



Foreign Sector and The Nigeria's Economy: An Autoregressive Distributed Lag Analysis

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Abstract

An empirical investigation of the effect of foreign sector on the Nigeria's economy is conducted in this study for the sample period, 1990 to 2023. The selected indicators as foreign direct investment (FDI), foreign remittances, foreign aid, exchange rate and trade openness for the foreign sector while gross domestic product per capita is used as measure for the Nigeria's economy. Secondary data were sourced from the World Bank's World Development Indicators (WDI) and examined by applying the processes of Auto-Regressive Distributed Lag (ARDL) econometric method of analysis. The empirical outputs established that FDI and foreign remittances had significant positive effects on GDP per capita in the short run and long run, foreign aid exhibited insignificant positive relation with GDP per capita in the short run and long run, exchange rate negatively but significantly impacted on GDP per capita in both the short and long runs, and trade openness, though positive, had an insignificant effect on GDP per capita in the long run. The study concluded that, overall, the selected foreign sector indicators made relevant contributions to improving the per person gross domestic product of Nigeria. It is thus recommended that the Nigerian Investment Promotion Commission (NIPC) intensify efforts to market the country as a prime investment destination through targeted campaigns and investment forums to attract more foreign capital for driving economic growth.

Keywords: Foreign Sector Indicators, Inclusive Growth, GDP Per Capita, Nigeria's Economy, ARDL Method.

Background to the Study

The Nigerian economy, like many others globally, operates within a complex web of domestic and international interactions. Central to this economic landscape is the foreign economic sector, comprising among others, international trade, foreign direct investment (FDI), remittances, and other cross-border transactions. Therefore, in the context of this study, foreign sector refers to the part of the economy that encompasses all economic activities involving interactions with other countries or foreign entities. It includes international trade in goods and services, cross-border investment flows (such as foreign direct investment and portfolio investment), movements of labour (migration and remittances), and international financial transactions (including foreign exchange market and international debt activities). The foreign sector plays crucial role in shaping any country's economic performance, influencing factors such as exchange rates, balance of payments and external competitiveness. According to Akidi, *et al.*, (2018) the foreign sector is a network of economic transactions a country has with other countries. It reflects the economic transactions between the residents of an economy and the rest of the world. "An ideal external sector" is one that is stable and in equilibrium over time, for this situation ensures sustainable economic growth of a country. In line with this assertion, Central Bank of Nigeria (2014) and Wasurum and Leera, (2023) viewed foreign sector as the part of a country's economy that is in constant interactions with the economies of other countries. The foreign sector is very crucial to a country's growth and development, especially, a developing country like Nigeria. For example, engaging with the foreign sector opens up trade and export opportunities, allowing access to international markets and boosting export earnings, particularly in key sector like oil, agriculture, and manufacturing.

It is important to note consequently that in recent decades, Nigeria has emerged as one of Africa's leading economies, buoyed by its vast natural resources, a large population, and its strategic geopolitical position. However, the country's economic trajectory has been influenced significantly by its interactions with the global economy. The foreign sector acts as both a catalyst for growth and a source of potential stability, shaping key economic indicators such as exchange rates, balance of payments, and inflation rates. It is imperative to note that the Nigerian economy heavily relies on oil exports, which account for over 90% of the country's total exports in recent years, according to data from the Nigeria's National Bureau of Statistics (NBS, 2022). Also, fluctuations in global oil prices directly impact Nigeria's export revenues and government income. For instance, during the COVID-19 pandemic, the decline in Nigeria's oil export earnings, highlighted vulnerability of the economy to external shocks in the oil market. Additionally, foreign direct investments (FDIs) inflows to Nigeria play crucial role in driving industrial growth and structural transformation. According to data from the United Nations Conference on Trade and Development (UNCTAD), Nigeria attracted an average of \$3.2 billion in FDI annually between 2010 and 2019. These investments contribute to capital formation, technology transfer and job creation, particularly in sectors like telecommunications, manufacturing and agriculture as evident from sector-specific FDI data.

Furthermore, remittance from Nigerians abroad serve as stable source of foreign exchange and household income, supporting consumption, savings and investment activities. According to the World Bank 2022, Nigeria was the largest recipient of remittances in Sub-Saharan Africa in 2020, receiving over \$17 billion. The elasticity of remittances with respect to income levels and economic conditions can be analyzed using household survey data, which inflows influence consumptions patterns and poverty alleviation efforts at the household level. Technological transfer, facilitated by FDI and multinational cooperation (MNCS) enhance productivity, innovation, and competitiveness in Nigeria. Conclusively, multinational corporations as a component of foreign sector contribute to capital formation, employment creation, and technology diffusion in Nigeria, as evidenced by company-specific investment data and employment statistics. Analysis of MNCs strategies, such as technology licensing agreements and joint ventures with local firms can provide empirical evidence of their influence on Nigeria's industrial landscape, value chain participation, and global competitiveness.

