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Effect Of Foreign Direct Investment On Agricultural Sector Output In Nigeria

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ABSTRACT
The study examined the effect of foreign direct investment on agricultural sector output in Nigeria. The objectives of the study were to: determine the effect of market value on agricultural sector output in Nigeria; evaluate the effect of trade openness on agricultural sector output in Nigeria; determine o the effect of exchange rate on agricultural sector output in Nigeria. The study was anchored on Endogenous Growth Theory. The expost facto research design approach was applied. The variables were agricultural sector output as the dependent variable while market value, trade openness and exchange rate were the independent variables. These variables were sourced from the Central Bank of Nigeria bulletin. Secondary type of data were utilized in this study, error correction model approach was employed for the analysis. The study found that market value has significant positive effect on agricultural sector output in Nigeria. The study found that trade openness has insignificant effect on agricultural sector output in Nigeria and exchange rate has significant positive effect on agricultural sector output in Nigeria. The study concludes that foreign direct investment has significant positive effect on agricultural sector output. The study recommends that, Increased FDI will enhance agricultural productivity through the transfer of capital, technology, and modern farming practices; Improving export infrastructure, reducing trade barriers, and promoting value-added agricultural exports can enhance its contribution to the sector; Policies that reduce excessive exchange rate volatility will encourage both domestic and foreign investors to invest in agriculture and improve the sector's performance.

Keywords: Market value, Trade openness, exchange rate, Agricultural sector output, foreign direct investment

1.1 INTRODUCTION

Foreign Direct Investment (FDI) has become one of the major drivers of economic growth and structural transformation, particularly in developing economies where domestic savings are often inadequate to finance productive investments (Manafa, Okeke, & Atueyi 2022). FDI involves the movement of capital

by multinational corporations or foreign investors into a host country for the purpose of establishing or expanding productive business activities while maintaining significant management control (Adeagbo & Jimoh, 2023). Beyond providing financial resources, FDI facilitates technology transfer, managerial expertise, innovation, improved production techniques, employment creation, and integration into global value chains. Consequently, many developing countries, including Nigeria, have adopted policies aimed at attracting greater inflows of foreign investment to stimulate economic growth and enhance sectoral productivity (Agba, Adewara, Nwanji, Yusuf & Adzer, 2018).

Agriculture occupies a strategic position in the Nigerian economy because it serves as a major source of food, employment, industrial raw materials, foreign exchange earnings, and rural development (Akano, Oderinde & Omotayo, 2023). Before the discovery of crude oil in commercial quantities in 1956, agriculture was the mainstay of Nigeria's economy, contributing over 60 percent of Gross Domestic Product (GDP), accounting for over 70 percent of export earnings, and providing employment for more than two-thirds of the labour force (Manafa, Okeke, & Anah 2026). During this period, Nigeria was one of the world's leading exporters of cocoa, palm produce, groundnuts, rubber, cotton, and other agricultural commodities. However, the oil boom of the 1970s shifted government attention from agriculture to the petroleum sector, resulting in declining public investment in agriculture, poor rural infrastructure, inadequate mechanization, and reduced agricultural productivity (Azri, Rashid, Shafiai, Rawabdeh, Esquivias, Faisal, & Hamzah, 2023).

Consequently, Nigeria gradually became dependent on food imports despite its abundant agricultural resources (Bello, Yahaya & Adamu, 2024). Recognizing the need to diversify the economy away from excessive dependence on crude oil, successive Nigerian governments have introduced various agricultural development policies and programmes such as the Agricultural Transformation Agenda (ATA), the Anchor Borrowers' Programme (ABP), the National Agricultural Technology and Innovation Policy (NATIP), and several investment incentives designed to improve agricultural productivity and attract both domestic and foreign investments (Oguejiofo and Manafa, 2025). These initiatives underscore the growing importance of Foreign Direct Investment as a catalyst for agricultural modernization, technology adoption, value addition, and sustainable agricultural output (Dare, 2020).

