine the long- and short-run correlations between FDI and economic growth (Mazenda, 2014) .

GDP was utilised as the dependent variable once again, while domestic investment, foreign debt, exchange rate, and foreign direct investment within South Africa were used as explanatory variables (Mazenda, 2014). The domestic investment was found to have a statistically significant positive effect on economic growth in both the long and short run, while the remaining explanatory factors had a statistically significant negative effect on economic growth (Mazenda, 2014).

According to the most recent research mentioned above, the overall effect of FDI on economic growth in South Africa remains somewhat unclear, with Mazenda's (2014) findings contradicting those of Masipa Tshepo (2014) and Fedderke et al. (2006). Cointegration models appear to be the most frequently used in these studies, with both Masipa Tshepo (2014) and Mazenda (2014) using the Johansen (Mazenda, 2014). All three models used the Vector Error Correction Model to determine the short-run impacts. However, the most significant distinction between the various research is the periods covered, with Fedderke et al. (2006) focusing on the late 1950s to the early 2000s and Masipa Tshepo (2014) and Mazenda (2014) on 1990-2013 and 1980-2010, respectively. By extending the period, the study may be able to contribute to the current literature and better explain why Mazenda (2014) 's conclusions differ from those of Masipa Tshepo (2014) and Fedderke et al. (2006).

3. DATA, METHODOLOGY AND VARIABLES

Due to the scarcity of data, particularly for FDI, the analysis will be confined to annual data rather than the more common quarterly data. A larger sample group will be used to verify that the study's findings are valid. By utilising the period 1970 to 2019 (potential concerns related to this period will be examined in Sections 5 and 6), the study ensures that a total of 50 observations are used, allowing the study to develop a model similar to those outlined in Section 3. The following factors will be used to estimate the long- and short-run growth effects of FDI on the South African economy:

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3.1 Economic Growth (GDP)

Economic growth is a term that refers to an increase in a country's production capacity (Fourie, 2015). As GDP measures the total value of final goods and services produced inside a country, this study uses real GDP per capita to estimate economic growth.

3.2 Foreign Direct Investment (FDI)

Foreign Direct Investment can be described as an investment by a company in one nation into another company in another country to acquire a long-term interest in the host company by acquiring at least 10% of the voting power in the host country (OECD 2008). Due to sanctions imposed on South Africa during the apartheid era, the country had a few years of negative FDI inflow. This may provide a challenge, as the study plans to use the natural logarithms of each variable to eliminate heteroscedasticity and facilitate interpretation.

Wicklin (2011) recommends that by converting the data to natural logarithms, the study can continue to use a log-log form to estimate the influence of FDI on economic growth. Busse et al. (2007) recommend using the following equation to transform the data to preserve the variable's size and sign.

$$Y = \ln(x + \sqrt{x^2 + 1}) \quad \text{.....(4.1)}$$

The study attempted this strategy; nevertheless, it appears sufficient only when dealing with relatively tiny numbers. On the other hand, the FDI variable contains extremely great values due to the larger variables employed. As a result, the study employed Van Wicklin (2021) simplified technique, which included the following equation.

$$Y = \ln(x + \text{minimum value} + 1|) \quad \text{.....(4.2)}$$

The data is merely pushed upward using this strategy, while the connection between the dependent and independent variables remains unchanged. The study simply excluded 1979 from the sample because this value was a large outlier and may have skewed the results slightly. By employing this strategy, the degrees of freedom and number of observations used in the study will remain constant, ensuring the validity and reliability of the results.

3.3 Domestic Investment and Labour (DOM and LAB)

To ascertain if an increase in FDI inflows into the South African market results in the eviction of domestic investors, the study incorporates gross capital formation as a proxy for domestic investment into the regression. Section 2 of this study discussed how the quality of labour inside a country contributes to knowledge spillover within the country. The South African Reserve Bank's labour productivity index for the manufacturing sector will be used as a proxy to examine if a rise in labour productivity results in a significant increase in FDI within the country. Although labour productivity in all non-

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agricultural sectors was investigated, initial tests of the variable's stationarity revealed that it was integrated on the second order, implying that some cointegration tests may be impossible. Additionally, because manufacturing often requires higher-skilled labour than the primary sector, examining how productivity in this sector influences economic growth can provide insight into the existing skill levels in the local labour market.

