

Research Article

Foreign Direct Investment and the Nigerian Economy: An Empirical Analysis

Muhammed Akpai Amade^{1,*}, Peter Luke Oyigebe²

¹Department of Economics, Federal University, Lokoja, Nigeria

²Department of Political Science, Federal University, Lokoja, Nigeria

Abstract

The primary motive of this paper was to investigate the impact of Foreign Direct Investment on economic growth of Nigeria from 1985 to 2022. Ex – post facto research design was carefully carried out; annual time series data were extracted from Central Bank of Nigeria Statistical Bulletin of 2021 and World Development Indicator. Real Gross Domestic Product (RGDP) was used as the dependent variable proxy for economic growth. Foreign Direct Investment (FDI), Exchange Rate (EXCR), Trade Openness (TOPN) and Inflation (INF) all denoted for explanatory variables of the study. The estimated coefficients of the variables under study displayed that all the variables are integrated of the same order 1(1) exception of Foreign Direct Investment which was integrated of order 1(0). The bound test conducted showed that there is proof of the presence of a long run correlation among the variables used while the causality test clearly showed that FDI granger causes economic growth in Nigeria under review. Other diagnostic tests seen in this paper are unit root test, descriptive statistics, correlation coefficient matrix, Cointegration test and test of Normality respectively, and they long-established the validity and reliability of the model used. Based on the inferential results revealed by the research work, the paper came up with recommendation that government should improve the investment climate for both domestic and foreign investors through adequate infrastructural development, soft loans and tax holidays.

Keywords

Economic Growth, Foreign Direct Investment, Inflation, Nigeria, ARDL

1. Introduction

The contribution of investment in any economy cannot be over emphasized. Investment is one of the key drivers of today's world economic growth and development. It proves significant among major economic variables that stimulate economic growth and development in either developed or third world nations of the world. It is a mechanism for expanding and growing the economy from country to countries

or continent to continents. Investment entails the combination of capital, human resources, technology and other factors of production into productive activities for profit motive [89, 37, 2, 74]. Eze [44] stresses that amongst the various investments in the economies, Foreign Direct Investment (FDI) alone can improve the financial expansion in both developing and developed economies.

*Corresponding author: amademohammed5@gmail.com (Muhammed Akpai Amade)

Received: 10 February 2024; **Accepted:** 5 March 2024; **Published:** 2 April 2024



The demand for foreign capital flows in an economy is a fundamental target of all economic policy makers all over the world, including the third world nations where inadequate capital is a major constraint to their economic growth and development. The Foreign Direct Investment (FDI) provide numerous economic benefits to the host country. However, it is crystal clear that FDI is conspicuously used to generate employment opportunity and capital formation through domestic capital inflows and outflows of business ventures which invariably leading to economic growth [108, 91, 7, 47, 38]. In addition to the above assertion, Adediran et al. [3] stress that stakeholders in emerging economies precisely anticipated for FDI inflow as it brings much-needed capital, new face of technologies, marketing techniques and managerial acumen needed for economic growth.

In addition to the above assertion, FDI contains various kinds of financial management instruments such as bonds and portfolio investment in foreign stocks. FDI can bring much-needed additional foreign capital to the economy, advanced technology and improved managerial acumen, it is considered by many scholars as an indispensable part of economic growth and a fulcrum of economic globalization [6, 12, 73, 1, 21].

However, foreign direct investment has been a topic of debate by many scholars in the field of economics and politics concerning its role it offers for socio-economic growth of a country. Some independent research works or studies argued immensely that FDI directly affects economic growth and development of the Nigerian economy Mokuolu [75], Sokang [102], Awa [16], Hammed Yinka Sabuur [51] and Ogu [83] while others are of the view that FDI only contributes insignificant amount to economic growth and development [99, 17, 22, 4, 43].

It has been verified by Anetor [13] that both domestic and international economic researchers that Nigeria is the major host of FDI in Sub-Saharan Africa, the third in the continent, behind Egypt and Ethiopia. Currently, Nigeria has witnessed several trades, social and economic policies targeted at diversifying the economy away from oil revenue. These policies are focused on the improvement of the social service sectors (Education, Health, Communication, Transport, Tourism, etc.) and the real sectors (Mining, Industrialization, Manufacturing, Mining, Agriculture, etc.) of the economy that would encourage FDI.

In Nigeria, Foreign Direct Investment could be dated back to the period of colonial rule that came up with the intention of exploiting and transporting Nigeria's oil and other mineral resources to their own countries of origin at the expense of Nigeria. In fact, the colonial masters were mainly British nationals who made little investment in Nigeria within the period of colonial rule but with the discovery of oil in commercial quantity at different parts of Nigeria, the flow of FDI in the oil sector increased tremendously [4, 9, 24, 112, 77].

It has been recorded by the World Bank that from 1970 to 1979, Nigeria as a country recorded an average ratio of FDI

net inflow of about 1.6 to GDP, from 1980 to 1989, the average ratio of FDI net inflow to GDP stood at 1.95 and from 1993 and 1994, the country made a remarkable record of net inflow of 6.3 and 8.3 respectively. The increase in the early 1990s was mainly due to rejection of restrictive measures which the indigenization decree brought against the free flow of FDI in and out of the country, and the move towards trade liberalization that favours more foreign participation in the economy. In fact, sudden shock was experienced from 1995-2010, FDI net inflow into the country as percentage of GDP in Nigeria has not gone outside four point zero (4.0) apart from the years 1996, 1997, 2005 and 2009 respectively that Nigeria had a remarkable record of 4.51, 4.3, 4.4 and 5.1

In the same view, World Bank Global Development Finance in 2008 depicted clearly that Thailand as a country attracted nine point six billion dollars (9.6 billion dollars) in the year 2007 but Nigeria attracted six point zero three billion (6.03 billion dollars). Again, Danja [52].

annual bulletin reports that the total FDI inflow into Nigeria in year 2010 was seen as five-point nine billion (5.99 billion dollars). As the figure was broken down, FDI was about 12.2% or 668 million dollars, this represents a 78.1 percent drop from 3.31 billion dollars in 2009. As at 2017, Nigeria's FDI flows has dropped by 21% from the previous year to reach 3.5 billion dollars which could be as a result of political instability, lack of transparency, widespread corruption, inadequate economic policies and poor quality of infrastructure [107, 49, 23]. In 2018, the total FDI inflow to the country was around 1.9 billion dollars, showing a decrease due to the consequence of the austerity measures imposed in 2018. At the third quarter of 2019, the FDI was only 3.37 percent (200.08 million dollars) of the total capital inflow for the period under review. In light of the above analysis, many economists are lost in speculations of the likely causes of the insignificant inflow of FDI into the country. This poor inflow of FDI has been a source of worry to both policy makers and government. Amidst, Aminu [58] asserted that the level of FDI attracted by Nigeria is indifferent compared with the resource based and potential need, taken into cognizance of the fact that Nigeria is the 7th ranked most populous nation and 31nd biggest economy in the world (CIA World fact book) with the endowment to do better than its counterpart South Africa as the Africa biggest economy. It is against this background that this research work seeks to investigate the impact of foreign direct investment inflow into Nigerian economy from 1985 to 2022.

Statement of the Problem

Economic growth and development generally entail improvement in the various aspects of the life of the citizenry. For instance, there is economic improvement when a greater number of useful jobs are created for the greater portion of employable persons, higher real income is recorded, better health conditions, better housing, high level of education in the economy. However, adequate economic investment can hardly be achieved without commensurate investment in

both human and material resources.

Achieving economic growth is one of the major macroeconomic objectives of Nigeria, but the economy faces the foremost challenges of low capital formation to finance the necessary investments for economic growth. As domestic investment is often lower than the required investment that can stimulate high growth rate in the economy. This circumstance has led to the wide gap created between actual domestic investment and required investment for accelerating economic growth [41, 28, 50, 30]. The author argued that the situation has in turn resulted in high level of unemployment, poor standard of living, poor educational system, high level of inequality, insecurity and poor business environment etc.