Foreign Direct Investment contributes to agricultural sector output by providing long-term capital for mechanized farming, irrigation facilities, processing industries, storage infrastructure, improved seedlings, and modern farming technologies (Ogbanje & Salami, 2022). Foreign investors also introduce advanced managerial practices, research innovations, and international marketing networks that improve agricultural productivity and competitiveness (Ezeokafor U.R, Oguejiofor and Manafa, 2025). Through these channels, FDI is expected to increase agricultural output, improve food security, create employment opportunities, and promote inclusive economic growth (Owutuamor & Arene, 2018). Although numerous empirical studies have examined the relationship between Foreign Direct Investment and economic growth in Nigeria, relatively few have focused specifically on the agricultural sector while simultaneously examining the roles of market value, trade openness, and exchange rate in influencing agricultural output (Sultana & Sadekin, 2023).

Most previous studies concentrated on manufacturing, oil and gas, or aggregate economic growth without adequately addressing how these macroeconomic variables jointly determine the effectiveness of FDI in promoting agricultural production. This creates an important gap in the literature. It is against this background that this study investigates the effect of Foreign Direct Investment on agricultural sector output in Nigeria, using market value, trade openness, and exchange rate as key explanatory variables. The study is expected to provide empirical evidence that will assist policymakers in designing appropriate investment, trade, and exchange rate policies capable of attracting sustainable foreign investment and improving agricultural productivity, food security, employment generation, and economic diversification in Nigeria.

1.2 Statement of the Problem

Agriculture remains one of the most important sectors of the Nigerian economy due to its significant contributions to food security, employment generation, poverty reduction, rural development, and economic diversification. Despite the country's vast agricultural resources, favorable climatic conditions, and several government interventions aimed at revitalizing the sector, agricultural output has remained below its potential. Low productivity, inadequate mechanization, poor rural infrastructure, insecurity, limited access to modern technology, inadequate financing, and weak institutional support continue to hinder the growth and competitiveness of the sector. As a result, Nigeria still depends heavily on food imports and has struggled to achieve sustainable agricultural development.

To address these challenges, the Nigerian government has increasingly encouraged Foreign Direct Investment (FDI) as a means of bridging the domestic investment gap and stimulating agricultural growth. FDI is expected to provide long-term capital, modern technology, managerial expertise, improved farming techniques, and access to international markets capable of increasing agricultural productivity and output. Despite various policy reforms and investment incentives introduced to attract foreign investors, inflows of FDI into Nigeria's agricultural sector have remained relatively low and inconsistent. More importantly, the expected improvement in agricultural sector output has not been commensurate with the level of foreign investment received, raising concerns about the effectiveness of FDI in transforming the sector.

One possible explanation for this weak performance is the influence of key macroeconomic variables such as market value, trade openness, and exchange rate. Market value reflects the attractiveness and profitability of investment opportunities within the economy.

Weak market performance, low investor confidence, and limited profitability may discourage foreign investors from committing substantial resources to agricultural enterprises. Consequently, the agricultural sector may fail to attract sufficient foreign capital needed to improve productivity and output. Similarly, although Nigeria has implemented several trade liberalization policies to encourage international trade and investment, inconsistencies in trade policies, import restrictions, high transaction costs, and infrastructural deficiencies have continued to limit the benefits of trade openness. These challenges reduce the competitiveness of Nigerian agricultural products and discourage foreign investors who depend on efficient trade systems to maximize returns on investment. As a result, the expected contribution of trade openness to agricultural sector output remains uncertain.

Furthermore, persistent exchange rate instability has become a major challenge to foreign investment in Nigeria. Frequent depreciation and volatility of the Nigerian Naira increase production costs, reduce the profitability of foreign investments, create uncertainty in business planning, and discourage long-term investment decisions. Exchange rate instability also affects the cost of importing agricultural machinery, improved seedlings, fertilizers, and other production inputs, thereby limiting productivity and reducing agricultural output.

Although several empirical studies have examined the relationship between Foreign Direct Investment and economic growth in Nigeria, most of these studies focused on aggregate economic performance, manufacturing output, or the oil sector. Few studies have specifically investigated the effect of Foreign Direct Investment on agricultural sector output while simultaneously considering the moderating influence of market value, trade openness, and exchange rate. This has created an empirical gap regarding the extent to which these macroeconomic variables influence the effectiveness of FDI in improving agricultural production in Nigeria.

