

Foreign Direct Investment and Economic Growth: Empirical Evidence from Nigeria

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Abstract

The study investigates the effect of foreign direct investment (FDI) on the economic growth of Nigeria by examining the long run and the short run relationship between the variables over the period of 1978 to 2022 using the Auto-Regressive Distributed Lag approach (ARDL). The study finds that in the long run, FDI, gross fixed capital formation and labour force participation have positive effect on economic growth, while military expenditures have negative effect. However, gross fixed capital formation was indicative of having a significantly negative relationship with the economic growth in the short run, but variables such as FDI, military expenditures and labour force participation were found to have positive impact. Inflation shows negative significant relationship in both the short and long run whereas final consumption expenditure showed insignificant relationship in both the short and long run. The study recommends among other things, that Nigeria should strengthen R&D efforts to reduce dependence on imports and increase self-sufficiency, Nigeria should improve the power sector as it is crucial to alleviating Nigeria's energy crises and ensuring the smooth operation of industries across the country and that Nigeria should maintain macroeconomic stability in order to encourage savings and private investment, which will lead to high overall investment in the country.

Keywords: ARDL, Economic Growth, FDI, Nigeria

1. Introduction

Foreign direct investment (FDI) has long been heralded as a catalyst for economic growth, particularly in developing nations. In the context of Nigeria, Africa's most populous country and one of its largest economies, the role of FDI has been a subject of extensive analysis and debate. Nigeria's abundant natural resources, substantial market size, and strategic geographic location present significant opportunities for foreign investors. However, the relationship between FDI and economic growth in Nigeria is complex, influenced by a myriad of factors including

political stability, regulatory environment, infrastructure quality, and human capital development. This article seeks to explore the effect of FDI on the economic growth of Nigeria, examining how inflows of foreign capital impact various sectors of the economy and identifying the conditions under which FDI can most effectively contribute to sustainable development.

The Nigerian economy has experienced periods of significant growth as well as substantial challenges. FDI has played a pivotal role in shaping these economic dynamics, particularly in the oil and gas sector, which has traditionally been the main

recipient of foreign investments. However, the benefits of FDI are not limited to this sector alone. Other industries, such as telecommunications, manufacturing, agriculture, and services, have also attracted foreign investments, contributing to economic diversification and job creation. The impact of FDI on economic growth in Nigeria can be observed through various channels, including technology transfer, improvement in managerial skills, increased competition, and access to international markets.

Despite the potential benefits, the effectiveness of FDI in promoting economic growth in Nigeria is often hindered by several challenges. Political instability and insecurity, including insurgency and conflict in certain regions, can deter foreign investors. Additionally, regulatory uncertainties and bureaucratic hurdles can complicate the investment process, making it less attractive for foreign entities. Infrastructure deficiencies, particularly in power supply, transportation, and telecommunications, further constrain the ability of FDI to drive economic growth. Moreover, the quality of human capital, influenced by the education and health systems, affects the capacity of the local workforce to fully benefit from foreign investment.

Nigeria, a West African country with a population of more than 218 million people, won its independence in 1960. It is still based on an oil economy, but has faced huge challenges in its socio-economic settings. In the past six decades, Nigeria has been struggling to improve its poor economic

situation and to achieve economic development from the very day of independence. It has received an increased amount of inward foreign direct investment (FDI) over time. In the year 1978, Nigeria received an FDI of USD \$400 million, which went up to USD \$588 million in 1988. The amount gradually decreased to USD \$299.57 million in 1998. In 2008 FDI significantly increased to USD \$8.2 billion. Along with the increase of FDI, GDP per capita of Nigeria also continued to fluctuate over the years. It achieved USD 39.6 billion in 1978, USD 23.7 billion in 1988; this marks a 40percent decline within a decade and recorded a slight increase of approximately 5percent in 1998, when the GDP rose to USD \$23.83 billion and in 2008 the GDP significantly increased to USD \$212.1, which was an increase of approximately 895percent in a decade, while, in 2018 the GDP was USD \$397.3 billion, which was an increase of approximately 187percent (World Bank, 2019).

The growth of an economy is influenced by a variety of factors, including political stability, peace and security, infrastructure and communication systems, quality education, a skilled labor force, advanced technological frameworks, savings and investments, trade (exports and imports), inflation, advancements in agriculture and industry, military expenditure, the adoption of modern research and development practices, foreign investment, and various socio-economic factors.

A number of researches on the growth enhancing factors have been conducted

around the world. As a very recent study, Jehangir, Lee and Park (2020) investigate the effect of foreign direct investment on the economic growth of Pakistan. In another study, Švigir and Miloš (2017) investigated the relationship between inflation and economic growth. Furthermore, Yildirim, Sezgen, and Öcal (2005) investigated the effect of military expenditure on economic growth. The impact of FDI on economic growth was explored in details by Crespo and Fontoura (2007). FDI and its effect on economic growth have been of particular interest to researchers across countries. Given the rapid merging of production and monetary markets in the present economic activities, researchers are led to conclude that FDI is a crucial indicator regarding the development and an antidote for the economic hurdles in the emerging economies (Baliamoune-Lutz, 2004; Wong & Adams, 2002).