However, foreign direct investment is a strong force that has a positive impact on economic growth and development through technology transfer which including technical know-how, skills acquisition, raising domestic firms' productivity and human capital development that could spur economic growth [5, 27, 43, 35]. Therefore, we experience reduction in poverty, better income distribution, income inequality gap reduction in the face of FDI. Despite the prospects that FDI inflow seeks to bring to the country, Nigeria as a country is faced with huge challenges such as political instability, bureaucratic bottleneck, heavy reliance on oil, government inefficiency, Boko Haram insurgency, banditry, poor level of human capital, poor legal and judicial systems, small markets size and business environment, among others [79, 4, 19, 31].

It is in light of these problems explained above that this study is primarily intended to investigate the impact of Foreign Direct Investment on economic growth of Nigeria between 1985 and 2022. Although, the study is premised on the following objectives:

1. To determine the long-run relationship between Foreign Direct Investment and economic growth of Nigeria.
2. To determine if trade openness show a significant impact on economic growth of Nigeria.
3. To determine if there exist a causal relationship between inflation rate and economic growth.

For the research work to be carried effectively, the research work is outlined serially into five sections. Section one covers the introduction of the study, section two depicts the literature review, section three displays the methodology, section four describes analysis of data and interpretation of result while section five explains conclusion and recommendations of the research work respectively.

2. Literature Review

The correlation between FDI and economic growth has been intensively debated among economic scholars in recent time. To obtain a thorough knowledge of this relationship within the purview of Nigerian economy and other developing economies alike, it is imperative to look into the concep-

tual review, theoretical literature and empirical literature studying the works of scholars in the field FDI and economic growth. The main focus here is to investigate how FDI impacts directly to the sustainable growth of Nigerian economy.

Conceptual Review

Concept of Economic Growth

"Economic growth can be defined by Adigun [5] as a continuous increase in per capita national output or net national product over a long period of time. Eze [44] pointed out that economic growth is a process of quantitative and qualitative structural change which has a significant impact on the nation's economy and the standard of living of its citizenry. In a narrower sense, economic growth can be understood as an increase in national income per capita, involving the analysis of the functional relationships between endogenous variables. In a broader sense, it encompasses the increase in GDP, GNP, and NI, thus reflecting the overall national wealth, including production capacity and both absolute and relative size per capita, as well as the structural modifications of the economy.

Economic growth refers to the qualitative expansion in the production of economic goods and services over time, comparing one period to another. Economic growth can be calculated in nominal or real terms, with the latter adjusted for inflation. Conventionally, aggregate economic growth is measured through indicators such as Gross National Product (GNP) or Gross Domestic Product (GDP) [18, 26, 11].

Concept of Investment

The concept of investment refers to the kind of capital transfer either within or outside the country that leads to increase in production and purchase of capital goods. Investment encompasses new production plants and equipment, construction of public infrastructural facilities like dams, roads, building, (meant for further production), net foreign investment, inventories, stocks and shares of big companies. Investment may be divided into local (domestic or generated within an economy) and investment that is foreign (extraneous and coming from outside the economy) [5, 14, 25, 103, 65].

Domestic Investment

Oyedokun and Ajose [90] clarified that real domestic investment as the name implies involves the expenditures made to increase the total capital stock in the economy over time. This is possible by obtaining further capital-producing assets and assets that can generate income within the domestic economy. In fact, physical assets add to the existing total capital stock, will boosting economic growth and development.

Foreign Direct Investment

Foreign Direct Investment on the other hand, has been labeled as investment made so as to obtain a lasting management interest and at least 10% of equity shares in a company operating in another country other than that of investor's country of origin [25, 14, 29, 32, 113]. FDI as an economic

variable plays an integral part in economic growth and development of most countries of the world [5, 46, 97, 72, 93].

Determinants of FDI Flow

Series of different studies highlight the significance of the size of the market and health of the economy as the major factors attracting FDI in developing and industrialized economies. Market size and good economic atmosphere have proved to be the most exceptional determinants of FDI. In an economy with large markets, the stock of FDI is projected to be large since market size is a degree of market demand in the economy. In this scenario, the host country allows the efficient utilization of economies of scale for import-substituting investment.

Costs as well as the skills of labor

The skills and costs of labor in a host country are known as the major attraction for FDI. When investment is export oriented the cost of labor is one of the factors to be considered when it comes to FDI [68, 46, 36]. Economically, lower cost of labor directly reduces the cost of production, all other factors of production remained constant. Sometimes, the availability of cheap and skilled labor justifies the reason for the relocation of the production processes in foreign countries [96, 54, 101, 78, 63]. Accordingly, the investors are concerned about the value of the labor force. It is generally believed that highly skilled labor is able to learn and adapt to new technological innovation faster than unskilled labor, and the cost of retraining is also less. As a result of this investors are targeting economies where the government sustains a substantial policy on the recruitment of expatriate staff. This situation enables investors to bring in immigrants to their productive operations in order to bridge the gap in the dexterity of domestic workforce.

Trade Openness

Trade openness is a situation whereby a country opens its economy for international trade without trade tariff or obstacles on its borders. Openness of a country's economy fosters the inflows of FDI smoothly. The more a country opens its economy, the more it allows trade and exchange rate regimes and the more it attracts FDI. The institutional environment is considered as an important factor as it affects business operations. Generally, there are many arrays of factors that can directly promote or prevent investment in an economy. The first of these factors that can deter investment is corruption and bribery. In fact, corruption deters the inflow of FDI as it creates uncertainty in the economy and inhibits the free flow of FDI. The level of bureaucracy is another major factor to be considered before establishing a business in a country. Sophisticated and time-consuming procedures directly deter investment. The institutional factor that favour investment is the existence of incentives in the form of fiscal and financial attractions and the institution of the judiciary, which is the key to protecting property rights and law enforcement regulations [89, 48, 35, 45].

Availability of natural resources

The availability of natural economic resources is a key

factor in attracting FDI. This is so in Africa particularly Nigeria where a large share of its FDI has been in an area of abundant natural resources. In some cases, the abundance of natural resources combined with a large domestic market attract FDI. It is crystal clear that most African countries that attract FDI are those with abundant natural and mineral resources as well as large domestic markets [33, 39, 34, 110]. The clustering of investors may lead to positive externalities. Three types of externalities have been identified in the economic literature. These are

1. Technological transfer
2. Shared pool of skilled labor and specialized input suppliers
3. Users and suppliers of inputs cluster near each other due to greater demand.

Return of investment is another major determinant of FDI flows.

Foreign investors will go to countries that pay a higher return on capital. For third world countries, the rate of return on capital is difficult to come by because of poor capital market [15, 109, 84, 60]. The investors normally use the inverse of real GDP per capita to measure the return on their capital. The implication of this is that investments in countries with higher per capita income yield lower return and therefore real GDP per capita is inversely related to FDI [112, 53, 61, 76]. The empirical findings of the correlation between real GDP per capita and FDI ended a mixed reaction. The works of Edwards [40] and Jaspersen et al. [59] applying the inverse of income per capita as proxy for the return on capital, the study revealed that real GDP per capita and FDI/GDP are negatively related while the works of Schneider and Frey [59] and Tsai [106] are quite different as the authors find a positive relationship between the two real GDP and return on capital. In summary, higher GDP per capita shows better prospects for FDI in the host country [20, 114, 56, 69].

Relationship Between FDI and Economic Growth

It has been shown in most of the research works that There is an agreement between FDI and economic growth in an economy. Advanced countries had demonstrated clearly that productivity has been the main factor for local firms' efficiency. Invariably, the role of Foreign Direct Investment in export promotion becomes debatable as its sole aim is purely for the purpose of investment in the economy. The major agreement is that FDI effect (positive or negative) depends directly on the size of the beneficiary nation in order to engage the kind of investment type and, foreign technology. The association between FDI and economic growth is marked conditional depending on the host country the FDI is passing through. It has been inferred by many academics that the contribution of FDI to economic growth depend on economic and social conditions or the value of the conducive environment of the beneficiary country [115, 91, 55, 64].