Consequently, the Nigerian economy's interaction with the foreign sector is evidential by its engagement in international trade inflows of foreign direct investment (FDI), foreign aid, remittances, use of denominated international currency for transactional exchange made possible by openness of trade. Each of these components plays significant role in shaping the country's economic landscape, yet numerous challenges hinder their expected positive impact. Nigeria's trade is heavily skewed towards crude oil, which constitutes approximately 90% of its export earnings. This over-reliance on a single commodity makes the economy highly susceptible to global oil price fluctuations. Despite having abundant natural resources and a large, potentially productive population, the non-oil export sector remains rudimentary, accounting for just 11.7% of total exports in 2019. FDI inflows into Nigeria have been inconsistent and generally low in comparison to its potential. Regulatory uncertainties, inadequate infrastructure and a challenging business environment have deterred investors, with FDI declining significantly from \$8.84 billion in 2011 to \$2.39 billion in 2020. While foreign aid has been a source of funding for various development projects in Nigeria, its effectiveness is often questioned due to mismanagement and corruption. Remittances from Nigeria's diaspora constitute a significant portion of foreign exchange earnings, amounting to approximately \$23.8 billion in 2019. However, high transaction costs and regulatory challenges limit the full potential of these funds in driving economic outcomes. Following these perceived and relatable issues, and their possible implications on the Nigeria's economy, this study is empirically set out to investigate the effects of Nigeria's foreign sector economic indicators, specifically, the effects of foreign direct investment, foreign remittances, foreign aids, exchange rate and trade openness on gross domestic product per capita as a measure of the economy's health.

Theoretical and Empirical Review

The Dual Gap Theory

The Dual Gap Theory was developed by Hollis Chenery and Alan Strout in 1966. It explains that economic growth in developing countries like Nigeria is often constrained by two major

gaps: the savings-investment and the foreign exchange gaps. The savings-investment gap arises when domestic savings are insufficient to finance the level of investment required for growth. Developing economies like Nigeria typically face this challenge because low-income levels create difficulty for accumulating sufficient savings to fund development projects and infrastructure. The foreign exchange gap, on the other hand, occurs when export earnings are insufficient to finance the necessary imports of capital goods, technology, and raw materials. Many developing countries, including Nigeria, experience trade deficits, which limits their ability to gather the needed foreign exchange for economic development. It is important to note that the two-gap model is a framework used to analyze economic growth of developing countries by focusing on the interplay between savings and foreign exchange which spans out to be gaps in resources needs. The model posits that both gaps must be addressed to achieve sustainable economic growth. Therefore, the mathematical framework is expressed below;

The Savings Gap: The savings gap is expressed as:

$$S - I = \Delta S \quad (1)$$

Where: S = Total savings in the economy, I = Total investment needed for the desired level of economic growth, ΔS = Savings gap, which is the shortfall in savings needed to finance required investment. This equation indicates that if total savings, S fall short of the required investment, I there is a savings gap (ΔS), which necessitates finding additional sources of funding (e.g., foreign aid, loans).

The Foreign Exchange Gap: The foreign exchange gap is given by the expression:

$$F - X = \Delta F \quad (2)$$

Where: F = Foreign exchange earnings (from exports); X = Foreign exchange required for importing essential goods, including capital goods for investment; ΔF = Foreign exchange gap, representing the shortfall in foreign exchange needed to import necessary goods for economic advancement.

This equation illustrates that if foreign exchange earnings, F are less than the required foreign exchange, X, a foreign exchange gap (ΔF) exists, which can limit investment opportunities and economic growth. Proponents of the theory, such as Chenery and Strout argue that external assistance, in the form of foreign aid or foreign direct investment (FDI), can help bridge these gaps and stimulate growth. They believe that filling the savings gap with foreign capital or addressing the foreign exchange gap through trade improvements can drive development. In the case of Nigeria, for example, foreign direct investment in sectors like telecommunications (e.g., MTN) and oil and gas have brought in considerable capital needed to supplement domestic savings.

Empirical Review

Ikwuakwu, *et al.*, (2024) in a study of the impact of foreign remittances on economic growth of Nigeria, using annual time series data from 1981 to 2019 applied the Autoregressive

Distributed Lag (ARDL) model for analysis. It was found that remittances and economic growth had a long-run relationship. The long-run and short-run estimates showed that remittances had a negative and significant effect on economic growth in Nigeria after controlling for FDI, gross fixed capital formation, inflation and exchange rate. The study also revealed that FDI and gross fixed capital formation had positive and significant effects on economic growth while inflation and exchange rate had negative and significant effects in the long-run. Abdirisak (2023) explored the impact of remittance on economic growth and unemployment from 1991 to 2020 for Nigeria. Adopted here is the Autoregressive Distributed Lag (ARDL) model to determine the connection between the variables. The study found that interaction effect of the remittance and unemployment has a positive and insignificant influence on economic growth in the long run.

Examining the effect of foreign direct investment (FDI) inflows on economic growth in Nigeria, Peterson (2024) employed annual data from 2010 to 2019 and used the ordinary least square regression method for analysis. The findings reveal that foreign direct investment inflows do not have significant effect on economic growth in Nigeria. The result holds when different measures of economic growth and different measures of foreign direct investment inflows are employed. In the study of foreign direct investment (FDI) on economic growth in South Africa using yearly time series data from 1985 to 2019, Rito, *et al.*, (2024) by utilizing the Autoregressive Lag Distribution method to examine the short-run and long-run established that the ARDL empirical test indicated negative long-run relationship between FDI and economic growth, while saving rate positively correlated with growth. Inflation and real interest rate also had negative long-run relationships. Shehu and Basiru (2023) examined to reveal how FDI influences Nigerian economic growth over the period 1999-2020. The variables used are FDI, economic growth, governance and domestic investment. The research unearthed that FDI positively affect Nigerian EG. Oghenefejiro and Egbon (2023) examines the Impact of Foreign Direct Investment and Economic Growth in Nigeria from 1980 to 2022 by employing the processes of Vector Autoregressive (VAR) estimation technique. The findings reveal that the one period lag of GDPGR, FDIO, as well as FDII had positive relationship with GDPGR equation, same with their second period lag except that of FDIO which have a negative impact. The FDII equation showed that GDPGR and FDIO as well as its own lagged variables had positive relationship with FDII. As before only second period lag of FDIO had negative impact on FDII. Ogbonna, *et al.*, (2023) examine the impact of foreign direct investment inflows on Nigeria's economic performance from 1981 to 2020. The analysis starts with examining the stationarity of the data set using the Augmented Dickey-Fuller (ADF) unit root test. The Bounds test confirmed the existence of a negative association between FDI and the economy in the long run while in the short run, Portfolio Investment and Balance of Trade had a negative relationship on the economy and FDI maintained a positive relationship with the economy.

