

The Role of Foreign Direct Investment in Economic Development: The Nigeria Context (1981-2023)

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ABSTRACT

This study examines the role of foreign direct investment (FDI) in economic development within the Nigerian context using annual time series data spanning from 1981 to 2023. The data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin (2023) and the World Bank Development Indicators (2024). Real Gross Domestic Product (RGDP) was used as a proxy for economic development, while other explanatory variables included foreign direct investment, exchange rate, domestic savings, government expenditure, and trade openness. Employing the error correction model (ECM) technique, the study investigates both the short-run and long-run dynamics among the variables. The findings reveal that FDI has a positive and statistically significant impact on economic development in the short run, with effects that persist over several periods. Exchange rate movements show a mixed influence, indicating the implications of currency instability. Domestic savings exhibit inconsistent and largely negative short-run effects, while government expenditure has a positive and significant impact. Trade openness does not significantly affect economic development in the short term. The study concluded that foreign direct investment plays a vital role in promoting economic development in Nigeria, with evidence of significant short-run effects. Based on these findings, the study recommends strategies to attract productive FDI, stabilize exchange rates, efficiently utilize domestic savings, prioritize growth-enhancing public expenditure, and reform trade policies to support local production and sustainable economic growth in Nigeria.

Keywords: Foreign Direct Investment, Real Gross Domestic Product, Economic Development, Error Correction Mechanism

INTRODUCTION

Many countries, particularly developing ones like Nigeria, seek to attract Foreign Direct Investment (FDI) as it plays a crucial role in bridging the gap between domestic savings and required investments in the economy. Due to global economic changes, several countries lack the necessary investments for local and regional development. Consequently, attracting Foreign Direct Investments (FDI) is seen as vital and a priority for policymakers. FDI refers to net inflows of investments aimed at gaining a lasting management interest (10 percent or more of voting stock) in an enterprise located in a different country from that of the investor. It is essential for sustained economic growth and development. FDI involves international investments where investors gain substantial control over an entity outside their home country. For instance, global FDI inflows totaled \$1,114bn in 2009 (UNCTAD, 2011). These investments supplement domestic capital shortages and facilitate the transfer of management, marketing, and technology skills, ultimately increasing employment opportunities and productivity.

FDI is a significant financial resource supporting local economies in developing countries. However, not all countries can attract suitable FDI, and investors often assess local conditions before investing. Understanding foreign investors' motivations concerning economic development is crucial.

Economic development encompasses various aspects, including social progress, political freedom, social justice, and environmental sustainability. Empirical evidence shows that economic development elements correlate with economic growth. Typically, countries with faster economic growth experience better health, education, political freedom, wealth distribution, and environmental management outcomes. Although economic growth alone does not automatically bring social, institutional, and environmental improvements, it is essential for achieving these goals without foreign direct investment.

Given this context, analyzing the role of foreign direct investment in Nigeria's economic development is necessary. This study covers a period of 42 years, from 1981 to 2023. One limitation is obtaining comprehensive statistical data for the review period. The study aims to: (i) Determine the extent of FDI inflow's influence on Nigeria's economic development; (ii) Examine any relationship between economic development and FDI in Nigeria; (iii) Identify any bi-directional relationship between FDI and economic development in Nigeria. The paper is structured as follows: Section one is the introduction, section two reviews related literature, section three outlines our methodology, section four presents empirical results analysis, and section five provides conclusions and recommendations.

LITERATURE REVIEW

Concept of Foreign Direct Investment

Foreign Direct Investment (FDI) definitions vary, but the World Trade Organization (WTO) provides a widely accepted definition. According to the WTO, FDI involves an investor from one country investing in a foreign country to create assets with control rights. FDI includes transferring resources, such as financial capital, technology, and human resources, across borders while maintaining parent company control. FDI definitions have common elements: substantial equity shareholding control and shifting part of the company's assets, production, or sales to the host country.

Current FDI trends align with traditional definitions. Theodore Moran (2012) describes FDI as establishing business operations in another country through new affiliates, local company acquisitions, or joint ventures. Essential criteria for FDI include participation in enterprise control and ownership of invested funds. The International Monetary Fund (IMF) states that FDI must constitute at least 10% of the enterprise's total value or ordinary shares. The International Monetary Fund (IMF) provides guidelines on Foreign Direct Investment (FDI) in its Balance of Payments and International Investment Position Manual (BPM6). According to the IMF, FDI is defined as cross-border investment where an investor in one economy acquires a lasting interest (typically 10% or more of voting power) in an enterprise in another economy, indicating a significant degree of influence or control.

Ownership of 10 percent or more of the ordinary shares or voting power is the guideline for determining the existence of a direct investment relationship.

Source: IMF, Balance of Payments and International Investment Position Manual (BPM6), 2009, para. 6.8. [Link to IMF BPM6] (<https://www.imf.org/external/np/sta/bop/BPM6.pdf>)

Some authors, however, suggest a minimum of 25% ownership for effective organizational control. Key FDI characteristics are control and profit participation rights.

