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Foreign Direct Investment, Institutions and Economic Growth: Evidence from South Africa

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Abstract: The association between Foreign Direct Investment (FDI), institutions, and economic growth in South Africa is examined in this study from 1996Q1 through 2019Q4 using Autoregressive Distributed Lag (ARDL). FDI was found to have a negative effect on economic growth in the long run. Institutions and economic growth, on the other hand, have no long-term relationship. However, an interaction between FDI and political stability is discovered to have a direct effect on economic growth in both long and short run. As a result, there is no reliable proof that an interaction between FDI and institutions may induce economic growth. However, there is a short-run link between FDI and economic growth. In the short run, regulatory quality and political stability have a positive effect on economic growth. The study recommends that to invite more FDI inflows into South Africa, the government must prioritize on protecting foreign businesses in the country through minimizing xenophobic attacks in order to boost their confidence hence leading to economic growth. In addition, to achieve economic growth, favorable tax policies that are fair to protect foreign and local investors must be implemented.

Keywords: foreign direct investment; institutions; economic growth; ARDL.

JEL classification: C22; F21; O43.

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1. INTRODUCTION

During the Great Depression of 2008-2009, global Foreign Direct Investment (FDI) flows were not spared, with up to $1.2 trillion in FDI inflows received worldwide, compared to $1.833 trillion the previous year (UNCTAD, 2020). Tracking FDI inflows in the global economy, a peak of $2 trillion was observed in 2015, and FDI flows have been moderately dropping since 2016, with the 2019 worldwide pandemic aggravating the situation (UNCTAD, 2020). Following the reduction in FDI inflows induced by the coronavirus pandemic, there has been and will continue to be a global economic slowdown in terms of growth (UNCTAD, 2020). Global economic growth fell by 3.5% in 2020 and is expected to stay low until 2022, with most emerging and developing countries' per capita incomes unlikely to recover rapidly (World Bank Group, 2021).

South Africa is recognized as Africa's largest market, and it received significant foreign direct investment between 1997 and 2000. In contrast, as a result of the global pandemic, FDI inflows have declined from $4.6 billion in 2019 to $2.5 billion in 2020 (UNCTAD, 2021). On the other hand, economic growth contracted by -7.8% in 2020 compared to 2018, and it fell by 3.2% in the first quarter of 2021. With that in mind, South Africa requires more FDI flows to enhance its economy, as FDIs are seen as drivers of economic growth, and they have historically played an important role in increasing output production (Awolusi and Adeyeye, 2016). Apart from encouraging economic growth, FDI creates jobs in host countries. South Africa now has a 32.6% unemployment rate, with young adults being the most impacted category (Statistics South Africa, 2021), indicating the need for more FDI inflows.

According to the research, the most essential factors that provide stability to foreign investors are trade openness, market size, infrastructure, natural resource abundance, labor cost, human capital availability, and return on investment (Asiedu, 2002; Nunnenkamp, 2002). By extension, the idea that FDI boosts economic growth has no bearing unless the nature of the host country into which FDI is expected to flow is understood. Meanwhile, in a changing world, foreign investors are increasingly concerned about the host country's institutional structure, which has a significant impact on their return on investment, profitability, and the FDI-growth nexus. With that said, it is critical to examine the institutional policies that govern FDI as they relate to economic growth.

In this instance, South Africa is anticipated to have a strong government structure to attract more FDI. Kaufmann *et al.* (2011) define a good governance system as one that includes rule of law, political stability and the lack of violence, voice and accountability, corruption control, regulatory quality, and government performance. For example, because equality, transparency, and freedom make South Africa's constituency more democratic, the Protection of Investment Act was passed to ensure equal treatment of foreign and domestic investors (Republic of South Africa, 2015). This will encourage more foreign direct investment, ultimately boosting growth. On the contrary, a number of xenophobic attacks and looting against foreigners have been documented in South Africa, which has deterred FDI over time.

Numerous studies have only focused on the impact of FDI on South African growth (Asafo-Adjei, 2007; Masipa, 2014; Mazenda, 2014; Sunde, 2017), but others have investigated the causes of FDI flows to South Africa (Jadhav, 2012). Few studies have explored the function of institutions in South Africa's FDI-growth nexus. Meyer and Habanabakize (2018), for example, reviewed the significance of political instability in South Africa's FDI-growth nexus.

The above-mentioned studies' main flaw is that they did not sufficiently study the role of institutions in the FDI-growth nexus in SA. This makes this work particularly relevant since it contributes to understanding the interrelationships between FDI, institutions, and economic growth. This will help the country regardless of whether the institutions are well maintained in order to attract more FDI. The ARDL model, which has been widely used in similar studies, was used to fully examine the function of the governance system in the FDI-growth nexus. The study tackles the following questions: Does FDI stimulate economic growth? How do institutions influence the relationship between FDI and economic growth? To assist me in determining the answers, the study examines the effects of domestic investments, currency rates, population growth, and inflation on GDP growth rate.

Following Section 1, Section 2 reviews previous findings on the interconnectivity of FDI, institutions, and economic growth. Section 3 is based on the theoretical framework, methodology, and explanation of the data used. In Section 4 the empirical results of the study is presented while Section 5 concludes the paper.

2. LITERATURE REVIEW

Foreign Direct Investment (FDI) has been thoroughly studied and is generally regarded as a driver of economic growth in host countries. Numerous recent studies have focused on the factors influencing foreign direct investment (FDI) in host countries, as well as the relationship between FDI and economic growth, with insufficient attention paid to the role of interacting variables in the FDI-growth equation.

The relationship between FDI and growth is influenced by the host country's governance structure. According to Agbloyor *et al.* (2019), countries with more economic freedom and strong governance have better long-term growth outcomes. The research found that the favourable impact of FDI on economic growth is dependent on the strength of a country's institutions. Upreti (2015) finds a direct link between higher investment rates, longer life expectancy, and higher export volumes and GDP per capita growth in emerging countries. Jadhav (2012) discovers that, unlike institutional and political factors, economic characteristics such as trade openness and market size are positively connected with foreign direct investment (FDI). According to their findings, the BRICS countries (Brazil, Russia, India, and South Africa) are deemed exceptional in terms of rule of law, voice, and accountability.