Due to the study's reliance on annual data to estimate the growth impact of FDI, it contains a relatively small number of observations. It will be necessary to employ a cointegration method that is well-suited to working with few observations and degrees of freedom. The Autoregressive Distributed Lag (ARDL) model is well-known for producing reliable findings even when a minimal number of observations is used (De Jongh, 2018). As a result, the study employs a modified Cobb-Douglas function with capital disaggregated into a foreign and domestic component, as de Mello (1999) and Zhang (2001) have done:

$$\Delta LGDP = \alpha_t + \sum_{n=1}^{k} \beta_1 \Delta LGDP_{t-n} + \sum_{n=1}^{k} \beta_2 \Delta LFDI_{t-n} + \sum_{n=1}^{k} \beta_3 \Delta LDOM_{t-n} + \sum_{n=1}^{k} \beta_4 \Delta LNLAB_{t-n} + \phi_1 LGDP_{t-1} + \phi_2 LFDI_{t-1} + \phi_3 LDOM_{t-1} + \phi_4 LNLAB_{t-1} + \mu_t \quad (4.3)$$

Within equation 4.3, ΔLGDP refers to the change in the natural logarithm of GDP per capita, and ΔLFDI refers to the change in the natural logarithm of the levels of FDI inflows. ΔLDOM refers to a change in the natural logarithm of the levels of domestic investment in South Africa, while ΔLN LAB refers to the change in the natural logarithm in the levels of labour productivity during a certain period. β_1 to β_4 denote the short-term dynamics for the model while $\phi_1$to ϕ_4 indicate the long-term dynamics, α_t indicates the intercept for the model, while μ_t refers to the error term for the results obtained within the study. Finally, k indicates the number of lags used within the model.

The ARDL model will be used to identify the variables' long-run relationships, while the Error Correction Model will determine the variables' short-run associations. Because the ARDL model is only viable when no variables of order I(2) or higher are integrated, the study will employ the Augmented Dickey-Fuller and Phillips Perroni stationarity tests to guarantee the model's validity. Finally, the study employs the Toda-Yamamoto Granger causality test with the maximum order of integration set to assess whether any causation exists within the study. The study will determine the role of FDI in the South African economy based on these findings.

4. RESULTS AND FINDINGS

The study's first step was to incorporate a Toda-Yamamoto Granger causality test to determine any causal relationship between the variables. This test may provide insight into whether FDI is growth-enhancing or attracted to extended growth periods in the South African economy.

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Table I: Granger Causality Tests for the Growth Impact Regression

LDOM as the dependent variable		
Explanatory variables	**p-values**	**Result**
LFDI	0.0436*	Possible causality
LGDP	0.0022*	Possible causality
LLABOUR	0.4014	No causal relationship
All	0.0021*	Possible causality
LFDI as the dependent variable		
LDOM	0.2303	No causal relationship
LGDP	0.8474	No causal relationship
LLABOUR	0.6510	No causal relationship
ALL	0.0181	Possible causality
LGDP as the dependent variable		
LDOM	0.3134	No causal relationship
LFDI	0.0630**	Possible causality
LLABOUR	0.9096	No causal relationship
ALL	0.1822	No causal relationship
LLABOUR as the dependent variable		
LDOM	0.4665	No causal relationship
LFDI	0.9204	No causal relationship
LGDP	0.2280	No causal relationship
ALL	0.5548	No causal relationship
***** denotes significance with 95% certainty, ** denotes significance with 90% certainty.		

Source: Author's own estimates

The study discovered that while there may be a causal association between LGDP and LDOM when LDOM is used as the dependent variable, the study could not reject the null hypothesis of no relationship when LGDP is used as the dependent variable. The analysis concludes that the only direction of causality in the South African economy is from economic growth to domestic growth. This could imply that domestic investment will expand only after its economy has been boosted, implying that it will be growth-seeking rather than growth-enhancing. The converse might be stated of FDI, as FDI has been shown to increase economic growth, but economic growth has not been shown to increase FDI within the country.