Literature on the relationship between FDI and economic growth indicate drastic variations in the findings of researchers from various economic backgrounds. Alexiou and Tsaliki (2007), for example, found no relationship whatsoever between FDI and economic growth and vice versa. Carbonell and Werner (2018) and Epaphra and Massawe (2016), on the other hand, reported a negative relationship between the two. Contrary to all, Jawaid and Saleem (2017), Nantwi and Erickson (2019), and Whyman and Petrescu (2017) reported a positive relationship between FDI and economic growth.

Literature particularly relevant to Nigeria, regarding the relationship between FDI and

economic growth, also reveal a great deal of contradiction among researchers. Nilofer and Qayyum (2018) and Saqib, Masnoon and Rafique (2013) identified a negative relationship between FDI and economic growth in Nigeria. The works of Ali and Hussain (2017) and Siddique et al. (2017), however, indicated a positive relationship between FDI and economic growth in Nigeria. The highly varied results reported by various scholars call for further investigation of the impact of FDI on the economic growth of Nigeria. The analysis presented here differs from most of the previous studies in terms of the incorporated variables as well as the time frame under observation in Nigeria. Most of the available literatures have used variables such as GDP, FDI, capital. Also the time frames under observation were mostly limited. In this analysis, however, we have incorporated inflation, military expenditure, labour force participation, gross fixed capital formation, and final consumption expenditure in addition to FDI and GDP.

Although an adequate amount of literature is available on FDI and growth for Nigeria, clear consensus is absent on theoretical relationship between FDI and economic growth. Almost all of the researchers have studied the link between FDI and economic growth in piecemeal. For instance, FDI can promote technological advancement and productivity through knowledge spillovers and technology transfer (Lucas, 1988); the effects of FDI on growth are more evident in the long run, especially when supported by favourable macroeconomic policies (Adeniyi et al., 2012); FDI had a significant positive impact on economic growth in

Nigeria (Akinlo, 2004); FDI contributed to economic expansion by increasing capital formation and providing access to advanced technology (Olokoyo, 2012); FDI's impact on growth may depend on factors such as the absorptive capacity of the economy, human capital development, and the quality of infrastructure (Nwankwo et al., 2021); increasing capital formation boosts economic growth or that higher economic growth results in higher capital formation (Uneze, 2013); positive and significant relationship between gross fixed capital formation and economic growth in Nigeria (Ugochukwu & Chinyere, 2013); negative insignificant relationship between GFCF and economic growth (Ajose and Oyedokun, 2018).

Therefore, there still remain chances to present concrete evidence on this subject. In this respect, this study attempts to look into the relationship between FDI and economic growth in Nigeria both in the long-run and the short-run, using the Auto-Regressive Distributed Lag (ARDL) approach. To the best of my knowledge, I have not come across any study that uses the ARDL model to investigate the impact of FDI on economic growth of Nigeria using GDP, government consumption expenditure, public investment, FDI, lending rate, military expenditure, labour force participation, final consumption expenditure, gross fixed capital formation, inflation, and FDI.

Although there is a study that analysed these variables by Jehangir, Lee and Park (2020) in the context of Pakistan, and this study is mostly based on their methodology, it is

crucial for the same type of research to be replicated in Nigeria for several reasons:

Nigeria and Pakistan while both developing countries; have distinct economic structures, industrial bases, and macroeconomic conditions. Nigeria's economy is highly dependent on oil exports, making it vulnerable to fluctuations in global oil prices, whereas Pakistan has a more diversified economy. This difference can lead to varying effects of FDI on economic growth.

The regulatory environment, governance structures, and economic policies concerning FDI in Nigeria are different from those in Pakistan. Nigeria's policies toward attracting FDI, including tax incentives, investment protections, and ease of doing business, might lead to different outcomes, requiring country-specific analysis.

FDI inflows to Nigeria may be concentrated in different sectors (e.g., oil and gas, telecommunications) compared to Pakistan. The sectorial distribution of FDI can have diverse impacts on economic growth depending on the industry and its role in the local economy.

Nigeria faces unique challenges such as exchange rate volatility, inflationary pressures, and macroeconomic instability, which may alter the relationship between FDI and economic growth. These factors may affect the effectiveness of FDI in spurring growth differently than in Pakistan.

Nigeria's geopolitical and regional position within Africa plays a critical role in shaping its trade relationships, foreign investments,

and regional economic integration, which may yield different results in comparison to Pakistan's situation in South Asia.

Economic conditions and FDI dynamics can shift over time, and findings from Pakistan may no longer reflect current realities in Nigeria. Conducting the research in Nigeria using the same methodology allows for up-to-date analysis that is relevant to its current economic context.

Thus, conducting this research in Nigeria is essential to generate country-specific insights into the relationship between FDI and economic growth, providing policymakers with targeted recommendations suited to Nigeria's unique environment.

2. Theoretical Perspectives on FDI and Economic Growth

Theoretically, FDI is seen as a crucial element of economic growth in many developing countries. The neoclassical growth model suggests that FDI supplements domestic savings, increases capital accumulation, and drives growth (Solow, 1956). On the other hand, endogenous growth theory argues that FDI can promote technological advancement and productivity through knowledge spillovers and technology transfer (Lucas, 1988). In the Nigerian context, this theoretical foundation underpins the expectation that FDI should enhance productivity and foster long-term economic growth (Adeniyi et al., 2012).