Moreover, FDI generated job opportunities in many countries and this is necessitated through direct recruitment in the

internal economy for efficient operations, for onward and backward connections which directly leads to reasonable employment generation in the economy due to growth. Economic growth and development can be attained through FDI and a sustain state of growth over a time period, thereby reduces poverty among the citizenry [8, 67, 111, 81].

Brief Background of the Current State of Foreign Direct Investment in Nigeria

UNCATD [108] gives a clear report that Nigeria is one of the commonly known countries for FDI in Africa. The nation is characterized as FDI destination in Africa especially in areas of building, hydrocarbon, energy and other valued economic resources having their deposit in commercial quantities. Nigeria as a country knows the impact of oil on its economy for many decades now. UNCATD specified that FDI inflows into the country totaled USD 1.9billion in 2018 and experienced a deterioration when compared to the previous year of 2017 to be USD 3.5 billion under the canopy of austerity measures, this was estimated at USD 99.6B in 2018, the total shock of FDI represents 25.1% of the country's GDP. The foreign countries that flow their investments directly into Nigeria are UK, France, China, Canada, USA, Netherland and Germany respectively. The country has a plan of expanding its economy by relatively staying away from oil dependence and build a competitive global industrial sector that would encourage collaboration into international value chains and productivity.

Theoretical Literature

Theoretical studies on FDI have led to a better understanding of the economic operations and the behavior of economic agents both at micro and macroeconomic levels which allows the opening of new areas of study in economic theory. To understand FDI better we have to identify and understand the main theories that shade light on FDI. The theories of FDI may be enumerated under the following headings:

Harrod-Domar Growth Model

Harrod-Domar model is one the foremost models of economic growth. This model is used in the field of development economics to explain an economy's growth rate in terms of savings and capital productivity [85, 105]. This model looks at economic growth as an outcome of the equilibrium between savings and investment. The essential variables in the Harrod-Domar Growth Model include capital denoted as (K) accumulation and the ratio of increase in output denoted as (Y) to increase in investment denoted as (I). However, the change in output is brought by a change in capital stock ($\Delta Y = \Delta K$) and that the change in capital stock is due to investment, thus, $\Delta K = I$. In this scenario, an economy runs more on savings than on spending. As such, economic growth rate is depending on the level of savings and the productivity of investment [95, 76, 88]. Furthermore, the model clarified that investment is the main source of national income while productivity is enhanced from the savings invested which eventually increases in the capital stock of a

nation [82, 105, 72]. In summary, national productivity and economic growth based on this model follows the expansion of investment levels in an economy (Todaro & Smith, 2011).

The model is very relevant to the research study because FDI is a form of capital, which an independent variable captured in the research model and the Harrod-Domar model clarified that growth in output occur as a result of growth in capital and vice versa.

Fisher Theory of Inflation and Foreign Direct Investment

The Fisher equation hypothesizes that nominal interest rate is made up of real interest rate plus inflation rate. From this correlation, it indicates that low inflation rates lead to low nominal interest rates. Therefore, cost of capital and investment will be low. Thus, the availability of capital at lower nominal interest rate in the beneficiary country will attract investors from foreign countries. Fisher's equation proves that inflation and foreign direct investment related negatively.

The theory is relevant to the study because inflation and FDI are independent variables are included in the model and the fisher's model explains how they correlate to bring about economic growth.

The Intervention/Integration/Middle Path Theory

The Intervention/Integration/Middle Path Theory seems or attempts to evaluate FDI from the viewpoint of the beneficiary state and that of the foreign investors. It encompasses debates heavily from both classical and dependency school of thoughts. Thus, the model pointed out that foreign investments must be protected adequately by looking at the advantages it generates to the beneficiary nation and the extent for which FDI have behaved as good corporate entities in promoting the economic and social wellbeing of the beneficiary state. The MODEL demands adequate intervention and openness in dealing with foreign investment and caution against too much regulation by host country [102, 92, 98, 70]. The theory recognizes market forces in resource allocation and the intervention of government in resource allocation. What is needed is an equilibrium between those economic activities that can be handled by the market mechanism and those economic activities that can be handled properly by the government itself.

This theory shares the elements Adam Smith's case of free market forces and Keynes's argument in favor of government interventionism.

This theory is very important for this research study because it encompasses on relatively government involvement in the regulation of FDI which is the center pillar of this research work. This means that Nigerian government should involve in policies that would attract FDI.

Direct Input Theory

Direct Input Theory adopts the direct input theory as propounded by the neoclassical school of thought, which directly link economic growth on aggregate production function. This implies that economic output represented by letter (Y) was related to primary inputs of capital represented by letter

(K) and labor (L). This is noticeable to the seminar paper presented by Solow (1956), which formed the foundation for numerous studies that have employed growth analysis procedure within the neoclassical model framework; this research study adopts this approach as consistent with the literature analyzed above. Therefore, the role of investment is summarized in the two equations below.

$$Y = A^* f(K, L) \quad (1)$$

$$\Delta K_t = I_t - \alpha K_{t-1} \quad (2)$$

Equation (1) describes an aggregate production function which shows the link between output (Y), capital (K), labor inputs (L) and technological progress (A) in equation (1) while Equation (2) is the capital accumulation equation. This expressed the link between investment in tangible assets (I) and capital stock (K).

The consistency of the above neoclassical model and its theoretical framework on capital formation and economic growth is pertinent and applicable to this paper. In fact, the main challenges identified in this theory is that accumulation of capital is subjected to the law of diminishing return and without exogenous technical progress, stable growth could not be achieved. This study adopts the theory because it links accumulation of capital to output.

The theory is relevant to the study because it indirectly captures all the parameters in the model design in section three (theoretical framework).

Empirical Literature Review

There has been constant debate across different fields in economics and businesses regarding the impact of FDI on economic growth in an economy, which has resulted in mixed reactions within academia. Some researchers such as Hamed & Okunoye [51], Haruna [52], Mokuolu [75] Sokang [102] and Isah [57] argued that FDI encourages economic growth and development while other school of thought pointed out by [99] that FDI does not any way impact significantly on economic growth.

Sekunmade [99] independently investigates on Foreign Direct Investment, Economic Freedom and Economic Growth of Nigeria between the period of 1995 and 2018 respectively. Specifically, the study harnessed the data on Foreign Direct Investment (FDI) inflows, Economic Freedom (Aggregate index) and real gross domestic product (RGDP) used during the estimation from Central Bank of Nigeria and World Development Indicator. The paper employed the Augmented Dickey-Fuller Unit Root test method for stationarity of the variables. Vector Autoregressive (VAR) estimation method was applied to investigate the impact of FDI, Economic Freedom on Economic growth. The findings of the Vector Autoregressive (VAR) indicates that both FDI and Economic freedom do not have a significant impact on economic growth of Nigeria. The result of regression analysis reveals that the coefficients of both FDI and EF show

negative and not significant. The output of Granger Causality Test explained that there is a uni-directional relationship between EF and FDI and RGDP and FDI respectively.

Hamed and Okunoye [51] investigate the impact of foreign direct investment on economic growth between 1981 and 2018. The study used annual time series data sourced from Central Bank of Nigeria Statistical bulletin of 2017 using ordinary least square method. The findings of the study reveal that foreign direct investment has significant impact on the growth process of the Nigerian economy overtime. The contribution of FDI to the growth is further improved when interacted with the level of human capital in the country. In summary, the study finds out that FDI contributed directly the growth and development of Nigerian economy.

Emmanuel [42] examines the relationship between FDI and economic growth using the annual time series data between 1981 and 2015. These data used were sourced from Central Bank of Nigeria. The paper employed an econometric technique called the multiple regression estimation techniques. The estimation results indicated that there was a strong positive relationship between FDI and economic growth. The paper equally made use of the Error Correction Model (ECM) and the Granger causality test, the results reveal that FDI and economic growth moved in the same positive direction.

Subsequently, Khan, Arif, & Raza [62] examined the impact of FDI on Nigerian economy using annualized time series data obtained Central Bank of Nigeria for the period of 1981 and 2014 employing VECM. The results revealed that there was a significant positive effect of FDI on economic growth in Nigeria within the period of study.