This indicates a one-way causal relationship between FDI and GDP in South Africa; similar findings were obtained by Masipa Tshepo (2014), indicating that FDI in South Africa has the potential to boost growth in the country, rather than simply being attracted to prolonged periods of growth. As a result, officials must guarantee that local conditions are as friendly as possible to attract overseas investors. By bringing a greater amount of

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FDI into the country, Additional causality was discovered between LDOM and LFDI, with a one-way path from LFDI to LDOM. This may indicate that domestic investors may emulate international investors' behaviour due to the higher levels of competence and information associated with industrialised countries. Therefore, maintaining both foreign and domestic investor confidence should be a priority for authorities.

The study's second stage was to assess the stationarity of the variables to ensure that none of them was integrated to order I(1) or higher, as this would preclude the adoption of the ARDL model. The ADF and PP tests were used to determine the variables' stationarity.

The following conclusions can be drawn from the results shown in Table II above:

• The null hypothesis of a unit root must be rejected for the investigation to infer that the variables are stationary. At the level of the variable, LNLABOUR could only reject the null hypothesis of a unit root in one of the six-unit root tests done. As a result, the study was compelled to take the variable's first differences. When the variable's initial difference is observed, all six tests can confidently reject the null hypothesis of a unit root. Most likely, the LNLABOUR variable is integrated into the order I. (1).

- A similar result may be reached for the LGDP variable at a level with only one of the ADF tests conclusively rejecting the null hypothesis of non-stationarity. Once again, the first differencing was used to confirm that the variable had not been integrated to a higher order. These tests indicated that the variable is most likely integrated order I(1), with all tests rejecting the null hypothesis with a 95% probability.

- Due to the relatively volatile nature of FDI in South Africa, the LFDI variable is the most likely candidate for integration of order I(0). However, formal testing does not give sufficient evidence for this, with only three of the six tests rejecting the null hypothesis with any degree of certainty. As a result, the variable may be integrated into order I. (0). Even though the variable is not regarded as integrated order I(0), it will be of order I(1) because all tests will reject the initial difference values with a probability of 95%. For the LDOM variable, a similar situation obtains, with four of the six tests failing to reject the null hypothesis of no unit root with any degree of certainty at levels. Again, this variable is very certainly integrated into the sequence I. (1).

- Because all variables in this study are demonstrated to be of order I(0) or I(1), the study may continue to employ the ARDL model, which is capable of working with variables of mixed integration as long as the maximum order of integration is I. (1).

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Table II: Formal stationarity testing results for growth impact regression

Variable	**Augmented Dickey-Fuller Test**			**Phillips-Perron Test**		
	Individual intercept	**Individual trend and intercept**	**None (no trend or intercept)**	**Individual intercept**	**Individual trend and intercept**	**None (no trend or intercept)**
LGDP	0.3637	0.0478*	0.9099	0.3794	0.1529	0.9502
D(LGDP)	0.0003*	0.0017*	0.0000*	0.0005*	0.0036*	0.0000*
LFDI	0.8459	0.0006*	0.8656	0.0906**	0.0007*	0.8342
D(LFDI)	0.0000*	0.0000*	0.0000*	0.0001*	0.0000*	0.0000*
LDOM	0.5748	0.0152*	0.8962	0.4712*	0.1379	0.9476
D(LDOM)	0.0000*	0.0004*	0.0000*	0.0000*	0.0004*	0.0000*
LNLABOUR	0.5804	0.0000*	0.7988	0.5284	0.7299	0.7960
D(LNLABOUR)	0.0000*	0.0044*	0.0000*	0.0000*	0.0000*	0.0000*

D denotes the first differencing of variables.
* Denotes significance with 95% certainty, ** denotes significance with 90% certainty

Source: Author's Table

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4.1 Long-run Relationship

The study used the F-stat testing provided by Pesaran et al. (2001) to investigate whether a long-run link existed between FDI and economic growth in South Africa. The study obtained the following findings. If the estimated F-statistic is greater than the upper bound, the study can reject the null hypothesis of no level association and continue testing.