Concept of Economic Development

The global economy is experiencing an unprecedented trade war which is decelerating growth that is projected to slow to 2.9% in 2025 down from 3.3% in 2024 triggered by the U.S tariff policies, trade uncertainties and the global energy crisis. These tariffs are structurally affecting global growth negatively with no end in sight as their removal is most unlikely to restore pre-shock growth levels (the IMF WEO: A critical juncture amid Policy shifts, 2025). With the Nigeria economy projected by the IMF's WEO 2025 to decline from 3.4% in 2024 to 3.0% in 2025 and 2.7% in 2026, there is the critical need to evaluate the impact of this growth slope with the previous years inline with the FDI inflows.

Economic growth and economic development are often used interchangeably, but they differ. Economic growth refers to yearly increases in total and per capita output of goods and services, emphasizing sustained output increases. Economic development focuses on overall societal welfare improvements, both qualitative and quantitative. Todaro and Stephen (2011) define economic development as a process increasing the economy's productive capacity over time, leading to rising national income levels. Development relies on resource availability and utilization. While this is very crucial, current happenings globally seem to be working against resource availability particularly to the developing economies. This may be due to the escalating trade tensions and elevated policy-induced uncertainties which ultimately hinder growth.

- **Economic Growth** refers to an **increase in a country's output of goods and services** (real GDP or GNP) over time. It is a **quantitative** measure.
- **Economic Development** is a broader concept that includes **improvements in living standards, infrastructure, education, health, and income distribution**, along with economic growth. It is a **qualitative** and **multidimensional** process.

Scope

- **Growth** is **narrowly** focused only on rising GDP, production, and income.
- **Development** is **widely** encompassing social, institutional, and human progress.

Measurement

- **Growth** is measured using:
 - **GDP/GNP growth rate**
 - **Per capita income**
- **Development** is measured using:
 - **Human Development Index (HDI)**
 - **Inequality-adjusted HDI (IHDI)**
 - **Multidimensional Poverty Index (MPI)**
 - **Literacy rates, life expectancy, access to healthcare**

Nature

- **Growth** is **short-term** and can happen without development (e.g., a country with high GDP but poor healthcare).
- **Development** is **long-term** and sustainable, requiring structural changes.

Types of Economic Growth and Development

Economic growth can be extensive or intensive. Extensive growth involves increasing output quantities by expanding production factors. Intensive growth improves input efficiency and quality (Volek & Novotna, 2014). Types of Economic development

Structural Economic Transformation

- This is a development that focuses on shifting an economy from low-productivity sectors (e.g., agriculture) to higher-value sectors (e.g., manufacturing, services). This involves upgrading production capabilities and diversifying exports. (Harvard Growth Lab).

Human Capital Development

- Investments in education, health, and skills to enhance workforce productivity. Recent studies highlight:
 - School meal programs in Colombia and India improved long-term educational outcomes (Oliver Hanney, 2024). This has also been witnessed in the Northern part of Nigeria
 - Teacher training and early childhood interventions (e.g., in Kenya and Uganda) show mixed but context-dependent impacts on learning (Music & Evans, 2023)

Green Growth

- Integrates environmental sustainability with economic progress. Examples include:
 - The Philippines' National Greening Program, which combined carbon sequestration with poverty reduction (Oliver Hanney, 2024)
 - The Growth Lab's research on leveraging existing capabilities for green industries

Regional and Place-Based Development

- Tailored strategies for local economies, such as the U.S. **Comprehensive Economic Development Strategy (CEDS)**, which emphasizes resilience, SWOT analysis, and multi-stakeholder collaboration (U.S. EDA)

Technology and Innovation-Driven Development

- Focus on diffusion of knowledge and technological adoption. Key insights:
 - Low R&D in African agriculture exacerbates yield gaps, requiring localized solutions (Oliver Hanney, 2024)
 - AI's potential to boost research productivity in development economics can be harnessed (Oliver Hanney, 2024)

Inclusive and Gender-Responsive Development

Addresses disparities through targeted policies:

- Cash transfers in Malawi improved women's economic mobility but reinforced traditional gender roles in Peru (Music & Evans, 2022)

Migration-Led Development

Development that leverages remittances and skill transfers:

- Philippine nurses' migration increased domestic training capacity ("brain gain") Income growth in origin countries often increases emigration, countering conventional narratives (Oliver Hanney, 2024)

Types of Foreign Investments

Countries' attitudes towards FDI have evolved, with some initially adopting restrictive stances and others opening markets to foreign investments. Recently, restrictive countries have recognized FDI's benefits and implemented measures to attract it. Nigeria acknowledges foreign capital's importance for local economic impact. Foreign investments can be categorized as Foreign Portfolio Investment (FPI) or Foreign Direct Investment (FDI). FDIs can be further divided into Joint Ventures and Individual Investments.

Joint Ventures

Joint ventures involve external and local partners jointly investing to achieve shared goals. Partners control investments together, share risks, and distribute profits. Contributions may include financial capital, technology, infrastructure, or combined forms. Joint ventures can be bilateral or multilateral, with varying foreign partner participation levels (minority, equal, majority).

