REVISITING FOREIGN DIRECT INVESTMENT - ECONOMIC GROWTH NEXUS IN NIGERIA: AN ARDL APPROACH

***SHEHU EL-RASHEED**
Department of Economics and Development Studies
Federal University of Kashere, Gombe State, Nigeria
selrasheed2017@gmail.com +2348033225804

BELLO MUHAMMAD ABDULLAHI
Department of Economics and Development Studies
Federal University of Kashere, Gombe State, Nigeria
belloabdullahimuhammad1@gmail.com +2348109585801
**corresponding author*

ABSTRACT
This article aims to examine the relationship between foreign direct investment (FDI) and economic growth in Nigeria. The study investigates the relationship between economic growth (GDP), foreign direct investment (FDI), gross fixed capital formation (K), total labour force (L) and, exchange rate (RER). This paper employs annual time series data covering 1990 up to 2020. Utilizing the auto-regressive distributed lag (ARDL) model, the existence of long-run relationship between the independent and dependent variables was found. Additionally, we conducted the granger causality test to determine the direction of causality. The ARDL bounds testing result shows that labor has a long-term negative impact on economic growth, with foreign direct investment, exchange rates, and capital having a positive influence. The empirical findings from a pair-wise Granger-causality model showed the existence of a bidirectional relationship between FDI and economic growth. Based on our findings, we further suggest that the government should pursue a strategy to attract FDI by enhancing Nigeria's business climate, environment, and infrastructure. To increase investor trust, the government should continue to execute sensible policies through the central bank with a goal of achieving stable exchange rates. Additionally, through enhanced educational policy, the government should aim to improve human capital and skilled workforce in the nation.
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JEL Classification: C32, E22, F21, F43, O11, O16

1. INTRODUCTION

For every economy to achieve predictable and long-term growth, capital inflow from abroad is very critical. Majority of research on foreign direct investment-economic growth nexus in Nigeria were centered on the extractive industry, with a greater emphasis on the oil sector (Joshua, Ameh, & İdari, 2021). Investment is the most important and strategic component in driving growth in any country. It has been established as the most important factor in increasing production. Several empirical and theoretical investigations by researchers in both developing and industrialized nations have indicated a substantial association between investment and economic growth. Poor savings habits occur in Nigeria, resulting in savings falling short of anticipated investment, and product market instability, which slows economic growth. The continuous flow of foreign investment into Nigeria dates back to Atlantic slave trade era (Rufai, Aworinde, & Ajibola, 2022).

In less developed countries, particularly Nigeria, a shortage in the capital investment required for rising levels of investment was experienced (Adofu, 2010). This is due to a lack of savings, which is induced by reasons like severe hardship, a poor financial system that can't efficiently organize funds internally, a lack of spirit by the local business owners, and many others. Nigeria's overly reliant on the oil industry as a monocultural economy is also thought to be the factor behind the country's dwindling capital. The country's current condition has generated a savings and foreign exchange gap. In recent years, the Nigerian economy has received a significant volume of inflows of foreign capital inflows compared to other developing economies. This is primarily attributable to the country's attempts to execute responsible macroeconomic policies to draw foreign direct investment and an investment-friendly environment for investment to thrive in the economy. Nigeria's sub-optimal investment ratio was caused by a variety of factors, such as ongoing inflationary pressures, dwindling savings, continuous fall in the value of naira, low infrastructural development, lapses in fiscal and monetary policy, and political unrest (Ahmad & Aworinde, 2020). The FDI coming into the country is also limited by subpar infrastructure, import restrictions, political unrest and pervasive corruption. Generally, investment from abroad plays is significant in attracting key economic factors such as capital flows, technology transfer, managerial know-how, employment opportunities and access to global markets (UNCTAD, 2016 2020). As a result of the austerity measures implemented in 2018, the total amount of foreign capital inflows that entered the country in 2018 was approximately 1.9 billion dollars, down from around 3.5 billion dollars in 2017. Flow of foreign direct investment to Nigeria totaled USD 2.4 billion in 2020, indicating a slight 3.5% increase from the previous year (USD 2.3 billion in 2019), despite the global economic crisis triggered on by the Covid-19 epidemic (UNCTAD, 2021). Also, Nigeria, with a score of 56.9 for economic freedom, is placed 131st globally for business ease. This is an improvement from the 2019 edition, when the nation was rated 146th. For the second time, Nigeria is included as one of the top 10 improvers. However, every economy with an investment gap, such as Nigeria, must give capital inflow from abroad significant consideration for it to attain a particular and desired pace of economic growth (Rufai et al., 2022; Adofu, 2010). This is because FDI brings money in from all around the world to fill the investment shortfall. The nexus between economic growth and foreign direct investment in Nigeria is still ambiguous, and recent data suggests that it may be nation and era specific (Ayanwale, 2007). However, greater research into their links is necessary. Foreign capital inflows is a key source of capital for developing economies; its contribution to economic growth is debatable, but most economists agree that the benefits outweigh the costs (Ali & Mingque, 2018). Furthermore, both developed and developing countries view FDI as a key factor in determining economic growth and development. FDI boosts employment, expands consumer options in the host economic market, and increases knowledge transfer to the intended economy (Liang, Shah, & Bifei, 2021). The study's main objective is to investigate the nexus between economic growth and foreign direct investment in Nigeria over the period spanning 1990 to 2020. The granger causality technique developed by (Granger, 1969) will be utilized in illustrating the causal relationship between the variables under consideration.