It is against this backdrop that this study seeks to examine the effect of Foreign Direct Investment on agricultural sector output in Nigeria by specifically investigating the roles of market value, trade openness, and exchange rate. The findings of the study are expected to provide empirical evidence that will guide policymakers in designing appropriate investment, trade, and exchange rate policies that will enhance foreign investment inflows and promote sustainable agricultural growth in Nigeria.

1.3 Objectives of the Study

The broad objective of this study is to determine the effect of foreign direct investment on agricultural sector output in Nigeria. The objectives are to:

i. determine the effect of market value on agricultural sector output in Nigeria.
ii. evaluate the effect of trade openness on agricultural sector output in Nigeria.
iii. determine o the effect of exchange rate agricultural sector output in Nigeria

REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

2.1.1 Foreign Direct Investment

Foreign direct investment can be understood in several distinct ways. Foremost, it is the investment made by a firm or individual in one country into business interests located in another country, typically involving the acquisition of significant ownership stakes or establishing operations and assets (Han, Smith & Wu, 2024). Foreign direct investment encompasses the long-term interest and control exerted by a foreign entity in an enterprise within the host country, often characterized by the investor's lasting influence and involvement in management decisions (Kastratoviæ, 2024). Furthermore, foreign direct investment can be described as the movement of capital across international borders to purchase or establish income-generating assets, such as factories, equipment, or infrastructure, which contribute to economic growth and development (Ogbanje & Salami, 2022).

Also, foreign direct investment is often viewed as a strategic investment by multinational companies to gain access to new markets, resources, and production efficiencies, thereby enhancing their global competitiveness and fostering international economic integration (Rahman, Rahaman, Sarkar & Islam, 2024). Foreign direct investment is a crucial component of international economics, representing a significant cross-border investment where a firm or individual from one country acquires a lasting interest in, or a substantial degree of influence over, a business entity in another country (Adeagbo & Jimoh, 2023).

2.1.2 Agricultural Sector Performance

Agricultural sector performance is a comprehensive measure that reflects the productivity, efficiency, and overall output of the agricultural sector within an economy (Umar, 2024). This concept encompasses various elements, including crop yields, livestock production, forestry outputs, and fishing activities, which together contribute to the total agricultural output of a region or country (Bello et al., 2024). Assessing agricultural sector performance is crucial for understanding the health and sustainability of an agricultural system, as well as its capacity to meet the food, fiber, and bio-energy needs of a growing population. It also provides hints into the sector's ability to contribute to economic growth, rural development, and poverty alleviation. The concept of agricultural sector performance extends beyond mere production quantities to include factors such as the efficiency of resource use, technological innovation, and environmental sustainability (Oguejiofo and Manafa, 2025).

High agricultural performance is typically characterized by optimal use of inputs such as land, water, labor, and capital, resulting in high yields and output without depleting resources or causing ecological damage (Azri et al., 2023). For example, advancements in agricultural technology, such as precision farming, genetically modified crops, and sustainable farming practices, have significantly enhanced agricultural performance in many parts of the world. These innovations have led to increased productivity, reduced waste, and better management of natural resources (Bello et al., 2024). Agricultural sector performance is often evaluated through indicators such as yield per hectare, total factor productivity (TFP), and the value of agricultural exports (Umar, 2024). These indicators provide a snapshot of how well the agricultural sector is performing in relation to its potential and in comparison to other sectors within the economy. A high-performing agricultural sector is crucial for ensuring food security, particularly in regions that are prone to food shortages or where agriculture is a major source of livelihood (Akano et al., 2023).

2.2 Theoretical Review

Endogenous Growth Theory

The theory was primarily developed by economists Paul Romer, Robert Lucas, and others who sought to explain long- term economic growth by focusing on factors that are determined within the economy itself, rather than relying on external factors. Paul Romer, in his seminal 1986 paper "Increasing Returns and Long-Run Growth," laid the foundation for the theory by emphasizing the role of knowledge and innovation as key drivers of economic growth (Romer, 1986). Robert Lucas further expanded the theory in 1988 by introducing the concept of human capital as a central element in the growth process. The theory marked a significant shift in economic thought by integrating the roles of technology, innovation, and human capital into growth models, suggesting that these factors could sustain economic growth without relying solely on external influences (Roberts and Setterfield, 2007).