Despite the augmented capital influx into African nations, including Nigeria, numerous African countries continue to exhibit poor per capita income and elevated unemployment rates; foreign direct investments are theoretically and empirically expected to address these issues. The Nigerian government has concentrated on policies aimed at attracting international investors; yet the economy continues to decline. Fasanya (2012) examines the influence of foreign direct investment on Nigeria's economic growth from 1970 to 2010, utilizing annual time series data within a neo-classical framework. The results indicate that foreign direct investments positively influence economic growth in Nigeria, as does domestic investment. The study recommends that to effectively Furthermore, Gani (2007) discovers that for Asian and Latin American countries, rule of law, corruption control, government effectiveness, regulatory quality, and political stability are all strongly associated with foreign direct investment inflows. Tax breaks, property protection rights, investment-friendly legislation, improvements to service support systems, and economic and political stability at the national

and regional levels, among other fiscal elements and regulations, all have a significant impact on FDI inflows Cleeve (2008).

An empirical study in Indonesia found a favourable relationship between foreign direct investment and total economic growth (Khaliq and Noy, 2007). In contrast, Yalta (2013) indicates that, at the aggregate level, foreign direct investment has no correlation with growth. The cross-country association between foreign direct investment (FDI) and economic growth is uncertain; nonetheless, research reveals a positive correlation between financial system development and FDI with economic growth. Nations with advanced markets, in particular, attract large FDI, which promotes economic growth (Alfaro *et al.*, 2004).

While foreign direct investment (FDI) has a significant impact on growth, other data show that economic expansion is not always driven by FDI. Two different studies were conducted in South Africa and Chile. These two studies found an equivocal association between FDI and economic growth, implying that economic growth drives FDI rather than the other way around (Chowdhury and Mavrotas, 2006; Asafo-Adjei, 2007). According to Ang (2009), economic improvement in Malaysia only increases foreign direct investment over time. Iamsiraroj (2016) found a bidirectional association between foreign direct investment (FDI) and economic growth. According to Iamsiraroj (2016) paper, foreign direct investment does not have a direct impact on growth and must be studied with other factors such as labour force levels, protectionist measures, and economic stability. In contrast, Mody (2004) investigated the influence of foreign direct investment (FDI) on the global economy and discovered that, while various forms of FDI have historically promoted economic integration, there is little evidence that FDI has accelerated income convergence across different regions of the world.

According to studies, the effects of foreign direct investment vary by sector. Foreign Direct Investment (FDI) in the secondary sector greatly boosts economic growth in host countries, but FDI inflows into non-manufacturing industries have little impact on growth (Ayanwale, 2007; Chakraborty and Nunnenkamp, 2008). Nair-Reichert and Nair-Reichert and Weinhold (2001) discovered that the link between FDI, domestic investment, and economic growth in emerging countries is highly variable. According to the research, the efficiency of foreign direct investment (FDI) in boosting future growth rates varies by country, with FDI having a stronger impact in open economies and growth being unconnected in closed countries. The evidence repeatedly shows that foreign direct investment (FDI) contributes greatly to economic growth, not just through FDI itself, but also through the use of interaction variables.

Following a detailed assessment of institutions, Driffield and Jones (2013) conclude that all sources of FDI have a positive and considerable impact on the economy. In contrast, Li and Liu (2005) and Baliamoune-Lutz (2004) show that foreign direct investment (FDI) has a direct or indirect impact on economic growth through its interaction characteristics. Nonetheless, research looking at the impact of FDI on economic growth found that FDI can improve political stability by effectively utilizing corporate resources (Baliamoune-Lutz, 2004). Obwona (2001) stressed macroeconomic stability, political consistency, and policy continuity over tax incentives in attracting foreign direct investment (FDI), which was found to be positively related to economic growth in Uganda. The association between foreign direct investment (FDI), institutions, and economic growth shows favourable and accelerated growth in many African nations at both the aggregate and individual levels (Adeleke, 2014).

Foreign Direct Investment (FDI) has been proved to have a favourable impact on both short- and long-term growth in emerging and developed economies (Freckleton *et al.*, 2012). Agbloyor *et al.* (2016) discovered that foreign direct investment (FDI), institutions, and

economic growth are not generally correlated in Sub-Saharan Africa (SSA) but are linked in a selection of countries with weak financial markets. In contrast, the study stressed that in countries with limited natural resources, foreign direct investment, institutions, and economic growth are all linked. Numerous studies have found that corruption and foreign direct investment are inextricably linked, whether directly or indirectly. Lower levels of corruption have a significant beneficial impact on FDI inflows, and vice versa (Asiedu, 2006; Bénassy-Quéré *et al.*, 2007). According to Cuervo-Cazurra (2006), high corruption attracts additional FDI inflows because investors from high-corruption nations are more likely to invest in countries with similar levels of corruption. Bénassy-Quéré *et al.* (2007) found that numerous institutions, including bureaucracy, information systems, banking, and legal frameworks, had an impact on incoming foreign direct investment, regardless of GDP per capita. According to Asiedu (2006), macroeconomic insecurity and political unrest all have a negative impact on FDI inflows into Africa.

Nations with strong democratic structures attract FDI, resulting in economic progress, as seen in Southern Africa (Malikane and Chitambara, 2017). Feng (1997) research found an indirect link between democracy and economic growth, mediated by constitutional changes among diverse political parties. Concurrently, the analysis discovered that growth has a limited relationship with regime transition but has a positive effect on the likelihood of the ruling party remaining in power, and that long-term economic growth enhances democracy. Schneider (2005) investigated the relationship between global commerce, patents, and FDI in order to determine the rate of technological innovation and growth among 47 mature and emerging economies from 1970 to 1990. According to the study, imported technology has a bigger impact on economic growth than native technology, while intellectual property rights (IPRs) have a greater impact on innovation rate, particularly in industrialized nations, whereas the implications of FDI remain unclear. Azman-Saini *et al.* (2010) demonstrated in a case study of 85 nations that FDI is not proportionate to output growth for its own sake, but rather its influence is dictated by the level of stability in the economy receiving FDI. Raza *et al.* (2019) discover that excellent governance leads to a positive association between FDI and economic growth, with regulatory quality and FDI having a two-way interaction with economic growth and the other interacting components having a one-way relationship, in OECD (Organization for Economic Cooperation and Development) countries from 1996 to 2013. Omri and Kahouli (2014) discovered a two-way interaction between FDI and economic growth, as well as domestic investment and growth, with FDI having a causal association with domestic investments.

