International Journal of Foreign Trade and International Business

E-ISSN: 2663-3159
P-ISSN: 2663-3140
Impact Factor: RJIF 5.22
www.foreigntradejournal.com
IJFTIB 2025; 7(2): 48-53
Received: 24-06-2025
Accepted: 27-07-2025

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Impact of foreign direct investment on economic growth in Nigeria

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DOI: https://www.doi.org/10.33545/26633140.2025.v7.i2a.173

Abstract
The impact of foreign direct investment on economic growth in Nigeria is examined in this study with the use of secondary data sourced from the world development indicator from 1985 to 2023. The model adopted by this research work as empirical strategy to examine the relationship between foreign direct investment and economic growth is the auto regressive distributed lag (ARDL) model. The findings revealed that the impact of foreign direct investment on economic growth in Nigeria is negative in the short run but positive in the long run. The researchers therefore recommended that policymakers must create a stable and investment friendly environment to attract and retain high quality foreign investments.

Keywords: Foreign direct investment (FDI), inflation, oil rents, exchange rate, domestic investment

1. Introduction
One of the macroeconomic objectives of any nation is economic growth. This is because increase in per capita income as a result of economic growth improves the general welfare of citizens. Therefore, nations with this foresight all over the world seem to create more avenue for economic policies that will enable them achieve this basic objective (worldbank, 2021) [15].

Foreign Direct Investment (FDI) therefore has been perceived among some researchers to be one of the key elements that can enable a nation to achieve this goal of economic growth (Kolade, 2019) [7]. According to Wikipedia, Foreign Direct Investment (FDI) is when a company or individual of one country invest in the business interest of another country in the form of either acquiring foreign companies or establishing business operations. Foreign Direct Investment is said to have the ability to reduce poverty in the country (Ogunniyi & Igberi, 2014) [9], promote economic growth (Kolade, 2019) [7] and reducing urban unemployment (Okoli & Calistus, 2024) [10]. However, foreign Direct Investment has been fluctuating in recent years. For example, FDI in Nigeria averaged 792.31 USD million from 1990 until 2024, reaching an all-time high of 3084.90 USD million in the fourth quarter of 2012 and a record low of -558.45 USD million in the fourth quarter of 2022. It increased again by 564.41USD million in the third quarter of 2024 (CBN, 2024). Considering the importance of Foreign Direct Investment Vis-à-vis the fluctuation in Nigeria prompts the researchers to revisit the effect on economic growth.

Objectives of the Study
1. To examine the impact of foreign direct investment on economic growth in Nigeria.
2. To examine the relationship between Foreign Direct Investment and economic growth in Nigeria.

Research Hypotheses
1. Foreign Direct Investment has no significant impact on economic growth.
2. There is no significant relationship between Foreign Direct Investment and economic growth.

2. Literature Review
Theoretical Framework: Neoclassical Growth Theory
The theoretical framework for this study is based on the neoclassical growth model which

suggests that economic growth is driven by the accumulation of human capital, physical capital, and progress in technology. The model also suggest that Foreign Direct Investment can play a crucial role in promoting economic growth by bringing in new technologies, management skills and capital.

Empirical Literature Review

Kolade (2019) [7] examined the effect of foreign direct investment on economic growth in Nigeria from 1986 to 2017 using descriptive and regression analyses as techniques estimation. The findings revealed that whereas the impact of foreign direct investment on economic growth was positive and significant at 5% alpha level, the impact on domestic investment was positive but not significant at 5% alpha level.

Ezo *et al*. (2022) [3] analysed the effect foreign direct investment on economic growth in specific sectors in 19 developing countries from 2005 to 2018 using a two-step system generalized method of moment (GMM) for the analysis of the data. The study found that foreign direct investment has positive and significant impact on economic growth only in the manufacturing sector, whereas in the tertiary and primary sector it has negative effect. They therefore concluded that, countries that attract more manufacturing foreign direct investment, have greater chances of economic growth.

Okoli & Calistus (2024) [10] assessed the effect of foreign direct investment on rate of unemployment in Nigeria utilizing data from 1990 to 2020 employing dynamic ordinary least square. The results showed that the impact of foreign direct investment on urban unemployment was significant but insignificant on rural unemployment in Nigeria.

Ariayefa *et al*. (2024) [1] analysed the effect of foreign direct investment on growth of Nigerian economy utilizing data from 1981 to 2022. The findings showed that whereas gross fixed capital formation had significant negative effect on economic growth in the short run, foreign direct investment, per capita income and exchange rate have positive but insignificant effect in the long run.