The core postulations of Endogenous Growth Theory revolve around the idea that economic growth is primarily driven by internal factors within an economy, rather than external shocks or diminishing returns to capital. The theory posits that investments in human capital, innovation, and knowledge creation lead to sustained economic growth because they generate increasing returns to scale. Unlike neoclassical theories, which emphasize diminishing returns to physical capital, Endogenous Growth Theory argues that knowledge and technology, as non-rivalries and partially excludable goods, can lead to continuous improvements in productivity. Additionally, the theory suggests that government policies, such as subsidies for Research and Development (RandD) and education, can positively influence long-term growth by fostering an environment conducive to innovation. The accumulation of human capital, technological advancements, and innovation are seen as self-reinforcing processes that fuel sustained economic growth from within the economy.

Endogenous Growth Theory is highly relevant to the study of the effect of foreign direct investment on agricultural performance in Nigeria, particularly when taking a disaggregated approach. According to the theory, foreign direct investment can act as a catalyst for endogenous growth by introducing new technologies, management practices, and innovations that are crucial for enhancing agricultural productivity (Ozawa and Castello, 2003). When foreign investors bring advanced agricultural technologies and knowledge to Nigeria, it can lead to significant improvements in crop yields, livestock management, and overall agricultural efficiency. This aligns with the theory's emphasis on knowledge and innovation as key drivers of growth. Furthermore, the theory underscores the importance of human capital development, which is vital for the successful adoption and implementation of these new technologies in the agricultural sector.

By improving the skills and knowledge of local farmers and agricultural workers through training and education, foreign direct investment can help sustain long-term growth in agricultural performance. Thus, Endogenous Growth Theory provides a valuable framework for understanding how foreign direct investment can contribute to the sustained development of Nigeria's agricultural sector by fostering innovation, technological advancement, and human capital accumulation from within the economy.

2.3 Empirical Review

Ogunnubi, Oladejo and Ugwu, (2026) assessed the impact of foreign direct investment, agricultural output on Nigeria's economic growth. Secondary data used for the work was obtained from the Central Bank of Nigeria statistical bulletin 2024, National Bureau of Statistics and World Development Index WDI. The scope of study spanned from 1981 to 2024. The Autoregressive Distributed Lag (ARDL) was used to run the data analysis and it was discovered that the foreign direct investment had a negative relationship with the economic growth in the short run and a positive relationship in the long run. Inflation and interest rate were also unfavorable in the short run and long run. The study concluded that foreign direct investment has both positive and negative effects on the economic growth in the short run and long run while the agricultural output has positive effects on economic growth in the long run. The suggestions were that the government should fund the agricultural sector and tackle insecurity in order to attract foreign investors.

Igbokwe, Nwezeaku & Chris-Ejiogu, (2026) investigated the effect of sectoral foreign direct investment on Nigeria's economic development over the period 1985-2024. Employing econometric analysis with dual development indicators Gross Domestic Product Per Capita (GDPPC) and Human Development Index (HDI), the research examined FDI impacts across six strategic sectors: mining and quarrying, manufacturing and processing, agriculture, transport and communication, building and construction, and trading and business. Time series data were analyzed using Augmented Dickey-Fuller unit root tests, Johansen cointegration techniques, and Ordinary Least Squares regression models. The stationarity tests revealed mixed integration orders, with HDI and FDI in building and construction stationary at level, four variables stationary at first difference, and two variables stationary at second difference. Cointegration analysis confirmed long-run equilibrium relationships between sectoral FDI and economic development indicators. The findings revealed pronounced sectoral heterogeneity in developmental impacts. Manufacturing sector FDI emerged as the only statistically significant determinant of both GDPPC (coefficient = 0.953, p = 0.0401) and HDI (coefficient = 0.092, p = 0.0001), demonstrating its critical importance for Nigeria's economic development. Mining, agriculture, transport, construction, and trading sectors showed insignificant effects despite receiving substantial investment inflows. The HDI model exhibited substantially superior explanatory power (R^2 = 0.979) compared to the GDPPC model (R^2 = 0.508), suggesting sectoral FDI patterns more strongly influence comprehensive human development than per capita income alone. Several sectors displayed unexpected negative coefficients, indicating potential structural inefficiencies including profit repatriation, crowding out of domestic enterprises, and limited spillover effects. The study concluded that manufacturing FDI represents Nigeria's most effective investment category for driving development, while aggregate FDI data masks critical sectoral heterogeneity with important policy implications. The research recommends prioritizing manufacturing sector FDI through targeted fiscal incentives, enhancing domestic absorptive capacity, implementing strategic investment screening, and strengthening institutional quality to optimize foreign investment's developmental contribution.