A study by Nguyen *et al.* (2024) looks at how FDI affects small and medium-sized businesses' (SMEs) R&D spending in Vietnam. According to the report, SMEs' R&D efforts are impeded by FDI because of their limited market strength, technological gap, absorptive ability, and economies of scale. Institutions, however, attenuate this relationship. When local institutions reach a certain level of quality, they might encourage SMEs' R&D activities. The moderating effect of FDI from nations with poorer institutional quality is less pronounced. For scholars and policymakers examining FDI and R&D investment by domestic SMEs, institutions are essential. Bothner (2024) explores the relationship between institutional quality and FDI flows in developing countries. The study found that weak institutions attract FDI due to rent-seeking behaviour, but also increase uncertainty, discouraging investments with large initial costs. The study found that institutional quality positively affects FDI inflows only for countries with high natural resource endowment, contradicting previous research.

This suggests that higher endowment increases institutional quality's importance as a determinant of FDI.

Islam and Beloucif (2024) use a systematic literature review to assess 112 empirical investigations from 2000-2018 on factors influencing foreign direct investment in host nations. Results show market size is the most reliable factor, followed by trade openness, infrastructure quality, labour cost, macroeconomic stability, human capital, and growth potential. Using Principal Component Analysis (PCA), Lee *et al.* (2024) examine the factors that influence FDI inflows into 178 different nations. They discover that social factors have a greater impact on FDI inflows in mature economies, whereas emerging countries mostly rely on economic indicators. Nonetheless, there is very little correlation between FDI inflows and institutional features.

The relationship between democracy, corruption, economic growth, ICT, and carbon emissions in sub-Saharan Africa (SSA) is examined in Ganda (2024). The study, which uses data from 37 countries, concludes that democracy and carbon emissions are negatively correlated. Nonetheless, there is a positive relationship between FDI, ICT, economic growth, and environmental quality. The study recommends a targeted approach to boost FDI in order to fight corruption, promote democracy, ICT, and economic expansion for a green economy. Ali *et al.* (2025) examines the impact of FDI, GDP, income inequality, and CO2 emissions on renewable energy consumption in Asia from 1995 to 2020. It reveals that rising GDP and FDI support renewable energy consumption, while income inequality and CO2 emissions have context-sensitive effects. The findings provide valuable insights for Asian sustainable energy transition.

In the member nations of the Association of Southeast Asian Nations, Nam *et al.* (2023) look into how FDI affects technical advancement. The crucial responsibilities that governmental and financial institutions play as intermediaries in the relationship between foreign direct investment and technological advancement are highlighted by our investigation. The rule of law, one of the sub-indicators of the Worldwide Governance Indicators, has a strong mediating effect in this relationship, according to our empirical findings based on the 25-year panel dataset from 1996 to 2020. Even if they act as a mediator, FDI has a suppression effect, which means that it has a detrimental impact on financial institutions while having a beneficial impact on technological advancement. Governments should support the efficient operation of the rule of law and devise plans to remove financial barriers that could impede FDI in order to optimize its spillover effects. Sinha *et al.* (2024) investigates the effects of political regimes and institutional quality on US FDI outflows. It investigates property rights protection as a measure of institutional quality in 41 countries from 1984 to 2021. The findings demonstrate that protecting property rights can attract US foreign direct investment if countries become more democratic. The report concludes that incomplete reform or unconsolidated democratization are insufficient to attract US FDI. Stronger property rights protection and higher-quality infrastructure can make democratic countries more appealing to US investors.

Based on the reviewed literature, the report concludes that macroeconomic climate, trade openness, financial system development, economic freedom, natural resource richness, political stability, infrastructure, human capital, regulatory quality, and corruption have the greatest impact on the FDI-growth nexus. Despite substantial research on the relationship between FDI, institutions, and economic growth around the world, empirical studies in South Africa are scarce. Prior study has shown that institutions play a key role in FDI since they correspond with growth. This paper investigates whether or not this has occurred in South Africa.

3. THEORETICAL MODEL AND METHODOLOGY

3.1 Theoretical Framework

The Solow model best describes the FDI-growth nexus. The model implies that the introduction of technology enables labour and capital to rise through time, resulting in sustained growth (Solow, 1956), and it follows a production function which is expressed as:

$$Y(t) = F(K(t), A(t)L(t) \quad (1)$$

where total output (Y), capital (K), effectiveness of labour (A) and labour (L). Due to the equivalence of input payments and total output, this production function is reliant on the premise that returns remain constant across time as follows:

$$y = f(k) \quad (2)$$

This production function meets the following condition:

$$f(0) = 0, f'(0) = \infty, f'(\infty) = 0, f(k) > 0, f'' < 0 \quad (3)$$

The function then takes the Cobb-Douglas form:

$$F(K, AL) = K^{\beta}(AL)^{1-\beta}\ , \qquad 0 < \beta < 1 \quad (4)$$

Such that, $k = \frac{K}{AL}$ is the capital labour ratio which changes through time, and given as; $= k^{\beta}$.

According to Romer (2012), the difference between the amount of savings per unit of effective labour and break even investment influences the speed of change in the capital labor ratio. This is expressed as:

$$\dot{k}(t) = sf\big(k(t)\big) - (n + g + \delta)k(t) \quad (5)$$

A rise in s causes an upward shift in actual investment,$sf(k)$ resulting in an increase in $k*$. This will result in a continuous increase in k until it reaches a point where it equals to $k*$. A constant increase in s causes a brief increase in k. This means that over time, k increases until it reaches a point where the extra s is only used to contain the constant k. Conversely, an increase in s causes a rise in output per worker growth rate, until g no longer rises (Romer, 2012).

