

The Impact of Foreign Direct Investment, Inflation, and Exchange Rate Fluctuations on Economic Growth in Nigeria

Kayode David Kolawole¹, Oluwagbenga Abayomi Seyingbo²

Abstract. With its rich natural resources and large domestic market, Nigeria is one of the largest economies in Africa, attracting foreign investment. However, inflation and the exchange rate determine the profitability of foreign investment and, therefore, affect its role in stimulating economic growth in the country. This study aims to assess the impact of foreign direct investment (FDI), inflation, and exchange rate fluctuations on economic growth in Nigeria. This study adopted the Solow Growth Theory and the Dependency Theory as a theoretical framework. The researchers used an ex-post facto design and gathered annual secondary data from the World Bank from 1990 to 2024. The analysis employed unit root tests, descriptive statistics, cointegration tests, and the Autoregressive Distributed Lag (ARDL) model to assess short- and long-run trends. The findings show that past GDP has a significant impact on present growth. This points to path dependence in Nigeria's economy. Inflation and changes in exchange rates had inconsistent and short-lived effects. Their varying positive and negative signs reflect economic instability. In the short run, FDI was not significant, meaning foreign capital inflows do not immediately lead to productivity gains. This is due to weak institutions, limited technology transfer, and the repatriation of profits. In the long run, exchange rates and inflation did not have a significant effect, while FDI played a weak but positive role in growth, with significance only at the 10% level. These results highlight that unstable short-term shocks are more influential than long-term growth drivers. Thus, coordinated policies are needed to stabilise inflation and exchange rates, strengthen institutions, and create a better investment environment for sustainable growth. Government institutions can use the results of this research to develop coordinated fiscal and monetary policies that improve the country's investment climate and facilitate the inflow of foreign investment.

Keywords: inflation, foreign direct investment, exchange rate, economic growth, Nigeria.

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Вплив прямих іноземних інвестицій, інфляції та коливань обмінного курсу на економічне зростання в Нігерії

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Анотація. Завдяки багатим природним ресурсам та великому внутрішньому ринку, Нігерія є однією з найбільших економік Африки, що приваблює іноземні інвестиції. Однак інфляція та обмінний курс визначають прибутковість іноземних інвестицій а, отже, впливають на їхню роль у стимулюванні економічного зростання країни. Мета дослідження – оцінити вплив прямих іноземних інвестицій (ПІІ), інфляції та коливань обмінного курсу на економічне зростання в Нігерії. Теоретичною основою цього дослідження є теорія зростання Солоу та теорія залежності. Дослідники використовували метод *ex-post facto* та зібрили щорічні вторинні дані Світового банку з 1990 по 2024 рік. В аналізі використовувалися тести на одиничні корені, описова статистика, тести коінтеграції та модель авторегресивного розподіленого лага (ARDL) для оцінки короткострокових та довгострокових тенденцій. Результати дослідження показують, що минулий ВВП має значний вплив на поточне зростання. Це вказує на залежність від траєкторії розвитку економіки Нігерії. Інфляція та зміни обмінних курсів мали непослідовний та короткочасний вплив. Їхні різні позитивні та негативні ознаки відображають економічну нестабільність. У короткостроковій перспективі ПІІ були незначними, а це означає, що приплив іноземного капіталу не призводить негайно до підвищення продуктивності. Це пов'язано зі слабкими інституціями, обмеженим трансфером технологій та репатріацією прибутків. У довгостроковій перспективі обмінні курси та інфляція не мали суттєвого впливу, тоді як прямі іноземні інвестиції відігравали слабку, але позитивну роль у зростанні, зі значущістю лише на рівні 10%. Ці результати підкреслюють, що нестабільні короткострокові шоки мають більший вплив, ніж довгострокові рушійні сили зростання. Таким чином, уряд повинен проводити скоординовану політику для стабілізації інфляції та обмінних курсів, зміцнення інституцій та створення кращого інвестиційного середовища для сталого економічного зростання.

Ключові слова: інфляція, прямі іноземні інвестиції, обмінний курс, економічне зростання, Нігерія.

INTRODUCTION

Foreign Direct Investment (FDI) has been recognised as a key engine of economic growth and development. Apart from making capital investment, it invests in technology, management skills, and access to markets in host economies. FDI has a propensity to contribute to the economy through complementing local investment and savings, enhancing productivity through technology transfer, offering employment opportunities, and improving the balance of payments through foreign exchange inflows (Agbata et al., 2023; Ben-Obi et al., 2025; Binuyo et al., 2023; Obinna et al., 2025). In the last decades, FDI has also been at the centre of the economy of Nigeria, and despite some economic setbacks, it is still a major driver of Nigeria's growth potential (Obi-Nwosu, 2024; Okoroigwe et al., 2023). As one of Africa's biggest economies, Nigeria has abundant natural resources and a huge domestic market, becoming a major destination for foreign investment (Binuyo et al., 2023). However, the effectiveness of FDI in stimulating growth largely revolves around economic stability, most prominently inflation and the exchange rate. These both define the profitability of foreign investment as well as the competitiveness and resiliency of the economy (Oyamendan, 2022; Sabuur & Ismaila, 2020). Therefore, it is necessary to examine the relationship between FDI, inflation, and the exchange rate closely and their effect on Nigeria's growth.