The rest of the paper is structured as follows: The second section contains a review of the literature. Section three outlines the technique, data source, model, and estimation strategy employed in the paper. Section four highlights and discusses the results and findings. Section five provides conclusion and policy recommendation.

2. LITERATURE REVIEW

2.1 Conceptual Literature

This section provides a discussion of the main concepts which are highlighted in the following subsections.

2.1.1 Foreign Direct Investment (FDI)

Capital inflows from abroad also known as foreign direct investment is an investment in one country by another country through direct ownership control. Thus, the idea of direct control differentiates it from a foreign portfolio investment. As a crucial component of globalization and the global economy, foreign direct investment (FDI) promotes employment, technical advancement, increased productivity, and eventually economic growth (Asiedu, 2002). According to UNCTAD (2000) FDI boost economic growth through technology transfer via multinational corporations which can be through internal transfer technology to their foreign-owned businesses or externally transfer technology to domestically owned and controlled businesses in the host nation.

2.1.2 Economic Growth

Economic growth is the continuous rise in the value of the goods and services an economy produces over time, after adjusting for inflation. Typically, it is expressed as the rate of growth in real gross domestic product, or real GDP. GDP is the total actual amount of products and services produced within the country during a given time period, mostly a year. The rate of GDP growth is a critical measure of a country's economic strength. Despite being often estimated on an annual basis. GDP can also be computed on a quarterly basis. It consists of all domestic and international trade balances, government expenditures, investments, private inventories, and paid-in building expenses (exports are added, imports are subtracted).The economic growth of a country is a function of many factors including revenue of the government (Aigheyisi, 2017; Chude & Chude, 2015). Put simply, GDP is a comprehensive indicator of a country's overall economic activity.

2.1.3 Exchange Rate

The rate at which one currency is exchanged for another is known as its exchange rate. This can be quoted withwe directly or indirectly, consists of two components: a domestic and a foreign currency. The value of a unit of foreign currency is stated in terms of the domestic currency in a direct quotation. The value of a unit of domestic currency is stated in terms of the foreign currency in an indirect quotation. Quotes for exchange rates are given in terms of the US dollar. But exchange rates can also be quoted in relation to other country's currency; this is known as a cross currency or cross rate. Exchange rates, which are the cost of a foreign currency in local currency, are significant in terms of both their magnitude and their volatility. Exchange rates could have an impact on both the total amount of foreign direct investment and how it is distributed across various countries (Abdulrahmaman & Ajayi, 2022)

2.2 Theoretical Literature

2.2.1 Endogenous growth theory

The endogenous growth theory, which was established by Lucas (1988), Rebelo (1991) and Romer (1986) supported the notion underlying internal rather than external economic variables as the drivers of economic growth. The concept was predicated on the idea that improvements in human capital, knowledge, and innovation lead to higher productivity, which improves the outlook for the economy. In this view, internal causes serve as the primary drivers while technological advancement serves as a cause for growth. They emphasized the importance of investing in technology advancements and human resources to promote growth. Moreover, the idea was

developed by considering advances in technology and mathematical explanations (Sharipov, 2015). The connection linking mechanics of economic growth and the process of acquiring and stockpiling new information, which manifests itself in technical advancements, was formalized by endogenous growth theories. These theories investigate the causes of the disparities between the growth rates of various nations, the efficacy of various state scientific, technological, and industrial strategies, as well as how trade and integration processes affect the expansion of the world economy (Sharipov, 2015). The neoclassical exogenous growth models, which anticipated economic development without taking technological innovation into consideration, were especially challenged by the theory.

2.2.2 Neo-classical exogenous Growth theory

Neo-Classical Growth Theory was the main subject of studies that utilized growth research. Many academics, including Alfred Marshall (1842–1924), Irving Fisher (1867–1947), Leon Walras (1834–1910), and others researched this hypothesis. In the late 1950s and 1960s, it was created (Sharipov, 2015). This theory primarily focuses on the process of capital accumulation together with the choices made regarding savings, which are regarded as significant factors in economic growth. The two production elements that Solow (1956) thought were the main drivers of output were labor and capital. Technology was also incorporated as an external component to the production function. In the absence of technical advancement, income will decline, halting economic growth as well. The theoretical underpinnings of their theories were the classical theory of the factors of production, that regards land, capital, and labor as sole contributors to the creation of the national product, and the theory of marginal productivity, which maintains that the income received by owners of the production factors is largely decided by the factor prices of these factors (Sharipov, 2015). According to Solow's theory, if an economy stored part of its resources for the future so they could be used to create more, its capacity could be expanded. The author also noted that the movement of resources, including labor, capital, and expertise, from wealthy to impoverished nations supports the latter's economic development.