Ultimately, changes in s have level impacts on production per worker rather than growth effects. Capital per unit of effective labor is calculated as follows:

$$k = sf(k) - (n + g + \delta)k \quad (6)$$

Applying an intensive form of the Cobb-Douglas function –f (k)=k^{β}, results in:

$$k = sk^{\beta} - (n + g + \delta)k \quad (7)$$

As a result, the balanced growth path (k) is zero, indicating a balance between actual and break-even investments per unit of effective labour. As shown in the following expression, the balanced-growth path is indicated by$k*$.

$$sk^{\beta} = (n + g + \delta)k* \tag{8}$$

Equation (8) is rearranged to solve for $k*$, and yields:

$$k* = \left(\frac{s}{n + g + \delta}\right)^{\frac{1}{1-\beta}} \tag{9}$$

The intensive form of the production function is then applied, that is $y=k^{\beta}$, so as to obtain the balanced-growth path value of output per worker as follows:

$$y* = \left(\frac{s}{n + g + d}\right)^{\frac{\beta}{1-\beta}} \tag{10}$$

Considering the preceding equation is linear in logarithms, which are taken and differentiated with respect to time, with little letters denoting individual variable growth rates.

3.2 Methodology and Data

3.2.1 Model Specification

In developing the empirical model for this work, the purpose of this study is kept in mind, which is to thoroughly examine the connection between FDI and growth in the presence of interacting variables. Borensztein *et al.* (1998) discovered that FDI has a beneficial impact on economic growth because of the technology gains brought into host nations. According to Solow (1956), an increase in investment means an increase in total output (Y), ending in a country's growth speeding up towards a stable equilibrium. In absence of technological change, economic growth is attained through population growth and per capita incomes will remain constant in the long run (Solow, 1956). Firstly, considering that FDI brings technology to host countries, and the model to be estimated is modified to account for the effect of technological advancement through FDI while including population growth, domestic investments, CPI, and exchange rates because they have an effect on output in some way. Following the Solow Baseline model, the equation to be estimated is as follows:

$$LogGDP_t = \beta_0 + \beta_1 Log\frac{FDI_t}{GDP_t} + \beta_2 Log\frac{DI_t}{GDP_t} + \beta_3\, LogCPI_t + \beta_4 LogEXR_t + \beta_5 LogPOP_t + \varepsilon_t \tag{11}$$

Institutions, according to several studies, have a critical influence in the FDI-growth nexus. Equation (11) is then adjusted to account for the role of institutions in the FDI-growth nexus:

$$\begin{aligned} LogGDP_t = \beta_0 + \beta_1 Log\frac{FDI_t}{GDP_t} + \beta_2 Log\frac{DI_t}{GDP_t} + \beta_3 LogCPI_t + \beta_4 LogEXR_t + \beta_5 LogPOP_t \\ + \beta_6 Log\left(\frac{FDI_t}{GDP_t} * INST\right) + \varepsilon_t \end{aligned} \tag{12}$$

where GDP = GDP Growth rate, DI = Domestic Investments, CPI = Consumer Price Index, EXR = Real Exchange Rate, POP = Population Growth Rate and INST = Institutional Variables which are Control of Corruption (CC), Rule of Law (RL), Regulatory Quality (RQ), Government Effectiveness (GE), Voice & Accountability (VA) and Political Stability (PS).

3.2.2 Methodology

The study is undertaken using the ARDL model to estimate the prolonged dynamic relationships. The chosen model is more suitable when dealing with small samples (Pesaran *et al.*, 2001). The model was chosen as it facilitates the inclusion of variables with different orders of integration that is $I(0)$ and $I(1)$ variables can be included in the same model, and simultaneously allows variables with varying lag lengths to be introduced to the same model (Pesaran *et al.*, 2001). It also captures both short and long term variations (Pesaran *et al.*, 1999), making it a better fit for this research project. According to Pesaran *et al.* (2001), the ARDL model to be estimated is as follows:

$$\begin{aligned}\Delta LGDP_t = \varphi_0 + \sum_{i=1}^{d} \alpha_i \Delta\, LGDP_{t-i} + \sum_{i=1}^{e} \beta_i \Delta LFDI_{t-i} + \sum_{i=1}^{g} \gamma_i\, \Delta LDI_{t-i} + \sum_{i=1}^{k} \delta_i \Delta LCPI_{t-i} + \\ \sum_{i=1}^{m} \theta_i \Delta LEXR_{t-i} + \sum_{i=1}^{p} \sigma_i\, \Delta LPOP_{t-i} + \sum_{i=1}^{v} \vartheta_i \Delta LFDI * INST_{t-i} + \varphi_1 LGDP_{t-1} + \varphi_2 LFDI_{t-1} + \\ \varphi_3 LDI_{t-1} + \varphi_4 LCPI_{t-1} + \varphi_5 LEXR_{t-1} + \varphi_6 LPOP_{t-1} + \varphi_7 LFDI * INST_{t-1} + \varepsilon_t\end{aligned} \quad (13)$$

where φ_0 denotes the constant; $\alpha_i, \beta_i, \gamma_i, \delta_i, \theta_i, \sigma_i$ and ϑ_i signifies short run dynamics; whilst $\varphi_1, \varphi_2, \varphi_3, \varphi_4, \varphi_5, \varphi_6$ and φ_7 symbolizes the long run coefficients*; d, e, g, k, m, p* and *v* represent the model's lag length and ε_t reflects the disturbance error term.