Auta, *et al.*, (2023) examined the effect of exchange rate behaviour on economic growth in Nigeria covering the period 1980 to 2022. The Vector Error Correction Model technique of analysis was employed. The analysis established that nominal exchange rate, terms of trade,

foreign direct investment and interest rate are significant determinants of growth. The interaction models show that exchange rate overvaluation impacts negatively on economic growth while exchange rate undervaluation impacts positively on economic growth. Ukangwa and Ikechi (2022) explored the effect of Nigeria's exchange rate on the economic growth of Nigeria over 1987 to 2018. This study employed the Ordinary Least Squares technique of analysis, which showed that the Naira rate has no significant impact on economic growth in Nigeria and that the Naira rate has a significant influence on inflation rate. In other study, Abinabo and Abubakar (2023) analysed the relationship between trade openness and economic growth in Nigeria from 1990 to 2021. The study adopted the Error Correction Mechanism (ECM) model as the methods of estimation. The results indicate that a long-run relationship exists between trade openness on economic growth in Nigeria. Furthermore, the result reveal that trade openness has positive and statistically significant impact on economic growth in Nigeria; and that import has a negative significant impact on economic growth. Using another indicator, Stanislav, *et al.*, (2023) assessed the impact of foreign aid on the Nigerian economy with a specific interest in official development assistance from 1980 to 2019. It employed the ARDL bounds testing approach to cointegration and finds a long-run relationship among the variables employed, and the estimated results suggest that official development assistance as a form of foreign aid and credit extensions does not contribute to the progress of the Nigerian economy, it rather retards it. Isiyaku et al. (2022) utilized historical method of analysis to examine whether foreign aid has a positive or negative effect on Nigeria's economic development from 1999 to 2021. The finding of the research shows that foreign aid has not contributed much in the development of Nigeria. Following clear economic maladies of Nigeria, Osinubi and Amaghionyeodiwe, (2010) explored how foreign private investment influenced economic growth, using secondary data over 1970 to 2005. Exposed from the analyses, Foreign Private Investment, Domestic Investment growth and Net Export growth were positively related to economic growth in Nigeria. More so, the Foreign Private Investment, Domestic Investment growth, Net export growth and the lagged error term were statistically significant in explaining variations in Nigeria's economic growth.

Empirical Gap

Interestingly, studying existing body of empirical literature related to the current research revealed that several studies have been conducted in this area. However, it is observed that, scarcely is there any previous contributions that is particularly similar in content of independent variables as captured here. Some of the existing empirics explored the individual effects of the indicators of foreign sector such as foreign direct investment, international remittance, foreign aid, exchange rate and trade openness on economic growth in Nigeria with selected support regressors, Peterson (2024); Ikwuakwu, *et al.*, (2024); Shehu and Basiru (2023); Auta, *et al.*, (2023); Ukangwa and Ikechi (2022); Stanislav, *et al.*, (2023); and Abinabo and Abubakar (2023). This made clear that the current study which focuses on how a collection of individual indicators of the foreign sector impact on the Nigeria's economy measured as GDP per capita in a single model, is a clear departure from previous studies in Nigeria.

Methodology

Research Design

This study adopted the *ex-post-facto* research design. It is a method in which groups with qualities that already exist are compared on some dependent variables. The *ex-post-facto* research design can also be described as a quasi-experimental study examining how an independent variable, present prior to the study, affect a dependent variable. This study made use of annual time series data from 1990 to 2023 as collated from the Central Bank of Nigeria (CBN) statistical bulletin and World Bank's world development indicators.

Model Specification

This study adopted the dual gap theory. This theory was adopted because it explains how external resources, like foreign direct investment, remittances, foreign aid, exchange rate and trade openness help developing countries augment domestic savings shortage that limit growth. Empirically, the model for this study is with modification adapted to Osinubi and Amaghionyeodiwe (2010) whose study investigated the impact of foreign private investment on economic growth in Nigeria. Therefore, to achieve the objective of this study, the researcher modified the model to accommodate foreign remittance, foreign aids and exchange rate. The new expanded model is presented in functional form as shown below;

$$gdppc = f(fdi, frm, fad, exr, top) \quad (1)$$

Equation (3.1) above is remodeled in econometric form to include the error term, thus specified below:

$$gdppc_t = \beta_0 + \beta_1 fdi_t + \beta_2 frm_t + \beta_3 fad_t + \beta_4 exr_t + \beta_5 top_t + \mu_t \quad (2)$$