In Nigeria, inflation is one of the most serious economic problems that guides investment decisions and long-term growth. Inflation is a sustained increase in the general price level of goods and services, whose negative or positive impact on growth varies with the level of intensity and effectiveness of its management. Moderate and constant inflation fosters production and investment, but high and variable inflation erodes purchasing power, dampens saving, and enhances economic uncertainty (Agbata et al., 2023; Okonkwo et al., 2021). Nigeria has recorded double-digit inflation over time, largely driven by government deficits that are too large, the exchange rate pass-through effect, its extensive reliance on imports, and structural issues in the economy (Ben-Obi et al., 2025). For example, inflation has increased since 1995 under structural adjustment and has been consistently higher compared to the other emerging markets. This situation undermines the confidence of foreign and domestic investors, as rising costs of production and lower yields make Nigeria less competitive for long-term investment. The Central Bank of Nigeria has implemented varied monetary policies, focusing on inflation, varying interest rates, and controlling liquidity (Obinna et al., 2025). Government overreaches and external shocks have opposed these and caused inflation to be a significant threat to sustainable growth.

Also, the exchange rate is an essential economic indicator influencing Nigeria's foreign capital inflow and economic growth. The exchange rate shows the value of

the naira compared to other currencies, and it has direct consequences for trade, capital inflow, and the business cost. On paper, a competitive and stable exchange rate would improve exports, enhance investor confidence, and spur growth. However, Nigeria has experienced exchange rate volatility due to overreliance on the export of crude oil, dwindling foreign reserves, and changing policy settings (Agbata et al., 2023; Ayano, 2023; Etale & Sawyerr, 2020; Miftahu & Isaac, 2023). The naira has profoundly depreciated, from ₦0.62 per \$1 in 1981 to over ₦1,400 per \$1 in 2024, showing economic vulnerability and the lack of diversification. The changes deter foreign investors from searching for secure returns and render domestic businesses that utilise imported inputs more costly. In addition, a depreciated naira causes inflation by raising the cost of imports, with economic uncertainty recycling itself (Ben-Obi et al., 2025). Government policy initiatives to stabilise the naira through foreign exchange manipulation, multiple exchange rate regimes, and unification policies have been ineffective, as structural defects and corruption hinder further improvement. Therefore, exchange rate volatility remains a formidable obstacle to translating FDI inflows into sustainable growth.

Various Nigerian governments have tried to attract FDI, contain inflation, and stabilise the exchange rate in a bid to attain growth. Initiatives such as the Structural Adjustment Programme (SAP) of 1986, trade liberalisation, privatisation, and ongoing reforms under the Economic Recovery and Growth Plan (ERGP) aimed at enhancing Nigeria's foreign investor attractiveness. However, effects have been mixed because high inflation, exchange rate fluctuation, and institutional weaknesses have diminished the effectiveness of such policies (Binuyo et al., 2023; Miftahu & Isaac, 2023; Obinna, Chinweizu & Emeka, 2025; Obi-Nwosu, 2024; Oyamendan, 2022; Sabuur & Ismaila, 2020). According to the CBN, FDI flows, which averaged \$8.9 billion between 2000 and 2009, fell to less than \$2 billion in 2022, primarily due to economic uncertainty and insecurity (Bailey, 2023). The expansion of Nigeria's GDP has been lackluster, averaging less than 3 percent over the past decade, which is insufficient to equal the population growth rate at 2.6 percent (World Bank, 2023). The combined effect of bad FDI performance, inflation, and volatile exchange rates has resulted in Nigeria's inability to attain inclusive growth. With the aforementioned backdrop, it is necessary to explore the influences of FDI, inflation, and exchange rates on economic growth in Nigeria. This research not only improves our knowledge of these variables but also offers great insight into ensuring economic stability and foreign investment to foster long-term success.

THEORETICAL BACKGROUND AND LITERATURE REVIEW

The Solow Growth Theory

Solow Growth Theory is a key neoclassical theory of long-run economic growth that was developed by Robert Solow (1956). It focuses on the significance of capital accumulation, rise in the labour force, and exogenous

technological progress as the major sources of output growth. The model shifts the focus from Keynesian short-run demand management to the long-run supply-side determinants of growth. It examines capital formation and productivity (Solow, 1956; Barro & Sala-i-Martin, 2004). The theory relies on several assumptions.

First, it assumes that there are decreasing returns to labour and capital, i.e., added investment leads to increasing marginal output over time (Solow, 1956). Second, it assumes that economies converge towards a steady state, where growth is motivated only by technological progress, an exogenous variable. Third, the theory states that while savings and investment ratios affect the output level, they do not affect the long-run growth rate. (Solow, 1956; Dykas et al., 2023) Lastly, foreign direct investment (FDI) and capital mobility are deemed external forces that heighten capital accumulation and accelerate convergence. On the contrary, inflation and unstable exchange rates reduce efficiency since they erode savings, discourage investment, and distort resource allocation (Dykas et al., 2023). A limitation of the Solow model is that it does not explain the source of technological progress since it assumes innovation is exogenous (Barossi-Filho et al., 2005). For all that, its virtue is in demonstrating how FDI flows can boost growth by introducing capital and technology and even highlighting the risk of macroeconomic instability, which can destroy capital productivity.

For this research, Solow's theory explains FDI growth contribution to Nigeria through capital deepening and knowledge transfer. Meanwhile, high inflation and volatile exchange rates avert the steady-state equilibrium by discouraging long-term investment and lowering productivity. Therefore, the model demonstrates how Nigeria's economic issues undermine the potential contribution of FDI inflows.