In light of equation (13), the hypothesis to be tested is as follows:

H0: $\boldsymbol{\varphi_1 = \varphi_2 = \varphi_3 = \varphi_4 = \varphi_5 = \varphi_6 = \varphi_7 = 0}$ **:** *Cointegration does not exist in the long run.*

H1: $\boldsymbol{\varphi^1 \neq \varphi^2 \neq \varphi^3 \neq \varphi^4 \neq \varphi^5 \neq \varphi^6 \neq \varphi^7 \neq 0}$: *Cointegration does not exist in the long run.*

Along with Pesaran *et al.* (2001), the ARDL model relies on the F-statistic when determining the long run association amongst the variables. Prior to performing the bound test, the lag structure is established using Akaike Information Criterion (AIC) or Schwarz Information Criterion (SIC) until serial correlation is no longer present. Suppose the determined F-stat is smaller than the lower constraint $I(0)$, cointergration does not exist and the null (H_0) is acknowledged. Suppose the F-stat is higher above the upper bound $I(1)$, cointergration prevails in the long run, and the null hypothesis (H_0) is rejected in such a case. If the obtained F-stat sits between $I(0)$ and $I(1)$, the results are deemed vague.

After proving the scope of cointergration, the error correction model (ECM) is derived to predict the long run connection. The ECM is necessary because it is utilized to detect any short-run changes from equilibrium Gujarati and Porter (2009). The ECM is as follows:

$$\begin{aligned}\Delta LGDP_t = \varphi_0 + \sum_{i=1}^{d} \alpha_i \Delta\, LGDP_{t-i} + \sum_{i=1}^{e} \beta_i \Delta LFDI_{t-i} + \sum_{i=1}^{g} \gamma_i\, \Delta LDI_{t-i} + \sum_{i=1}^{k} \delta_i \Delta LCPI_{t-i} + \\ \sum_{i=1}^{m} \theta_i \Delta LEXR_{t-i} + \sum_{i=1}^{p} \sigma_i\, \Delta LPOP_{t-i} + \sum_{i=1}^{v} \vartheta_i \Delta LFDI * INST_{t-i} + \lambda ECT_{t-1} + \omega_t\end{aligned} \quad (14)$$

while ECT_{t-1} signifies error correction term and λ gauges the speed of adjustment.

The coefficient of the ECT quantifies the rate of adjustment towards the equilibrium relationship. The rate of adjustment is projected to be negative and be between 0 and 1 (Gujarati and Porter, 2009).

3.3 Data Description and Sources

This paper examines the relationship between FDI and economic growth, and simultaneously assessing the role of institutions using quarterly time series data. The study concentrates at the period from 1996Q1 to 2019Q4, which incorporates the post-apartheid era, the Great Depression of 2008-2009, and the new Fourth Industrial Revolution era. The statistics for the institutional variables were derived from the World Governance Indicators. The World Bank Database is used to acquire statistics on FDI, Exchange Rates and Population Growth. The data for GDP growth rate, Direct Investments and Consumer Price Index is sourced from the OECD Database. Main variables are GDP growth rate (dependent variable), FDI (expressed as a proportion of GDP) and Institutional variables which are Control of Corruption, Rule of Law, Regulatory Quality, Government Effectiveness, Voice & Accountability and Political Stability. Control variables included in this model are Domestic Investments which is expressed as a proportion of GDP, CPI is logged to derive the inflation rate, Exchange rate is expressed as the nominal value of the South African Rand versus other foreign currencies and Population Growth is expressed as the growth rate of the total population.

4. RESULTS AND DISCUSSION

4.1 Preliminary Analysis

To begin with descriptive data, Table no. 1 shows that the average values are rather small, fluctuating between -0.1% and 4.5%, with the exception of domestic investments. The standard deviations for each of the variables in this paper are shown, with domestic investments and FDI being the most volatile among them. Apart from GDP growth rate and rule of law, the majority of the variables are skewed to the right. In most cases, the series appears to be skewed around zero, raising the possibility of normality. The Jarque-Bera statistics provide accurate findings for normality, and based on the reported findings, some series are distributed normally while others are not.

Prior cointegration analysis and unit root tests must be conducted. To verify for the quality of time series data, the unit root test is first performed using the graphical methods. According to Figure no. 1 graphical representation, CPI, domestic investments and exchange rates are trending upwards, while population growth is heading downwards, and this implies that the variables are non-stationary. FDI and GDP growth rate appear to have steady mean averages across time, while GDP growth rate appears to have no obvious trend as they change with time. The mean and variance of the majority of the variables appear to be time-varying, implying that these series in level form are non-stationary. Certain variables, such as GDP growth rate and FDI appear to be associated with shocks, suggesting the likelihood of structural breaks occurring around the Emerging Market Crisis of 1997-1998 and the Great Depression of 2008-2009. Firstly, the Augmented Dickey-Fuller is used, but since structural breaks are projected, the Phillips-Perron test is used thereafter.

Table no. 1 – Summary Statistics

Variable	Mean	Std. Dev	Min	Max	Skewness	Kurtosis	Jarque-Bera	Obs
GDPGR	0.6357	0.6292	-1.5555	1.8730	-0.5880	3.5757	6.8576	96
FDI_GDP	1.5035	1.3038	-0.0281	6.3305	1.7408	6.6318	101.2441	96
DI_GDP	18.4370	2.0799	-15.0836	23.7173	0.3658	2.7426	2.4057	96
CPI	4.2107	0.3653	3.5444	4.8159	0.0081	1.8394	5.3886	96
EXR	2.1063	0.3442	1.3432	2.7487	0.1278	2.2483	2.5215	96
POPGR	1.4412	0.1748	1.2160	1.9950	0.9163	3.7037	15.4155	96
RQ	0.4342	0.1755	0.1209	0.8088	0.2547	2.3853	2.5491	96
VA	0.6738	0.0860	0.5675	0.8567	0.8413	2.6413	11.8393	96
PS	-0.1744	0.1743	-0.5520	0.2306	0.0492	2.9252	0.0611	96
RL	0.1200	0.0914	-0.1050	0.2773	-0.8124	3.6723	12.3681	96
GE	0.5298	0.1922	0.2859	1.0875	0.6843	2.8444	7.5883	96
CC	0.2842	0.2749	-0.1372	0.7413	0.1975	1.6468	7.9495	96

Note: GDPGR signifies GDP growth rate, POPGR signifies Population Growth Rate, FDI_GDP signifies FDI as a percentage of GDP while DI_GDP signifies Domestic Investment as a percentage of GDP.