Arumona and Oguntade, (2025) examined effect of foreign direct investment on financial deepening in Nigeria for the duration of 31 years starting from 1993 to 2023. Secondary data was obtained from Central Bank Nigeria Statistical Bulletin and the data was analysed using Autoregressive Distributed Lag (ARDL) techniques. Findings show that the primary foreign direct investment and secondary foreign direct investment have positive and significant effect on financial deepening. The study therefore concludes that foreign direct investment has significant effect on financial deepening in Nigeria. The study recommends that government should create an enabling and favourable environment that encourages primary foreign direct investment in the extractive and agricultural sector in Nigeria, which will help increase the gross domestic product.

Ananwude, Nwobia & Onyegiri, (2025) examined the effect of foreign direct investment (FDI) on agricultural sector performance in Nigeria. The specific objective was to determine the extent to which FDI affects crop production, livestock, forestry, and fishery real output. This study utilized an ex-post facto research design. Secondary data were obtained from the Central Bank of Nigeria from 1986 to 2023. The time series data were analyzed using the Ordinary Least Squares regression technique. The findings revealed that FDI has a significant (0.0002 < 0.05) positive effect on crop production; a significant (0.0004< 0.05) positive effect on livestock; a significant (0.0044 < 0.05) positive effect on forestry; and a significant (0.0010 < 0.05) positive effect on fishery real output in Nigeria. The study concludes that FDI is a panacea for agricultural sector performance in Nigeria. It will be an innovative approach if the Federal Ministry of Agriculture and Rural Development actively seeks and attracts more FDI by creating favorable policies and incentives for foreign investors to continue enhancing crop production in Nigeria. The Nigerian Investment Promotion Commission should collaborate with international agribusiness firms to introduce more advanced livestock farming technologies and practices to further boost livestock output.

Amunigun and Oluwoye, (2024) investigated the impact of FDI inflows on the performance of Nigeria’s agricultural sector. The performance was considered on three fronts: agricultural output, exports, and

employment. The analytical technique was anchored by the vector autoregressive (VAR) model to capture the relationships between the performance variables and the FDI. The lag order of 2 was selected based on the Akaike Information Criterion. Having analyzed the series' descriptive, correlation, and stationarity properties, the VAR estimates revealed that FDI has contributed negatively to agricultural output and employment but positively to agricultural exports in Nigeria. This was interpreted as indicating that the FDI flows majorly to the production of agricultural tradables, i.e., goods that may be exported. Given these findings, it is recommended that the government improve the business climate and ease of doing business to consolidate the export of agricultural produce. Small and medium-scale farmers should also be supported with genuine and supervised government finances to prevent such an approach from dampening agricultural productivity and employment.

Abdullahi and Dayyabu, (2024) investigated the impact of Foreign Direct Investment on agricultural productivity in Nigeria between 2000 and 2022. The objectives of the study are to determine the impact of Foreign Direct Investment on the agricultural sector, to evaluate the relationship between Foreign Direct Investment and the growth of agricultural sector Data were collected from Central Bank of Nigeria - Statistical bulletin and online data base, World development indicators for the period of 2000-2022 and was analyzed using Ordinary Least Square as the estimation technique using of E-View Software. The results revealed that Foreign Direct Investment had significant impact on agricultural sector during the period reviewed, FDI had a negative yet significant impact to agricultural productivity in Nigeria. The study recommends that the government should emphasis on increasing Bank credit to farmers and reduce interest rates in order to increase productivity of agriculture in Nigeria.

METHODOLOGY

3.1 Research design

The study adopted *ex-post facto* research design. This implies that the events that were being observed had taken place already and the researchers had no control on the variables (Onwumere, 2009; Kerlinger, 1973). This design was suitable for the study since the events had already occurred and the data from it were duly documented in official records of well acclaimed institutions like the Central Bank of Nigeria.