Where: **gdppc** = Gross Domestic Product Per Capita. It is the total monetary value of goods and services produced within a country divided by its population, adopted as critical measure of inclusive growth, which is a lens for seeing performance the Nigerian economy. **fdi** = Foreign Direct Investment, which refers to the investment made by a company or individual from one country into business interests located in another country. This regressor would be measured as a percentage of GDP annually, with theoretical expectation to relate positively with **gdppc**. **frm** = Foreign Remittance, referred to as yearly total money transferred by individuals working abroad to their home country, typically for family support and personal investments. It would be expected to relate positively with GDP-PC. **fad** = Foreign Aids, is operationalized as the annual aggregate official development assistance by one country or international organization to Nigeria. It is expected to positively influence gross domestic product per capita. **exr** = Exchange Rate, utilized as the official rate at which the Nigeria Naira exchanges per US Dollar. It is expected that appreciation dollar against the Naira value will negatively impact gross domestic product per capita. **top** = Trade Openness, which refers to the level of free flow of international transactions across national frontiers, measured as the sum of imports and exports as percentage of GDP, and expected to have positive relation with gross domestic product per capita. μ = Error term, β_0 = Constant term, $\beta_1 - \beta_5$ = Parameter estimates of independent variables

Model Analysis Techniques

The empirically analysis process include, the summary statistics analysis for normality check is conducted using the Jarque-Bera statistics. Next in principle is the unit root test to ascertain the individual variable's order of integration by applying the Augmented Dickey-Fuller (ADF) test at 5% (Dickey & Fuller, 1981). The general ADF model for unit root estimation is specified as follows:

$$\Delta Y_t = \lambda_0 + \lambda_1 + \delta Y_{t-1} + \sum_{i=1}^n \lambda_i \Delta Y_{t-i} + \mu_t \quad (3)$$

Where, Y = the time series variables under consideration, t = Linear time trend, Δ = First difference operator, λ_0 = Constant term, n = Optimum number of lags on the dependent variables and μ_t = the stochastic error term.

In addition, the cointegrating relationship among the selected variables using the Auto-regressive Distributed Lag (ARDL) Bounds cointegration test is applied (Pesaran, Shin and Smith 2001). This is necessary when the unit root analyses establish $I(0)$ and $I(1)$ mixed stationarity orders. Three optional decision rules include existence of cointegrating, no cointegrating and inconclusive relationships, when the calculated F-statistic value is respectively greater than the upper bound $I(1)$, below the lower bound $I(0)$ and between the lower $I(0)$ and the upper $I(1)$ bounds. The general model for the ARDL Bounds cointegration is:

$$Y_t = \Delta_t Y_{t-1} + \dots \Delta_p Y_{t-p} + \delta R_t + U_t \quad (4)$$

Where Y_t = the time series variables under consideration in time t , Y_{t-1} and Y_{t-p} = cointegrating equations estimates, Δ = First difference operator and U_t = stochastic error term.

This study principally employed the ARDL method of data analysis as necessitated by the unit root outcomes. It is applied for estimating the combined long-run and the short-run model specified for purpose of examining the theoretical and significance relationship between the dependent and independent variables of the model. Hence, the customized ARDL model is presented below as Equation 3.5:

$$\begin{aligned} \Delta \ln gdp_{pc,t} = & a + C_1 \ln gdp_{pc,t-1} + C_2 \ln fdi_{t-1} + C_3 \ln frm_{t-1} + C_4 \ln fad_{t-1} + C_5 \ln exr_{t-1} + C_6 \ln top_{t-1} + \sum_{i=0}^p a_{1i} \\ & \Delta \ln gdp_{pc,t-1} + \sum_{i=0}^q a_{2i} \Delta \ln fdi_{t-1} + \sum_{i=0}^r a_{3i} \Delta \ln frm_{t-1} + \sum_{i=0}^s a_{4i} \Delta \ln fad_{t-1} + \sum_{i=0}^u a_{5i} \Delta \ln exr_{t-1} + \\ & \sum_{i=0}^v a_{6i} \Delta \ln top_{t-1} + \psi ECM_{t-1} + \mu_t \end{aligned} \quad (5)$$

Where Δ is the first difference operator, $\ln$ is the natural logarithm, $C_1 - C_6$ are the long-run dynamic coefficients, a_1 to a_5 are the short-run coefficients, and μ_t is serially uncorrelated stochastic term with zero mean and constant variance. Also, the ECM_{t-1} defines the error correction term determined in the short-run analysis with ψ as the coefficient of the error correction term, which measures the annual speed of adjustment level from its previous

period's disequilibrium to re-establish long-run stability (equilibrium). This coefficient indicator of the ECM is expected to be negative and significant.

From Equation (5), it was tested if gross domestic product per capita (gdppc) is co-moving with the regressors. To test for a long-run relationship between gdppc and the regressors, the study restricted the coefficients C_1, C_2, C_3, C_4, C_5 and C_6 to be Zero against the alternative by conducting a restricted F-test. Therefore, the null and alternative hypotheses are stated as follows;

$H_0: C_1 = C_2 = C_3 = C_4 = C_5 = C_6 = 0$ (no long-run relationship between gdppc and the regressors)

$H_1: C_1 \neq C_2 \neq C_3 \neq C_4 \neq C_5 \neq C_6 \neq 0$ (there is long-run relationship between gdppc and the regressors)

Relying on the innovative framework of Pesaran, *et al.*, (2001), the distribution of the test statistics exhibits nonstandard behaviour, regardless of whether the variables are integrated of order zero ($I(0)$) or order one ($I(1)$). To navigate this complexity, Pesaran and colleagues computed two distinct sets of critical values: one assuming the variables are $I(0)$, representing the lower-bound critical values (LCB), and the other assuming the variables are $I(1)$, representing the upper-bound critical values (UCB). This methodology not only captures the nuances of short-term fluctuations but also uncovers the enduring economic linkages that persist over time.