2.3 Empirical Literature

FDI is defined as an investment by significant multinational corporations with headquarters in developed nations (Todaro, 2006). According to Mordi, Adewumi, & Oyedokun (2021) foreign direct investment (FDI) is an investment by an entity based in another country as a controlled ownership of a company in one country. However, FDI is not limited to international capital transfer; it also includes the expansion of a business from its home country, involving flows of capital, technology, and entrepreneurial skills to the situating economy, where they are combined with local factors in the production of goods for local and export markets. A multinational corporation, according to (Jhingan, 2011), is a company or organization that has its headquarters in another country, such as the United States, the United Kingdom, Germany, or Japan, and functions in other developed and developing countries. (Lipsey, 1994) describe economic growth to be a long-term rising trend in a country's overall output. This means that the gross domestic product (GDP) will rise over time. Several empirical studies have been undertaken in a number of countries using various econometric methodologies on the link between FDI and economic growth, with varied and conflicting results. In general, the majority of the studies that have been done are as shown below.

Abdulrahmaman and Ajayi (2022) investigated the impact of infrastructure on Foreign Direct Investment inflow to Nigeria. The multiple regression result indicated that the exchange rate has a

p-value of 0.035, significant at the 5% significance level. This implies that the exchange rate has a significant impact on the amount of FDI flowing into Nigeria. In addition, the result also suggests that amount of FDI that enters Nigeria is barely influenced by the consumption of energy. At the 5% level of significance, the market size has a p-value of 0.024, which is statistically significant. This suggests that FDI into Nigeria is significantly impacted by market size. Additionally, Olowe (2022) examines the links between FDI and capital formation in Nigeria. The result suggest that a long-run relationship between FDI and capital formation in Nigeria exist. The findings further show that foreign direct investment significantly and favorably affects capital formation in Nigeria. Other factors that positively influenced capital formation are government expenditure, interest rate and gross domestic product. However, inflation rate and exchange rate have negative impact on private investment in Nigeria. Moreover, Rufai et al., (2022) used the Gregory-Hansen and Bayer-Hanck cointegration techniques to examine the long-run relationship between foreign direct investment inflows and exchange rate in Nigeria from 1980M01 to 2019M12. The effect of FDI on the exchange rate was investigated using the Dynamic Ordinary Least Square (DOLS) method. A negative relationship was found between the two variables. This suggests that a rise in foreign direct investment causes the naira to appreciate and vice versa.

Acquah and Ibrahim (2020) studied the association between FDI, financial sector development and economic growth of 45 African nations, spanning 1980 to 2016. Results of the two-system generalized technique of moments show an equivocal effect of FDI on economic growth; however, larger FDI is generally correlated with higher growth. Furthermore, Ali and Mingque (2018) using data covering 1990 to 2014 investigated the causal relationship between FDI and GDP in Malaysia, Bangladesh, India and Indonesia. Utilizing the cointegration test, the existence of long-term correlation was found between FDI and economic growth. The results for the short run indicate that there is no evidence of a causal relationship between FDI and GDP or vice versa, whereas the results for the long run indicate that there is a positive impact of FDI and other variables on GDP, though it is not significant, and a negative interrelation among both GDP and other variables and FDI, though it is significant. Moreover, Kinuthia and Murshed (2015) explored the determinants of FDI in Kenya and Malaysia in a comparative context. The vector autoregressive model is utilized in analyzing the data from 1960 to 2009. The results show that foreign direct investment played a significant influence in Malaysia's industrial success, but not in Kenya's growth. Furthermore, Leitão and Rasekhi (2013) used panel data fixed-effects and random-effects regression models to assess the impact of FDI on real GDP per capita in Portugal from 1995 to 2008 and found that FDI promotes growth.

The causal association between inward foreign investment and Kenyan economic growth was investigated by Odhiambo (2021). Using the ARDL-bound testing strategy. The findings show that Kenya's present booming FDI inflows have been mostly driven by strong economic development together with cautious macroeconomic policies. Furthermore, Muse and Mohd (2021)looked at the effect of foreign direct investment on Ethiopia's economic growth. Using the Vector Autoregressions (VARs) model for the period 1981-2017. It concludes that economic growth in Ethiopia is boosted by FDI in both the short and long run. Furthermore, Ma'in and Mat Isa (2020) investigate the impact of foreign direct investment on Malaysian economic growth. To explore the long-run relationship between FDI and economic growth, the Autoregressive Distributed Lag (ARDL) method was used. The bound test shows that life expectancy, gross fixed capital formation, and FDI all contribute in Malaysia's economic growth. Moreso, the population shows the opposite. In addition, Jehangir, Lee, and Park (2020) investigated the influence of FDI

on Pakistan's economic growth from 1974 to 2018. The results show that while military spending negatively affect economic growth, with FDI, gross fixed capital formation, and labor force participation exerting favorable long-term effects. However, Gross fixed capital formation has a substantial inverse link with economic growth in the short-run model.