The Dependency Theory

The Dependency Theory, developed by Andre Gunder Frank (1967) and later advanced by Immanuel Wallerstein (1974), emerged as a reaction to modernisation theory. The theory argued that developing countries are underdeveloped not just because of internal factors but also because of exploitative global capitalist forces that promote unequal exchanges. According to this theory, foreign economic links and investment recreate the Global South's dependency, underdevelopment, and economic weakness (Wallerstein, 1974).

Dependency theory has several central assumptions. It argues that FDI, while seemingly positive, tends to reinforce dependency since it allows for capital flight, repatriation of profits, and control of domestic markets by multinational corporations (Wallerstein, 1974; Dos Santos, 1970). Secondly, it posits that countries such as Nigeria heavily rely on the export of primary commodities, thereby making them vulnerable to price fluctuations as well as external weaknesses (Dos Santos, 1970). Third, it highlights that foreign investors tend to invest in extractive resource sectors rather than productive ones, which constrains diversification and

sustainable development (Wallerstein, 1974). Both exchange rate volatility and inflation are viewed as manifestations of structural dependency on imports, oil revenues, and external capital.

Among the weaknesses of Dependency Theory is that it tends to overlook the possibilities of policy change at home and the advantages of globalisation in leveraging FDI for development (Evans, 1979). Its utility lies, however, in explaining the enduring structural weaknesses of developing countries despite massive inflows of FDI. In this study, Dependency Theory clarifies why Nigeria, being an excellent FDI recipient in Africa, still suffers from macroeconomic instability, inflation, and a weakening of its currency. The theory assumes that overdependence on foreign capital without developing national capacity is responsible for weak economic growth performance because external shocks can destabilize economic stability and sustainable development.

Review of Empirical Research

Agbata et al. (2025) in their study evaluated the impact of exchange rate (ER) volatility and foreign direct investment (FDI) on Nigeria's economic growth with an ex post facto research design, utilising National Bureau of Statistics and Central Bank of Nigeria (CBN) data from 2012 to 2021. On E-View 9, regression analysis revealed that FDI, exports, and exchange rate variations had positive but statistically not significant effects on growth. Conversely, inflation had a significant negative influence, suggesting that rising inflation undermines growth prospects. The evidence shows that greater FDI inflows, exports, and a stable exchange rate tend to increase GDP slightly but leave output and productivity significantly worse when inflation is allowed to rise. It was concluded that exchange rate volatilities and FDI affect Nigeria's growth trajectory and that inflation is a critical constraint.

Obinna et al. (2025) investigated the connection between FDI and economic growth in the United Kingdom using annual World Bank data from 1981 to 2021. Two results emerged from the study, based on the Toda-Yamamoto causality test and the Auto-Regressive Distributed Lag (ARDL). First, FDI flows were positively linked with UK economic growth. Second, although it has long been argued that FDI leads to growth, the results indicated that domestic growth rather leads to an inflow of FDI. Based on these results, the authors inferred that policymakers impose measures to attract more foreign investors through incentives such as tax reductions, duty exemptions, and subsidies on infrastructure. Such measures would enhance knowledge transfer, generate employment, and enhance productivity, thereby solidifying the favourable relationship between FDI and sustainable development.

Ben-Obi et al. (2025) examined the influence of exchange rate volatility on FDI, inflation, and the terms of trade in Nigeria from quarterly data 1995–2022 sourced from CBN reports. Employing the Nonlinear Autoregressive Distributed Lag (NARDL) approach, it was found that higher exchange rate volatility positively but insignificantly affected FDI in the long term.

Exchange rate depreciation significantly increased inflation both in the short and long term, whereas appreciation reduced inflation significantly. Both the balance of trade and outcome were responsive to the fluctuations, since results confirmed the divergent impacts of volatility on macroeconomic performance. The study recommended enhancing Nigeria's ease of doing business and strengthening security measures to instill stable FDI, suppress inflationary pressures, and stabilize macroeconomic variables against chronic volatility.

Obi-Nwosu (2024) evaluated the influence of exchange rate fluctuations on Nigeria's economy, specifically nominal GDP, inflation, and balance of payments, via Ordinary Least Squares (OLS) regression and Granger Causality test with time-series data over 2001–2022. Findings indicated a positive and significant connection between exchange rate fluctuation and nominal GDP, suggesting that depreciation increases measured growth. While changes in the exchange rate had a large but positive effect on inflation, they had a negative and significant influence on the balance of payments, making external imbalances more profound. The study highlighted the two-way causality between GDP and the changes in the exchange rate. Policy recommendations included adopting exchange rate policies aligned with growth targets, unifying exchange markets, and implementing complementary stabilisation instruments such as higher interest rates and more foreign exchange supply to enhance macroeconomic stability.

Okoroigwe et al. (2023) evaluated the impact of inflation, exchange rate, and interest rate volatility on Nigeria's GDP between 1986 and 2021 under regression analysis on data from CBN and NBS. The findings revealed that these three macroeconomic variables significantly contributed to GDP growth. While exchange rate, inflation, and interest rates individually contributed to growth, their combined impact had a greater explanatory power of Nigeria's economic growth. The study's findings revealed that stable macroeconomic variables have a direct proportion with GDP performance. The study concluded that the higher the stability of such variables, the greater their contribution to economic growth. Recommendations included adopting policies that would guarantee exchange rate, inflation, and interest rate stability, enhancing Nigeria's growth prospects, and establishing a more stable economic climate.