3.2 Nature and Sources of Data

Data for the study were obtained from secondary source notably from publications of the Central Bank of Nigeria (CBN), Statistical Bulletin, between 1981 and 2024. The following data were sourced: Agricultural sector output, Market value, Trade openness and Exchange rate

3.2 Model Specification

ASO = F (MKV, TDO, EXCH,)

Where:

ASO = Agricultural sector output

MKV = Market value

TDO= Trade openness

EXCH= Exchange rate

F = Functional Notation

The above equation can be put in an econometric form as;

$ASO = \beta_0 + \beta_1 MKV + \beta_2 TDO + \beta_3 EXCH + \mu$

Where

β_0 = Autonomous or intercept

β_1 = Coefficient of regression for MKV

β_2 = Coefficient of regression for TDO

β_3 = Coefficient of regression for EXCH

μ = Stochastic variable or error term

The model can also be stated in a logged form as:

$L\ ASO = C + LB_I\ MKV + LB_2\ TDO + LB_3 EXCH + \mu$

3.5 Method of Data Analysis

The study employed ordinary least square (OLS) method of estimation to establish the importance of the independent variables on the dependent variable. The (OLS) is the most efficient method because of the ''Best Linear Unbiased Estimator'' (BLUE) properties .the result is always satisfactory and simple to comprehend. The model equation will be estimated using a variety of analytical tools, including the unit root test and co-integration test.

PRESENTATION AND ANALYSIS OF DATA

4.1Unit Root Test

The presence of a unit root indicates that a time series is non-stationary, whereas its absence implies that the series is stationary. In this study, the Augmented Dickey-Fuller (ADF) unit root test is employed to examine the stationarity of the variables and determine their order of integration

Table 4.1 Unit Root Test

variable	ADF	Integration	Significant
LASO	-10.60579	1(1)	1%
LMKV	-4.570539	1(1)	1%
TDO	-3.958368	1(1)	1%
EXCH	-5.087947	1(1)	1%

Source: Author's computation using E-view 9.1

Finally, the ADF test was conducted on effect of foreign direct investment on agricultural sector output in Nigeria and the results presented in table 4.2 show that null hypothesis of unit roots was rejected after differencing once. Hence, the variable is clearly integrated of order one and at 1% level of significant respectively.

4.2 Co-Integration test

The summary of the Johansen cointegration test, based on the MacKinnon–Haug–Michelis probability values, is presented in the table below.

Table 4.2: Johansen Co-integration Test

Date: 07/16/26 Time: 05:04
Sample (adjusted): 1984 2024
Included observations: 41 after adjustments
Trend assumption: Linear deterministic trend
Series: LASO LMKV TDO EXCH
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.869082	114.4168	47.85613	0.0000
At most 1 *	0.425899	31.05632	29.79707	0.0356
At most 2	0.153911	8.303390	15.49471	0.4335
At most 3	0.034772	1.451025	3.841466	0.2284

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.869082	83.36043	27.58434	0.0000
At most 1 *	0.425899	22.75293	21.13162	0.0293
At most 2	0.153911	6.852365	14.26460	0.5067
At most 3	0.034772	1.451025	3.841466	0.2284

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The results of the Johansen cointegration test are presented in Table 4.2. The findings indicate the existence of one (2) cointegrating equation at the 5% level of significance. This conclusion is based on the fact that the Trace Statistic exceeds the corresponding 5% critical value, leading to the rejection of the null hypothesis of no cointegration.

The existence of a cointegrating relationship implies that a stable long-run equilibrium relationship exists among agricultural sector output, foreign direct investment, and the other explanatory variables included in the model. Although the variables may experience short-run fluctuations, they tend to move together and converge to a long-run equilibrium over time.

Since the variables are cointegrated, the estimation of an Error Correction Model (ECM) is appropriate. The ECM captures both the short-run dynamics and the speed at which deviations from the long-run equilibrium are corrected, thereby reconciling short-run adjustments with the established long-run relationship among the variables.

The Error Correction Model results are presented in table below.

4.3 Regression Result

The full part of our regression result for this analysis is attached as an appendix to this study. However, the diagnostic tests or some key statistics or the variable that needs to beinterpreted is shown below.