Ashakah and Ogbebor (2020) using the fixed and random effects regression models examined the role of role of financial development in absorbing the positive effect of FDI in major emerging economies. The empirical results highlighted FDI as an important factor driving growth in emerging markets, since the ratio of foreign direct investments to GDP in emerging markets was both significantly and positively related. The results also showed that financial developments and an interaction term between FDI and financial developments had a negative impact on growth in emerging market. Furthermore, Sarker and Khan (2020) examined the causal link between FDI and GDP in Bangladesh from 1972 to 2017 using the Auto-Regressive Distributed Lag technique and Granger causality. The ECM and Granger causality results demonstrated that GDP and FDI had a unidirectional causal relationship. However, Hussein and Ahmed (2019) accesses the influence of FDI on economic growth in Oman from 1994 to 2014. The main driver of economic growth, as shown by the results, is FDI. Additionally, there existed a bidirectional relationship the two variables. The results showed that FDI causes GDP since the causation trend showed both a direction from FDI to GDP and vice versa.

Sokang (2018) assess the influence of FDI on Cambodian economic growth. The correlation matrix and other regression analysis techniques were employed. FDI was found to be impactful on Cambodia's economic growth. Furthermore, Khamis Hareb Alshamsi (2017) used the United Arab Emirates as a case study to analyze the impact of inflation and GDP per capita on foreign direct investment. The results indicated that FDI is positively affected by GDP per capita. Furthermore, Masipa (2018) studied foreign direct investment influence on South African economic development and employment across a 24-year period. Using Johansen cointegration and the Granger causality test, it was found that FDI, GDP, and work opportunities in South Africa have positive long-run associations stating that foreign investment should be viewed as a tool for boosting long-term economic growth in South Africa.

Furthermore, Anetor (2019) used the SVAR model to investigate quarterly data from the 1961Q1 to the 2016Q4 periods. The study, which aimed to analyze the effects of private capital inflow shocks on Nigerian economic growth, revealed that when FDI was compared to other capital inflows, it accounted for the bulk of the variation in Nigerian economic growth. Long-run economic growth is linked to fixed capital formation and population expansion. However, Emmanuel, Ike, and Alhasan (2019) investigated exchange rates, interest rates, and inflation effects on FDI in Nigeria. The findings indicated a considerable positive link between FDI and exchange rate.

In another study, Calistus (2019) analyzed the effects of exchange rate fluctuations, interest rates, inflation, gross fixed capital formation, and gross domestic product on foreign direct investment in Nigeria from 1980 to 2016. FDI and exchange rate fluctuations were found to be positively correlated. The results also showed that while variables like gross fixed capital formation and gross domestic product had a negative link with the entry of foreign inflows into Nigeria, interest rates and inflation had a positive impact on it.

However, Onayemi, Olomola and Alege (2018) findings revealed that foreign direct investment alone cannot promote economic growth in Nigeria except there is sufficient absorptive capacity.

In another study, Adamu, Idi, and Hajara (2015) found a positive and significant correlation between FDI and the economic growth proxied by real GDP. FDI and Nigerian economic growth were also causally related in both directions.

Various studies were undertaken in Nigeria by earlier researchers, such as Emmanuel et al., (2019); Omankhanlen (2011);Awe (2013); Matthew & Johnson (2013); Calistus (2019); Onayemi et al., (2018); & Adamu et al., (2015), but they were unable to assess the long run and short run influence of FDI on economic growth this is evident in their methodology (Ordinary least square). Therefore, the goal of this research is to look into the long-run and short-run effects of foreign direct investment on Nigerian economic growth, as well as the causality link between FDI and growth in Nigeria. Since few studies in Nigeria employed the ARDL approach in investigating foreign direct investment and economic growth nexus, more research into this relationship is required. This study differs from earlier ones conducted in Nigeria (Adamu et al., 2015; Andrew et al., 2022; Ashakah & Ogbebor, 2020; Awe, 2013; Kpoghul, Okpe, & Anjande, 2020; Olubunmi, 2021) in terms of the number of years taken into account and other interacting variables. Additionally, the majority of studies(Anetor, 2019; Ashakah & Ogbebor, 2020; Kpoghul et al., 2020) were conducted in the period before COVID-19; however, the period after COVID-19 is arguably different, and (Liang et al., 2021) suggested future studies to examine foreign direct investment and economic growth nexus up to the post-COVID period; this study aims to close this gap. This study therefore adds to the literature by examining broadly how FDI affects economic growth in Nigeria in light of current modifications and data additions (1990-2020).