Ogunniyi & Igberi (2014) [9] analysed empirically, the relationship between foreign direct investment and reduction of poverty in Nigeria using data from 1980 to 2012. The estimation technique employed was ordinary least squares. The results showed that foreign direct investment affect real per capita income positively though insignificant thereby having the capacity to reduce poverty in the country.

Ugwuegbe *et al*. (2013) [13] investigated the empirical relationship between foreign direct investment and growth of Nigerian economy from 1981 to 2009. Annual data from Central Bank of Nigeria statistical bulletin were used. The finding indicates that impact of foreign direct investment on economic growth in Nigeria is positive but insignificant.

Based on the review so far, no researcher has attempted to include oil rents and inflation which are important variables in determining economic growth. Furthermore, this study covers a period of 36years (1985-2023), which place it in a more current outlook. Also, the previous studies did not attempt to find out both short run and long run relationship between foreign direct investment and growth of Nigerian economy.

Methodology

Data and Data Source

This paper utilizes secondary data from 1985 to 2023 which was obtained from the World Development Indicators (2024). Specifically, time series data was used for analysis in this study so as to have enough observations for drawing long run inferences. GDP, FDI, Domestic Investment, Exchange Rate, Inflation, and Oil Rents are the variables used in the study.

Strategy of Estimation, Specification of Model and Procedures of Estimation: The Autoregressive Distributed Lag (ARDL) model was adopted as the empirical strategy in this study to explore the relationship between foreign direct investment and economic growth. This method is particularly suitable given the stationarity properties of the variables used, which are a mix of level-stationary and first-difference stationary series. The Autoregressive Distributed Lag (ARDL) approach, which was introduced originally by Pesaran, Shin, and Smith (1996b), offers significant benefits over traditional estimation techniques such as Ordinary Least Squares (OLS) and other dynamic lag models. As highlighted by Nkoro and Uko (2016) [8], one of the key value of the ARDL method is its capacity to address potential endogeneity issues that often emerge from residual correlation, as each variable in the model is treated as a single-equation estimator. This reduces bias and enhances the reliability of the results.

Moreover, a major benefit of the ARDL approach lies in its capacity to effectively identify cointegrating relationships, even in cases where multiple cointegrating vectors are present something that other models may struggle with. Additionally, the ARDL technique permits for both long run and short run estimation dynamics within a unified framework. Through the derivation of the Error Correction Model (ECM), researchers can assess both the instant impacts of changes in Foreign Direct Investment on growth of the economy and also determine whether a long-run equilibrium relationship exists among the variables. This dual capability makes ARDL a powerful and versatile tool for empirical analysis, particularly in macroeconomic studies involving mixed integration orders and complex dynamic interactions. The following ARDL model is estimated with economic growth as the dependent variable

$$\Delta GDP_t = \alpha_1 GDP_{t-1} + \alpha_2 X_{t-1} + \sum_{i=1}^{p-1} \beta_i \Delta GDP_{t-i} + \sum_{j=0}^{q-1} \gamma_j \Delta X_{t-j} + \varepsilon_t$$

Where;

$\alpha_1 GDP_{t-1} + \alpha_2 X_{t-1}$ is the part of the model showing the long run relationship which exist among the variables. And $\alpha_2 X_{t-1} + \sum_{i=1}^{p-1} \beta_i \Delta GDP_{t-i} + \sum_{j=0}^{q-1} \gamma_j \Delta X_{t-j}$ is the Error Correction Model (ECM) which shows the short run relationship that exist among the variables.

α_1 & α_2, are the parameters of the long run form of the dependent and independent variables, β_i & γ_j are the parameters of the shortrun form of the dependent and independent variables.

X_t a vector of independent variables; FDI, Domestic Investment, Exchange Rate, Inflation, and Oil Rents Δ is the first-difference operator GDP_t is the dependent variable; which is the economic growth in the country.

Before proceeding with model estimation, a unit root test that accounts for structural breaks is conducted to determine the stationarity properties of the variables, after which the cointegration test using the Bound's test is carried out. Following the estimation, a series of post-estimation diagnostic tests are carried out to ensure the validity and robustness of the model results. These tests help determine whether the estimates produced are both unbiased and efficient, making them suitable for informing policy decisions. Specifically, the Ramsey RESET test is used to assess model specification, the Breusch-Godfrey Serial Correlation LM test is applied to detect the presence of serial correlation, and the Breusch-Pagan-Godfrey test is employed to check for heteroskedasticity in the residuals. These diagnostics are essential to validate the reliability of the ARDL model for policy analysis and formulation.