Furthermore, post diagnostic tests such as: the Ramsey RESET test is conducted on the model for correctness of the specified model, the Jarque-Bera normality statistic test to ascertain if all variables are jointly normally distributed, the serial correlation **test** to know whether the residuals are serially independent, the heteroscedasticity test to check for homoscedasticity and the CUSUM stability model to test whether the estimated model is stable.

Estimated Results and Discussion of Findings

Descriptive Analysis Result

The results are presented in Table 4.1 below. This analysis draws from a robust dataset of annual 34 observations for one dependent variable and five independent variables. The data revealed that the average gross domestic product per capita (gdppc) stands at 1670.476, with a range that spans from a minimum of 494.1 to a maximum of 3201.0. The standard deviation of 829.52 suggests significant variability in economic progress across the population, indicating that while some individuals enjoy higher standard of living, many still face substantial economic challenges. In the realm of foreign direct investment (fdi), the mean value is 3783.73, with a minimum of 4.69, a maximum of 69944.32, and a standard deviation of 11845.33. This variation highlights the uneven distribution of investment inflows, which can play a pivotal role in economic development by

Table 1: Descriptive Statistics Test Result

	GDPPC	FDI	FRM	FAD	EXR	TOP
Mean	1670.476	3783.727	49.56588	1780.807	161.3147	323.0897
Median	1874.100	1190.175	45.60000	936.2450	130.7550	305.3350
Maximum	3201.000	69944.32	111.2100	11431.96	645.1900	927.4500
Minimum	494.1000	4.690000	11.04000	118.0800	8.040000	120.7600
Std. Dev.	829.5208	11845.33	25.28113	2293.971	143.1272	143.0782
Skewness	-0.039870	5.344296	0.673588	2.466946	1.425237	2.290651
Kurtosis	1.804584	30.38993	2.891494	10.47411	5.187665	10.56018
Jarque-Bera	2.033452	1224.644	2.587766	113.6247	18.29069	110.7050
Probability	0.361777	0.000000	0.274204	0.000000	0.000107	0.000000
Sum	56796.20	128646.7	1685.240	60547.43	5484.700	10985.05
Sum Sq. Dev.	22707459	4.63E+09	21091.48	1.74E+08	676017.9	675555.5
Observations	34	34	34	34	34	34

Source: Authors' Computation, 2024.

creating jobs and fostering innovation. Meanwhile, remittances (frm) averaging 49.57, with a minimum of 11.04 and a maximum of 111.21, reflect the crucial support that families receive from abroad, with a standard deviation of 25.28, underscoring the reliance on these funds for household sustenance and economic stability. foreign aid (fad) presents an intriguing picture, with a staggering mean of 1780.81, ranging from 118.08 to 11431.96 and a standard deviation of 2293.97. This indicates a significant influx of resources aimed at alleviating poverty and fostering development, though the wide range suggests that not all sectors benefit equally. The exchange rate (exr) averages 161.31, with a minimum of 8.04 and a maximum of 645.19. The considerable standard deviation of 143.13 reveals fluctuations that can impact trade, investment decisions, and overall economic stability. Lastly, the trade openness (top) averages 323.09, with a minimum of 120.76 and a maximum of 927.45. The considerable standard deviation of 143.08 reveals fluctuations that can impact trade, investment decisions, and overall economic stability.

Unit Root Test Results

The data representing each variable in this study were subjected to testing for presence or absence of unit root using the Augmented Dickey-Fuller (ADF). The results are summarized in Table 2 below: Apparent in the results are that the variables are integrated of different orders or a combination of $I(0)$ and $I(1)$ series. The ADF result revealed that $lfrm$ and $ltop$ were stationary at levels $I(0)$ while, $lgdppc$, $lfdi$, $lfad$, $lexr$ and $ltop$, are stationary after first differencing $I(1)$. This condition makes the Autoregressive Distributive Lag (ARDL) Bounds test approach to co-integration appropriate for investigating the long-run relationship among these variables.

Table 2: Augmented Dickey Fuller (ADF) Unit Root Test Results

Variables	Levels		First Difference		Order of Integration	P-value
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value		
LGDP	-1.589863	-2.954021	-4.931657	-2.957110	I(1)	0.0004
FDI	-0.620402	-2.954021	-3.733301	-2.957110	I(1)	0.0082
FRM	-3.240692	-2.954021	-	-	I(0)	0.0264
FAD	-0.963880	-2.960411	-5.421005	-2.960411	I(1)	0.0001
LEXR	-1.534355	-2.954021	-5.288105	-2.957110	I(1)	0.0001
TOP	6.519830	-2.954021	-	-	I(0)	0.0000

Source: Author Computation 2024* Level of significance at 5%

ARDL Bounds Cointegration Test Result

Presented in Table 3 below is the result of the Bounds cointegration test.

Table 3: ARDL Bounds Test Result

Test Statistics	Value	K
F-statistics	4.719634	5
Significance	I (0)	I (1)
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Source: Authors' Computation, 2024.