Table IIIII: F-bounds Test Results

Test statistic	Value	% For n=45	Lower bound	Upper Bound
F-stat	3.831418	10%	2.56	3.428
k	3	5%	3.078	4.022
		1%	4.27	5.412

Source: Author's Table generated using EViews 10 software.

Using the EViews 10 software, the study calculated the F-statistic for the regression as 3.831418. This meant that the calculated value of 3.831418 exceeds the upper bound value of 3.428. Therefore, the study can reject the null hypothesis of no long-run relationship with 90% certainty and continue estimating the long-run relationship and error correction models as presented below.

Using the Akaike criterion and constant trend specification within EViews 10, the study was able to compute the following long-run equation:

LGDP= -9.998158*+ 0.855627LDOM*- 0.396085LLABOUR*- 0.032364LFDI + error.....(5.1)

Based on the equation presented above, the study can conclude the following:

The coefficient for the LABOUR variable indicates that an increase in labour productivity has a statistically significant negative impact on economic growth within the country, with a 1% increase in labour productivity leading to a 0.396085 decrease in economic growth. Given that the manufacturing productivity was used within the study, this could point to the skills within the sector not being utilised efficiently and therefore not increasing productivity. This coincides with results published by Miller et al. (2018), in which a negative relationship between labour productivity and economic growth was detected when utilising data from 2000 to 2016 to construct a simple linear regression.

The coefficient for FDI was negative, indicating that an increase in FDI may not now boost growth in the South African economy, with a 1% increase in FDI resulting in a 0.032364% fall in the country's GDP per capita. This contrasts with Fedderke et al. (2006) and Masipa Tshepo (2014) conclusions that FDI can greatly boost economic growth in the South African market. However, the findings of this analysis are more consistent with those of Mazenda (2014:105), who discovered a statistically significant

negative association between FDI and economic growth. However, this coefficient was determined to be statistically insignificant in our analysis. This could be because the studies used different periods, with this study and Mazenda (2014) incorporating more observations from the post-apartheid era than Fedderke et al. (2006).

Finally, the LDOM coefficient demonstrates a statistically significant positive association between domestic investment and economic development in South Africa. A 1% increase in domestic investment results in a 0.855627% increase in the South African economy's GDP per capita. This is consistent with the findings of Jugurnath (2016), and De Jongh (2018), who concluded that increasing domestic investment would result in a statistically significant rise in GDP and economic growth in South Africa and other emerging markets. According to the relative sizes of the LDOM, LFDI, and LNLABOUR variables, the domestic investment appears to have the greatest impact on economic growth in the South African economy, followed by the LNLABOUR and LFDI variables. Domestic investment, as a result, may need to become a priority for local governments.

4.2 Error Correction Model

The investigation will employ an error correction model to ascertain the regressors' short-run effect on the independent variable. The study will establish how long it takes for the country to revert to long-run equilibrium by utilising the Error Correction Term (ECT). Generally, the error correction term should be between 0 and 1. Thus, if a value of 0.5 is reached, it will take the country two years to revert to long-run equilibrium. Additionally, the short-run coefficients may provide insight into the lagged influence of the various variables.

For the study's growth effect regression, the following error correction model might be obtained.

Table IV: Error Correction Model for Growth Impact of FDI

Variable	Coefficient	t-stat	Probability
D(LGDP(-1))	0.020689	0.270318	0.7886
D(LGDP(-2))	-0.151591	-2.134811	0.0403*
D(LGDP(-3))	-0.093241	-1.327684	0.1934
D(LFDI)	-0.014253	-2.309909	0.0220*
D(LFDI(-1))	0.002177	0.573774	0.5700
D(LFDI(-2))	0.006143	2.272604	0.0297*
D(LDOM)	0.769371	-1.154409	0.0000*
cointEq(-1)	-0.496789	-5.770653	0.0001*
* Denotes significance with 95% certainty			

Source: Author's estimates using Eviews 10.