4. Results

Table 1 shows the descriptive statistics for the variables employed in this study. As evident in the table 1, the data is balanced, and spans 36 years, which is efficient for a time series analysis, seeking to establish both short-run and long-run dynamics. Furthermore, all variables have sufficient variations needed for an efficient estimation. Of interest is the mean of FDI, which is relatively small with a figure of 1.38 over the study period.

Table 1: Descriptive Statistics

	GDP	FDI	Exchange Rate	Domestic Invest	Inflation	Oil Rents
Mean	2.78E+11	1.389476	111.8784	5.80E+10	19.17819	12.43664
Median	2.28E+11	1.288550	119.5724	5.68E+10	12.38103	12.60535
Maximum	5.09E+11	4.282088	358.8108	8.02E+10	72.83550	28.70544
Minimum	1.21E+11	0.137154	0.893774	3.97E+10	5.388008	2.684290
Std. Dev.	1.40E+11	0.940533	100.1713	1.03E+10	17.68454	5.975087
Skewness	0.496040	0.797626	0.784745	0.224492	1.742203	0.392627
Kurtosis	1.644702	3.651409	2.875050	2.315974	4.695082	2.988700
Jarque-Bera	4.231586	4.453746	3.718367	1.004218	22.52158	0.925127
Probability	0.120538	0.107865	0.155800	0.605253	0.000013	0.629668
Sum	1.00E+13	50.02113	4027.624	2.09E+12	690.4147	447.7189
Sum Sq. Dev.	6.91E+23	30.96111	351199.8	3.71E+21	10946.00	1249.558
Observations	36	36	36	36	36	36

***Source*:** Author's computation

The results of the unit root test in table 2 shows that variables; inflation rate, domestic investment, oil rents and exchange rate were all stationary at first difference, while GDP and FDI were stationary at level. The unit root test results confirm a mix of integration orders among the variables—some stationary at level and others at first difference—making the ARDL approach appropriate. This justifies its use, as it accommodates such combinations and allows for reliable estimation of both short- and long-run relationships within the model framework. Table 3 shows the results of the bounds test carried out in our analysis to ascertain whether there is cointegration among the variables in our series. The null hypothesis of no cointegration is tested using the value of the F-statistic and the I1 bound. To conclude that there is cointegration among the variables, the value of the F-statistic should be greater than that of the I1 bound. From the results in table the value of the F-statistic is 10.5 which is greater than that of the I1 bound which is 3.79. Thus, the presence of cointegration among the variables can be affirmatively posited.

Table 2: Unit Root Test Result

Variable	ADF Test Statistic	ADF Critical Values	Probability	Stationarity
Log GDP	-2.943427	-2.944115	0.0499	I(0)
FDI	-3.821540	-2.944115	0.0059	I(0)
Inflation Rate	-4.561529	-2.963972	0.0011	I(1)
Log Investment	-10.09245	-2.948404	0.0000	I(1)
Oil Rents	-6.933875	-2.951125	0.0000	I(1)
Exchange Rate	-4.087338	-2.945842	0.0030	I(1)

***Source*:** Author's Computation

Table 3: ARDL Bounds Test

Included observations: 33		
Test Statistic	Value	K
F-statistic	10.50640	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

***Source*:** Authors Computation based on data estimated.

The short run results of the model fitted to ascertain the impact of FDI on economic growth is presented in table 4. First, the value of the ECM (CointEq) is of crucial importance. For the short run results to be valid, the value of the ECM must be negative and significant. From the results, the value of the ECM is -0.188 and it is statistically significant at 5% level of significance. This means our results are valid and can be interpreted. The results show that the impact of FDI on economic growth in Nigeria is negative in the shortrun. This is the same for the first and second lags of FDI respectively. Meanwhile, for the control variables, while domestic investment did not impact economic growth in the short run, exchange rate, inflation and oil rents had negative and significant effects on economic growth in the short run. Meanwhile, table shows the long run estimates ascertaining the effect of FDI on economic growth. The result shows that in the long run, FDI has a positive and increasing effect on economic growth. For other controls, Domestic investment, exchange rate and oil rents also increase economic growth significantly in the long run, while inflation still exerted a negative effect on growth as in the short run.

The result of post estimation is presented in table 6 and figure 1. Post estimation was carried out using the Breusch-Godfrey Serial Correlation LM Test, the Breusch-Pagan-Godfrey Heteroskedasticity Test, Ramsey RESET Test, and CUSUM sum of squares test. The result shows that the probability values of all the tests are not statistically significant at 5%. Meanwhile, the CUSUM sum of squares is within the 5% significance bound, suggesting model stability. The post-estimation diagnostic tests indicate that the model is well-specified and statistically reliable. The Breusch-Godfrey LM test confirms the absence of serial correlation, while the Breusch-Pagan-Godfrey test shows no evidence of heteroskedasticity. Additionally, the Ramsey RESET test suggests that the model does not suffer from functional form misspecification. Lastly, the CUSUM of squares test falling within the 5% significance bounds indicates that the model is structurally stable over the sample period. These results collectively validate the robustness of the ARDL model used.