3. METHODOLOGY

3.1 Theoretical Framework

The theoretical underpinning of this study is based on the neoclassical theory of growth. The Neoclassical production function, often regarded as a Cobb-Douglas production function, is the foundation of the neoclassical growth theory proposed by Solow and Swan in 1956. This production function shows that when capital and labor are accompanied by diverse inputs in the production function, growth may be accomplished. This is stated as follows:

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha} \dots\dots\dots\dots\dots\dots.1$$

Where, Y_t represent aggregate output, $K_t$represent capital, L_t represent labour input and A_t represent Total Productivity Factor which reflects the state of technology, skill, education as well as the level of workforce which changes over time.

3.2 Data Description and Sources

Annual time series data from World Bank Development Indicators is used in the study, which spanned 1990 to 2020. Economic variables such as gross domestic product, foreign direct investment, capital, labor, and real exchange rate are considered in this study, with economic growth being the dependent variable, proxied by GDP per capita (current US$); foreign direct investment by FDI net inflows (Bop, current US$); capital by gross fixed capital formation (current US$); labor by labor total force; and real exchange rate by the official exchange rate (Local currency unit per US$, period average)

Table 1. Description of Variables

Variables	Definition	Source
Economic Growth (EG)	Economic growth proxied by GDP per capital is calculated as the total gross value added by all producers who are residents of the economy, plus any applicable product taxes, minus any unaccounted-for subsidies.	Wdi
Foreign Direct Investment (FDI)	This is refers to as inflows of capital from other countries. This includes reinvested earnings, total of equity capital and other capitals.	Wdi
Capital (K)	Gross fixed capital formation encompasses the construction of schools, offices, hospitals, private residences, industrial and commercial structures, as well as land improvements (fences, ditches, drains, and so on). It also includes the purchase of plant, machinery, and equipment.	Wdi
Labour (L)	The labor force consists of persons of age 15 and above who provide labor for the creation of goods and services in a given time period. It includes both those who are currently working and those currently looking for paid employment.	Wdi
Real Exchange Rate (RER)	Rate at which one currency is exchange by other in a market recognized by law. Based on monthly averages, an annual average is calculated (local currency units relative to the U.S. dollar).	Wdi

Source: World Development Indicators (2022)

3.3 ARDL-bound testing Cointegration

The Autoregressive Distributive Lag (ARDL) technique established by Pesaran, Shin, & Smith (2001) will be used to estimate the econometric model. The ARDL was adopted because of its capacity to discover long-run relationships between variables, its efficiency in small sample sizes, and, most importantly, the variable's distinct level of integration I(0), I(1).

Following the study by Kulu, Mensah, & Mike Sena (2021) , we specify the model as:

$$lnGDP_t = \beta_0 + \beta_1 lnGDP_t + \beta_2 lnFDI_t + \beta_3 lnK_t + \beta_4 lnL_t + \beta_5 lnRER_t + \varepsilon_t \dots\dots\dots\dots\dots 2$$

Where ln is log, GDP is gross domestic product, FDI is foreign direct investment, K is capital, L is labor and RER is real exchange rate

We then transformed it to the ARDL specification as;

$$\Delta \ln GDP_t = \theta_0 + \theta_1 \ln GDP_{t-1} + a_1 \ln FDI_{t-1} + a_2 \ln K_{t-1} + a_3 \ln L_{t-1} + a_4 \ln RER_{t-1} + \sum_{i=1}^{b} \beta_1 \, \Delta lnGDP_{t-i} + \sum_{i=1}^{b} \beta_2 \, \Delta lnFDI_{t-i} + \sum_{i=1}^{b} \beta_3 \, \Delta lnK_{t-i} + \sum_{i=1}^{b} \beta_5 \, \Delta lnL_{t-i} + \sum_{i=1}^{b} \beta_5 \, \Delta lnRER_{t-i} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

The first part of the equation without Δ indicates long-run dynamics while the second part with Δ indicates the short-run dynamics. The bound testing approach is utilized to establish cointegration among the variables before estimating the equation. To estimate the short-run adjustment to equilibrium we specify the Error Correction Model (ECM) in equation 4 as follows;

$$\Delta \ln GDP_t = \theta_0 + \sum_{i=1}^{b} \beta_1 \, \Delta lnGDP_{t-i} + \sum_{i=1}^{b} \beta_2 \, \Delta lnFDI_{t-i} + \sum_{i=1}^{b} \beta_3 \, \Delta lnK_{t-i} + \sum_{i=1}^{b} \beta_4 \, \Delta lnL_{t-i} + \sum_{i=1}^{b} \beta_5 \, \Delta lnRER_{t-i} + \delta ECM_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

Where, the speed of adjustment of the parameters for the long run equilibrium following a shock to the system is δ, and the error correction model is ECM_{t-1}.