It indicates that there exists long-run relationship amongst the variables as the F-statistic value of 4.719634 exceeds both the lower and upper bound critical values. Thus, the null hypotheses of no long run relationship are rejected and accepted its alternative. This means that there is a long-run relationship between the foreign sector and the Nigeria economy.

ARDL Long-run and Short-run Estimates

As presented in Table 4 below, the Autoregressive Distributive Lag (ARDL) long-run result, revealed that foreign direct investment (lfdi) is positively (+0.471478) connected to gross domestic product per capita (lgdppc) as the indicator for the Nigerian economy This suggest that there is a 47% annual increase in LGDPPC for every one billion Naira increase in LFDI. Accordingly, the p-value of 0.0000 indicates the statistical significance of the link between lfdi and lgdppc. In the short-run results as shown in Table 5, statistically significant ($p = 0.0000$ and $P = 0.0008$) values are found for the current and one-year delayed values of foreign direct investment (lfdi) with respective positive 0.233983 and 0.159133 coefficients. This suggests that gross domestic product per capita (LGDPPC) as proxy for the Nigerian economy in this study will increase by 23%, and 16% for every billion Naira increase in foreign direct

investment. This implicatively agrees with economic theory that foreign direct investment tends to increase gross domestic product per capita.

Table 4: ARDL Long-run Result (Dependent Variable = LGDPPC)

Variable	Coefficient	Std. Error	t-statistics	Prob
LFDI	0.471478	0.048683	9.684713	0.0000
LFRM	0.546750	0.245211	2.229707	0.0440
LFAD	0.001483	0.044101	0.033633	0.9737
LEXR	-0.594185	0.078839	-7.536718	0.0000
LTOP	0.243544	0.187700	1.297516	0.2170
C	8.706530	1.290154	6.748445	0.0000
EC = LGDPPC - (0.5191*LFDI + 0.3433*LFRM - 0.0303*LFAD - 0.2578*LEXR - 0.0720*LTOP)				

Source: Authors' Computation, 2024.

Table 5: ARDL Short-run Result (Dependent Variable = LGDPPC)

Variable	Coefficient	Std. Error	t-Statistics	Prob
DLOG(GDPPC(-1))	0.024127	0.133860	0.180244	0.8597
DLOG(GDPPC(-2))	0.546750	0.133046	4.109469	0.0012
DLOG(FDI)	0.233983	0.020076	11.65477	0.0000
DLOG(FDI(-1))	0.159133	0.036716	4.334111	0.0008
DLOG(FDI(-2))	-0.031219	0.018550	-1.682966	0.1162
DLOG(FRM)	0.140227	0.043492	3.224196	0.0067
DLOG(FAD)	0.089438	0.148536	0.602132	0.5574
DLOG(EXR)	-0.950722	0.034803	-27.31724	0.0000
DLOG(EXR(-1))	-0.514946	0.143262	-3.594440	0.0033
DLOG(TOP)	0.005280	0.021377	0.247004	0.8088
CointEq(-1)*	-0.516005	0.083647	-6.168851	0.0000
Adj R ² = 0.773679, DW = 1.984322				

Source: Authors' Computation, 2024.

As a component of the foreign sector, the analysis of foreign remittances (lfrm) in Table 4 suggests a positive (+0.546750) association with the gross domestic product per capita (lgdppc). According to the findings, each billion Naira increase in lfrm in the long-run is associated with about 55% increase in lgdppc. Remarkably, the p-value of 0.0440 indicates that lfrm and lgdppc had statistically significant association. In the short-run in Table 5, a billion Naira increase in foreign remittances is linked to 14% increase in gross domestic product per capita in the current period, which is indicated by the positive coefficient of 0.140227. The statistical significance of this association ($p = 0.0067$) highlights the role that international remittance plays in raising citizens' average incomes as measured by gross domestic product per capita.

In addition, the long-run value of foreign aid (lfad) in Table 4 suggests a positive (+0.001483) association with the gross domestic product per capita (lgdppc). This suggests that one billion Naira increase in foreign aid (lfad) received contribute annual per person GDP of roughly 0.015%. Similarly, its p-value of 0.9737 indicated that lfad and lgdppc did not significantly associate over the sampled period. Similarly, in Table 5, with coefficient of 0.089438 for foreign aid (lfad) in the short-run, it had a positive correlation with gross domestic product per capita. This illustrates the contribution of increased foreign aid to economic advancement by showing that a billion Naira increase in aid results in 8.9% increase in GDP per capita. The statistically insignificant ($p = 0.5574$) value suggests that foreign aid had inconsequential influence on the gross domestic product per capita.

Furthermore, in Table 4, the long-run value of the exchange rate (lexr) suggests a negative (-0.594185) link with the value of gross domestic product per capita (lgdppc). This suggests that one Naira depreciation in the Naira (lexr) relative to the US Dollar will cause about 59% rise in gross domestic product per capita (lgdppc). The 0.0000 p-value of lexr means that it exerted significant effect on lgdppc. This is similar in the short-run in Table 5, as the coefficient value of exchange rate (lexr) is negative (-0.950722), which indicates that gross domestic product per capita rose by 95% for a Naira depreciation relative to the US Dollar. The p-value of 0.0000, indicate a robust statistical significance, highlighting importance of the foreign sector to Nigeria's economy.