Since its independence, Nigeria, just like other developing countries has suffered from political instability, resulting from military

interventions, terrorism, high level of insecurity, like, banditry, Boko haram, kidnappings, insurgency, natural disasters like floods, and high population growth rates resulting in poverty, lower literacy rates and indeed lower economic growth compared to other developing countries.

Increase in capital formation is crucial for the economic development of all nations, and in order to achieve that, a high level of savings and investments are required but developing economies like Nigeria considerably lack the required amount of national savings. According to Ali et al. (2017) the gap that exists between the level of investment and the desired savings in a country can only be fulfilled through external capital inflows. Incoming FDI is one of the capital inflows from external sources which can play an important role in the economic development of a country (Jehangir, Lee and Park, 2020).

Consequent upon that, the Nigerian government initiated its economic liberalization program in the late 1980s, primarily through the SAP in 1986, by deregulating key sectors such as telecommunications, oil and gas, manufacturing, encouraging privatisation of state-owned enterprises, introduction of fiscal and monetary policies that would make the investment climate more attractive for foreign investors, liberalisation of the foreign exchange market and the adoption of market-determined interest rates. As a result of that, Nigeria saw a gradual increase in FDI, particularly in the oil and gas sector during the 1990s and early 2000s. By the early 2000s, Nigeria became one of the top

FDI destinations in Africa, attracting billions of dollars in investment from multinational companies (Bello, 2020).

3. Literature Review

Foreign Direct Investment (FDI) has been widely regarded as an essential driver of economic growth, particularly in developing economies like Nigeria. The relationship between FDI and economic growth is multifaceted, involving aspects such as capital formation, technology transfer, and employment generation. However, the extent to which FDI contributes to Nigeria's economic growth has been a subject of extensive academic debate. Economists are, in general, of the opinion that FDI is one of the major elements of economic growth in all countries, especially in countries that are on the track towards development.

Extant literature on the relationship between FDI and economic growth in Nigeria present mixed evidences. Several scholars have identified a positive correlation between FDI inflows and economic growth. Akinlo (2004) found that FDI had a significant positive impact on economic growth in Nigeria, particularly in sectors like oil and telecommunications, which receive substantial foreign investment. Similarly, Olokoyo (2012) reported that FDI contributed to economic expansion by increasing capital formation and providing access to advanced technology.

Adeniyi et al. (2012) emphasized that the effects of FDI on growth are more evident in the long run, especially when supported by favourable macroeconomic policies. The study highlighted that Nigeria's economic growth is positively impacted by FDI,

particularly in capital-intensive sectors such as manufacturing and telecommunications.

However, other scholars argue that the relationship between FDI and economic growth in Nigeria is more complex and conditional. Nwankwo et al. (2021) contend that FDI's impact on growth may depend on factors such as the absorptive capacity of the economy, human capital development, and the quality of infrastructure. They suggest that while FDI has the potential to boost growth, its benefits are often limited to specific sectors and regions, with unequal distribution of development gains.

Furthermore, extant literature on the relationship between FDI and economic growth in other countries around the world were also conducted. According to Li and Liu (2005) and Johnson (2006) FDI is not only considered as a major source of important capital formation but also as a primary channel to access the advanced technologies and intangible factors including managerial as well as organizational skills and marketing networks, indicating its positive impact on the economic development of a country.

In Nigeria, Uneze (2013) stated that causality between gross fixed capital formation and economic growth is bi-directional. This means that increasing capital formation boosts economic growth or that higher economic growth results in higher capital formation. In another study, Ugochukwu and Chinyere (2013) found a positive and significant relationship between gross fixed capital formation and economic growth in Nigeria, which is contrary to the results of Ajose and Oyedokun (2018) that

studied the impact of capital formation and growth in Nigeria and found negative insignificant relationship between GFCF and economic growth.

In Pakistan, Jehangir, Lee and Park (2020) finds that FDI, gross fixed capital formation and labour force participation have a positive effect on economic growth, whereas military expenditures have negative effect on economic growth in the long run. However, gross fixed capital formation indicates a significant negative relationship with the economic growth while variables such as FDI, military expenditures and labour force participation were found to have positive impact in the short run. Furthermore, Inflation shows a significant but negative impact in both models while, final consumption expenditure shows an insignificant relationship in both models.

The growth rate of FDI has been documented to be very fast in recent years, when compared to international trade (Jehangir, Lee & Park, 2020), most of which flows mainly to the developed countries. Buttressing the above findings, the developing countries according to UNCTAD (2019), recorded an FDI inflow of over 671 billion US dollars in 2018.

The extent that the FDI inflows affect the economic activities of a host county has been explored extensively in recent years. The FDI flow can ‘crowd in’ or “crowd out” the domestic investment and its effect on savings is very ambiguous (Jehangir, Lee and Park, 2020).

The causal relationship of FDI, economic growth and the gross domestic investment

was examined by Choe (2003) on 80 countries from 1971 to 1995 by using the panel vector autoregressive model. A bi-directional causality run was suggested between FDI and economic growth. Another study focusing the flows of FDI on the Mexican economy conducted by Ramirez (2006) reported a positive impact of the FDI on the labor productivity, implying that the superior technology of the foreign firms affects the productivity of the host country positively. However, some researchers reported negative influence of FDI on domestic economy (Crespo & Fontoura, 2007). For instance, when multinational firms enter the domestic market, the competition between the foreign firms and the local firms may get fierce, which may lead to the low volume production and reduced efficiency of the local firms. Thirlwall and Barton (1971) reported a positive relationship with the dataset collected from industrial countries while a negative relationship between inflation and economic growth was reported in a dataset of 7 developing countries. Fisher (1993) and Ghosh and Phillips (1998) showed a negative relationship between inflation and growth. In another study concerning four neighboring countries such as India, Pakistan, Sri-Lanka and Bangladesh, Mallik and Chowdhury (2001) concluded with a positive relationship in the long run between economic growth and inflation.