Individual Investments

Individual investments involve creating wholly owned companies abroad by acquiring existing organizations or establishing new ones (greenfield investment). Each format has advantages and disadvantages. Acquiring existing companies offers immediate capacity utilization and market share, while greenfield investments allow

modern standards implementation and business process organization. Foreign investment types also differ based on investment nature: horizontal (same activity as home country) or vertical (unrelated activities).

Horizontal Foreign Direct Investments

Horizontal FDIs involve investing in the same production or service activities as the investor's home country. For example, Volkswagen invested in the Czech auto industry (Skoda) and acquired Spain's Seat Company.

Vertical Foreign Direct Investments

Vertical FDIs involve investing in unrelated activities outside the investor's core operations. These activities do not complement or support the primary production field.

In summary, FDI is a critical component of economic growth and development, facilitating resource transfer, technology advancement, and increased productivity. Understanding its role and dynamics is essential for policymakers and stakeholders in developing countries like Nigeria.

Theoretical Framework

Theories of Foreign Direct Investment

Theories of foreign direct investment (FDI) can be categorized into two groups: micro-level theories and macro-level theories. Micro-level theories seek to explain why multinational companies (MNCs) prefer establishing subsidiaries in foreign countries rather than exporting or licensing their products, how MNCs select their investment locations, and why they invest in those specific locations. Lipsey (2004) notes that the microeconomic perspective examines FDI motivations from the investor's viewpoint, which often involves assessing firm-level or industry-level considerations when making investment decisions. This view focuses on the consequences for the investor and the home and host countries resulting from the operations of multinationals and their subsidiaries, rather than examining the size of flows or the value of investment stock. These consequences stem from trade, employment, production, and intellectual capital flows and stocks, which are measured in balance of payment accounts.

Microeconomic FDI theories provide insights into the reasons behind MNCs' choices of subsidiary locations and their strategies for market penetration. Many of these theories are based on the concept of imperfect markets.

On the other hand, Lipsey (2004) describes the macroeconomic aspects of FDI as capital flows across national borders, from home countries to host countries, and these flows are recorded in balance of payment statistics. Key variables include the flow of financial capital, the accumulated value of stock capital by investing firms, and the income flows generated from these investments. Macroeconomic theories address the host country's conditions that attract FDI, such as economic growth rate, GDP, infrastructure, natural resources, and political stability. Indicators like GDP, per capita income, and population size measure the local market size. Nevertheless, for export-oriented firms, the domestic market size may not be a significant determinant of FDI (Root and Ahmed, 1979). Efficient infrastructure is crucial for attracting FDI, as it lowers business costs and facilitates access to resources. Political stability is equally important; without it, efforts to attract FDI may fail despite favorable economic conditions (Petrohilos, 1983, as cited in Shin, 1998).

Some notable macroeconomic FDI theories include capital market theory, the location-based approach to FDI, and the institutional FDI fitness theory.

Capital Market Theory

Also known as the "currency area theory," this early theory posits that FDI arises due to capital market imperfections. Weaker currencies benefit more from FDI attraction by leveraging differences in market capitalization rates compared to stronger currencies. Source country MNCs have access to cheaper capital sources for their overseas affiliates and subsidiaries than local firms (Aliber, 1970, 1971). This theory is most

applicable to developed economies but has been challenged for ignoring basic currency risk management fundamentals (Lall, 1979).

Location-Based Theory

FDI location decisions are influenced by factors such as resource seeking, market seeking, efficiency seeking, or asset seeking, with overall economic geography playing a significant role (Popovici and Calin, 2014). The theory assesses the success of FDI based on national wealth indicators like natural resources, labor availability, market size, infrastructure, and governmental policies. Location advantages evolve over time, with determinants shifting due to changes in globalization, technological standards, and cross-border activities (Dunning, 2000). The product cycle theory also impacts location decisions, encouraging firms to establish affiliates and subsidiaries in other countries as their products mature (Vasyecko, 2012).

Institutional FDI Fitness Theory

Proposed by Wilhems and Witter (1998), this theory argues that FDI is influenced more by institutional factors, such as policies and laws, than by fundamental variables like population size. Four key institutions—government, markets, education, and sociocultural activities—contribute to a country's ability to attract and retain FDI. Government fitness, including economic openness, low intervention, and transparency, plays a crucial role in attracting FDI. Political instability and unfavorable government policies deter MNCs due to increased investment risks.

Theories of Economic Development

Economic development theories linked to growth emphasize the interplay between growth and development. Several key theories highlight the importance of foreign capital, technological advancement, and innovation.

Harrod-Domar Growth Model

According to Chenery and Strout (1966), foreign resources are essential for growth in developing countries. The Harrod-Domar model emphasizes capital shortages and suggests that foreign capital can supplement inadequate domestic savings to achieve growth targets.

Solow Growth Model

This model underscores the role of technology, efficiency, and productivity in promoting economic growth. It demonstrates how growth in capital stocks, labor force, and technological advancement interact to influence output, emphasizing the supply and demand for goods.