Lastly in Table 4, the value of trade openness (ltop) as a proxy for the foreign sector had positive (+0.243544) relation with gross domestic product per capita (lgdppc) in the long-run. The implication is that, a 1% increase in trade openness (ltop) spur lgdppc by roughly 247%, but with p-value of 0.2170, it means that this external sector indicator did not significantly impact on lgdppc in the sampled period. In the short-run, trade openness (ltop) as shown in Table 5 has a positive coefficient of +0.005280. This implies that for every percentage rise in trade openness, the value of gross domestic product per capita rises by 0.05%. Improved trade openness is expected to have a positive effect on gross domestic product per capita according to economic theory, even though the p-values of 0.8088 indicates less significant effect.

The model corrects its deviations from long-run equilibrium at a rate of 52% per year, according to the error correction term (ECM (-1)) in Table 5, which has a negative and significant coefficient at the 0.05 level. This points to a strong adjustment mechanism that resolves disparities from the prior year. The model's significant explanatory power is demonstrated by the corrected R-Square (R^2) value, which indicates that the independent variables (lfdi, lfrm, lfad, lexr and ltop) together account for about 77% variance in the dependent variable (lgdppc). Furthermore, the Durbin-Watson statistic of 1.984322, which is nearly equal to 2, indicates that there is no serial correlation, demonstrating the dependability of the model.

Post Diagnostic Tests Results

The diagnostic tests are conducted to test the robustness and stability of the model results. The empirical outcomes are presented in Table 6 and discussed below. In the table, the diagnostic test results showed that the Ramsey Reset linearity test with f-statistic (0.745222) value and computed p-value of 0.4049 greater than 5 percent (0.05) critical value, means the study reject the null hypothesis and conclude that the model is correctly specified.

Table 6: Ramsey Reset, Serial Correlation and Homoscedasticity Tests' Results

Methods	F-Statistic	Prob-Value
Ramsey Reset Test	0.745222	0.4049
Breusch-Godfrey Serial Correlation LM Test	1.561762	0.2529
Breusch-Pagan-Godfrey Heteroskedasticity Test	0.430037	0.9477

Source: Authors' Computation, 2024.

The Serial or Autocorrelation Test using Breusch-Godfrey Serial Correlation LM method shows that the f-statistic is 1.561762. This confirms no serial correlation in the model. The heteroscedasticity test using Breusch-Pagan-Godfrey method shows f-statistic value of 0.430037 with a Chi-Square probability value of 0.9477. The result suggests that there is no evidence of heteroskedasticity in the model at 5 percent ($P > 0.05$), as residuals do have constant variance which is desirable in regression meaning that residuals are Homoscedastic.

Stability Test Graph

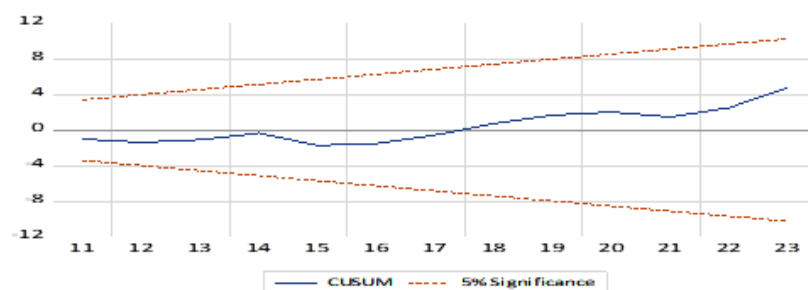


Figure 1: Stability Test

Figure 1 above, shows CUSUM stability analysis of the model. The graph showed that the model is stable, this is evident on the fact that the blue line in the graph is between the upper and lower bounds lines at 5% level of significance.

Normality Test Result

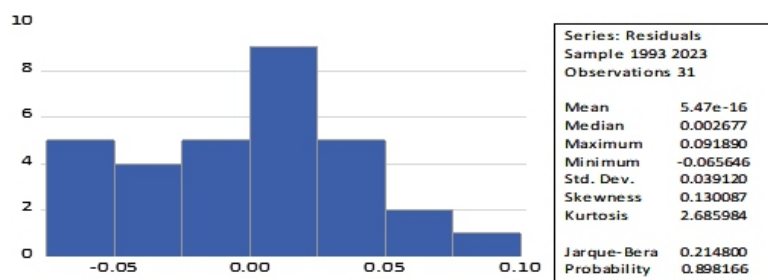


Figure 2: Normality Test

Figure 2 above, shows summary of the normality test with Jarque-Bara value of 0.214800 and a corresponding probability value of 0.898166 more than 0.05 level of significance, indicating that the residuals of the model are normally distributed.

Discussion of Findings

As ascertained from the findings, it is indicative that foreign direct investment inflow directly and significantly influenced the per capita gross domestic product of Nigeria in both long-run and short-run over the sampled period. The implication is that improved inflow of this regressor is contributory to boosting the gross domestic product per capita of Nigeria, due possibly to attraction to massive natural resource endowment, cheap labour, large market, among others. Economic theory predicts that foreign direct investment should encourage job creation, which will boost gross domestic product per capita. This positive association between foreign direct investment and GDP per capita is consistent with this idea. The null hypothesis, which states that there is no significant association between foreign direct investment and gross domestic product per capita, is rejected as a result of the results' statistical significance, as demonstrated by the p-value, which supports the robustness of this relationship. This finding is supported by that of Ikwaakwu, *et al.*, (2024) as they revealed positive and significant effects of FDI on economic growth but negates the findings of Peterson (2024).