Estimating the threshold level of inflation in Pakistan, Mubarik (2005) concluded that above the threshold level, inflation negatively affects economic growth in Pakistan and below the level inflation is found to be conducive for the growth of the

economy. In another study in the USA Azar (2009) finds a statistical negative impact between inflation and economic growth. In Italy and Austria, Švigir and Miloš (2017) investigated the relationship between inflation and economic growth and the finding shows that inflation has no impact on economic growth. In their study of Korea and Japan, Prieto and Lee (2019) found that stock market index, economic growth and inflation have a long- term relationship.

On the relationship between military expenditure and economic growth, the literatures do not have any generalised relationship between them across the countries and over times. In a study on the relationship between military spending and economic growth in the United States, Atesoglu (2002) finds a significant positive relationship between military spending and economic growth. In another study by Yildirim, Sezgen, and Öcal (2005) it was established that military spending improves economic growth in Turkey and all of the countries in the Middle East, while Pradhan et al. (2013) found an equilibrium relationship between economic growth and military expenditure using dynamic multivariate-causality tests on a dataset of 22 countries for a period of 24 years. According to the Keynesian theory military spending enhances the aggregate demand by higher investment and the improved utilisation of capital stock, which boosts the economic growth (Khalid & Alsalam, 2015). According to Pacific, Shan and Ramadhan (2017) exports and military expenditure have a significant positive impact on the economic growth of Cameroon while FDI has shown no significant impact on the

economic growth of the country. However, Lim (1983) found that higher defense spending hurts economic growth, contrary Biswas and Ram (1986) whose finding shows that military spending does not significantly influence economic growth in the developing countries.

The study of Zareen and Qayyum (2014) on final consumption expenditure reveals that government size has a positive impact on the economic growth of Pakistan both in the long run and the short run. The ARDL approach was used by Rizeq (2015), and found that total government spending has a positive but insignificant impact on the economic growth of Palestine, which, according to him, is consistent to the neo-classical theory. In Namibia, Shafuda (2015) explored the relationship between government final expenditure and economic growth and concludes on the existence of unidirectional relationship between government expenditure and the economic growth of Namibia and that government expenditure carries a significantly positive impact on the growth of Namibian economy. In studies conducted by Alper and Verougstraete (2018) and Jeff-Anyeneh and Ibenta (2019), it was variously found that a 1percent increase in consumption increases growth by almost 0.41percent in the former and in the later, that government consumption has no impact on economic growth in Nigeria.

In Greece, Dritsakis, Varelas and Adamopoulos (2006) found that gross capital formation increases the economic growth of Greece and Gibescu (2010) concludes that there exists a strong

relationship between GFCF and GDP growth.

Skilled and learned labor force participation always plays a major role in the economic development of a country. In Pakistan, Asghar, Awan and Ur Rehman (2012) found a significant and positive relationship between labour force participation and the economic growth of Pakistan, while Tsani et al. (2013) and Lechman and Kaur (2015) found a “U” shaped reverse relationship between women workers’ participation and the economic growth. They further found that short-run deviations are close to long-run equilibrium figures. In Pakistan, Amir, Khan and Bilal (2015) found that there is a significant and positive relationship between labor force and the economic growth of Pakistan in the long run. In Turkey, Dogan and Akyuz (2017), while studying women workers’ participation and the growth of the economy in Turkey, concluded that there exists a “U” shaped reverse relationship between women workers’ participation and the economic growth. In another study the relationship between GDP and labour force participation in Sri Lanka, Pakistan, India and Bangladesh, Rahman and Saqui (2018) concludes that an increase in the labour force participation has a direct relationship with the economic growth of these countries.

Finally, we can see that some of the micro and macro level studies showed positive relationships between economic growth and the variables such as FDI, Inflation, military expenditure, final consumption expenditure, fixed capital formation, and labour force participation. FDI by MNEs, in general,

improves the level of experiences and knowledge, jobs and human development in the home country. However, if the home country has a lower absorptive capacity, FDI may show reverse effects. The related literatures conclude that FDI may have positive or negative effect on the growth of an economy.

4. Data and Empirical Model

4.1. Sample and Data Collection

The dependent variable, real GDP is used as proxy for the economic growth over the period from 1978-2022. Because the data for labour force participation is not available before 1978, the time period starts from 1978. All the other variables include foreign direct investment (FDI), inflation (INF), military expenditure (ME), final consumption expenditure (FCE), gross fixed capital formation (GFCF) and labour force participation (LFP). The data was taken from the World Bank Development Indicators. All of the variables (dependent and independent) used in this study are in real terms.

4.2. Empirical Model

Real GDP of Nigeria is used as the dependent variable and the in-bound FDI as the independent variable. Control variables were incorporated based on prior studies such as inflation, military expenditure, final consumption expenditure, gross fixed capital formation and labour force participation. All the variables, except for inflation and labour force participation, are in real terms.