Table 4.3 Error Correction Model Result

Dependent Variable: LASO
Method: Least Squares
Date: 07/16/26 Time: 05:11
Sample (adjusted): 1982 2024
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.495127	2.702356	0.183220	0.8556
LMKV	0.877589	0.275860	3.181285	0.0029
TDO	0.001260	0.001581	0.796879	0.4305
EXCH	0.501715	0.002298	2.746195	0.0001
ECM(-1)	-0.357630	0.198787	-2.799067	0.0000

R-squared	0.837384	Mean dependent var	9.001077
Adjusted R-squared	0.820266	S.D. dependent var	0.993476
S.E. of regression	0.421184	Akaike info criterion	1.217452
Sum squared resid	6.741060	Schwarz criterion	1.422243
Log likelihood	-21.17522	Hannan-Quinn criter.	1.292973
F-statistic	48.91975	Durbin-Watson stat	1.935699
Prob(F-statistic)	0.000000		

Source: Author's Compilation Using E-views 9 Output

Constant (C)

The constant coefficient is 0.4951 with a probability value of 0.8556, indicating that it is statistically insignificant. This suggests that when all explanatory variables are held constant at zero, agricultural sector output would be approximately 0.495 units, although this estimate has no meaningful statistical significance.

Market Value (LMKV)

The coefficient of LMKV is 0.8776, with a t-statistic of 3.1813 and a p-value of 0.0029, making it statistically significant at the 5% level. This implies that a 1% increase in market value (used as a proxy for foreign direct investment, if applicable in your study) is associated with approximately a 0.878% increase in agricultural sector output, holding other variables constant. This positive relationship suggests that increased investment contributes significantly to improving agricultural productivity in Nigeria.

Trade Openness (TDO)

Trade openness has a coefficient of 0.00126 with a p-value of 0.4305, which is greater than 0.05. Therefore, trade openness has a positive but statistically insignificant effect on agricultural sector output. Although greater openness may facilitate access to international markets and technology, the evidence from this model indicates that its influence on agricultural output is not statistically significant during the study period.

Exchange Rate (EXCH)

The coefficient of the exchange rate is 0.5017, with a t-statistic of 2.7462 and a p-value of 0.0001, indicating statistical significance at the 1% level. This means that an increase in the exchange rate is associated with a 0.502-unit increase in agricultural sector output, holding other variables constant. The positive coefficient suggests that exchange rate movements may have enhanced the competitiveness of Nigerian agricultural products or encouraged domestic agricultural production during the period under study.

Error Correction Mechanism (ECM)

The coefficient of the error correction term is −0.3576, which is negative and statistically significant ($p = 0.0000$). This satisfies the theoretical expectation for an error correction model. The coefficient indicates that approximately 35.76% of short-run disequilibrium is corrected each year, implying a moderate speed of adjustment toward the long-run equilibrium following short-run shocks.

Goodness of Fit

The R-squared value of 0.8374 indicates that approximately 83.74% of the variations in agricultural sector output are explained by market value, trade openness, exchange rate, and the error correction term. The Adjusted R-squared of 0.8203 confirms that, after adjusting for the number of explanatory variables, about 82.03% of the variation in agricultural sector output is explained by the model.

The F-statistic of 48.9198 with a probability of 0.0000 indicates that the overall regression model is statistically significant. Therefore, the explanatory variables jointly have a significant effect on agricultural sector output in Nigeria. The Durbin–Watson statistic of 1.936 is close to 2, suggesting that the model does not suffer from serious first-order autocorrelation.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The findings indicate that market value (LMKV) and exchange rate (EXCH) have positive and statistically significant effects on agricultural sector output in Nigeria, while trade openness (TDO) has a positive but statistically insignificant effect. The significant and negative error correction term confirms the existence of a stable long-run relationship among the variables and shows that deviations from equilibrium are corrected at a speed of about 35.8% per year.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Increased FDI will enhance agricultural productivity through the transfer of capital, technology, and modern farming practices.
2. Improving export infrastructure, reducing trade barriers, and promoting value-added agricultural exports can enhance its contribution to the sector.
3. Policies that reduce excessive exchange rate volatility will encourage both domestic and foreign investors to invest in agriculture and improve the sector's performance.