Sources: authors own compilation

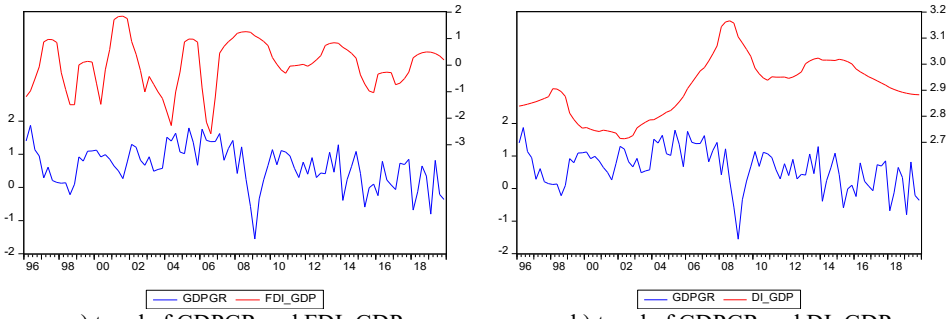
Table no. 2 – Unit Root Tests Results

	AUGMENTED DICKEY-FULLER			PHILLIPS-PERRON		
Variable	**Level form**	**1st diff**	***I*(d)**	**Level form**	**1st diff**	***I*(d)**
GDPGR	-5.2060 [a]*	-	*I*(0)	-5.0682[a]*	-	*I*(0)
FDI_GDP	-5.6383[a]*	-	*I*(0)	-3.2197[a]**	-	*I*(0)
DI_GDP	-1.9898[a]	-2.8054[a]***	*I*(1)	-1.5461[a]	-4.1607[a]*	*I*(1)
CPI	-3.1757[b]***	-	*I*(0)	9.3228[c]*	-	*I*(0)
EXR	-1.5453[a]	-8.1171[a]*	*I*(1)	-1.6329[a]	-8.1133[a]*	*I*(1)
POPGR	-0.2498[c]	-2.1886[c]**	*I*(1)	-3.3162[a]**	-	*I*(0)
RQ	-3.5832[b]**	-	*I*(0)	-0.9635[a]	-5.0949[a]*	*I*(1)
VA	-2.4204[a]	-2.9636[a]**	*I*(1)	-1.9275[a]	-4.9443[a]*	*I*(1)
PS	-2.0697[c]**	-	*I*(0)	-1.7392[a]	-5.0115[a]*	*I*(1)
RL	-1.6295[c]***	-	*I*(0)	-1.5669[a]	-5.3889[a]*	*I*(1)
GE	-3.2856[b]***	-	*I*(0)	-3.1576[a]**	-	*I*(0)
CC	-1.7687[c]***	-	*I*(0)	-1.9778**	-	*I*(0)

Note: The Null Hypothesis shows that the series is non-stationary. [a] indicates a model with constant but no time trend, [b] indicates a model with a constant and a time trend while [c] indicates a model without a constant and a time trend, while the exogenous lags are determined using the Schwarz Information Criterion (SIC). * signifies that a variable is stationary at 1%, whilst ** signifies that a variable is stationary at 5% and *** signifies that a variable is stationary at 10%.

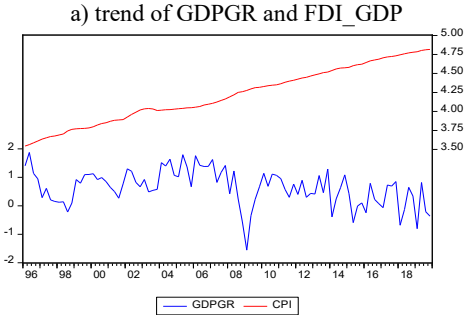
Sources: authors own compilation

Table no. 2 displays the unit root results for the Augmented Dickey Fuller and the Phillips Perron models respectively. There is evidently a combination series that are stationary at different orders of integration. Some test statistics were insignificant under the premises of constant without a time trend, constant with a time trend, and a model lacking a constant and a time trend; therefore, the presented ones generated better results. In some scenarios, stationarity is depicted in level form, implying that the series are integrated of order zero. Although in some series, unit roots existed on level form and onto differencing the series once, stationarity occurred, therefore these variables are integrated of order one.

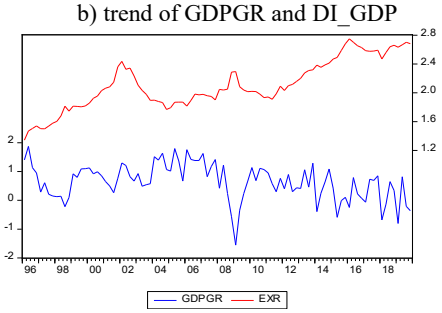


a) trend of GDPGR and FDI_GDP

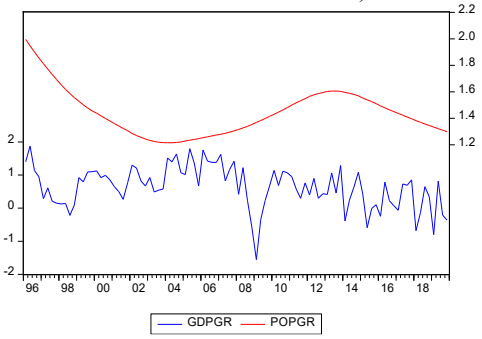
b) trend of GDPGR and DI_GDP



c) trend of GDPGR and CPI



d) trend of GDPGR and EXR



e) trend of GDPGR and POPGR

Figure no. 1 – Time-varying optimal hedge ratio (Single Graph)

4.2 Discussion of findings

The cointegration results confirmed the existence of a long run relationship between the series in all models, as evidenced from the computed F-stat, which was found to be greater than all the bound critical values at 1% level of significance. The economic logic underlying the linkage between investments and economic growth implies that FDI and domestic investments promote economic growth. Foreign investors' technological spillovers enhance productivity in host countries. Remarkably, from the reported results in Table no. 3, this opposes the case for South Africa. It is clear that FDI was found to be both negative and positive in some models, but it was insignificant in others both in the temporary and prolonged periods. Models 1 and 6 show a significant negative relationship between FDI and GDP

growth rate in the long run, which is supported by (Gui-Diby, 2014; Mazenda, 2014). One possible explanation for this negative association is the Great Depression of 2008, which caused FDI to suffer due to uncertainties brought about by the crisis, leading many foreign investors to refrain from investing abroad. The repercussions of this crisis are still being felt today, thereby resulting in economic decline. On the other hand, Model 7 discovered a short-run linkage between FDI and growth.