By examining these diverse theories, we gain a comprehensive understanding of the factors influencing FDI and economic development, providing valuable insights for policymakers and investors alike.

Empirical Literatures

Numerous empirical studies have been conducted to understand the relationship between foreign direct investment (FDI) and economic development or growth. This paper will review some of these empirical works.

Piteli, E.E. (2017) explored the issue of the impact of FDI on economic development as examined in IB scholarship, in both conceptual studies and the empirical evidence. Despite the mainly positive hypothesized effects, he reported mixed evidence on the potential benefits of inward FDI flows in host economies, which also suggests that the hypothesized positive impact of FDI inflows seems to be conditional on several factors, including the institutional environment, human capital endowments, and absorptive capacity of host countries. This has important policy implications.

Majumder, T., & Roy, S. S. (2023) while using cross-country data, investigated the impact of foreign direct investment (FDI) on growth in developing economies during globalization. The study adopts an approach different from existing studies by categorizing countries from Asia, Africa, Latin America, and the Caribbean based on FDI growth and per capita gross domestic product (GDP) growth relationship in the two phases: 1991–2004 and 2005–2019. In a sample of 29 countries, the study confirms the positive impact of FDI in the earlier phase, while a significant negative impact in the later phase. They observed negative relationship holds for sub-sets of the sample countries for the entire period. These results are despite the importance of human capital, infrastructure, financial development, trade openness and governance along with FDI. They postulated that these developing countries therefore need to formulate complementary domestic economic policies, including institutional changes, which complement foreign direct investment in promoting per capita growth.

B, A Joo and S. Shawl (2020) in their work on the relationship between FDI and Economic Growth: A comprehensive review of literature undertook a review of the existing literature on the subject under consideration in a variable-wise manner that focused on FDI growth linkages in developing economies. Laying special emphasis on identifying the determinants of FDI, revealing a positive FDI-GROWTH nexus in BRICS countries. The study revealed mixed evidence regarding the growth performance of FDI which is anchored on certain characteristics in the host country such as trade openness, macroeconomic stability, financial development and economic freedom.

Xin Xin Wang, et al (2021) in their work titled Foreign direct investment and economic growth: a dynamic study of measurement approaches and results opined that the relationship between foreign direct investment and economic growth (FDI-EG) has been subject to extensive research. The first document related to FDI-EG research in Web of Science was published in 1992 so that the research time is close to 30 years. They carried out a bibliometric study to measure the FDI-EG research from different points of view. 1,075 documents with respect to FDI-EG research were collected and reviewed by the researchers and a strong bibliometric analysis was carried out by Bibliometrix software and review of approaches. Bibliometrix software has revealed the leading researchers, conceptual structure, and thematic evolution of the FDI-EG research. At the same time, reviewing the literature helps to make content analysis, the most influential document analysis, co-authorship analysis, and citation and co-citation analysis. Amongst the findings. The FDI-EG research focused on technology and firm performance, research modelling, and theoretical inquiry. More discussions were made in terms of current research status, avenues for future research, advantages and drawbacks of the methods. This article helps in understanding the evolution of the FDI-EG research from the perspectives of bibliometric and review.

Ernest Udeh, et al (2025) in their research work titled, The Relationship Between FDI and Economic Growth: a review of the literature (1994-2023) carried an extensive review of related literature and drew out their findings which outlines the role of FDI in fostering productivity, innovation and infrastructural development. They further suggested a complex, context-dependent relationship with FDI which often stimulates economic growth in developing economies. However should be noted by their findings that it doesn't yield the same results in advanced and developed economies.

Ledyeva and Linden (2006) studied the impact of FDI on per capita growth in 74 Russian regions from 1996 to 2003. They linked real per capita growth rate to initial levels of physical capital, human capital, and other control variables significant for regional development. Their findings suggest that, generally, FDI did not significantly contribute to economic growth during this period, although there was evidence of positive FDI effects in higher-income regions.

Tang et al. (2008) explored the causal link between FDI, domestic investment, and economic growth in China from 1988 to 2003 using multivariate VAR and ECM. The results indicated a bi-directional causality between domestic investment and economic development, and a single directional causality from FDI to both domestic investment and economic development.

Ogbekor (2005) analyzed the role of exports and FDI in Namibia's economic growth from 1991 to 2001, concluding that both factors aid economic growth potential.

Osinubi and Amaghionye (2010) investigated the relationship between foreign private investment (FPI) and economic growth in Nigeria from 1970 to 2005, finding that FPI, domestic investment growth, and net export growth were statistically significant in explaining variations in Nigeria's economic growth.

Ayanwale (2007) utilized an augmented growth model via ordinary least squares and 2SLS methods to examine the relationship between FDI, its components, and economic growth in Nigeria. He identified market size, infrastructure development, and stable macroeconomic policy as determinants of FDI in Nigeria but found that openness to trade and human capital availability were not significant. Nonetheless, FDI contributed to economic growth.