Table 4: ECM Short-run Results

Dependent Variable: LOGGDP				
Selected Model: ARDL(2, 4, 2, 2, 4, 1)				
Sample: 1985 2023				
Included observations: 32				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGGDP(-1))	-0.586101	0.202766	-2.890525	0.0147
D(Foreign Direct Investment)	-0.014114	0.004912	-2.873645	0.0151
D(Foreign Direct Investment (-1))	-0.014694	0.004683	-3.137528	0.0094
D(Foreign Direct Investment (-2))	-0.021529	0.003841	-5.604965	0.0002
D(Domestic Investment)	-0.000000	0.000000	-1.478685	0.1673
D(Domestic Investment (-1))	-0.000000	0.000000	-0.906474	0.3841
D(Exchange Rate)	-0.000935	0.000206	-4.534289	0.0009
D(Exchange Rate (-1))	-0.000682	0.000253	-2.696214	0.0208
D(Inflation)	-0.001951	0.000236	-8.252201	0.0000
D(Inflation (-1))	0.000541	0.000337	1.604288	0.1370
D(Inflation (-2))	0.002110	0.000448	4.710364	0.0006
D(Oil Rents)	-0.005062	0.001051	-4.815756	0.0005
CointEq (-1)	-0.188723	0.038176	-4.943527	0.0004

Source: *Authors Computation based on data estimated*

Table 5: Long Run Estimates

Long Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Foreign Direct Investment	0.025467	0.060005	0.424406	0.6825
Domestic Investment	1.303810	0.236891	5.503827	0.0006
Exchange Rate	0.001254	0.000391	3.204283	0.0125
Inflation	-0.005151	0.001956	-2.633784	0.0300
Oil Rents	0.046505	0.008921	5.212908	0.0008
C	-6.488796	5.809782	-1.116874	0.2965

***Source*:** Authors Computation based on data estimated

Table 6: Post Estimations

Test	**F-Statistic**	**Prob**
Breusch-Godfrey Serial Correlation LM Test	1.317122	0.3150
Breusch-Pagan-Godfrey Heteroskedasticity Test	1.144674	0.4220
Ramsey RESET Test	0.622946	0.4483

***Source*:** Authors Computation based on data estimated

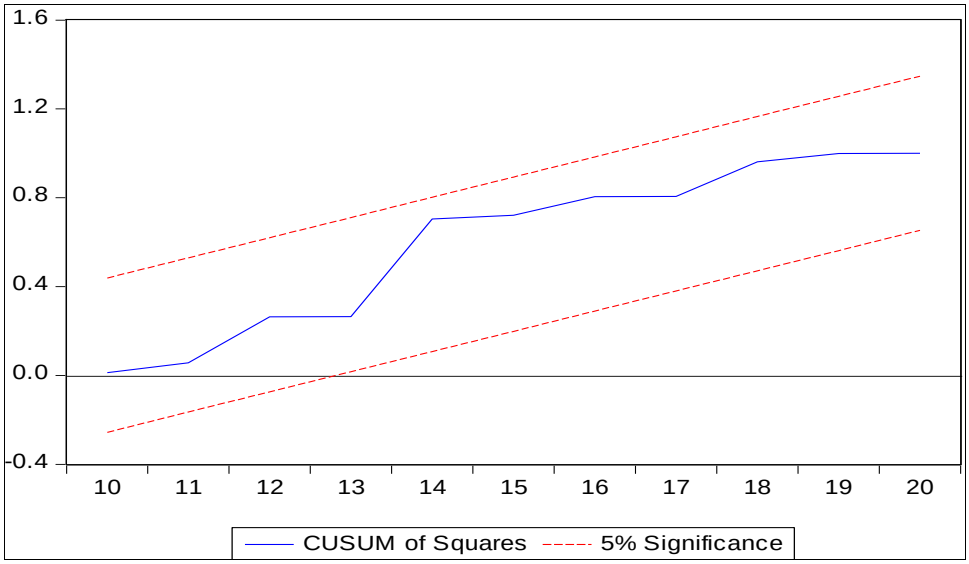

Fig 1: CUSUMS Sum of Squares Test

4.2 Discussion

The results from the ARDL estimation reveal a dual nature in the impact of Foreign Direct Investment (FDI) on Nigeria's economic growth, with contrasting effects in the short and long run. In the short run, FDI exhibits a negative and statistically significant effect on economic growth, with both its first and second lags reinforcing this adverse impact. This outcome aligns with the argument that the initial phases of FDI inflows, particularly in developing countries, may not immediately translate into economic benefits. The negative short-run effect may arise from several factors, including profit repatriation by foreign firms, crowding out of domestic enterprises, the dominance of FDI in the extractive (especially oil) sector with limited backward linkages, and weak absorptive capacity of the domestic economy. Additionally, foreign investors may incur substantial setup costs in the early periods, which are not instantly productive. These lags in transmission effects may explain the temporary growth drag observed in the short run.