The functional form of the model used is as follows:

$$Y_t = f(\text{FDI}_t, \text{INF}_t, \text{ME}_t, \text{FCE}_t, \text{GFCF}_t, \text{LFP}_t, \varepsilon_t) \text{-----} \quad (1)$$

Y_t : Real GDP

FDI_t : Foreign direct investment

INF_t : Inflation

ME_t : Military expenditure/GDP

FCE_t : Final consumption expenditure

GFCF_t : Gross fixed capital formation

LFP_t : Labour force participation

ε_t : Error term

The “t” in subscript stands for time “t” for each individual variable. GDP is not only depends theoretically upon FDI but also on other variables like FCE, GFCF, and LFP.

4.3. Auto-Regressive Distributed Lag (ARDL) Model

Among co-integration approaches, the autoregressive distributed lag model bears some advantages. Firstly, according to Pattichis (1999) and Mah (2000), the ARDL approach is relatively more robust in the case of finite or small samples.

Secondly, according to Harvey (1981) based on a single equation skeleton, the ARDL is more suitable to be utilised and the model clutches adequate number of lags and generates the data process in general to specific framework.

Thirdly, according to Yildirim, Sezgen, and Öcal (2005) the error correction model (ECM) can also be easily drawn from the ARDL approach. The ECM permits drawing outcome of long-run estimates while other traditional techniques of cointegration do

not allow such kinds of inferences. Without losing long-run information, ECM combines short-run adjustments with long-run equilibrium (Pesaran & Shin, 1996).

Fourthly, according to Akram and Afzal (2014) the ARDL approach estimates both the long-run and the short-run relationship simultaneously and gives efficient and unbiased estimates. Fifthly and sixthly, according to Jehangir, Lee and Park (2020) this approach can be used for regressors irrespective of their order of integration whether they are of $I(0)$ or $I(1)$, but none of them is of $I(2)$ or higher as in case of any of the regressors of $I(2)$ or higher order, the ARDL model will be inefficient and the model captures the data generating process from general-to-specific framework by incorporating sufficient number of lags.

Consistent with Jehangir, Lee and Park (2020), in order to get optimal length of lags for variables, the model estimates $(p+1)^k$ no. of regressions, where “p” indicates the maximum number of lags to be used and “k” denotes the number of variables. Other cointegration approaches may face the endogeneity problems, whereas the ARDL technique can differentiate between regressor and regressand, and solves the problems which may arise because of the presence of endogeneity and autocorrelation.

Bearing in mind the aforesaid merits of the ARDL model, the study utilised the model in the empirical analysis to find out the role of FDI in economic growth in Nigeria.

The generalised (p, q) model is specified below:

$$Y_t = a_0 + \sum_{i=1}^p \alpha_i Y_{t-i} + \sum_{i=1}^q \beta_i X_{t-i} + \varepsilon_{it} \quad (2)$$

Where:

“ Y_t ” is the dependent variable,

“ a_0 ” is the intercept or the constant in the model,

“ α_i ” is the coefficient of the dependent variable,

“ β_i ” is the coefficient of the regressors,

“ $i = 1, 2, \dots, k, p, \text{ and } q$ ” are the optimal lag orders,

“ ε_{it} ” represents the vector of error terms.

4.4. ARDL Model for Long and Short-run Estimation

The ARDL approach was used to test the cointegration. By incorporating sufficient lags, the ARDL model captures the data generating process in general to specific framework and assimilates the short-run dynamics through error correction model (ECM) without losing the long-run information (Laurenseson & Chai, 2003). The ECM can be conveniently obtained from ARDL by a simple linear transformation (Akram & Afzal, 2014). The dynamic ARDL model based on Pesaran & Shin (1996) is as follows:

$$\Delta \ln Y_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta \ln Y_{t-i} + \sum_{i=1}^{q_1} \beta_{2i} \Delta \ln FDI_{t-i} + \sum_{i=1}^{q_2} \beta_{3i} \Delta \ln INF_{t-i} + \sum_{i=1}^{q_3} \beta_{4i} \Delta ME_{t-i} + \sum_{i=1}^{q_4} \beta_{5i} \Delta \ln FCE_{t-i} + \sum_{i=1}^{q_5} \beta_{6i} \Delta \ln GFCF_{t-i} + \sum_{i=1}^{q_6} \beta_{7i} \Delta LFP_{t-i} + \lambda_1 \ln Y_{t-1} + \lambda_2 \ln FDI_{t-1} + \lambda_3 \ln INF_{t-1} + \lambda_4 \ln ME_{t-1} + \lambda_5 \ln FCE_{t-1} + \lambda_6 \ln GFCF_{t-1} + \lambda_7 \ln LFP_{t-1} + \varepsilon_t \quad (3)$$

In equation (3), the upper delta “ Δ ” is a first difference operator. The coefficients “ β_{1i} ” to “ β_{7i} ” in the first part of the equation represent the short-run dynamics, while “ λ_1 ” to “ λ_7 ” represent the long-run relationship among the selected variables, respectively. “ β_0 ” is the constant or the intercept, “ p ” is for the optimal lag length used for the dependent variable and q_1, q_2, q_3, q_4, q_5 and q_6 , respectively, are the lag lengths used for exogenous variables while ε_t is used for the error terms.