Ayadi (2009) explored the relationship between FDI and economic growth in Nigeria from 1980 to 2007, finding a weak correlation and causality between the variables. He recommended enhanced infrastructural development, human capital building, and strategic policies to attract FDI.

METHODOLOGY

This study is a descriptive research based on secondary data source analysis. In addition to the descriptive approach in the preceding section, the study now adopts an econometric approach in its empirical analysis of the relationship between foreign direct investment and economic development in Nigeria. The data used in this study are basically secondary data collected mainly from central Bank of Nigeria's statistically bulletin. The period of study spans from 1981 to 2018. Due to the difficult nature in measuring development, we use real gross domestic product as a proxy for economic development.

Specification of Empirical Model

In line with the endogenous growth model of economic growth and development that is rooted in the micro and at the macro level of foreign direct investment. The central goal of the present work is to investigate the role of FDI on the economic development in Nigeria. Other economic variables believed to impact on economic development are also included for completion and comparison purposes. A function that relates these parameters can be of the form:

$$RGDP_t = f(FDI_t, EXR_t, DS_t, GEX_t, OPN_t) \dots\dots\dots (1)$$

Econometrically, equation (1) is transformed into an econometric log linear form thus:

$$\log(RGDP_t) = \beta_0 + \beta_1 \log FDI_t + \beta_2 \log EXR_t + \beta_3 \log DS_t + \beta_4 \log GEX_t + \beta_5 \log OPN_t + \mu_t \dots\dots\dots (2)$$

Where:

Log (RGDP) = Real Gross Domestic Product as a proxy for economic development

Log (FDI) = Foreign Direct Investment

Log (EXR) = Exchange Rate

Log (DS) = Domestic Savings

Log (GEX) = Government Expenditure

Log (OPN) = Degree of Openness (Export + Import)/GDP

$\beta_1 - \beta_5 > 0$ That is the expected result of these variables is to have positive impact on economic development in Nigeria.

The unit root and the Error Correction Model (ECM) are generally presented as follows.

Unit Root Model

$$\Delta Y_t = \alpha Y_{t-1} + \sum_{i=1}^m B \Delta Y_{t-i} + \delta + Y_t + \varepsilon_t \text{ (For levels)}$$

$$\Delta \Delta Y_t = \alpha \Delta Y_{t-1} + \sum_{i=1}^m B \Delta \Delta Y_{t-i} + \delta + Y_t + \varepsilon_t \text{ (For first difference)}$$

Where;

ΔY is the first difference of the series, m is the number of lags and t is the time.

Error Correction Model

The error correction model for two variables X and Y is stated generally as:

$$\Delta Y_t = \alpha_0 + \alpha_1 \Delta X_t + \alpha_2 U_{t-1} + \varepsilon_t$$

Where; α_2 is the degree of adjustment?

This paper adopts an econometric technique that is rooted in co-integration while the method of estimation is the error correction model (ECM). The choice of error correction is informed by the fact that it is BLUE. The steps includes the testing of the series individually for stationarity using the Engle and Granger (1987) two step approach to determine the order of integration of the variables using the Augmented Dickey-Fuller (ADF) set of unit root test (Audu, 2010). After that we proceeded to search for the existence of long-run equilibrium causal relationship between foreign direct investment and economic development as stated in the model.

Presentation and Analysis of Empirical Results

Descriptive Statistics

The descriptive statistics in this study include measures such as the mean, median, standard deviation, minimum, maximum, skewness and the probability values of each variable. These measures help to describe the central tendency, dispersion, and overall distribution of the data. The result is given in table 4.1

Table 4.1 Descriptive Statistics of the variables

	RGDP	FDI	EXR	DS	GEX	OPN
Mean	39902.54	2.46E+09	128.0540	5982.983	3186.493	291.4066
Median	31064.27	1.87E+09	118.5700	592.0900	1018.200	304.9185
Maximum	77936.10	8.84E+09	645.1900	47375.98	19808.40	550.2128
Minimum	16211.49	1.87E+08	0.610000	6.560000	9.600000	75.22695
Std. Dev.	21651.62	2.50E+09	142.7429	9977.419	4475.373	111.5707
Skewness	0.485004	1.209850	1.546399	2.293346	1.925266	-0.061626
Jarque-Bera	5.239911	10.70219	28.81837	95.95905	49.80156	0.583732
Probability	0.072806	0.004743	0.000001	0.000000	0.000000	0.746869
Observations	43	43	43	43	43	43

Source: Author's own computation, 2025 using E-View 10.

The descriptive statistics revealed that the mean value of RGDP is ₦39,902.54 billion, with a standard deviation of ₦21,651.62, suggesting high variability in Nigeria's economic performance over the years.

Likewise, Foreign Direct Investment (FDI) has a mean value of ₦2.46 billion and a high standard deviation of ₦2.50 billion, reflecting significant fluctuations in foreign capital inflows.

Furthermore, the exchange rate (EXR) has an average of ₦128.05 per dollar, showing depreciation over time, and a standard deviation of 142.74, which points to high volatility. Domestic Savings (DS) has a mean of ₦5,982.98 billion and a standard deviation of ₦9,977.42, indicating wide fluctuations in savings levels.