Ayano (2023) investigated the impact of FDI on Nigeria's economic growth during 1980–2020 in real GDP as well as macroeconomic indicators such as inflation, exchange rate, gross capital formation, and interest rate. Using multiple regression, the findings confirmed a long-term relationship among the variables but stated that FDI had a negative and statistically insignificant effect on growth. Gross capital formation and inflation also reported negative but statistically insignificant effects on GDP, while exchange rates were positive but statistically insignificant. Conversely, interest rates had a positive and significant effect. Recommendations place emphasis on increasing FDI

inflows by creating an investor-friendly environment through producing an environment for investors, keeping inflation in a growth-supportive range, encouraging exchange rate stability, reducing lending rates to encourage investment, and increasing capital formation to boost Nigeria's long-run performance for economic growth.

Miftahu and Isaac (2023) examined the role of exchange rate volatility in Nigerian economic growth between 1986 and 2019, which experienced a change from a fixed to a flexible exchange system. Using OLS regression on the CBN data, the study found that exchange rates had a positive effect on growth, albeit not statistically significant. It thus suggests that flexible regimes have limited gains for developing economies. Inflation and interest rates were both negative drivers of GDP, but were not significant, indicating macroeconomic distortions. The evidence showed that while theoretically flexible exchange rates would benefit Nigeria, inflationary and interest pressures undercut the gains in growth. Policy suggestions emphasised embracing policies that stabilise exchange rates and curb inflationary forces while reorienting interest rate management in the direction of forging sustainable economic growth.

Eroglu and Olayiwola (2023) evaluated exchange rate movements into appreciation and depreciation effects on Nigeria's growth over the 1981–2020 period using a nonlinear ARDL model. The evidence revealed asymmetric effects: short-term depreciation reduced economic growth, but appreciation was pro-growth. To the disappointment of most, long-term effects were reversed, with depreciation later turning out to be pro-growth and appreciation anti-growth. Inflation and capital stock dynamics were also in the ambit of these effects. Of particular importance was the fact that the asymmetric test also guaranteed that appreciation and depreciation were distinct in their impacts on growth, which accounts for the complexity of Nigeria's exchange rate dynamics. The research suggested introducing accommodative policies that insulate against short-run depreciation shocks but yield long-run advantages, augment capital accumulation, and stem inflationary pressures to enhance Nigeria's macroeconomic performance further.

Ajayi and Ajayi (2023) estimated the influence of exchange rate volatility, balance of payments, and openness to trade on growth in Nigeria for the period 1989–2020 using ARDL and error correction models. Results indicated that exchange rates positively and significantly influenced growth in the short and long run, while balance of payments exerted a negative but insignificant effect. Trade openness negatively and significantly affected growth for horizons, which may mean that excessive liberalisation hurts domestic industries. Policy recommendations included applying stable exchange rate management methods, export base diversification to support the balance of payments, and regulation of trade openness to protect domestic capacity. The study determined that growth can be enhanced by balancing strategic openness and exchange rate stability.

Oyamendan (2022) tested the impact of FDI on Nigeria's real GDP between 1986 and 2020 using World

Development Indicators and CBN bulletins data. The variables used were FDI, trade openness, domestic investment, debt servicing, inflation, and exchange rate. The Augmented Dickey-Fuller and correlation test indicated that FDI and trade openness significantly and positively influence growth, while exchange rates have a negative correlation. Inflation and debt servicing also had a positive role, although varying in magnitude. The Granger causality test confirmed FDI to be a cause of GDP growth. Recommendations urged the policymakers to strengthen the monitoring structures for proper use of FDI inflows, while increasing openness to trade and macroeconomic reforms to guarantee Nigeria's long-term growth.

Andrew et al. (2022) analysed the dynamic nexus among exchange rate, foreign direct investment (FDI), and economic growth in Nigeria. It adopted the Autoregressive Distributed Lag (ARDL) model from 1981 to 2018. Their findings confirmed the long-run cointegrating connection among the variables, with FDI playing a role in determining economic growth. Specifically, the results showed FDI contributed positively and significantly towards economic growth with a high 78.46% speed of adjustment, featuring high correction towards the long-run equilibrium. The study emphasized that Nigeria had to create an enabling environment for private sector businesses, raise investor confidence, and create conditions that foster foreign participation. Policy suggestions included expanding investment in education and health infrastructure to consolidate drivers of growth.

Okonkwo et al. (2021) had researched the effect of movements in exchange rates on FDI inflow into Nigeria between 1981 and 2018, employing secondary data collected from the Central Bank of Nigeria and the Federal Office of Statistics. More stringent econometric methods with diagnostic tests, co-integration and stationarity tests, multicollinearity test, and error correction models were utilized to analyze the findings. The Granger causality test was also employed to verify the causality between FDI and the exchange rate. The findings confirmed that nominal and real exchange rates have a positive effect on FDI flows, thus presenting evidence that exchange rate stability is a key component of foreign investor confidence. Hence, the study advised that the Central Bank of Nigeria can supply forex with stability and maintain sustainable exchange rate policies as instruments to attract and retain foreign investors.

Sabuur and Ismaila (2020) tested the impact of FDI on Nigeria's economic growth between 1981 and 2018 with the ordinary least squares (OLS) method. The model contained fundamental macroeconomic determinants like FDI as a percentage of GDP, human capital, real GDP per capita, consumer price index, government expenditure, domestic investment, population growth rate, and household consumption expenditure per capita. The results confirmed that FDI was central to establishing Nigeria's economic growth over the research period as an important means for forming financial capital and economic development. The authors highlighted that besides capital flows, FDI also facilitated technology and

expertise transfer, resulting in an incentive for long-run economic productivity. Hence, the study confirmed FDI as a pillar of Nigeria's development process.