Following Jehangir, Lee and Park (2020), the hypothesis was tested by applying the Wald-coefficient test and the ARDL equation was estimated using the OLS technique.

$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = \lambda_7 = 0$
{Cointegration do not exist}

H_1 : At least one λ is not equals to zero
{Cointegration exists}

The estimated F-statistics was matched with the critical values of bounds to check the cointegration among the variables. The long and the short-term relationships among GDP, FDI, INF, ME, FCE, GFCF, and LFP are examined in the next part of the manuscript.

Once cointegration is established, we obtain the short-run dynamic parameters allied with long-run estimates by estimating an ECM of the form:

$$\Delta \ln Y_t = \omega_0 + \sum_{i=1}^n \omega_{1i} \Delta \ln Y_{t-i} + \sum_{i=0}^n \omega_{2i} \Delta \ln FDI_{t-i} + \sum_{i=1}^n \omega_{3i} \Delta \ln INF_{t-i} + \sum_{i=1}^n \omega_{4i} \Delta ME_{t-i} + \sum_{i=1}^n \omega_{5i} \Delta \ln FCE_{t-i} +$$

$$\sum_{i=1}^n \omega_{6i} \Delta \ln \text{GFCF}_{t-1} + \sum_{i=1}^n \omega_{7i} \Delta \text{LFP}_{t-1} + \theta \text{ECM}_{t-1} \dots\dots\dots (3)$$

Where $\omega_0, \omega_{1i}, \dots \dots \omega_{7i}$ indicate the short run dynamics, θ represents the parameter for speed adjustment and ECM_{t-1} is the one period lagged error correction term. A change in the dependent variable does not depend on the past errors if this coefficient is insignificant. The coefficient of ECM_{t-1} ranges from -1 to 0, where 0 implies no convergence toward equilibrium and -1 implies perfect convergence. That is, any shock is perfectly adjusted the next period if the value is -1 (Sarker & Khan, 2020).

4.5. The ADF Unit Root Test

Table 1: Descriptive statistics

Statistics	LY	LFDI	INF	ME	LFCE	LGFCF	LFP
Mean	10.799000	8.750000	8.720000	5.254000	9.048000	10.178000	52.29943
Median	11.830000	8.905000	7.765000	5.255000	9.065000	10.165000	51.91400
Maximum	11.010000	9.950000	2.850000	6.270000	1.140000	10.260000	55.49900
Minimum	10.520000	6.110000	2.300000	3.230000	9.900000	9.140000	50.47000
Std. Dev.	0.269211	0.787789	4.158535	1.112649	0.271305	0.186148	1.387713

The Augmented Dickey and Fuller (1979) test of stationarity was used to check data series. This test comes with the augmentation for the error term which has the problem of autocorrelation and not white noise. It handles the issue of serial correlation of the error terms using the lagged dependent variable as additional repressors (Ahmad & Ahmed, 2002). In general, the ADF equation is given as below:

$$\Delta \ln Y_t = a + \beta T + \rho \ln Y_{t-1} + \sum_{i=1}^{p+1} \Delta \ln Y_{t-i} + \sum_{i=1}^{q+1} \gamma_t - 1 + \varepsilon_t \dots (5)$$

Where $i = 1, 2, 3 \dots n$

The null hypothesis for the ADF unit root tests the existence of unit root while the alternative hypothesis checks its nonexistence in the series. - H_0 : Unit root exists and H_1 : Unit root does not exist.

5. Results and Discussions

Table 1 shows the summary of statistics with mean, median, maximum, minimum and standard deviation using the ARDL approach of cointegration. The descriptive statistics show the logged values of GDP, FDI, FCE, and GFCF while the values of INF, ME and LFP are not logged. As shown in Table 2, the mean of log real GDP is 10.79, and the mean of log GFCF (private sector) is 10.19. Mean values of log FDI and

log FCE are 8.75 and 9.05, respectively. The mean values of inflation (consumer prices annual percent) stay at 8.72 while military expenditure carries its mean as 5.25 percent of GDP.

5.1. Results of the ADF Unit Root Test

The ADF unit root test was used for checking the stationarity of the variables in this study. The results showed that some of the variables are of order $I(0)$ and others of order $I(1)$. None of the variables were identified to be of order $I(2)$. Two models namely “the trend model” and “the trend and intercept model” were included in this analysis. The results are shown in Table 3.

Table 2: Results of ADF Unit Root Tests

ADF Test with Intercept		ADF Test with Intercept and Trend	
Variables	T-statistics	Variables	T-statistics
LY	-3.93128	LY	-4.62182
LFDI	-2.52418	LFDI	-3.18250
INF	5.31408*	INF	-5.03140*
ME	-1.33132	ME	-2.15133
LFCE	-2.93826	LFCE	-3.62130
LGFCF	-2.10627	LGFCF	-3.32671
LFP	0.33123	LFP	1.36823
Δ LY	-4.19615*	Δ LY	-4.51169*
Δ LFDI	-8.11723*	Δ LFDI	-7.12413*
Δ ME	-4.50021*	Δ ME	-4.22100*
Δ LFCE	-8.16230*	Δ LFCE	-7.33262*
Δ LGFCF	-4.27251*	Δ LGFCF	-3.88912*
Δ LFP	-6.15034*	Δ LFP	-7.41361*

Note; ** and * indicate significance at 5percent and 1percent level, respectively

Table 2 shows the variables and their corresponding t-statistics values at level and at first difference. Using the ADF unit root test, the values of Y, FDI, ME, FCE, GFCF and LFP were found to be of order the I(1) while INF turned out to be of order I(0). The ARDL approach was used, instead of Johansen cointegration and Engel Granger approaches, because of the variable's order of integration.