Institutions were found to be unimportant in the long run meaning there is no prolonged relationship and likewise Agbloyor *et al.* (2016) drew similar results for a case in Sub-Saharan Africa (SSA). Nevertheless, regulatory quality (RQ) and political stability (PS) have a positive association with economic growth temporarily (see, Model 2). Government effectiveness (GE), rule of law (RL), and voice and accountability (VA) all had a negative but minor relationship with growth.

Table no. 3 – Estimation results

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Long Run Results								
Constant	25.284	-1.598	66.565	25.734	49.443	28.796	25.766	24.348
	(2.964)*	(0.159)*	(7.319)*	(3.015)*	(5.414)*	(9.194)*	(3.017)*	(2.842)*
Trend	0.072	-	0.214	0.073	0.1556	0.088	0.074	0.071
	(0.009)*		(0.024)*	(0.009)*	(0.017)*	(0.032)	(0.009)*	(0.009)*
FDI_GDP	-0.101	-0.036	0.074	-0.024	0.072	-0.173	0.084	-0.218
	(0.048)**	(0.051)	(0.121)	(0.326)	(0.082)	(0.103)*	(0.605)	(0.212)
DI_GDP	-0.136	-0.055	-0.186	-0.143	-0.193	-0.141	-0.147	-0.130
	(0.043)*	(0.052)	(0.050)*	(0.052)*	(0.052)*	(0.047)*	(0.056)**	(0.045)*
CPI	-7.301	0.834	-21.161	-7.418	-15.198	-8.899	-7.373	-6.930
	(2.902)**	(0.844)	(4.951)*	(2.959)**	(4.137)*	(2.961)*	(2.922)**	(2.968)**
EXR	0.337	-0.133	2.302	0.333	1.853	0.439	0.268	0.213
	(0.567)	(0.403)	(0.945)**	(0.571)	(0.897)**	(0.610)	(0.613)	(0.607)
POPGR	0.103	0.468	1.5776	0.123	1.739	0.385	0.130	0.086
	(0.657)	(0.923)	(0.9299)***	(0.666)	(0.917)***	(0.730)	(0.665)	(0.656)
RQ	-	0.664	-	-	-	-	-	-
		(0.908)						
VA	-	-3.146	-	-	-	-	-	-
		(3.049)						
RL	-	0.957	-	-	-	-	-	-
		(1.440)						
PS	-	0.490	-	-	-	-	-	-
		(0.974)						
GE	-	2.007	-	-	-	-	-	-
		(1.628)						
CC	-	0.307	-	-	-	-	-	-
		(0.806)						
FDI_GDP*RQ	-	-	-	-	-	-	-	0.228
								(0.404)
FDI_GDP*VA	-	-	-	-	-	-	-0.268	-
							(0.872)	
FDI_GDP*RL	-	-	-	-	-	0.523		-
						(0.664)		
FDI_GDP*PS	-	-	-	-	0.736	-	-	-
					(0.322)**			
FDI_GDP*GE	-	-	-	-0.116	-	-	-	-
				(0.454)				
FDI_GDP*CC	-	-	-0.367		-	-	--	-
			(0.256)					

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Short Run Results								
Constant	25.284	-1.598	66.565	25.734	49.443	28.796	25.766	24.348
	(9.141)*	(4.369)	(15.369)*	(9.384)*	(12.701)*	(9.194)*	(9.325)*	(9.329)**
Trend	0.072	-	0.214	0.073	0.156	0.088	0.074	0.071
	(0.032)**		(0.053)*	(0.032)**	(0.044)*	(0.032)*	(0.033)*	(0.032)**
ΔFDI_GDP	-0.087	-0.035	0.066	-0.021	0.065	-0.145	0.073	-0.189
	(0.042)**	(0.050)	(0.108)	(0.281)	(0.076)	(0.086)***	(0.522)***	(0.186)
ΔDI_GDP	0.149	0.385	-0.165	0.143	-0.177	0.166	0.136	0.132
	(0.158)	(0.208)***	(0.047)*	(0.161)	(0.051)*	(0.162)	(0.164)	(0.162)
ΔCPI	-6.291	0.810	-16.790	-6.392	-13.906	-7.430	-6.365	-6.015
	(2.637)**	(0.815)	(8.096)**	(2.685)	(3.954)*	(2.636)*	(2.662)**	(2.693)**
ΔEXR	0.291	-0.130	0.214	0.287	0.040	0.366	0.231	0.185
	(0.491)	(0.392)	(0.832)	(0.494)	(0.822)	(0.513)	(0.531)	(0.528)
ΔPOPGR	-24.069	0.455	-25.320	-23.771	-31.744	15.051	-25.096	-25.280
	(29.912)	(0.901)	(29.910)	(30.109)	(29.635)	(7.293)**	(30.262)	(30.113)
ΔRQ	-	6.338	-	-	-	-	-	-
		(2.872)**						
ΔVA	-	-3.056	-	-	-	-	-	-
		(2.929)						
ΔRL	-	-7.261	-	-	-	-	-	-
		(2.635)*						
ΔPS	-	9.404	-	-	-	-	-	-
		(2.138)*						
ΔGE	-	-4.213	-	-	-	-	-	-
		(2.486)***						
ΔCC	-	0.298	-	-	-	-	-	-
		(0.786)						
ΔFDI_GDP*RQ	-	-	-	-	-	-	-	0.198
								(0.352)
ΔFDI_GDP*VA	-	-	-	-	-	-	-0.231	
							(0.753)	
ΔFDI_GDP*RL	-	-	-	-	-	0.436	-	-
						(0.550)		
ΔFDI_GDP*PS	-	-	-	-	0.674	-	-	-
					(0.310)**			
ΔFDI_GDP*GE	-	-	-	-0.100	-	-	-	-
				(0.417)				
ΔFDI_GDP*CC	-	-	-0.326	-	-	-	-	-
			(0.227)					
ECT_{t-1}	-0.862	-0.971	-0.890	-0.862	-0.915	-0.835	-0.863	-0.868
	(0.101)*	(0.095)*	(0.098)*	(0.101)*	(0.100)*	(0.102)*	(0.101)*	(0.102)*
F-Stat	15.142*	13.932*	8.682*	15.165*	10.781*	17.520*	15.180*	15.268*
Bound F-Stat	11.407*	7.479*	10.911*	9.674*	11.031*	8.998*	9.684*	9.742*
Adj. R^2	0.432	0.561	0.458	0.432	0.462	0.413	0.433	0.434
JB Stat	0.805	0.973	1.568	1..028	0.874	0.089	1.045	0.507
	[0.669]	[0.615]	[0.457]	[0.598]	[0.646]	[0.956]	[0.593]	[0.776]
LM Test	0.722	3.466	3.996	0.758	5.476	1.916	0.748	0.733
	[0.697]	[0.177]	[0.136]	[0.685]	[0.065]	[0.384]	[0.688]	[0.693]
ARCH	0.153	1.817	0.250	0.164	0.072	0.022	0.150	0.087
	[0.696]	[0.178]	[0.617]	[0.685]	[0.788]	[0.883]	[0.698]	[0.769]
Ramsey Reset	0.266	1.981	1.811	0.235	0.898	0.501	18.050	0.593
	[0.608]	[0.164]	[0.183]	[0.630]	[0.346]	[0.481]	[0.220]	[0.444]
Lag Selection (AIC)	(1,0,1,0,0,2)	(1,0,1,0,0,0, 4,0,1,1,1,0)	(1,0,0,0,2,4,2)	(1,0,0,1,0,0,2)	(1,0,0,0,0,4,2)	(1,0,0,1,0,0,1)	(1,0,0,1,0,0,2)	(1,0,0,1,0,0,2)
CUSUM	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable
CUS. SQR	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable

Note: Standard errors are reported in parenthesis, while the probability values are presented in square brackets. *, ** and ***signifies significance at 1%, 5% and 10% respectively.

Sources: authors own compilation

Based on the interaction regression results, except for the interaction between FDI and political stability, the rest of the interactive terms were insignificant in the long run towards economic growth. This implies that FDI in the presence of political stability leads to prolonged and temporary economic growth (see, Model 5) which is similar to the results drawn by Agbloyor *et al.* (2016) on a full sample in SSA. One potential motive for this relationship is that South Africa is moderately stable in terms of democracy, as demonstrated in its ranking for this specific category of the World Bank's governance indicators, which is in the 40th percentile (World Bank Group, 2020). As a result, the study do not find compelling proof that FDI alongside institutions result in economic growth.

The study considered some of the elements that influence economic growth. Domestic investments have been found to be negatively related with GDP growth in both the long run (see all Models, except Model 2) and short run (see, Model 3 and 5) as confirmed by (Bakari, 2018) for an Algerian case study. This could be due to lack of proper management of local investments and weak growth strategy in South Africa. However, in the short run a positive association was observed (see, Model 2), which causes economic growth. Solow's theoretical reasoning that increased population growth leads to sustained growth, has been confirmed for South Africa in the long run (see, Model 3 and 5) and short run (see, Model 6) scenarios where POPGR was found to be significantly positive towards growth. Because FDI is related to economic growth in a negative manner, this proves that in the absence of technology, population expansion results in long-term growth, as proposed by Solow (1956).

According to the findings, when interactive terms are considered, the exchange rate and economic growth have a long-term significant association (see, Model 3 and 5). A unit increase in the exchange rate entails depreciation which may drag economic growth because depreciation reduces exports hence foreign currency profits will also decrease. However, in the short run, exchange rates were found to be insignificant. Economic growth results from a lower inflationary environment. In the case of South Africa, CPI has a negative link with economic growth in the prolonged period or temporarily, which contradicts the predicted results due to the Inflation Target Policy, which tries to keep rates between 3% and 6%. When the ECT is statistically significant, negative, and less than one, the model is well specified. According to the above-mentioned results, there is a high rate of adjustment. This means that every quarter, between 83% and 97 % of short-run and long-run discrepancies will be altered.

4.3 Diagnostic Tests

A series of diagnostic tests was undertaken to justify the fitness of the models adopted in all situations, with and without the interaction term. The results shown in Table no. 3 exhibits that the series are distributed normally and that the model is accurately stated. The results demonstrate the absence of autocorrelation as well as heteroscedasticity.

5. CONCLUSION

Using quarterly data, this paper investigates the impact of FDI on economic growth, taking into account the role of institutions in the FDI-growth nexus in South Africa. The ARDL Bound test is designed to identify both long-term and transient relationships between the variables under study. For the period under consideration, the analysis indicated that FDI and economic growth in South Africa have a negative long-run connection. As a result, there

is no meaningful long-term relationship between institutions and economic growth. When interaction variables were considered, a favorable short-term relationship between FDI and growth was established. The analysis incorporated interaction terms, and except for the interaction between FDI and political stability, the other institutional factors were shown to be insignificant in terms of growth. This means that there is no strong relationship between FDI, institutions, and economic growth.

The analysis shows that the government's investment policies have had little or no impact on attracting FDI into the country, and so the results do not follow Solow's economic theory of long-run linkage. Nonetheless, FDI has a beneficial short-term impact on economic growth, according to the same theory. Among other institutional variables, there was a temporary positive relationship between regulatory quality and political stability in terms of economic growth. The findings of this study should also serve as a starting point for policymakers in determining which areas should be targeted when encouraging FDI to South Africa in order to enhance growth. Desirable tax breaks promote international investment, which helps to boost GDP. Reduced xenophobic rallies against foreign nationals may encourage more foreign direct investment into the republic.

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