Finally, Government Expenditure (GEX) averages ₦3,186.49 billion with a standard deviation of ₦4,475.37, also indicating variability in fiscal spending. Trade Openness (OPN) has a mean value of 291.41 and a standard deviation of 111.57, reflecting moderate variation.

High standard deviations in key economic indicators like FDI, exchange rate, and savings reflect structural weaknesses and economic instability, which have implications for the role of foreign direct investment in Nigeria's economic development.

Unit root tests

The Augmented Dickey–Fuller test was used in testing the null hypothesis that there is a unit root in a particular time series of interest. ADF is not the only tests available, but it represents widely used approaches. The unit root test is presented in Table 4.2. The lag length used in the ADF test based on minimizing the Akaike Information Criterion (AIC), using maximum lag length.

Table 1. Result of Augmented Dickey Fuller Test

	ADF Test Statistics			
Variables	@ level	@ 1 st Diff	d (I)	Remark
Log(RGDP)	-1.500608	-4.010653	I (1)	Stationary
Log(FDI)	-1.077704	-10.99913	I (1)	Stationary
Log(EXR)	-1.650783	-5.727349	I (1)	Stationary
Log(DS)	-2.112038	-4.092659	I (1)	Stationary
Log(GEX)	-0.742554	-7.992377	I (1)	Stationary
Log(OPN)	-2.180555	-5.936524	I (1)	Stationary
	-4.205004	-4.198503		
Test critical values	-3.526609	-3.523623		
	-3.194611	-3.192902		

Source: Author's own computation, 2025 using E-View 10.

Table 4.2 indicated that all the variables were integrated of order one i.e. I (1). No variable was integrated of order zero or two. Therefore, the variables under study are integrated of the same order. It was found that all the variables of the study exhibited unit root process at various critical levels but mostly at 5% level of significance. In other words, all the variables were found to be non-stationary at their levels but stationary at their first differences (I (1)).

Cointegration Test

Cointegration analysis helps to clarify the long-run relationship between integrated variables. Johansen's procedure is the maximum likelihood for finite-order vector autoregressions (VARs) and is easily calculated for such systems, so it is used in this study. The Johansen's technique was chosen not only because it is VAR based but also due to the evidence that it performs better than single equation and alternate multivariate methods. The results of the Cointegration test are presented in Table 2.

Table 4.3: Johansen Cointegration Rank Test Result

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.805399	139.5565	95.75366	0.0000
At most 1 *	0.577278	72.44762	69.81889	0.0304
At most 2	0.324156	37.14495	47.85613	0.3407
At most 3	0.217978	21.08142	29.79707	0.3526
At most 4	0.168201	11.00066	15.49471	0.2115
At most 5	0.080701	3.449915	3.841466	0.0633

Trace test indicates 2cointegratingeqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.805399	67.10891	40.07757	0.0000
At most 1 *	0.577278	35.30267	33.87687	0.0336
At most 2	0.324156	16.06353	27.58434	0.6604
At most 3	0.217978	10.08075	21.13162	0.7371
At most 4	0.168201	7.550749	14.26460	0.4262
At most 5	0.080701	3.449915	3.841466	0.0633

Max-eigenvalue test indicates 2cointegratingeqn(s) at the 0.05 level

Source: Author's own computation, 2025 using E-View 10.

The Johansen tests revealed that the trace and maximal Eigen statistics show the existence of two cointegrating relationships between log (RGDP) and its determinants at 5% level of significance (Table 2). The conclusion drawn from this result is that there exist a unique long run relationship between log (RGDP), log (FDI), log (EXR), log (DS), log (GEX) and log (OPN). Since there are two cointegrating vector

The Parsimonious error correction model

Having ascertained that the variables are non-stationary at their levels but stationary after differencing once, and that they are cointegrated, the stage is set to formulate an error correction model. The intuition behind the error correction model is the need to recover the long-run information lost by differencing the variables. The error correction model rectifies the problem by introducing an error correction term. The error correction term is derived from the long-run equation based on economic theory. The error correction term enables us to gauge the speed of adjustment of economic development in its long-run. It gives the proportion of the disequilibrium errors accumulated in the previous period which are corrected in the current period.

Table 4.4. Estimated Long Run Error Correction Mechanism

Dependent Variable: Dlog(RGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
C	0.077548	0.013854	5.597407	0.0000
DLOG(RGDP(-1))	0.308837	0.106109	2.910565	0.0097
DLOG(RGDP(-2))	0.267967	0.089314	3.000274	0.0080
DLOG(FDI)	0.020828	0.006011	3.465207	0.0030
DLOG(FDI(-1))	0.008830	0.006170	1.431121	0.1705
DLOG(FDI(-2))	0.039232	0.010539	3.722435	0.0017