Anetor [13] finds out that FDI shows a significant variation on Nigeria economic growth when compared to other capital inflow into the country. The author uses quarterly data from 1961Q1-2016Q4 and applied Structural Vector Autoregression model for the estimation of the variables in the captured in the model.

Isah [57] investigates the long-term determinants of FDI in Nigeria covering a period of 1971 to 2009 using Vector Error Correction Mechanism (VECM). The author's results provided clear evidence which indicated that the size of Nigeria's domestic market, the liberalization policy and openness of the economy as well as domestic currency are positively significant in attracting FDI. The author recommends that Nigeria should support its investment environment by reducing challenges affecting the smooth running of business and export promotion schemes.

Sunde [104] examined the relationship between foreign direct investments, exports and economic growth. The author uses Autoregressive Distributed Lag Model (ARDL) in his estimation. The research was focused mainly on the economy of South Africa. The short-term dynamics of the study were carefully analyzed in an Error Correction Model, and the VECM, Granger causality Test approach was adequately utilized to explained the effect. The paper verified Cointe-

gration between economic growth, foreign direct investment and exports. The final findings clearly showed that FDI and exports were actually enhancing South Africa's economic growth. A unidirectional causal relationship is found in the model between FDI and economic growth, foreign direct investment and exports while a two-way causality between economic growth and exports.

Sokang [102] equally assessed the impact of FDI on Cambodia's economic growth using data from 2006 to 2016, the findings revealed that FDI has a significant positive relationship with Cambodia's economic growth. The study applies ARDL for its estimation selecting annual time series data sourcing from Cambodian Central Bank.

Kurtishi-Kastrati [66] carried a study on research topic-the impact of foreign direct investment on economic growth is dependent upon institutional level. The study used a generalized method of moment (GMM) panel estimator ranging 984-2013 period, the outcome of study revealed that with government steadiness and the respect to the rule of law, FDI stimulates GDP growth.

Okumoko and Karimo [86] investigate the endogenous impact of Foreign Direct investment and economic growth in Nigeria covering 1981 to 2013. The study applied the structural vector autoregressive (SVAR) model and revealed that FDI and economic growth not responding to nominal shocks in the short run period. The paper concluded intensively that within the period of study growth is stimulated by FDI but growth itself does not attract FDI.

Danja [52] conducted an independent research titled 'The Impact of FDI on the Nigerian Capital Market Development. The research work employed OLS, unit root test, and Johansen co-integration test, the findings of the paper showed clearly FDI impacted positively and significantly on market capitalization in Nigeria.

Haruna [52] examined impact of FDI on Nigerian economic growth between the periods 2008 to 2013 using the time series data obtained from Central Bank of Nigeria. The paper adopted Pearson Correlation, the findings of the study showed that there is a significant relationship between foreign direct investment, exchange rate and GDP in Nigeria. The paper concluded that economic growth in Nigeria has a direct link to foreign direct investment.

Contrary, Shuaib et al. [100] examined the impact of FDI on economic growth of Nigeria using two-gap model of Harrod (1948) and Domar (1957) using time series data from 1981 to 2013 extracted from Central Bank of Nigeria. The findings of the study showed that there is insignificant relationship between FDI and economic growth in Nigeria.

Onuoha and Oregwu [87] equally investigated the determinant of FDI and the Nigerian economy using ordinary least square (OLS) regression, the findings of the paper study revealed that GDP has nothing to do with FDI. Transportation and communication used as independent variables displayed positive relationship with FDI and the openness of trade is not significant.

The study of Ehimare [41] (2011) employed exchange rate as moderating variable in addition to inflation in examining the correlation between FDI and economic growth in Nigeria. The paper showed that FDI and trade openness are key significant contributor to the economy encouraging other companies into the country particularly the telecommunications sector. The investigation finds out inflation does not have an impact on FDI but the exchange rate affects FDI significantly.

3. Methodology

This section adopts theoretical framework that forms the foundation for the research topic- The impact of FDI on Nigerian Economy being examined using secondary data from 1985 to 2022. The data used in this study were sourced from the World Bank Database and Central Bank of Nigeria. The section discusses the methodology of data analysis and provides a description of the variables extracted

Theoretical Framework

For clarity sake, this research study adopts the direct input theory analyzed in section three above, as projected by the neo-classical theory, to establish a correlation between economic growth and aggregate production function in the context of modeling economic growth in Nigeria. Romer (2009) pointed out the economy possesses a certain level of capital, labor, and knowledge at any given time period. The direct input theory advocates that growth can be attained by enhancing capital and labor through the integration of several inputs in the production function. The direct input function is expressed as follows:

$$Y_t = A_t K_t^{\beta_1} L_t^{\beta_2} \quad (3)$$

Where Y_t is the output, A_t represents the total factor productivity, K_t represents capital while L is the labor. β_1 and β_2 are the coefficients for capital and labor in the model. It is important to note that the total factor productivity (A_t) is not fixed.

Y_t is economic growth proxy by Gross Domestic Product (GDP), Labor (L) at period 't' proxy for inflation and exchange rate while capital (K) at period 't' proxy for foreign direct investment and trade openness respectively.

Model Specification

The model adopted by this study for effective interpretation are [80, 71] respectively.

$$\text{LNRGDP} = f(\text{FDI}, \text{LNTOPN}, \text{EXCR}, \text{INF}) \quad (4)$$

$$\text{LNRGDP} = b_0 + b_1 \text{FDI} + b_2 \text{LNTOPN} + b_3 \text{EXCR} + b_4 \text{INF} + \mu \quad (5)$$

$$\text{LNRGDP} = b_0 + b_1 \text{FDI} + b_2 \text{LNTOPN} + b_3 \text{EXCR} + b_4 \text{INF} + \text{ECT}_{-1} \quad (6)$$

Where:

LNRGDP = Economic growth

FDI = Foreign Direct Investment

LNTOPN = Trade Openness ((import + export)/GDP)

EXCR = Exchange rate

INF = Inflation rate

μ = Error term

It is expected of the paper that $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$ and $\beta_4 < 0$

Description of Variables

See below the definition of each of the variable captured in the model:

Gross Domestic Product

Economic Growth is measured by RGDP, this is the total monetary value of all final goods and services produced in a country over a year. This serves as the explained variable in the specified regression form. The variable is measured in constant 2015 local currency.

Foreign Direct Investment

According to the International Monetary Fund's balance of payments and international investment position manual, FDI is the term used to represent the process of making a long-term investment in an enterprise which operates in any other economy than that of the enterprise's country of origin that is making this investment. The a priori expectation of the study is a direct relationship between FDI and economic growth. It is measured as a percentage of GDP.

Trade Openness

This is the ratio of trade (imports plus exports) to GDP. Trade openness is the extent to which a country participates in international trading system. It is one of the factors that encourage FDI flows to beneficiary countries. The a priori expectation of the study is a positive relationship between trade openness and economic growth

Real Exchange Rate

Real exchange rate is the rate at which the currency of one country would be changed for another if differences in prices and wages between the two countries are considered. Real exchange rates are used to compare the values of currencies of one country to another countries over time when considering the different rates of inflationary trend in different countries. The a priori expectation is a positive relationship between RGDP and Exchange Rate. Economically, the higher the exchange rate, the higher the economic growth, and vice versa. In Nigeria it is measured as the exchange rate of the naira to the dollar.

Inflation Rate

Inflation rate is the percentage increase in the general prices during a specified period in an economy, usually a month or a year. The percentage tells you how quickly prices rose during the period of inflationary trend in an economy. The a priori expectation of the study is a negative relationship between FDI and economic growth. It is measured as a percentage of annual GDP deflator.

Data Sources

This research work uses annualized time series data which are efficiently utilized, and data are extracted from the CBN Statistical Bulletin of 2022 and the World Bank Database-World Development Indicator covering the period from 1985 to 2022.