3.4 Granger Causality Test

To ascertain whether there is a causal relationship between the variables, the Granger-Causality test is applied. In any event, if cointegration exists, the causation between the variables must either be bidirectional, unidirectional, or neutral(Maganya, 2020). To accomplish this, we used the technique by (Granger, 1969). We test the null hypothesis that, GDP_t does not granger cause, FDI_t; and if we can reject the null hypothesis, it suggests that, GDP_t does Granger cause, FDI_t.

The estimation process for the Granger causality test includes the following two regressions:

$$GDP_t = \sum_{i=1}^{b} \alpha_i \, FDI_{t-i} + \sum_{i=1}^{b} \beta_i \, GDP_{t-i} + \varepsilon_{1t} \ldots\ldots\ldots 6$$

$$FDI_t = \sum_{i=1}^{b} \delta_i \, GDP_{t-i} + \sum_{i=1}^{b} \gamma_i \, FDI_{t-i} + \varepsilon_{2t} \ldots\ldots 7$$

Where it is presumed that the disturbances ε_{1t} and ε_{2t} are uncorrelated. The first equation makes the assumption that the current GDP is related to previous values of both the GDP and FDI, and the second equation makes the assumption that FDI behaves similarly to GDP.

4. RESULTS AND DISCUSSION OF FINDINGS

Table 2: Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis	J.B	P-value
LnGDP	31	6.9909	0.782409	6.990940	8.038830	-0.187480	1.462372	3.235490	0.198345
LnFDI	31	21.42076	1.007411	21.42076	22.90267	-0.211429	1.947987	1.660489	0.435943
LnK	31	24.39270	0.636782	24.39270	25.54221	-0.068287	1.786795	1.925255	0.381888
LnL	31	17.64273	0.205366	17.64273	17.94682	-0.247545	1.828056	2.090650	0.351577
LnRER	31	4.438413	1.094864	4.438413	5.882795	-0.738844	2.244580	3.557536	0.168846

Source: Authors' computation (2022)

Table 2 shows the descriptive statistics of the variables. The table shows that Nigeria's LnGDP between 1990 and 2020 ranged from 8.038830 (highest) to 6.990940 (lowest), with an average of 6.9909 and a standard deviation of 0.782409. The range of LnFDI is 22.90267 to 21.42076, while the mean and standard deviation are 21.42076 and 1.007411, respectively. The capital (LnK) mean value is 24.39270, and its standard deviation is 0.636782. Labor (LnL) has a mean value of 17.64273 and a standard deviation of 0.205366. Additionally, the exchange rate (LnRER) variable, which ranges in value from a minimum of 4.438413 to a maximum of 5.882795, has the largest standard deviation (1.094864).

Table 3: Unit root Results

	Stationarity of all Variables in Levels		**Stationarity of all Variables in First Difference**	
Variables	Without trend	With trend	Without trend	With trend
Panel A: Augmented Dickey Fuller (ADF)				
LnGDP	-0.5793	-1.4932	-4.2172***	-4.1304**
LnFDI	-1.4565	-1.9972	-2.3443	-2.2586**
LnK	0.2583	-3.4502*	-3.9884***	-4.0245**
LnL	-1.9757	-1.8110	-3.7014***	-4.2111**

LnRER	-1.8717	-2.2344	-5.0643***	-5.1527***
Panel B: Philip Perrons (PP)				
LnGDP	-0.6443	-1.8704	-4.1956***	-4.0688**
LnFDI	-1.8071	-1.9307	-6.7010***	-6.7051***
LnK	-0.0537	-3.1042	-3.8915***	-3.8697**
LnL	-1.8997	-1.3754	-2.7332*	-2.7110
LnRER	-1.9644	-2.2649	-5.0653***	-5.2553***

Source: Authors' computation (2022)

Note: *, ** and *** denotes stationarity at 10%, 5% and 1% significance levels, respectively.

The Augmented Dickey-Fuller (ADF) and Phillips-Perron(PP) unit root tests were employed to make sure that no variable used in the model is integrated of order two or higher. None of the variables employed in this investigation are integrated to an order of two or higher as reported in Table 2. This suggests that the cointegration relationship between GDP, FDI, capital, labor, and real exchange rate can be examined using the ARDL-bounds testing approach. At various levels of significance, the null hypothesis for the series was rejected.

Table 4: Bound F-test for Cointegration

Test statistics	**Value**	**K**
F-statistics	4.090833	4
	Critical Value Bounds	
Significance level	I(0) Bound	I(1) Bound
10%	1.9	3.01
5%	2.26	3.48
2.5%	2.62	3.9
1%	3.07	4.44

Source: Authors' computation (2022)

Table 4 shows the result of the ARDL bound test for cointegration. Comparing the value of the calculated f-statistics and the critical value bounds is the first stage in this process. Table 4 shows that the estimated f-statistics of 4.090833, evaluated at the k=4 (number of explanatory variables) at 5 percent level of significance, surpass the upper critical boundaries. The null hypothesis that there is no long-run relationship between the variables is thus rejected. This suggests that the variables have a long-run relationship.