Adeniyi (2020) investigated the connection between inflation, FDI, and economic growth in five randomly selected African countries between 1996 and 2018, employing the IMF Data Mapper and UNCTADStat as data sources. Using regression analysis and unit root tests, the study concluded that FDI was highly and positively correlated with economic growth in all the economies included in the sample. Conversely, inflation negatively affected four out of five countries, with Egypt as the exception. The implication of this is that even though FDI stimulates growth, macroeconomic instability, particularly via inflation, deters long-term prospects for development. The study advised that governments must introduce stable money policies to tackle inflation while establishing an investment environment that inspires foreign capital flows to the highest possible level.

Etale and Sawyerr (2020) analysed the role of foreign investment inflows to economic growth in Nigeria, based on secondary data between 2001 and 2018. With GDP as a proxy for economic growth and FDI, exchange rate, and foreign portfolio investment as independent variables, descriptive statistics and multiple regression analysis methods were employed. Findings indicated that all three variables made an appreciable and positive contribution to GDP, appreciating the collective contribution of foreign capital inflows in Nigeria's growth. Research concluded that although foreign investment inflows have contributed positively, much remains to be achieved to ensure a business-friendly environment. Therefore, the authors called for stronger regulatory frameworks and policy adjustments to ensure foreign investment inflows, enhance investor confidence, and promote capital utilisation growth-oriented.

Research Gap

Although several studies have analysed the connection between FDI, inflation, exchange rates, and economic growth in Nigeria and other countries (Agbata et al., 2025; Ben-Obi et al., 2025; Okoroigwe et al., 2023; Andrew et al., 2022), the results are mixed and unclear. Some research has shown a positive and strong effect of FDI and exchange rate on growth (Etale & Sawyerr, 2020; Sabuur & Ismaila, 2020), while other studies have found weak, negative, or statistically insignificant effects (Ayano, 2023; Agbata et al., 2025). The impact of inflation is also debated, with evidence showing significantly negative effects (Adeniyi, 2020) as well as mixed or insignificant impacts (Miftahu & Isaac, 2023; Obi-Nwosu, 2024). Most previous studies have also concentrated on two-variable relationships, uneven effects, or single economic indicators. Thus, previous studies have not fully explored how FDI, inflation, and the exchange rate influence growth in Nigeria. This creates a clear need for a thorough investigation that examines their combined and interactive effects in a modern context.

RESEARCH METHODOLOGY

This study utilised a quantitative approach with an ex post facto research design to collect, analyse, and interpret data per its objectives. The ex post facto design was chosen because it examines the relationships between variables after events have already occurred, thereby avoiding potential bias in the results. This design also allowed for examining variables over a long historical timeframe.

Secondary data was the primary source of information for this study. The analysis covered thirty-five (35) years from 1990 to 2024. Time series data were mainly gathered from the World Bank's World Development Indicators (WDI). The dependent variable was real gross domestic product (RGDP), which served as a proxy for economic growth. The independent variables included foreign direct investment (FDI) net inflows (BoP, current US\$), the real effective exchange rate (EXCH) index, and the annual inflation rate (percentage).

As previously described, this study's theoretical basis is the Solow Growth Model and Dependency Theory. With a few adjustments, Susilo (2018) inspired the study design, in which foreign direct investment, inflation, and exchange rate were examined to see their effects on Nigeria's economic growth using a multiple linear regression design specified by ordinary least squares (OLS).

Hence, this study employs a multiple regression model to analyse the effect of three independent variables – inflation rate, foreign direct investment, and real effective exchange rate – on the dependent variable, real gross domestic product.

The functional form of the model is expressed as:

$$RGDP = f(EXCR, INF, FDI) \quad (1)$$

In its linear form, equation (1) is expressed as follows:

$$RGDP = \beta_0 + \beta_1 EXCR + \beta_2 INF + \beta_3 FDI \quad (2)$$

Equation (2), as previously presented, shows the mathematical details of the model. The econometric form can be written as:

$$RGDP = \beta_0 + \beta_1 EXCR + \beta_2 INF + \beta_3 FDI + \mu \quad (3)$$

In equation (3), the error term (μ) represents a random variable with clear probabilistic properties. It accounts for other outside factors not directly included in the model, but can influence economic growth.

The variables in the model are defined as follows:

RGDP:	Real Gross Domestic Product (%);
EXCR:	Real Effective Exchange (%);
INF:	Inflation rates (%);
FDI:	Foreign Direct Investment (units);
μ :	Random Error;

β_0 – Intercept, and β_1 to β_2 are parameters representing the coefficients of the independent variables.

Apriori expectation: $\beta_1 > 0$; $\beta_2 < 0$; $\beta_3 < 0$

Null Hypothesis: $\beta_1 = \beta_2 = \beta_3 = 0$

Finance & Taxation

For the purpose of improving the analysis, an impulse response analysis was conducted. This provided a clearer view of how the variables were interrelated and distributed over time. Before estimation, the Augmented Dickey-Fuller (ADF) unit root test was used to ascertain stationarity of the time series data. This step was necessary to determine if the data were stationary, which the linear regression model demands, as well as to lay the groundwork for the subsequent econometric analysis.