Techniques For The Analysis

The estimation of these data covering the period of 38 years was possible through the econometric techniques listed below:

Unit Root Test

The first stage of the analysis involves testing the order of integration of the variables being investigated. Numerous methods have been developed by scholars for testing the order of integration of variables. One mostly used approach by researchers is the Augmented Dickey-Fuller (ADF) test. The aim of the ADF test is to know whether the variables used exhibit the unit root that is, non-stationarity or not, this is possible by comparing the null hypothesis (H_0) of a unit root against the alternative hypothesis (H_1) of stationarity. The ADF test is conducted with and without a deterministic trend (t) for each of the variables as shown below.

$$\Delta Y_t = \beta_t + \beta_t + \delta Y_{t-1} + \sum_{t=1}^m \alpha_t \Delta Y_{t-1} + \varepsilon_t \quad (7)$$

Where:

Y = is a time series,

t = is a linear time trend,

Δ = is the first difference operator,

β_s = are parameters,

n = is the optimum number of lags in the dependent variable and

ε_t is a pure white noise error term. The unit root test is then carried out under the null hypothesis against the alternative hypothesis of ADF (Augmented Dickey Fuller) normally at Significant level of 5% level.

Decision Rule:

If ADFs > critical value- stationary

If ADFs < critical value- Non-stationary

The outcome of the unit root test determines the econometric techniques to be applied.

Thus, the choice of autoregressive distributed lags (ARDL) is informed by the mixed order of integration obtained from the unit root test.

Autoregressive Distributed Lag Model

The ARDL bound test approach uses the F-statistic for the joint significance of the estimators of the lagged levels in the model to test the null hypothesis (H_0) of "no co-integration". As we can use the standard F-distribution, Pesaran et al. [94] (2001) provided two critical values: the lower value assumes that all variables are I(0) and the upper value assumes that all variables are I(1). If the calculated F-statistic is higher than the upper critical value, then the null hypothesis-no cointegration is rejected. Alternatively, if the calculated F-statistic is below the lower bound, we conclude that there is no co-integration. However, if the F-statistic is within the re-

spective bounds, the co-integration test is inconclusive. Once a co-integration correlation is detected, the ARDL model can be applied to investigate the long-run and the short-run relationship between the variables.

Therefore, since the paper uses time series data, stationarity of the variables and cointegration among the variables are tested before the estimation employing ADRL technique. The ARDL approach consists of the following equation:

$$\text{GDP} = \theta + {}_1\text{LNGDP}_{t-1} + {}_2\text{FDI}_{t-1} + {}_3\text{LNTOPN}_{t-1} + {}_4\text{EXCR}_{t-1} + {}_5\text{INF}_{t-1} + {}_1\Delta\text{LNGDP}_{t-1} + {}_2\Delta\text{FDI}_{t-1} + {}_3\Delta\text{LNTOPN}_{t-1} + {}_4\Delta\text{EXCR}_{t-1} + {}_5\Delta\text{EXR}_{t-1} + {}_5\Delta\text{INF}_{t-1} \quad (8)$$

Where;

θ = Constant term

Δ = First difference operator

Ln = Natural logarithm

${}_{1-5}$ = Short run elasticities (coefficient of the first-differenced explanatory variables)

${}_1 - {}_5$ = Long run elasticities (coefficient of the explanatory variables)

If there is evidence of a long-run relationship then, the error correction model (ECM) is estimated, which specifies the speed of adjustment back to long-run equilibrium after a short-run disturbance. The standard ECM includes estimating the following equation:

$$\text{GDP} = {}_0 + {}_1\text{GDP}_{t-1} + {}_2\text{FDI}_{t-1} + {}_3\text{LNTOPN}_{t-1} + {}_4\text{EXCR}_{t-1} + {}_5\text{INF}_{t-1} + \lambda_1\text{ECM}_{t-1} + \mu t \quad (9)$$

Where: ECM_{t-1} is the error correcting term, the coefficient of this error term should be negative and statistically significant. This coefficient indicates the speed of adjustment, how quickly the variables return to long run equilibrium.

Granger Causality Test

The Granger Causality was used to determine the causal direction between independent and dependent variables. The explained and explanatory variables by employing the Granger causality test. The most common way to test the causal relationships between two variables is the Granger-Causality projected by Granger (1969).

$$X_t = \sum_{t=1}^n \alpha_t Y_{t-1} + \sum_{j=1}^n \beta_j X_{t-1} + u_{1t} \quad (10)$$

$$Y_t = \sum_{j=1}^n \gamma_j Y_{t-1} + \sum_{j=1}^n \delta_j X_{t-1} + u_{2t} \quad (11)$$

Diagnostic Tests

Once the regression estimates have been obtained, it is essential to diagnose and verify the adequacy and stability of the regression model, as well as examine the normality of residuals and potential serial correlation. In this study, five diagnostic and stability tests will be conducted to validate the robustness of the estimated model. These tests include:

Serial correlation test: which test for auto or serial correlation among the variables.

Heteroscedasticity test: which measures the variance of the error term across the values of an independent variable in the regression model. Hereafter, heteroscedasticity occurs when a model can consistently predict the low values of the dependent variable, but not its high values. In such instances, estimated models cannot be trusted as relevant explanation of their target variables.

Normality test: which measures the normality of the residuals of the dependent variable which would indicate that nothing more can be collected from the dependent variable.

Specification test: which is used to measure the adequacy of the model. In other words, it is used to check whether the inclusion of more independent variables would better explain the dependent variable. Hence, Ramsey's regression specification error test (RESET) will be employed in other to test whether the model is well specified. The paper employs the stability test is conducted by applying the cumulative residual (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) respectively.

4. Data Presentation and Analyses of Results

This section thoroughly explains or analyze the coefficients of those variables employed in the model necessitated through descriptive statistics, Augmented Dickey-Fuller (ADF) test, ARDL bound test and others as shown in the subsequent tables or figures

Data Presentation

Table 1. Descriptive statistics.

	LNRGDP	FDI	LNTOPN	EXCR	INF
Mean	26.23412	1.734142	4.131049	111.0959	17.80978
Median	26.17273	1.552115	4.106532	120.5782	11.11892
Maximum	26.94374	5.790847	4.591999	306.9210	75.40165
Minimum	25.54105	0.195183	3.801428	4.016037	0.686099

	LNRGDP	FDI	LNTOPN	EXCR	INF
Std. Dev.	0.484815	1.253109	0.202225	91.13162	15.48021
Skewness	0.197452	1.648725	0.656290	0.649534	1.916839
Kurtosis	1.469190	5.591822	3.079082	2.747842	7.170330
Jarque-Bera	3.436580	24.18725	2.377539	2.407848	44.12202
Probability	0.179373	0.000006	0.304596	0.300015	0.000000
Sum	865.7261	57.22670	136.3246	3666.164	587.7228
Sum Sq. Dev.	7.521469	50.24900	1.308639	265759.1	7668.382
Observations	38	38	38	38	38

Source; Researchers compilation using E-Views 10

In Table 1 above, we have compiled the summary statistics for major variables such as Gross Domestic Product (LNRGDP), Foreign Direct Investment (FDI), Trade Openness (TOPN), Exchange rate (EXR), and Inflation rate (INF) using E-Views 10 software. The mean from the table represents the average value within a set of data which was calculated for each of these variables employed. Precisely, the mean values for GDP, FDI, TOPN, EXCR, and INF are 26.23412, 1.734142, 4.131049, 111.0959, and 17.80978, respectively.