Table 5. ARDL Estimates

Panel A: Long run Estimates				
Variable	Coefficient	Std. Error	T-statistics	P-value
LnFDI	0.438301	0.131417	3.335184	0.0031***
LnK	0.643923	0.300385	2.143658	0.0439**
LnL	-1.073420	0.299050	-3.589426	0.0017***
LnRER	0.192422	0.083614	2.301317	0.0317***
Panel B: Short run Estimate				
D(LNFDI)	0.017683	0.027102	0.652468	0.5212
D(LNFDI(-1))	-0.082214	0.035059	-2.345009	0.0289**
D(LNK)	0.784976	0.082945	9.463830	0.0000***
CointEq(-1)*	-0.348985	0.070722	-4.934592	0.0001***
Panel C: Diagnostics Test				
	LM-test	BGP Test	Wald Test	CUSSUMS
	0.021205 (0.9790)	0.818967 (0.5951)	18.20300 (0.0000)	Stable

Source: Authors' computation 2022 from E-Views 10

4.1 Discussion of Findings

Table 5 present the long run and short run results of the ARDL estimated model. In Panel A, the long run estimates show that economic growth is positively affected by foreign direct investment and significant at 1 percent significance level. Specifically, it shows that a 1 percent increase in foreign direct investment will result to approximately (44) percent increase in economic growth in Nigeria. Our finding is in corroboration with that of (Acquah & Ibrahim, 2020; M. S. Ahmad et al., 2022; Muhammad & Khan, 2019; Muse & Mohd, 2021; Sokang, 2018; Zaman, Pinglu, Hussain, Ullah, & Qian, 2021) that inflows of capital from abroad has been a primary engine of economic growth. This is due to the fact that foreign direct investment is a significant source of capital that supports infrastructure development, which improves both micro and macroeconomic activities in the country, hence stimulating economic growth.

Result on capital showed that, capital exacts a positively significant effect on economic growth over the period at 1 percent. Implying that a rise in capital stocks by 1 percent will result to an increase in economic growth by 64 percent. Our finding corroborates with (Aidi, Emecheta, & Ngwudiobu, M., 2016; Gherghina, Simionescu, & Hudea, 2019; Ma'in, Masturah and Mat Isa, 2020; Muhammad & Khan, 2019; Zaman et al., 2021) who discovered that capital had a crucial role in fostering economic growth.

A close examination of labor result reveals economic growth is negatively affected by labor overtime. Specifically, labor was found to statistically reduce economic growth by 107 percent in the long run. This implies that a 1 percent increase in total labor force reduces economic growth by 107 percent. At 1 percent significance level, this is statistically significant. However, our conclusion here contradicts the findings of (Cahyadin & Sarmidi, 2019). This could be due to an aging population, inefficiency, slow technological innovation, and a shortage of highly skilled personnel. Also, an aging population results in a decline in economic factors including productivity, labor force participation, and savings rate (Bloom, Canning, & Finlay, 2013).

The long run result of exchange rate shows that official exchange rate had a significant positive effect on economic growth at 5 percent level of significance. This implies that a 1 percent increase in exchange rate will result to 19 percent increase in economic growth in Nigeria. This finding, contradicts (Thorsten & Daniel, 2015) whose findings showed that the relationship between exchange rates and economic growth is negative. However, our finding corroborates with (Abdulrahmaman & Ajayi, 2022; M. S. Ahmad et al., 2022; Calistus, 2019)

Panel B of Table 5 shows the short run estimates of the ARDL Model and the fact that our variables are cointegrated provides support for the use of an error correction model (ECM) to investigate the short run dynamics. The result showed that the rate of foreign capital inflow the year before had a detrimental and statistically significant impact on the present rate of economic growth. In particular, a 1 percent increase in foreign direct investment in the previous year reduced economic growth in Nigeria by 8.2 percent. This is statistically significant at 5 percent level of significance.

Consistent with the long run results, the short run result of capital shows that capital has a positive and significant effect on economic growth at 1 percent significance level. The coefficient (0.784) shows that a 1 percent increase in capital stocks in the economy will result in approximately a 78 percent increase in economic growth in Nigeria.

Finally, the ECM result shows that the speed of adjustment to equilibrium in the dynamic model after disturbance is -0.34898. Implying that in the long run, 34.8 percent of the short run disequilibrium in economic growth is corrected.

The result of the diagnostic tests was revealed in panel C of table 5. These results ensure the robustness and reliability of our model by assuring that our residuals are free from serial correlation and heteroscedasticity. The p-value of the serial correlation LM test reveals that we cannot reject the null hypothesis of no serial correlation. Similarly, the Breusch-Pagan-Godfrey test for heteroscedasticity reveals that the model is free from heteroscedasticity as the p-value of the f-statistics is greater than 5 percent.