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The error correction term supplied is negative and statistically significant, showing that the study could collect and trust the adjustment rate. The negative and significant number suggests that the study does indeed have a convergent long-run model and that the above-mentioned long-run outcomes can be trusted. The study's ECT value of -0.496789 confirms that 44,55% of the disequilibrium is corrected yearly. It would take up to 2.01 years for the country to revert to long-run equilibrium.

According to the ECM, the growth achieved in previous years affects the growth achieved in the current time. The only variable with a statistically significant coefficient is the D(LGDP(-2)) variable. As a result, continuous economic growth does not guarantee that growth will continue to be high. Given South Africa's very uneven economic development, this was expected, as achieving any continuous periods of long-term growth has become a primary objective of policymakers in the post-financial crisis era.

Similarly to the long-run effect, D(LFDI) has a negative short-run effect on economic growth with coefficients of -0.014253. This coefficient, however, was shown to be statistically insignificant once again. As with the long-run effect, FDI appears to harm economic growth, with a 1% increase in FDI resulting in a 0.014253% decline in the country's GDP per capita. These findings corroborate Fedderke et al. (2006) finding that local investment might be displaced in the short run by FDI. This crowding out may explain why, in this analysis, the connection between FDI and economic growth remained negative.

When the lagged variables for FDI are examined, namely D(LFDI(-1)) and D(LFDI(-2)), the coefficients turn positive, with values of 0.002177 and 0.006143, respectively. D(LFDI(-2)) was statistically significant with a 95% confidence interval. This may indicate that it may take time for foreign investors' capital to completely mobilise and have a beneficial effect on the productive capacity of domestic workers. Given South Africa's high unemployment rate and poor skill level of workers, it may take some time for FDI to be completely implemented. Fedderke and Romm demonstrate in their study that crowding out of domestic investment happens in the short term and is eradicated in the long Fedderke et al. (2006).

Finally, with a coefficient of 0.769371, D(LDOM) was determined to be positive and statistically significant, indicating that an increase in domestic investment will almost certainly result in economic growth in the short run. This is consistent with the study's long run estimations and hence with the findings of Jugurnath (2016), Mazenda (2014), and De Jongh (2018).

Due to the study's reliance on annual data, the Apartheid era of 1970 to 1994 was included. To isolate the influence of this period, a secondary error correction model with an interacting dummy is incorporated to distinguish the effect of FDI on economic growth during this period. Between 1986 and 1991, the values were set to zero because

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South Africa faced trade restrictions due to apartheid-era sanctions. The following findings were made.

Table V: Error Correction Model for Growth Impact Regression with Interactive Dummy Variable

Variable	Coefficient	t-stat	Probability
D(LGDP(-1))	0.055088	0.783641	0.4396
D(LGDP(-2))	-0.188372	-3.007023	0.0054*
D(LFDI)	-0.008744	-1.498995	0.1447
D(LFDI(-1))	0.005385	1.437886	0.1612
D(LFDI(-2))	0.007590	2.846036	0.0080*
D(LDOM)	0.730554	12.85849	0.0000*
D(LLABOUR)	-0.248213	-3.137903	0.0039*
D(LLABOUR(-1))	-0.034753	-0.449269	0.6566
D(LLABOUR(-2))	-0.176953	-2.272116	0.0307*
D(LLABOUR(-3))	-0.137233	-1.669465	0.1058
LFDI*DUM	0.003672	3.849623	0.0006*
cointEq(-1)	-0.496789	-3.811213	0.0007*
* Denotes significance with 95% certainty			

Source: Author's estimates using EViews 10

The ECT, FDI, and DOM variables in Table VI retain their respective signs and relative sizes from Table 5.7, indicating that these variables remain largely steady. By including the interactive variable, the study can observe that labour productivity continues to have a negative correlation with economic growth, as was observed in the long-run equation, indicating once again that the manufacturing sector's skills may be insufficient to boost the country's economic growth.