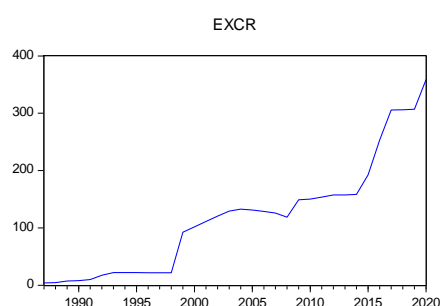
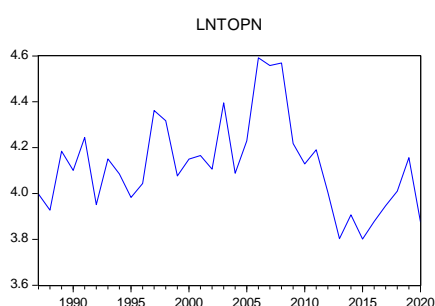
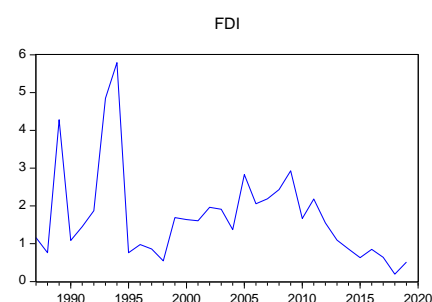
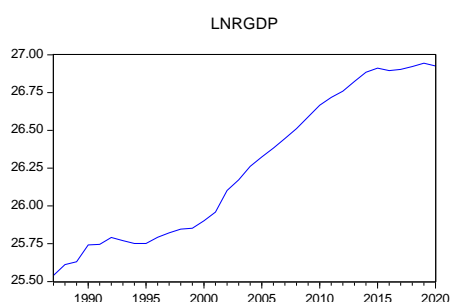
Moving on to the median, it denotes the middle value in a series when arranged in ascending descending order of magnitude. In our data set, the median values for LNRGDP, FDI, LNTOPN, EXCR, and INF are 26.17273, 1.552115,

4.106532, 120.5782, and 11.11892.

Skewness is a measure of distribution asymmetry around the mean, it can be informative. A skewness of zero (0) is observed in a perfectly normal distribution. Nevertheless, all variables employed exhibit positive skewness showing elongated right tails in their respective distributions.

The Jarque-Bera test results show further perceptions. For LNRGDP, LNTOPN, and EXCR, the probability values are very insignificant suggesting that these variables conform to a normal distribution. Conversely, the FDI and INF variables have significant probability values indicating non-normal distributions. In conclusion, our research model as a whole follow a normal distribution exception of FDI and INF.

Trend Analysis



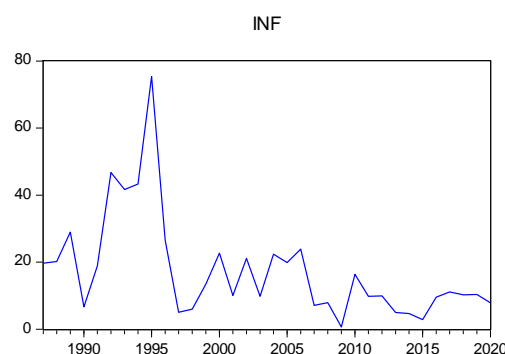


Figure 1. Graphical trend analysis of selected variables.

The graphs depicted above demonstrated trend analysis for each of the specific variables such as GDP, FDI, LNTOPN, and EXCR. In this arrangement, it becomes necessary that both GDP and EXCH follow a similar upward trend over a giving period of time. Therefore, all other variables such as FDI and TOPN exhibit an irregular trend characterized by variations and changes throughout the entire observation period.

Econometric Analysis

The Unit Root Test

The purpose of this ADF test is to investigate the characteristic features of the variables in the model. Precisely, the primary aim is to determine whether these variables have a unit root meaning lack of stationarity. To achieve this calculation, the ADF test is employed as the analytical tool.

Table 2. Unit root test result for selected variables.

At level				After first differencing			
Variables	ADF test statistic	Critical value at 10%	Remarks	ADF test statistics	Critical value at 10%	Remarks	Order of integration
LNRGDP	-0.485998	-2.957110	NS	-3.399034	-2.957110	S	I(1)
FDI	-3.812357	-2.957110	S	-7.245961	-2.960411	S	I(0)
LNTOPN	-2.703001	-2.954021	NS	-7.088551	-2.957110	S	I(1)
EXR	1.643233	-2.954021	NS	-3.911390	-2.957110	S	I(1)
INF	-2.932556	-2.954021	NS	-3.920520	-2.963972	S	I(1)

Source; Researcher's Compilation Using E-views 10

When applying the ADF test, the initial expectation is that a variable is stationary if the ADF test statistic exceeds the critical value at the 5% confidence level. In this analysis, only FDI aligns with this expectation, indicating that FDI is stationary at the level.

In fact, other variables such as GDP, TOPN, EXCR and INF were not achieved stationarity. There required differencing once again to attain stationarity. As a result, these variables are considered integrated of order one. In contrast, FDI stands out as the only variable that does not require dif-

ferencing to reach stationarity.

ARDL Bounds Test for Co-integration

In order to evaluate the existence of co-integration among the variables selected, we investigated the ARDL Bounds test. The results are detailed in Table 3 below revealed that the F-statistic 8.487773 surpasses both the lower bound I(0) and upper bound I(1) at a 5% significance level 3.05 and 3.97, respectively. This result supports the existence of a significant long-term relationship among the variables under examination.

Table 3. ARDL Bounds Test.

Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	8.487773	10%	2.68	3.53
K	4	5%	3.05	3.97
		1%	3.81	4.92

Source: Researcher's Compilation Using E-views 10

Estimation of the ARDL Model

The results obtained from the unit root tests and the bounds test above have confirmed that the Auto Regressive Distributed Lags (ARDL) model is the suitable technique to be applied for the estimation of GDP. In the subsequent sections, we will present both the short-run and long-run coefficients obtained through this approach.

Short run Co-efficient of the Estimated Model

From the [table 4](#) below, it becomes imperative that the estimated results are statistically significant. This result is supported by the F-statistic's probability value (0.000102) which is less than the conventional significance level of 0.05. The model accounts for 79 percent of the variations in GDP as indicated by the adjusted R-square value (0.799029).

Examining the short-run effects, we noticed that FDI in the previous year has a negative and statistically significant impact on RGDP at the 5% confidence level. This means that an increase in FDI in the previous year leads to a 0.04% decrease in RGDP in the current period. In fact, in the current period, FDI has a positive and significant impact on RGDP.

As for (LNTOPN) in the previous period, it has a positive but insignificant effect on RGDP at the 5% significance level. Equally, trade openness in the current period has a negative

and insignificant impact on RGDP implying that a unit increase in current-period, trade openness would result in a 0.01% increase in RGDP.

The exchange rate (EXCR) in the previous period displayed a negative significant impact on RGDP. In fact, in the current period, the exchange rate has a negative but statistically insignificant impact on RGDP indicating that a unit increase in the exchange rate would lead to a 0.00046% decrease in RGDP respectively.

Correspondingly, the inflation rate (INF) in the previous period is negatively and significantly affects RGDP while the current-period inflation rate has a negative but insignificant impact on RGDP. This implies that a unit increase in the inflation rate would result in a 0.00046% decrease in RGDP.

Most of the independent variables have a significant impact on the dependent variable (Prob < 0.05), in line with expectations.

Additionally, the error correction term (EC term), represented as $\text{CointEq}(-1)^*$, is negative with a coefficient of -0.419927. This suggests that approximately 41.9% of any deviations from equilibrium are corrected within one period. The associated t-statistic of 8.939684 indicates high significance for this coefficient.

Table 4. ARDL Error Correction Form.

Variable	Co-efficient	Std. Error	t-statistic	Prob
D(FDI(-1))	-0.049375	0.007362	-6.707090	0.0001
D(LNTOPN(-1))	0.051979	0.023234	2.237205	0.0521
D(EXCR(-1))	-0.000491	0.000208	-2.358258	0.0427
D(INF(-1))	0.002894	0.000524	5.521703	0.0004
D(FDI)	0.010150	0.003412	2.974469	0.0156
D(LNTOPN)	-0.018361	0.021641	-0.848439	0.4182
D(EXCR)	-0.000464	0.000208	-2.234572	0.0523
D(INF)	-0.000267	0.000344	-0.776574	0.4573
C	10.97189	1.227324	8.939684	0.0000
CointEq(-1)*	-0.419927	0.047180	-8.900518	0.0000

R-squared	0.899514
Adjusted R-squared	0.799029
S. E. of regression	0.016279
F-statistic	8.951684
Prob(F-statistic)	0.000102

Source: Researcher's Compilation Using E-views 10

Long run Co-efficient of the Estimated Model

Table 5 below gives an insight into the long-run coefficients derived from our estimated model. This table uncovers relationships between our independent variables and the dependent variable in the model.