Furthermore, the ARDL bounds testing method was used to determine whether or not there is a long-run relationship among the variables. The Pesaran and Shin (1999) Auto-Regressive Distributed Lag (ARDL) model was selected as the primary estimation technique. This type of model can handle variables with various integration levels and include short-run as well as long-run dynamics in a single framework.

RESULTS

Table 1. Descriptive Statistics for Foreign Direct Investment, Inflation, Exchange Rate and Economic Growth

	RGDP	EXCH	INF	FDI
Mean	2.66E+11	198.8671	18.70559	2.90E+09
Median	2.38E+11	131.2743	13.00697	1.96E+09
Maximum	5.74E+11	1478.965	72.83550	8.84E+09
Minimum	5.21E+10	8.038285	5.388008	-1.87E+08
Std. Dev.	1.67E+11	263.6575	15.86930	2.58E+09
Skewness	0.148278	3.509628	2.071452	0.960379
Kurtosis	1.591222	17.16925	6.495683	2.775485
Jarque-Bera	3.022542	364.6382	42.85088	5.453756
Probability	0.220629	0.000000	0.000000	0.065423
Observations	35	35	35	35

Source: Authors' Computation (2025).

The descriptive statistics for real GDP (RGDP), exchange rate (EXCH), inflation (INF), and foreign direct investment (FDI) are shown in Table 1. On average, RGDP was ₦2.66E+11. EXCH and INF averaged 198.87 and 18.71, respectively. FDI had a mean value of ₦2.90E+09 over the 35 years. The significant differences between the maximum and minimum values and their relatively high standard deviations indicate significant fluctuations in the variables during the study period. For instance, the exchange rate went from as low as 8.03 to as high as 1478.97. Inflation rates ranged from 5.39% to 72.84%, highlighting macroeconomic instability in Nigeria.

The skewness values indicate that all variables are positively skewed. EXCH (3.51) and INF (2.07) are highly skewed. This suggests their distributions are concentrated toward lower values but have long right tails. Regarding kurtosis, EXCH (17.17) and INF (6.50) are leptokurtic. This means they have heavier tails than normal. RGDP (1.59) and FDI (2.78) exhibit platykurtic distributions, indicating flatter distributions. The Jarque-Bera test confirms that EXCH and INF are not normally distributed, as their probability values are below 0.05%. In contrast, RGDP and FDI follow a normal distribution. Therefore, special care is needed when selecting the proper econometric techniques for analysis due to the presence of non-normal variables.

Table 2. Result of Unit Root (Stationarity) Test for Foreign Direct Investment, Inflation, Exchange Rate, and Economic Growth

Variables	Augmented Dickey-Fuller (ADF)	5% Critical level	Philip-Perron (PP)	5% critical level	Order of integration	
					ADF	PP
RGDP	-3.230966	-2.954021	-3.144800	-2.954021	I(1)	I(1)
EXCH	6.510840	-2.954021	3.669598	-2.951125	I(1)	I(0)
INF	-4.657166	-2.954021	-4.644190	-2.954021	I(1)	I(1)
FDI	-7.512038	-2.954021	-7.277905	-2.954021	I(1)	I(1)

Source: Authors' computation (2025).

Time series data are often non-stationary, which creates challenges for econometric modelling and inference. The results may be misleading when non-stationary variables are analysed at their level form using Ordinary Least Squares (OLS). This can lead to unrealistically high R2 values and significant t-statistics that do not represent true relationships. As a result, hypothesis testing becomes unreliable, and the estimates are inconsistent. To address this issue, verifying the stationarity properties of the variables using unit root tests before proceeding to estimation is essential. For this study, both Phillips-Perron (PP) and the Augmented Dickey-Fuller (ADF) tests were conducted, and the results is shown in Table 2 above.

The findings show that real GDP (RGDP) is non-stationary at levels but becomes stationary after first differencing. This indicates integration of order one, I(1), in both PP and ADF tests. Likewise, inflation (INF) and foreign direct investment (FDI) are stationary only after

first differencing in the two tests, confirming they are I(1) processes. In contrast, the exchange rate (EXCH) presents mixed results: the ADF test suggests it is non-stationary at levels and requires first differencing (I(1)), whereas the PP test indicates stationarity at levels, suggesting integration of order zero (I(0)). This difference shows the sensitivity of unit root tests but still confirms the presence of mixed integration orders among the variables.

Given these results, the data set includes a mix of I(0) and I(1) variables. Therefore, the Autoregressive Distributed Lag (ARDL) bounds testing approach is the appropriate estimation method. This method works well for models involving variables integrated of different orders, as long as none are I(2). Thus, the ARDL framework is used to analyse both the long-run equilibrium and short-run dynamic relationships among inflation, FDI, exchange rate, and economic growth in Nigeria.

Table 3. Cointegration Test (Bound Testing Approach)

Model	F-statistic	Lower Bound (5%)	Upper Bound (5%)	Remarks
RGDP	6.580	3.23	4.35	Significant

Source: Authors' Computation (2025).