The interaction dummy used in the investigation exhibits a positive and statistically significant coefficient. As a result, the effect of increased FDI on economic growth is greater in the post-apartheid era than during the period of South Africa's sanctions. This is encouraging because it suggests that the South African economy may be more capable of fully exploiting the benefits of FDI. However, the comparatively small value of this coefficient (0.003) shows that South Africa's increased productive capacity may yet be enhanced further to enable the country to exploit the benefits of FDI as indicated in FDI fully. As a result, the results produced using the original models may still provide relevant policy options for attracting and utilising FDI.

5. DISCUSSION OF RESULTS AND POLICY RECOMMENDATIONS

The study's primary objective was to assess the present impact of FDI on economic growth in the South African economy. The objective was to contribute to the current

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body of knowledge covered in Section 3 of this study. When analysing existing empirical literature, cointegration analysis was identified as the most often used technique for this investigation. At first glance, the findings of this study appear to be consistent with those of Mazenda (2014), with long run and initial short-run coefficients for FDI being negative, indicating that FDI was not beneficial to economic growth but rather destructive.

However, the statistical significance of these coefficients remained uncertain, as the study was unable to reject the null hypothesis with any degree of assurance. Fortunately, the study discovered that the variable became positive and statistically significant when the lagged variable was included in the error correction model. This demonstrates that while FDI investment can boost the economy in South Africa, it may take time to mobilise within the country fully. This was validated again in the study's Toda-Yamamoto Granger causality tests, which revealed that FDI Granger causes economic growth in South Africa. Thus, the findings replicate those of Fedderke et al. (2006), who found that while FDI has a marginally negative influence on economic growth in the short term, it has a statistically significant beneficial effect in the long run.

Section 2 of this study emphasised the country's absorptive capacity as a critical factor determining the efficacy of FDI in driving economic growth in South Africa. This implies that the country's infrastructure and labour skills must be sufficient to support the flow of FDI within the country. The findings of this study demonstrate that a rise in labour productivity did not increase economic growth in South Africa. Given that manufacturing requires a higher degree of competence than agriculture, this suggests that the South African workforce may lack the necessary capabilities to implement FDI efficiently.

This may explain why, when the lagged variable is employed in the study, a rise in FDI has a statistically significant positive influence on economic growth. Therefore, ensuring that workers and businesses are well equipped and have the requisite infrastructure and skills to capitalise on the benefits of increased FDI rapidly should be a priority for local firms and governments. Local investors should prioritise identifying critical skills gaps in manufacturing and other innovative industries. Similarly, ensuring that infrastructure spending is efficient and free of corruption should enable businesses to leverage FDI and continue to thrive fully.

Domestic investment should not be overlooked either, as LDOM is statistically significant and favourable in both the long and short-run in South Africa. Granger received FDI as a result of domestic investors. As a result, governments should ensure that FDI attracts domestic investment rather than displaces potential domestic investors. If partnerships, rather than competition, could be developed, domestic and foreign investors could collaborate to expand production greatly. According to Granger's causation, domestic investment is caused by FDI; hence, ensuring that the market

remains attractive to foreign investors may promote domestic investment and initiate a cycle of increased investment.

6. CONCLUSION

The primary objective of this study was to ascertain the effect of FDI on growth in the South African economy. Section 2 of this study offered the theoretical framework upon which the success of FDI in South Africa would be judged. The findings of this study, summarised in Sections 4 and 5, indicate that FDI does not now boost economic growth in the South African market. However, the T-Y Granger causality model and error correction model indicate that FDI can greatly boost economic growth provided the infrastructure and abilities of employees are enhanced to exploit the benefits associated with increased FDI fully. If this is adopted, the lagged beneficial effect observed in the error correction model might be visible immediately, allowing South Africa to address its triple crisis of poverty, unemployment, and inequality. Future research may have access to quarterly data from the post-financial crisis period and may seek to validate this study's findings and determine how the adjustments are done in post-apartheid South Africa may have impacted the efficiency of FDI in the domestic market.

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Data Availability

The data that support this study is openly available in World Bank (For FDI, Domestic investment and Real GDP) and South African Reserve Bank for Labour productivity using World Development indicators and online statistical query for macroeconomic information. at https://data.worldbank.org/indicator and https://www.resbank.co.za/en/home/what-we-do/statistics.

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