First, both FDI and EXCR showed positive coefficients meaning that there is a direct and favorable long-term correlation with RGDP. In summary, an increase in FDI and EXCR is linked to an increase in RGDP over the long run period.

Equally, Trade Openness (LNTOPN) and Inflation Rate (INF) showed negative coefficients, suggesting a negative long-term relationship with RGDP. This means that higher levels of TOPN and INF are associated with lower RGDP in

the long run.

It is important to note the significance of the positive impact of FDI on GDP, which is statistically significant since (Prob. < 0.05).

The negative effect of Trade Openness (LNTOPN) on Gross Domestic Product is statistically insignificant.

The positive effect of Exchange Rate (EXCR) on Gross Domestic Product is statistically insignificant in the long run.

Contrary, the negative impact on Inflation Rate (INF) on Gross Domestic Product is statistically significant in the long term.

In summary, this provides valuable insights into the long-run relationships between these dependent and independent variables.

Table 5. Long-run Coefficients.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.145033	0.047916	3.026811	0.0143
LNTOPN	-0.138509	0.121395	-1.140977	0.2833
EXCR	0.000991	0.000933	1.062281	0.3158
INF	-0.011867	0.002748	-4.317816	0.0019
EC = LNRGDP - (0.1450*FDI -0.1385*LNTOPN + 0.0010*EXCR -0.0119 *INF + 0.0410*@TREND)				

Source: Researcher's Compilation Using E-views 10

ECM

The Error Correction Model plays an important role in assessing how quickly a system returns to equilibrium on time. It captures the process of how the variables move from a state of disequilibrium back to equilibrium. In general note, error correction models provide a direct evaluation of the speed at which a dependent variable returns to equilibrium in response to changes in independent variables as pointed out by [115].

The followings are key criteria to assess the validity of an error correction model:

1. The ECM Must Be Between 0 and 1: The error correction model (ECM) should fall within the range of 0 to 1. This range signifies the degree to which the system adjusts toward equilibrium following a deviation.

2. The ECM Must Be Negative: For the ECM to have meaning and relevance, it must be negative. A positive ECM would indicate a lack of error correction, leading to divergence.

3. The T-Statistic Must Be Significant (Greater Than 2): The T-statistic associated with the ECM should be significant, with a value greater than 2, to affirm its statistical validity.

From Table 5 above, we noticed that the ECM is statistically significant (Prob < 0.1) with a speed of adjustment coefficient (SAC) for GDP at 41.99percent. This coefficient is negative and falls within the crucial range of 0 to 1. These findings strongly support the presence of co-integration, indicating a long-term, stable equilibrium between GDP and the independent variables in the model. The size and signifi-

cance of this result are emphasized by the T-statistic which exceeds the threshold of 2. This signifies that the model adjusts toward equilibrium in response to changes in the ex-

planatory variables.

Granger Causality

Table 6. Test for causality.

Null Hypothesis:	Obs	F-Statistic	Prob.
FDI does not Granger Cause LNRGDP	31	0.76778	0.4743
LNRGDP does not Granger Cause FDI		2.46167	0.1049
LNTOPN does not Granger Cause LNRGDP	32	1.76515	0.1903
LNRGDP does not Granger Cause LNTOPN		4.20997	0.0256
EXCR does not Granger Cause LNRGDP	32	0.18197	0.8346
LNRGDP does not Granger Cause EXCR		1.13631	0.3359
INF does not Granger Cause LNRGDP	32	0.23395	0.7930
LNRGDP does not Granger Cause INF		3.59131	0.0414
LNTOPN does not Granger Cause FDI	31	1.38297	0.2687
FDI does not Granger Cause LNTOPN		0.13771	0.8720
EXCR does not Granger Cause FDI	31	2.19855	0.1312
FDI does not Granger Cause EXCR		1.71398	0.1999
INF does not Granger Cause FDI	31	1.59240	0.2226
FDI does not Granger Cause INF		3.22735	0.0560
EXCR does not Granger Cause LNTOPN	32	0.31637	0.7315
LNTOPN does not Granger Cause EXCR		0.13125	0.8776
INF does not Granger Cause LNTOPN	32	1.97844	0.1578
LNTOPN does not Granger Cause INF		0.29483	0.7470

Source: Researcher's Compilation Using E-views 10

Our primary motive of this study is to investigate causal relationships between key economic variables selected. Specifically, the paper analyzes the causal association between FDI and (RGDP) as well as between GDP and INF. See more explanation below:

The first causal relationship, the H_0 postulates that FDI does not Granger Cause LNRGDP. The associated probability value is 0.4743, which exceeds the chosen significance level of 0.1 (or 10%). Consequently, we fail to reject the H_0 , suggesting that FDI does not Granger Cause LNRGDP. Similarly, the H_0 stating that LNRGDP does not Granger Cause FDI is not rejected. The conservative criterion for establishing causal correlation, where the F-statistic probability should be less than 0.1, is not met. As a result, we cannot conclude the existence of causality between LNRGDP and FDI.

Contrary, when measuring the causal association between INF and GDP, the H_0 declares that INF does not Granger

Cause LNRGDP. The relationship probability value is 0.7930 exceeding the significance level of 0.1 (or 1%). Subsequently, the study fails to reject the H_0 indicating that INF does not Granger Cause LNRGDP. However, the second H_0 asserting that LNRGDP does not Granger Cause INF, H_0 is rejected. The probability of the F-statistic for the causal variables, GDP and INF is 0.0414 which is below the 0.1 threshold. Finally, the study concludes that LNRGDP Granger causes INF suggesting that a unidirectional relationship where GDP influences INF.

In summary, the analysis reveals a unidirectional causal relationship between LNRGDP and INF where LNRGDP Granger causes INF. Therefore, there is no noticeable causal relationship between LNRGDP and FDI as FDI does not Granger Cause LNRGDP.

Diagnostic Test for Model Reliability and Stability
NORMALITY TEST

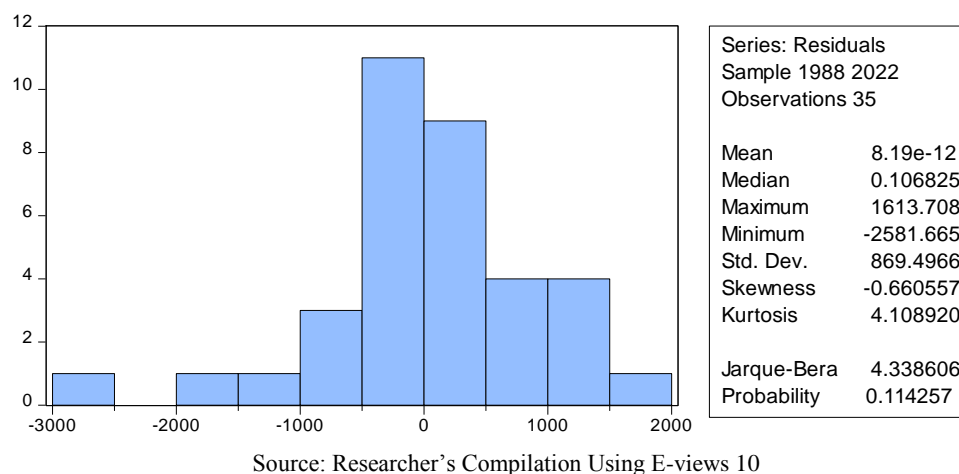


Figure 2. Histogram -Normality test.

The histogram normality test is a means used to assess the normality of the residuals of the dependent variable (GDP). A normal distribution of residuals designates that no further understandings can be removed from the dependent variable. In this background, the probability value of the Jarque-Bera test is not statistically significant (0.1142) suggesting that the

data follows a normal distribution. This finding reinforces the idea that the residuals adhere to a normal pattern affirming that no additional meaningful information can be derived from the dependent variable in this situation.