5.2. Lag Selection

Table 3 shows VAR lag order by the selection criteria. The obtained results from the AIC, SIC and HQ criteria suggested 4 lags as the optimal number of lags to be incorporated in this analysis. The optimum number of lags as suggested by the AIC and HQ criteria is 4 for the selected model.

Table 3: VAR Lag Order by the Selection Criteria

Lag	AIC	SC	HQ
0	0.97816	0.89453	0.78235
1	-8.79278	-8.74235*	-8.68020
2	-9.60398	-7.46405	-8.40592
3	-10.01935	-6.57201	-8.43591
4	-12.52859*	6.39374	-9.57867*

4.3. Cointegration: Bounds Test Result

The cointegration was tested using the bounds testing approach developed by Pesaran & Shin (1996). Table 4 shows the results of the Wald test of coefficient restriction applied on the estimated equation in order to check for cointegration among

the variables. The null hypothesis of no cointegration was rejected at both the 1percent and 5percent level, where the F-Statistics value 7.41 was found to be greater than I(1) bound at both 1percent and 5percent level.

Table 4: VAR Lag Order by the Selection Criteria

		Critical value 1%			Critical value 5%
Variables	F-statistics	I(0)	I(1)	I(0)	I(1)
LY: LFDI, INF, ME, LFCE, LGFCF, LFP	7.41	3.15	4.43	2.45	3.61

5.4. Results of ARDL Model of Cointegration

Table 5 shows the ultimate result of our ARDL cointegration. Both the long run and the short run coefficients of the respective variables are given in this table.

Table 5: Results of ARDL model

Long Run				Short Run				
Variables	Coefficients	T-statistics	P-value	Variables	Lags	Coefficients	T-statistics	P-value
				D(LY)	1	0.3477	2.6413	0.0132
				D(LY)	2	0.3182	2.3504	0.0258
				D(LFDI)	1	0.0283	3.7100	0.0009
LFDI	0.0267	2.6178	0.0133	D(LFDI)	3	0.0265	3.5113	0.0015
INF	-0.0016	-3.7793	0.0006	D(INF)	2	-0.0006	-2.2854	0.0298
ME	-0.0062	-2.9067	0.0065	D(ME)	2	0.0097	2.3118	0.0281
LFCE	-0.0145	-0.4196	0.6775	D(LFCE)	3	0.0070	0.3014	0.7652
LGFCF	0.1406	2.6535	0.0122	D(GFCF)	2	-0.1285	-2.9961	0.0056
LFP	0.0165	4.2934	0.0001	D(LFP)	3	0.0092	3.2538	0.0029
Constant	0.5541	2.9018	0.0066	Constant		0.5968	2.5715	0.0132
ECM (Derived from the residuals of long-run model)					1	-0.6947	-5.0939	0.0000
R2						0.7104		

The long run coefficient of the FDI in the model shows a positive significant impact on economic growth at 5percent level of significance. The long run relationship shows that a 1 percent increase of FDI is associated with higher GDP growth of about 0.027 percent, while the short run model shows that FDI has a significant positive effect on economic growth having coefficients, at lag (1) and (3), 0.0283 and 0.0265, respectively, at the 1percent level of significance. The finding is consistent with the findings of Jehangir, Lee and Park (2020), Ur Rehman (2015), Jawaid and Saleem (2017), and Ali and Hussain (2017). However, the result contradicts the findings of negative impact of FDI by Nilofer and Qayyum (2018).

The significant negative coefficients of inflation in both the long run and the short run, indicates symptoms of lack of commitment and discipline in monetary policy, and therefore, higher inflation hinders economic growth by hindering productivity growth and investment (Fisher, 1993; Onafowora & Owoye, 2018).

The negative and significant coefficient in military expenditure in the long term is consistent with the findings of Jehangir, Lee and Park (2020), Khalid and Alsalim (2015). However, it shows a positive and significant coefficient in the short, which is consistent with the findings of Jehangir, Lee and Park (2020) and Pacific, Shan and Ramadhan (2017). This indicates the adverse effects of ME on the economic growth in the long run, whereas in the short run, it supports the economic growth.

Furthermore, the coefficient of final consumption expenditure turned out to be insignificant both in the long and the short run, which is also consistent with the findings of Jehangir, Lee and Park (2020) and Rizeq (2015), but contradicts the findings of Zareen and Qayyum (2014) that reported a significantly negative impact of FCE in economic growth.

The significant positive coefficient of gross fixed capital formation in the long run and negative significant coefficient in the short run is consistent with the study findings of Jehangir, Lee and Park (2020) and Lach (2010). The implications of the findings is that gross fixed capital formation is an important factor in the economic growth in the long run, but may not appear so in the short run. The gross fixed capital formation covers four kinds of capital goods - equipment and machinery, furniture and fixture, structure, improvement of land and cultivated assets in orchard development and livestock sector. Given that Nigeria is a developing economy, it does not have sufficient resources to invest simultaneously in these sectors to yield enhanced productivity in the short run. Therefore, investment in these sectors appears to have negative effect on the economic growth of the country, even though, according to Arby and Batool (2007) it contributes to economic development in the long run.