The findings of the cointegration test using the ARDL bounds testing tool are indicated in Table 3. The essence of this procedure is to verify whether a long-run equilibrium relationship exists among the variables under study: real GDP (RGDP), foreign direct investment (FDI), inflation (INF), and exchange rate (EXCH). The null hypothesis of the bounds test states that no cointegration exists among the variables, while the alternative hypothesis assumes the presence of a long-run relationship. The decision rule is straightforward: if the calculated F-statistic is greater than the upper bound critical value at the chosen significance level (5% in this study), the null hypothesis is rejected, confirming cointegration. Conversely, an F-statistic below the lower bound indicates no cointegration, and values falling between the bounds are considered inconclusive. In this case, the calculated F-statistic for the RGDP model is 6.580, which clearly exceeds the upper bound critical value of 4.35 at the 5% level. This provides strong evidence to reject the null hypothesis of no long-run relationship. Thus, the result confirms the existence of cointegration among economic growth, foreign direct investment, inflation, and the exchange rate in Nigeria. This outcome validates the suitability of the ARDL model in estimating both the long-run equilibrium and the short-run dynamic relationships among these macroeconomic variables.

The regression results in Table 4 show the short-run and long-run dynamics of the relationships between real GDP (RGDP), foreign direct investment (FDI), inflation

(INF), and the exchange rate (EXCH). This is based on a 5% significance level. In the short run, only the first lag of RGDP is statistically significant ($p = 0.0261$). This finding confirms that previous output performance influences current economic growth in Nigeria, supporting the idea of path dependence in the economy. While the exchange rate and inflation coefficients are large and significant, their signs change between positive and negative values across different lagged terms. This variability highlights the unstable macroeconomic environment in Nigeria, where shocks to inflation and exchange rates have immediate but unstable effects on growth. These results align with Nigeria's historical economic situation, where high inflation and exchange rate volatility have led to unpredictable impacts on productivity and output levels. Conversely, FDI shows no statistically significant short-run effects in current or lagged terms. This suggests that foreign capital inflows do not provide immediate economic benefits, possibly due to issues such as profit repatriation, limited technology transfer, or structural challenges within the domestic economy. Additionally, the error correction term (CointEq(-1)) is negative as expected, but statistically insignificant ($p = 0.3901$). This suggests the Nigerian economy lacks a robust mechanism for correcting deviations from its long-run equilibrium. This indicates a weak adjustment process, where shocks to output, inflation, or exchange rates persist longer than anticipated, thereby further harming macroeconomic stability.

Table 4. Regression Results for Foreign Direct Investment, Inflation, Exchange Rate and Economic Growth

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-1))	0.801187	0.311851	2.569130	0.0261
D(RGDP(-2))	0.859564	0.439666	1.955037	0.0765
D(RGDP(-3))	0.974445	0.500137	1.948357	0.0773
D(EXCH)	-973097148.570132	171555969.548459	0.000000	0.0000
D(EXCH(-1))	1278691517.107872	1144077601.683492	0.000000	0.0000
D(EXCH(-2))	-777118157.173466	1323545021.834829	0.000000	0.0000
D(EXCH(-3))	2954221258.333010	1357579498.208303	0.000000	0.0000
D(INF)	185621886.942379	788071109.372177	0.000000	0.0000
D(INF)	-50024520.408321	748027660.801346	0.000000	0.0000
D(INF)	-1479820955.879564	709177530.551474	0.000000	0.0000
D(INF)	1715309726.442192	841867816.519745	0.000000	0.0000
D(FDI)	4.712072	4.788841	0.983969	0.3463
D(FDI(-1))	-3.247898	5.133526	-0.632684	0.5399
D(FDI(-2))	-5.001638	6.466753	-0.773439	0.4556
D(FDI(-3))	9.210859	6.605955	1.394327	0.1907
CointEq(-1)	-0.160820	0.179745	-0.894714	0.3901

$$\text{Cointeq} = \text{RGDP} - (-1548765402.7637 * \text{EXCH} + 1766991390.1212 * \text{INF} + 44.4757 \text{ FDI} - 354290783458.7205)$$

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCH	-1548765402.763710	3466672584.159546	-0.446758	0.6637
INF	1766991390.121208	5307929378.476762	0.332897	0.7455
FDI	44.475732	24.575763	1.809740	0.0977
C	-354290783458.72044	429453140946.88968	-0.824981	0.4269

Source: Authors' Computation (2025).

In the long run, the regression results show that the exchange rate and inflation are statistically insignificant at the 5% level. This suggests that while these variables are important in short-run fluctuations, their long-term impact on growth is weak. This could mean that policy distortions, speculative pressures, and cyclical shocks reduce their potential as stable growth factors in Nigeria. On the other hand, FDI has a positive long-run coefficient (44.48), suggesting a potential growth-boosting effect. However, its statistical significance is limited to the 10% level and does not reach the stricter 5% threshold. This suggests that while FDI can positively impact growth, its

effect is relatively weak and inconsistent unless supported by robust institutional frameworks and macroeconomic stability. Overall, the results suggest that Nigeria's growth is more influenced by unstable short-term dynamics rather than steady long-term factors. The insignificance of the error correction term and the limited role of FDI in the long run highlight the structural weaknesses of the Nigerian economy. Therefore, policies that aim to stabilise inflation, ensure consistent exchange rates, and create a favourable investment climate are essential for turning FDI into a stronger and more reliable source of sustained economic growth.

Table 5. Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.733812	Prob. F(2,9)	0.5067
Obs R-squared	4.346389	Prob. Chi-Square(2)	0.1138

Source: Authors' Computation (2025).