The presence of co-movement among the variables is determined by the Wald-test. From the diagnostics test results in panel C, table 5. The p-value is less than 0.01, which implies that the variables are statistically significant at 1 percent, and therefore, we reject the null hypothesis of no evidence of cointegration (H0 = C(1) = C(2) = C(3) = C(4) = 0) and accept the alternative hypothesis that there is a long run movement among the variables. At the 1 percent significance level, the f-statistics value of 18.20 is greater than the upper bound level of 4.44. The significance and positive f-statistics value indicate a long run co-movement among the variables in the model.

To verify the stability of the model estimates during the time period, the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMQ) were also employed. Based on the ECM model, which was estimated. At a 5 percent significance level, the figures show that both series are between the critical intervals. This implies that there are no structural breakpoints in the model.

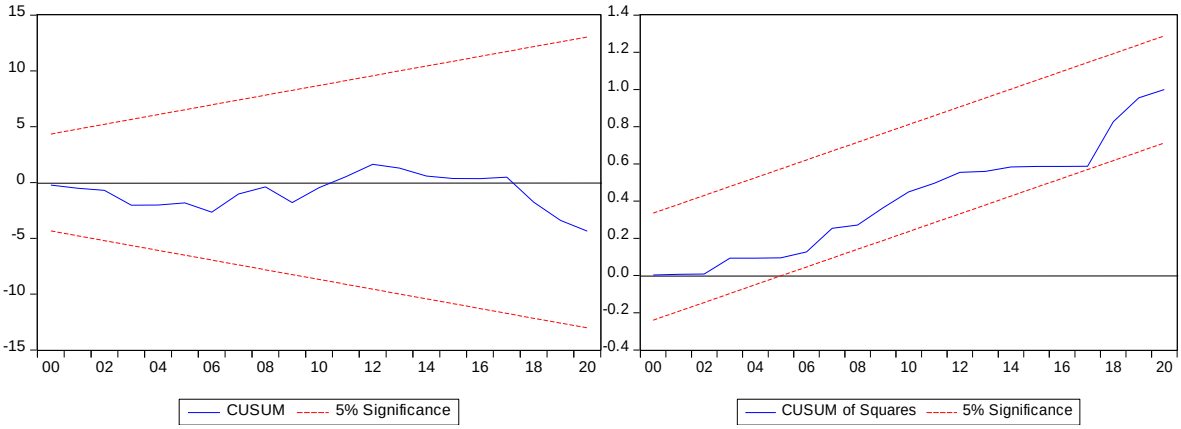

Figure 1: CUSUM and CUSUMQ

4.2 Pair-wise Granger causality test

We use the pair-wise granger causality test with a lag of 4 to establish the direction of the causation between the variables after the ARDL bound test for cointegration confirms the existence of cointegration among the variables. In any event, if cointegration exists, the causation between the variables must either be bidirectional, unidirectional, or neutral (Maganya, 2020). The result is presented in table 6

Table 6. Granger Causality

Null Hypothesis	F-Statistic	Probability	Decision
LnGDP does not Granger Cause LnFDI	4.03940	0.0165	Reject
LnFDI does not Granger Cause LnGDP	3.15474	0.0395	Reject

Source: Authors' computation (2022)

Using the pair-wise granger causality test we tested for the direction of causality between economic growth and foreign direct investment. The null hypothesis of no direction of causality was tested against the alternative that there exists a direction of causality among the variables. However, the results revealed a bidirectional causality between economic growth and FDI. The finding of the granger causality test supports the result obtained from the ARDL estimation and the results corroborates with (Adamu et al., 2015; Alaa, Ashraf, & Marwa, 2021). This finding however, contradicts (Ali & Mingque, 2018; Belloumi, 2014; Jilenga, Xu, & Gondje-Dacka, 2016; Mahembe & Odhiambo, 2016), whose results indicated neutrality of causality.

5.0 CONCLUSION AND POLICY RECOMMENDATION

We examined the impact of foreign direct investment, the exchange rate, and labor on economic growth in Nigeria. According to the ARDL calculations, FDI, the exchange rate, and capital all have a positive impact on economic growth, with only labor having a negative impact in the long run. Using a pair-wise granger-causality model, however, the results revealed that between economic growth and FDI there exist a bidirectional causality . The finding of the granger causality test result corroborates with the ARDL estimation results. According to the study's conclusions, the study suggests that; government policy in Nigeria should be targeted at attracting FDI through improving business conditions, the environment, and the quality of infrastructure. The government, through the central bank, should also continue to execute appropriate measures in the foreign exchange market to achieve stable exchange rates so as to increase investors' confidence. Additionally, the government should also aim to strengthen educational programs in order to develop the human capital and skilled workers in the nation.

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