The coefficient of labour force participation, like that of FDI, is also positive and significant in both the long run and the short run for economic growth. This result emphasizes the role the labor force plays in the economic development of Nigeria. This

result is consistent with that of Asghar, Awan & Rehman (2012) and Jehangir, Lee and Park (2020).

The coefficient of the ECM (-0.6947) is negative and statistically significant at 1 percent level of significance. ECM is one period lagged error correction model/term. The coefficient of ECM shows fast convergence of the variables to the equilibrium.

5.5. Results of Diagnostic Tests

The results of the diagnostic test show the stability test results. The values of F-Statistics and the corresponding P-values of the serial correlation LM test indicate that we cannot reject the null hypothesis of no serial correlation, meaning that this model has no serial correlation.

The Heteroskedasticity Test (Breush-Pagan-Godfrey, ARCH) reveals that the model does not suffer from Heteroskedasticity as the p-values of the F-Statistics are more than 5percent, implying that we cannot reject the null hypothesis of no Heteroskedasticity. Similarly, the results of the Jarque-Bera normality test indicate that the null hypothesis of normality cannot be rejected.

Additionally, the CUSUM and QUSUMSQ techniques have also been applied based on the ECM model which was estimated. The following figures reveal that both the series are lying inside their critical bounds at 5percent significance level. This verifies the stability of the ECM model with respect to all involved variables and also indicates that there are no structural breakpoints in the estimated model.

6.0. Conclusion

Concentrating on the effect of FDI on the economic growth of Nigeria, the study utilises time series data for a period of forty-five years from 1978 to 2023. As a result of the empirical analysis, inward FDI has shown positive and significant relationship with the GDP growth, both in the long and the short run. The significant coefficient of FDI in the long run model reveals that a 1percent change in FDI causes 0.015percent change in the economic growth. This implies that an increase in FDI inflow set the economy of the country on the route to development. In the long run model, inflation and military expenditure have shown significantly negative results while final consumption expenditure has shown insignificantly negative result. Both gross fixed capital formation and labor force participation are significant with positive signs. In the short run model, military expenditure and labor force participation have shown significantly positive results while inflation and gross fixed capital formation have shown significantly negative results.

6.1. Policy Recommendations

Nigeria has been under certain pressures regarding internal and external issues such as security, peace, law and order situations among others. The continued unrest and insecurity in the country as well as several other issues have deterred foreign investors from investing and doing business in Nigeria. The government of Nigeria along with its armed forces is trying to handle the situation of terrorism, banditry, kidnappings and all forms of insurgency across the country in a decent and organised way.

Based on the results obtained by this study, it is recommended that the government of Nigeria should maintain investment policies relaxed and easy in order to attract more foreign investors.

Our empirical analysis has also shown that while military expenditure has a significantly positive effect on the economic growth in the short term, it has a significantly negative impact in the long term. This means that while the increase in military expenditure contributes to the economic growth by increasing domestic demand and investment in the short term, it leads to the decrease of investment in technology and infrastructure, consequently weakening national competitiveness in the long term.

There is an intense need of promoting education with special focus on technical education in the country. Technical education leads to producing skilled labour which is an important part of the production cycle. Nigeria needs to undertake various reforms in multiple areas in order to improve labour productivity and capital formation.

Trust building measures may play a vital role in the development of a country. Nigeria needs to take measures to build up trust between public and private sectors. Problems faced by business community in Nigeria must be identified through mutual discussions and steps by the government in order to reduce their stress regarding business security and to ensure creating healthy business environment in the country.

Besides the above mentioned policy recommendations, there are some other important points which, if taken into consideration, can help Nigeria's economy to develop fast:

First, Nigeria's economy struggles to sustain high growth rates over extended periods. Recurrent issues, such as balance of payments deficits, have hindered the country's aspirations of achieving middle-income status. The brief periods of growth are largely driven by private and public consumption rather than increased investment, limiting the potential for long-term economic expansion.

Second, demand is growing at a much faster pace than the supply of goods and services, leading to a high reliance on imports. As shown in Table 2, data from the Central Bank of Nigeria highlights that the country is not investing enough in research and development (R&D) to boost domestic production. Strengthening R&D efforts is essential to reduce dependence on imports and increase self-sufficiency. For a lower-income economy, the heavy reliance on importing even basic goods and services is unsustainable, making local production a priority."

Third, improving the power sector is crucial to alleviating Nigeria's energy crises and ensuring the smooth operation of industries across the country. Power shortages in the industrial sector have led to the shutdown of production units, resulting in increased unemployment and a decline in overall productivity.

Fourth, persistent macroeconomic instability discourages savings and private investment, leading to low overall investment in the country. This instability has also contributed to Nigeria's relatively lower foreign direct investment (FDI) compared to neighboring countries at similar stages of economic development. In 2008, FDI inflows to Nigeria declined by 49 percent, amounting to USD \$299.57 while other developing countries recorded increases in FDI during the same period (UNCTAD, 2022).

Finally, strengthening public and private institutions, digitising revenue records, and fostering strong interconnections between public departments will help establish stability and build trust among foreign investors. These measures are essential for positioning Nigeria on the path toward becoming a prosperous, developed nation.

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