As in Table 5, the Breusch-Godfrey Serial Correlation LM test states that the F-statistic value (0.7338, Prob. 0.5067) and Obs R-squared value (4.346, Prob. 0.1138) are not significant at the 5% level. It means that the null hypothesis of non-serial correlation cannot be rejected, which states that the model is serial correlation-free. The second test with a larger lag length yields an F-statistic of 0.5053 and a Prob. value of 0.9077, and the

Obs R-squared is 14.4476 with a Prob. value of 0.7570; once more, this confirms the lack of serial correlation. The Prob. value in the scaled explained sum of squares test was 1.0000, again confirming that the model was satisfactory. Therefore, the residuals are not autocorrelated, indicating that the regression estimates are efficient and trustworthy.

Table 6. Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.505325	Prob. F(19,11)	0.9077
Obs R-squared	14.44755	Prob. Chi-Square(19)	0.7570
Scaled explained SS	2.542364	Prob. Chi-Square(19)	1.0000

Source: Authors' Computation (2025).

From Table 6, the Breusch-Pagan-Godfrey test statistics are not significant because the Prob. values are larger than the 5% critical level. This means that the null hypothesis of homoskedasticity cannot be rejected. It shows that the error terms are of equal variance for all observations. So, the model does not suffer from heteroskedasticity, and the residual variance is constant. Such stability is very important for the classical linear regression model. Heteroskedasticity is guaranteed to ensure that the estimated coefficients are efficient and unbiased and that the standard errors are consistent. Consistency ensures the validity of the statistical inferences drawn from the model.

DISCUSSION OF FINDINGS

ARDL results show that Nigeria's short-run economic activities are influenced more by past GDP performance and volatile movements in exchange and inflation rates than by foreign direct investment (FDI). Statistical significance of lagged GDP ensures that past economic results drive the current growth trends. The above findings are confirmed by Okoroigwe et al. (2023), who valued steady macroeconomic variables to ensure the maintenance of GDP performance. The asymmetric impacts of inflation and exchange rates in the long run reflect the unpredictable macroeconomic state of Nigeria, as validated by Ben-Obi et al. (2025) and Eroglu and Olayiwola (2023), who found that volatile exchange rates exert asymmetric and volatile impacts on inflation and growth. Agbata et al. (2025) also found that inflation has a highly negative impact on Nigeria's growth prospects, validating the adverse effect of recurring price shocks.

Despite large coefficients, the insignificance of FDI in the short run indicates that capital inflows do not contribute to an increase in productivity in the short run. This supports Ayano (2023) and Miftahu and Isaac (2023), who have established that FDI in Nigeria may sometimes be constrained by structural factors, technology transfer inefficiency, and going back home. On the other hand, samples from more developed settings, such as Obinna et al. (2025) of the United Kingdom, indicate that FDI can stimulate growth but only if domestic conditions are favorable, and Nigeria's inefficiency in making the best of foreign capital graphically illustrates this. The insignificance of the error

correction term is also a reflection of a low adjustment mechanism, as opposed to Andrew et al. (2022), who found a high adjustment speed in FDI-growth relations. This suggests that other countries quickly regain stability from shock, but Nigeria's structural flaws extend the duration of economic imbalances.

In the long run, the irrelevance of the exchange rate and inflation suggests that their effects on growth will be reduced, possibly due to speculative pressures and cyclical shocks. This is consistent with Obi-Nwosu (2024), citing that exchange rate gains dissipate external balances and do not generate long-run growth. On the contrary, the long-run positive sign of FDI is also consistent with Oyamendan (2022) and Sabuur and Ismaila (2020), who both observed that FDI can enhance growth if properly addressed. Yet, they are convinced that marginal statistical significance at only the 10% level indicates volatility, which is also consistent with Etale and Sawyerr (2020). In contrast, foreign investment is a growth-enhancing force, and institutional changes are responsible for unleashing its greatest gains. Overall, all these suggest that Nigerian growth is increasingly short-term shocks-led, yet long-run gains through FDI remain vulnerable to deep-rooted policy, inflation management, and an improved institutional framework.

CONCLUSIONS AND RECOMMENDATIONS

This study examined the short-run and long-run dynamics of real GDP, foreign direct investment, inflation, and the exchange rate in Nigeria using the ARDL framework. The findings show that growth in Nigeria is mainly influenced by past output, indicating strong path dependence. Inflation and exchange rates have unstable short-term effects that disrupt macroeconomic stability. The lack of significance of foreign direct investment in the short term points to structural weaknesses, including profit repatriation, weak technology transfer, and institutional inefficiencies. The insignificant error correction term also suggests a weak adjustment process, indicating that economic shocks persist longer than expected. In the long run, the effects of inflation and exchange rates fade, while foreign direct investment has a weak but positive effect on growth, significant only at the 10% level. These results suggest that unpredictable short-term shocks have a

greater influence on Nigeria's economic growth than stable, long-term factors, highlighting ongoing structural and institutional challenges.

Based on these findings, several recommendations come forward.

First, stabilising inflation and the exchange rate through coordinated fiscal and monetary policies should be a priority to create a predictable investment climate.

Second, policies focusing on structural reforms – such as strengthening institutions, improving governance, and

upgrading infrastructure – are crucial for converting FDI inflows into genuine economic growth.

Third, incentives such as tax relief, duty exemptions, and reduced regulatory hurdles should be pursued to build investor confidence and encourage the reinvestment of profits within the domestic economy.

Lastly, Nigeria must diversify its productive base beyond oil by developing manufacturing, agriculture, and knowledge-driven sectors that can support long-term growth and lessen vulnerability to external shocks.

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