Similarly, the model analysis results provided compelling insight that foreign remittances (frm) had significant positive impact on gdppc in the short and long terms. This means that as frm increases, citizens' income increases as well. The likely explanation for this relationship is that there are more economic opportunities available, such as higher-paying jobs and wider range of employment options partly taken by Nigerians in diaspora who remit some earnings back home, which diffuse to support the economy. The positive correlation between frm and gdppc is consistent with economic theory, which holds that foreign remittances should encourage the creation of jobs, which in turn improves gross domestic product per capita. The statistical significance of the results, denoted by the p-value, confirms this relationship. The result disagrees with Ikwaakwu, *et al.*, (2024) whose finding revealed a long-run negative and significant effect on economic growth in Nigeria, but agrees with Abdirisak (2023) who found positive influence on economic growth in the long run.

With slightly different result, foreign aid (fad) in the short and long terms had minor positive and statistically insignificant influence on GDPPC (gross domestic product per capita). This suggests that there is infinitesimal contribution to employment generation and citizens' income as foreign aid increases. The most plausible reason could be that, received fad are not productively allocated but mostly deployed into recurrent government activities and diversion, which are pronounced contributors to economic retardation in Nigeria. Economic theory however suggests that foreign help should boost job creation leading to improvement in gross domestic product per capita, yet this association between foreign aid and GDP per capita is not encouraging, and the outcome indicated acceptance of the null hypothesis that this independent variable insignificantly contributed to the Nigeria's economy. This conformed with the assessment by Isiyaku, *et al.*, (2022) and Stanislav, *et al.*, (2023), which suggest that official development assistance as a form of foreign aid did not contribute significantly to progress of the Nigerian economy.

Also emerged from the finding is that the exchange rate (exr) negatively impacted on gdppc, both in the short and long term. This result suggests that the income of residents increase significantly as the exchange value of the Naira depreciates relative to the dollar. The implication is that Nigeria needs to produce more local goods and sell cheaper in the international market to have competitive advantage rather than surviving only on crude oil production and sale. This conforms with the economic theory that, low value of a local currency relative to the US Dollar in the international market would result in high demand for locally made goods, raise local production, employment and earnings, which will improve GDP per capita. And the relationship is significant consistent, indicating rejection of the null hypothesis. In tandem with this, Auta, *et al.*, (2023) established that nominal exchange rate is a significant determinant of growth. But Ukangwa and Ikechi (2022) showed that the Naira rate had no significant impact on economic growth in Nigeria.

Trade openness (top) results showed that positive and insignificant influence on gross domestic product per capita (gdppc) over the short and long runs. This suggests that there is low contribution to residents' average production in GDP when trade openness improves. The most plausible argument is that there are less economic opportunities, including better-paying jobs and more employment options, which lead to insignificant effect of trade openness on GDP per capita. This agrees with economic theory that improved trade openness should boost productive activities, increase job creation, and result in rising GDP per capita but the effect here is poor. The null hypothesis is accepted as the test outcome indicated statistically insignificant implication of trade openness on GDP per capita in Nigeria. This result partially conforms with Abinabo and Abubakar (2023) who found trade openness as positive and statistically significant on economic growth in Nigeria.

Conclusion Remarks

This study examined the effects of foreign sector economic indicators on the Nigeria's economy by applying the Autoregressive Distributed Lag (ARDL) econometric procedure on secondary data for the variables from 1990 to 2023. The findings of the study established that foreign direct investment, foreign remittance and exchange rate are significant for

improving the per capita GDP of Nigeria but exchange rate exerted an inverse effect in both long and short-runs during the sampled period. Foreign aid and trade openness exhibited positive associations with the per capita GDP but insignificantly contributed to its improvement over the years. Predicated on these findings, it is concluded in this study that the foreign sector measures significantly contributed to advancement of the gross domestic product per capita of Nigeria.

Policy Recommendations

Following the research outcomes and inferred conclusion, the following policy recommendations are proffered.

- i. The Nigerian Investment Promotion Commission (NIPC) should intensify efforts to market the country as a prime investment destination through targeted campaigns and investment forums, aimed at attracting more foreign capital to drive economic growth.
- ii. Central Bank of Nigeria (CBN), should continue to promote and facilitate remittance flows by reducing transaction costs and improving the ease of sending money through formal channels. It can collaborate with financial institutions to lower fees for remittance transfers and encourage digital financial services that make it easier for Nigerians abroad to send money home.
- iii. The Federal Ministry of Finance should reassess the structure and utilization of foreign aid. Aid should be directed towards productive investments rather than consumption or non-essential sectors. It should promote self-sufficiency by funding projects that stimulate local production, entrepreneurship and infrastructure development.
- iv. The Central Bank of Nigeria (CBN), should stabilize the exchange rate by implementing policies that reduce volatility, such as maintaining adequate foreign reserves and using market-based tools like interventions in the foreign exchange market when necessary. This can help protect the purchasing power of the currency and reduce inflationary pressures on GDP per capita.
- v. Lastly, Federal Ministry of Industry, Trade, and Investment should implement policies that reduce trade barriers, improve customs procedures, and enhance the ease of doing business to make trade openness more impactful. Streamlining these processes will help Nigeria fully leverage on the benefits of international trade and boost its contribution to GDP per capita.

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