DLOG(FDI(-3))	0.051034	0.010025	5.090569	0.0001
DLOG(EXR)	-0.088750	0.013779	-6.440784	0.0000
DLOG(EXR(-1))	0.053376	0.015994	3.337328	0.0039
DLOG(EXR(-2))	-0.063711	0.018489	-3.445899	0.0031
DLOG(EXR(-3))	0.033042	0.014721	2.244559	0.0384
DLOG(DS)	-0.028944	0.038575	-0.750329	0.4633
DLOG(DS(-1))	-0.073973	0.033899	-2.182134	0.0434
DLOG(DS(-2))	-0.057188	0.038553	-1.483344	0.1563
DLOG(DS(-3))	-0.149645	0.029791	-5.023192	0.0001
DLOG(GEX)	0.080569	0.026301	3.063361	0.0070
DLOG(GEX(-2))	0.026261	0.028071	0.935523	0.3626
DLOG(GEX(-3))	-0.053671	0.023679	-2.266658	0.0367
DLOG(OPN)	-0.037412	0.022659	-1.651041	0.1171
DLOG(OPN(-1))	0.016812	0.015028	1.118650	0.2788
DLOG(OPN(-2))	-0.017160	0.014855	-1.155183	0.2640
ECM(-1)	-0.439107	0.058724	-7.477462	0.0000
R-Square = 0.917184, F-Statistic = 8.965485, Prob(F-Stat) = 0.0000, Durbin-Watson = 2.245790				

Source: Author's own computation, 2025 using E-View 10.

The parsimonious error correction mechanism (ECM) result explained both short-run dynamics and long-run adjustment properties of the model, with real GDP serving as the dependent variable.

Starting with foreign direct investment, the current value foreign direct investment has a positive coefficient of 0.0208 and is statistically significant at the 5% level ($p = 0.0030$), implying that a 1% increase in FDI leads to approximately 2.08% increase in economic development in the short run. This result confirms the short-run positive influence of FDI inflows on real GDP growth. Similarly, FDI in second and third lagged are also positively signed and significant at 5% level, with coefficients of 0.0392 and 0.0510 respectively, indicating lagged effects of FDI continue to contribute to economic development. However, $DLOG(FDI(-1))$ is positive but not statistically significant ($p = 0.1705$), suggesting its immediate past impact is weak.

For the exchange rate, the current value exchange rate has a negative coefficient of -0.0887 and is statistically significant at 5% level ($p = 0.0000$), indicating that exchange rate depreciation reduces economic growth in the short run. Interestingly, the first lag exchange rate is positive and significant (0.0533, $p = 0.0039$), suggesting a slight reversal or correction effect, while the second lag is negative and significant, reinforcing the initial negative impact. The third lag of exchange rate is again positive and significant, showing alternating short-run effects, possibly due to exchange rate volatility.

In terms of domestic savings, the current value is negative (-0.0289) but not statistically significant ($p = 0.4633$), suggesting that current savings do not significantly influence growth immediately. However, the first and the second lag of domestic savings are both negative and significant, especially the third lag (-0.1496, $p = 0.0001$), which indicates that lagged domestic savings may crowd out investment or reflect low saving-investment efficiency in Nigeria.

Government expenditure has a positive and significant impact (0.0806, $p = 0.0070$), implying that increased public spending stimulates short-run economic growth. Conversely, the third lag is negative and significant, suggesting that excessive past government spending may later harm growth, possibly due to debt overhang or inefficient allocation.

For trade openness, the current and lagged values of trade openness, though negative or mixed in signs, are not statistically significant, implying that trade openness has no substantial short-run impact on economic development in the model.

The error correction term $ECM(-1)$ is negative and statistically significant (-0.4391, $p = 0.0000$), which is theoretically expected. It shows that about 43.91% of deviations from long-run equilibrium are corrected in the current period, confirming the existence of a stable long-run relationship among the variables. This validates

the long-run causality running from FDI, exchange rate, domestic savings, government expenditure, and openness to economic development.

The R-squared value of 0.9172 indicates that approximately 91.72% of the variations in real GDP growth are explained by the model, suggesting a strong explanatory power. The F-statistic of 8.97 with a probability value of 0.0000 confirms the overall significance of the model. Lastly, the Durbin-Watson statistic of 2.2458 suggests no presence of first-order serial correlation, confirming the reliability of the regression estimates.

Diagnostic Test

S/No	Test	F-Stat	Probability
1	Normality (Jargue-Bera Statistic)	1.691308	0.4292
2	Serial Correlation (Breusch-Godfrey Test)	1.992443	0.3693
3	Heteroskedasticity (White heteroskedasticity Test)	11.75055	0.9461

Source: Author's own computation, 2025 using E-View 10.

The diagnostic test results for the study provide evidence of the statistical reliability and robustness of the estimated model.

The normality test using the Jarque-Bera statistic yields a value of 1.6913 with a probability of 0.4292. Since the p-value is greater than 0.05, the null hypothesis of normal distribution of residuals is not rejected. This implies that the residuals of the model are normally distributed, satisfying one of the key assumptions of classical linear regression.

The serial correlation test using the Breusch-Godfrey method shows an F-statistic of 1.9924 and a probability of 0.3693. Given that the p-value exceeds the 5% significance level, the null hypothesis of no serial correlation is not rejected. This indicates that the residuals are not autocorrelated, confirming that the model does not suffer from serial correlation and the estimates are efficient.