Serial Correlation

Table 7. Serial Correlation.

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	4.279485	Prob. F(2,7)	0.1611
Obs*R-squared	15.95286	Prob. Chi-Square(2)	0.0003

Source: Researcher's Compilation Using E-views 10

The purpose of auto or serial correlation is archived among the variables under question, which can transpire when an unwarranted number of variables are factored into a model. In this situation, the H_0 suggests that the residuals are serially not associated. The F-statistic's associated p-value which is 0.1611 suggests that the paper do not have sufficient prove to reject the H_0 . The paper concludes that the residuals are serially not related.

This result showed that the variables for this research study is properly balanced. It suggests that the model has been constructed with a moderate number of independent variables, which is advantageous to the accuracy of the econometric test. In short, the test results confirmed that the choice of variables in this research study is suitable and does not introduce uninvited serial correlation into the model.

The Heteroscedasticity

Table 8. Heteroscedasticity test.

Heteroscedasticity Test: White			
F-statistic	0.379522	Prob. F(19,9)	0.9639
Obs*R-squared	12.89973	Prob. Chi-Square(19)	0.8437
Scaled explained SS	1.279157	Prob. Chi-Square(19)	1.0000

Source: Researcher's Compilation Using E-views 10.

The heteroscedasticity test plays an important role in appraising the variance of the error term across different values of an independent variables within a regression model.

In this framework, the H_0 suggests that the residuals are homoscedastic meaning that the variability of the errors is constant across the independent variables. The p-value associated with the F-statistic which represents 0.9639 indicating that the paper lack sufficient evidence to reject the H_0 . The study concludes that the residuals displayed homoscedasticity at a 10% significance level.

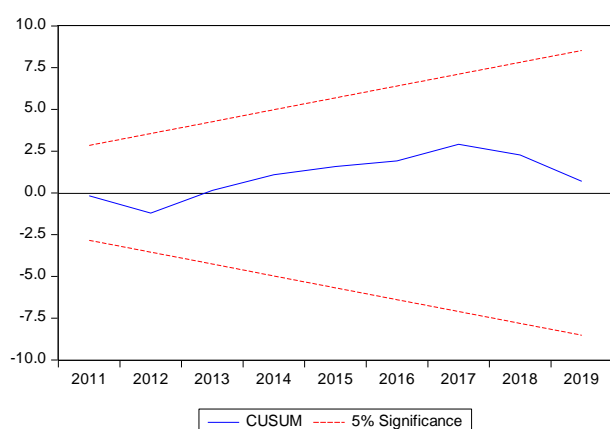
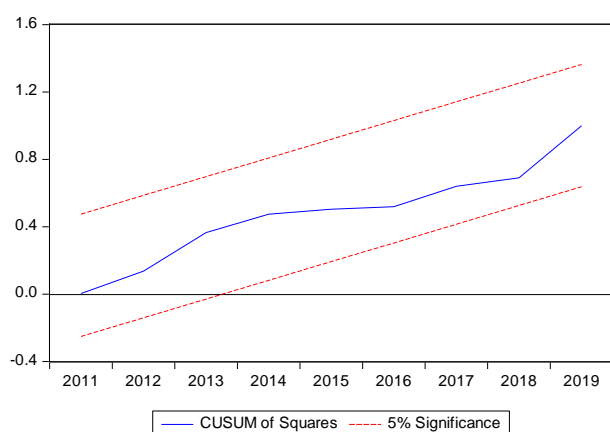


Figure 3. Cusum Test.



Source: Researcher's Compilation Using E-views 10

Figure 4. CUSUM of squares test.

These findings showed that the variability of the errors remains stable and consistent across different values of the independent variables employed in the model confirming the reliability and suitability of the regression model for predicting the selected variables.

Cusum Test

The cumulative sum of squares (CUSUM) test, test for the stability of our model. From figure 3, it is clear that the estimated variables in the model represented by the thin blue

line which falls within 10% critical value denoted by the thin red lines.

5. Summary, Conclusion and Recommendation

5.1. Summary

This study examined a wide-ranging analysis of the Impact of Foreign Direct Investment (FDI) on the Nigerian economy over a considerable period from 1985 to 2022-38 years. The research study journeyed from descriptive statistics, moving on to graphical trend analysis, and concluding at empirical tests to depict the economic dynamics in the country.

The vital findings of the study are as follows:

The study started with the examination of descriptive statistics, showing a summary of crucial data characteristics. This key foundation paved the way for subsequent analyses.

An intensive graphical trend analysis was done on all variables under study, spanning more than three decades. This pictorial investigation revealed important understandings into the behavior and characteristics displayed by these economic variables.

The empirical stage of the study involved a series of statistical tests as mentioned below:

This test measured the stationarity of variables and emphasized their unique characteristics. Importantly, FDI depicted stationary behavior at the level.

This test revealed the presence of a long-run association among the variables suggesting associations in the Nigerian economic atmosphere.

The ECM provides understandings into the speed of error correction within the system showing a convergence towards equilibrium.

This test examined causal relationship between GDP and FDI revealing that neither of the variable Granger caused the other indicating the absence of a causal link.

A long-run relationship was established between FDI and GDP highlighting the impact of FDI on Nigerian economic performance.

The study showed that 41.9927% of errors would be corrected in the long run demonstrating a tendency towards equilibrium.

There was no evidence of a causal relationship between GDP and FDI based on the Granger Causality test results.

Above all, this research study offers a comprehensive understanding analysis of the relationship between Foreign Direct Investment and the Nigerian economy. The results contribute immensely to our insights of the economic dynamics in Nigeria, beam light on the long-term relationships and causal factors at work. These investigations hold significance for governmental policymakers, economists and

stakeholders alike looking for informed decisions under the framework of foreign investment and economic growth in Nigeria.

5.2. Conclusion

The research study has been made to focus or analyze the impact of FDI on economic growth in Nigeria. Time series data of 38 years was collected which was tested for stationarity. The paper adopted econometric technique of co-integration and error correction mechanism within the framework of [80, 71] and ARDL model to investigate the FDI on economic growth of Nigeria. Explicitly, the study discloses that FDI only impacted a positive and substantial influence on economic growth in Nigeria in the long run.

FDI is an important factor of economic growth, emphasis on most economy especially developing countries' economy. The impact of FDI on economic growth is country specific and the level of inflows controlled by institutional quality. The interaction between FDI and institutions can hinder the influx of FDI where there is poor institutional development and the consequent impact on the attraction of the multinational enterprises. FDI comes in different forms.

Importantly, economic policies that aim to attract FDI in the short run period will not bring fundamental benefits to the host economy. Third world nations have been trying to attract FDI to enjoy its positive benefits. The impact of FDI on economic growth is not always positive as shown in section two of this paper, as it depends on characteristics of the investment resulting from FDI, such as type, sector, scope, duration, proportion of domestic businesses in the sector. Governments at all levels should come up with policies that will improve the quality of human resources and other factors of production. FDI always comes with technological improvement, there needs to be skilled labor in order to utilize the new technological know-how to create a positive technological diffusion.

5.3. Policy Recommendations

The paper made the followings recommendations based on its findings:

- i. Nigerian government should liberalize its economy that will lower or eliminate trade barriers such as tariffs, import and export duties.
- ii. from the findings of the study, FDI and EXCR were found to have more impact on economic growth, government should focus on economic policies that will attract FDI in Nigeria.
- iii. The government should provide an enabling environment for FDI such as infrastructural facilities or guaranteed security consciousness that will directly cut the cost of doing business in the Nigeria.
- iv. Provision of services and regulatory framework that will relax laws on profit repatriation which will en-

courage foreign investors to increase their investments and encourage new investors to flow their investments into the country.

Abbreviations

GDP: Gross Domestic Product
 RGDP: Real Gross Domestic Product
 GNP: Gross National Product
 EXCR: Exchange rate
 INF: Inflation
 TOPN: Trade Openness
 VAR: Vector Autoregressive
 ECM: Error Correction Model
 GMM: Generalized Method of Moment

Conflicts of Interest

The authors declare no conflicts of interest.

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