However, the long-run estimates present a contrasting and more optimistic scenario. Over time, FDI contributes positively and significantly to Nigeria's economic growth. This finding supports endogenous growth theories that highlight the role of FDI in facilitating technology transfer, enhancing human capital development, and providing long-term capital for infrastructural and industrial expansion. It suggests that once initial distortions or inefficiencies are overcome, FDI becomes an essential engine for sustained growth. The improvement over the long term may also reflect policy adjustments, institutional learning, and better integration of FDI into productive sectors of the economy. Therefore, while short-run effects might appear discouraging, the long-run benefits underscore the need for sustained FDI-friendly policies, investment in complementary infrastructure, and reforms to enhance the quality of FDI Nigeria attracts particularly into sectors with greater potential for structural transformation.

The control variables included in the model domestic investment, exchange rate, inflation, and oil rents offer additional insights into the growth dynamics of Nigeria's economy. In the short run, domestic investment does not exert a significant impact on economic growth, suggesting that investments made may not be efficiently allocated or immediately productive. This could result from bureaucratic delays, infrastructural deficits, or low capital productivity, which often characterizes many developing economies. Over time, however, domestic investment exerts a positive and significant effect on growth in the long run. This result validates the neoclassical assumption that capital accumulation, when managed effectively, contributes meaningfully to long-term output expansion. The exchange rate has a negative and significant impact on growth in the short run, possibly due to volatility, depreciation pressures, and uncertainty that inhibit investment and importation of productive inputs. Interestingly, in the long run, the exchange rate has a positive impact, likely due to stabilization effects and improved competitiveness of Nigerian exports over time. This underscores the importance of exchange rate management in fostering macroeconomic stability and investor confidence.

Inflation retains its negative impact on growth in both the short and long run, highlighting its persistent distortionary effect on savings, investment, and consumption. High inflation erodes purchasing power, increases transaction costs, and creates uncertainty, all of which deter productive activity. This confirms the need for consistent and credible monetary policy aimed at maintaining price stability. Lastly, oil rents negatively impact growth in the short run but show a positive and significant influence in the long run. This reflects the "resource curse" in the short term, where excessive dependence on oil may stifle other sectors. However, with better governance and oil revenue management, oil resources can contribute positively to long-run growth through public investment and infrastructure development.

5. Conclusion and policy implications

This study has examined the short-run and long-run effects of Foreign Direct Investment (FDI) on economic growth in Nigeria using the ARDL estimation technique. The findings reveal that while FDI has a negative and statistically significant impact on economic growth in the short run possibly due to structural rigidities, profit repatriation, or initial adjustment costs it exhibits a positive long-run effect. This indicates that, over time, FDI contributes meaningfully

to Nigeria's economic development, likely through technology transfer, employment generation, capital formation, and productivity improvement. In the short run, other control variables such as exchange rate, inflation, and oil rents negatively affect economic growth, pointing to macroeconomic instability and dependence on volatile external sectors. However, in the long run, domestic investment, exchange rate stability, and oil rents exert positive effects on growth, emphasizing the importance of economic policy consistency and investment in productive sectors.

Given the long-run benefits of FDI on economic growth, policymakers must create a stable and investment-friendly environment to attract and retain high-quality foreign investments. Key actions include strengthening institutional quality and governance to reduce investment risk and build investor confidence. Furthermore, enhancing macroeconomic stability particularly by managing inflation and maintaining a competitive and predictable exchange rate system is crucial. Additionally, providing targeted incentives to attract FDI into non-oil sectors such as manufacturing and technology to encourage diversification and reduce vulnerability to external shocks is also important. Governments and policy makers should also improve infrastructure and human capital, which are crucial for maximizing the spill over effects of FDI on domestic productivity. Finally, monitoring and regulating profit repatriation to ensure that FDI contributes meaningfully to capital accumulation without excessive capital flight should be addressed. Therefore, by focusing on long-term policy reforms and structural improvements, Nigeria can fully harness the developmental potential of FDI and place the economy on a more sustainable growth trajectory.

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