The heteroskedasticity test conducted using the White test returns an F-statistic of 11.7506 with a probability of 0.9461. Since the p-value is far above the 0.05 threshold, the null hypothesis of constant variance (homoskedasticity) is not rejected. This implies the absence of heteroskedasticity in the residuals, ensuring that the standard errors are reliable and the inference drawn from the regression is valid.

CUSUM test for Stability

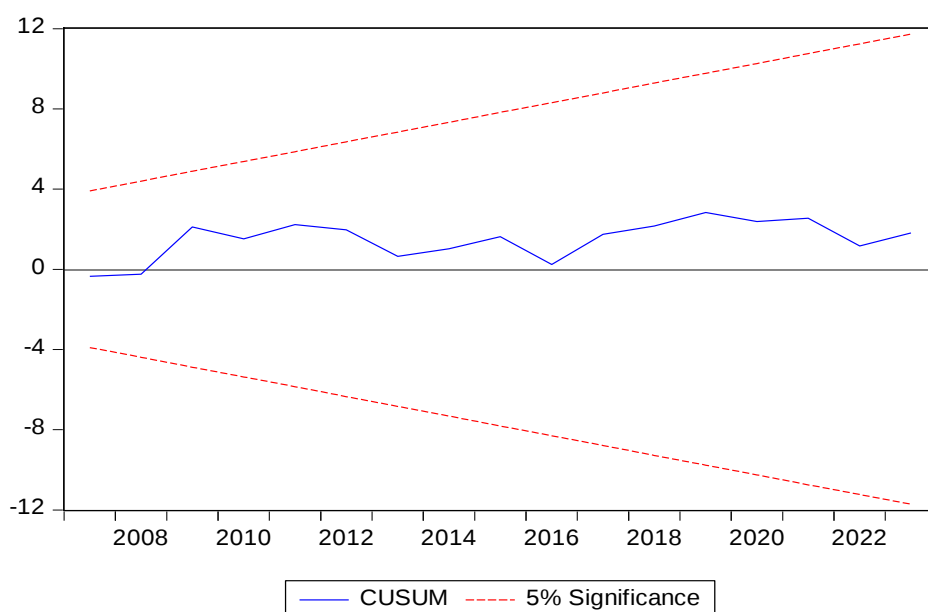


Figure 4.1 CUSUM test

The CUSUM test result for the study indicates that the blue line, which represents the cumulative sum of recursive residuals, lies within the two red lines that mark the 5 percent significance boundaries. This suggests that the estimated model is stable over the sample period. Since the line does not cross the critical boundaries, there is no evidence of structural instability or significant changes in the relationship among the variables over time.

DISCUSSION OF FINDINGS

The findings from the error correction model indicate that foreign direct investment has a positive and statistically significant effect on economic development in Nigeria, both in the current period and in several lagged periods. This suggests that FDI contributes meaningfully to short-run economic growth, with its impact persisting over time. Exchange rate fluctuations show a mixed effect, with current depreciation negatively affecting growth, while some lagged periods reflect a reversal effect, indicating exchange rate instability has short-run implications for the economy.

Domestic savings, though an essential source of investment, appears to have an inconsistent and mostly negative effect on economic development in the short run, implying that savings may not be efficiently channeled into productive investments. Government expenditure positively influences growth in the current period, reflecting the role of fiscal spending in stimulating the economy, though excessive past spending shows some adverse effects. Trade openness does not show a significant short-run impact, suggesting that openness alone is not enough to drive immediate growth without strong supporting structures.

The error correction term is appropriately signed and significant, confirming that the model adjusts effectively back to equilibrium after short-run disturbances. Overall, the model exhibits strong explanatory power and reliability, supported by normality, serial correlation, heteroskedasticity, and stability tests.

CONCLUSION AND RECOMMENDATIONS

In conclusion, the study has shown that foreign direct investment plays a vital role in promoting economic development in Nigeria, with evidence of significant short-run effects. Exchange rate movements and government expenditure also influence growth, while domestic savings and trade openness exhibit weaker or inconsistent impacts. The error correction model confirms the existence of a stable long-run relationship among the variables, indicating that policy interventions can effectively restore equilibrium when disruptions occur.

Based on the findings, the following recommendations are made:

- i. Government should implement policies that encourage and sustain foreign direct investment inflows, particularly in productive sectors of the economy.
- ii. Exchange rate management should focus on achieving stability, as volatility undermines investor confidence and economic performance.
- iii. Domestic savings should be better mobilized and efficiently allocated to investment channels that support industrial and economic growth.
- iv. Public spending should be directed toward growth-enhancing sectors such as infrastructure, health, and education to maximize its developmental impact.
- v. Trade policies should be restructured to ensure that openness to international markets is complemented with supportive local production policies that enhance competitiveness and drive sustainable growth.

Declarations

1. Ethical Approval

Not Applicable

2. Consent To Participate

Not Applicable

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