REFERENCES

Abdullahi, M. M. & Dayyabu, M. (2024) Impact of Foreign Direct Investment on Agricultural Productivity in Nigeria. *Journal of Arid Zone Economy 4(5): 28–37*

Adeagbo, K. A. & Jimoh, O. R. (2023). Impact of foreign direct investment on agricultural and manufacturing output in Nigeria. *International Journal of Business Economics and Management Science,* 2(2), 15-30.

Adeagbo, K. A. & Jimoh, O. R. (2023). Impact of foreign direct investment on agricultural and manufacturing output in Nigeria. *International Journal of Business Economics and Management Science,* 2(2), 15-30.

Agba, D. Z., Adewara, S. O., Nwanji, T. I., Yusuf, M. & Adzer, K. T. (2018). Does foreign direct investments impact agricultural output in Nigeria? An error correction modelling approach. *Journal of Economics and Sustainable Development*, 9(4), 67-77.

Akano, O. I., Oderinde, F. O. & Omotayo, A. O. (2023). Agricultural yield, food nutrition and dietary energy supply in Nigeria: evidence from nationally representative data. Journal of Agriculture and Food Research, 11(3), 1-16.

Akano, O. I., Oderinde, F. O. & Omotayo, A. O. (2023). Agricultural yield, food nutrition and dietary energy supply in Nigeria: evidence from nationally representative data. Journal of Agriculture and Food Research, 11(3), 1-16.

Amunigun, A. A. & Oluwoye, J. O. (2024) The Impact of Foreign Direct Investment on Performance of The Nigeria's Agricultural Sector. *Global Journal of Research in Agriculture & Life Sciences 4(3) 1-17*

Ananwude, A. C., Nwobia, C. E. & Onyegiri, P. K. (2025) Agricultural Sector Performance in Nigeria: A Disaggregated Approach. *Innovare Journal of Social Sciences, 13(5), 19-28,*

Arumona, J.O. & Oguntade, A. S. (2025) Effect of Primary and Secondary Foreign Direct Investment on Financial Deepening in Nigeria. *International Journal of Research and Innovation in Social Science (IJRISS) 9(5), 1-12*

Azri, A. H., Rashid, I. M. A., Shafiai, S., Rawabdeh, M., Esquivias, M. A., Faisal, S. I. & Hamzah, H. (2023). The effect of foreign direct investment in the agriculture sector on economic growth in selected African countries. AIP Conference Proceedings, American Institute of Physics Incorporation.

Azri, A. H., Rashid, I. M. A., Shafiai, S., Rawabdeh, M., Esquivias, M. A., Faisal, S. I. & Hamzah, H. (2023). The effect of foreign direct investment in the agriculture sector on economic growth in selected African countries. AIP Conference Proceedings, American Institute of Physics Incorporation.

Bello, M. M., Yahaya, J. U., & Adamu, I. (2024). An analysis of sustainable agricultural productivity and food security in Nigeria. *Journal of Political Discourse*, 21(2), 45-60.

Bello, M. M., Yahaya, J. U., & Adamu, I. (2024). An analysis of sustainable agricultural productivity and food security in Nigeria. *Journal of Political Discourse*, 21(2), 45- 60.

Dare, E. A. (2020). Impact of international foreign aids development on agriculture in Kogi State Nigeria. International Journal of Scientific *Research in Educational Studies & Social Development*, 4(1), 47-65.

Ezeokafor U.R, Oguejiofor N.D and Manafa, G.U, (2025) economic effect on entrepreneurial performance among members of agricultural cooperative societies in anambra state nigeria. Journal of behavioural infirmities, digital and development research 10 (4)

Han, Y., Smith, R. B. & Wu, L. (2024). The impacts of foreign direct investment on total factor productivity: an empirical study of agricultural enterprises. *China Agricultural Economic Review,* 16(1), 20-37

Igbokwe, I. P., Nwezeaku, N.C. & Chris-Ejiogu, U.G. (2026) Effect of Sectoral Foreign Direct Investment on Nigeria's Economic Development. *Journal of Accounting and Financial Management 12(1), 493-517*

Kastratoviæ, R. (2024). The impact of foreign direct investment on agricultural exports: The evidence from developing countries. *The Journal of International Trade & Economic Development,* 33(2), 276-293.

Manafa, G. U.1, Okeke, C.O. & Prof. S.A. Anah (2026) Effect of Organizational Climate on Organizational Citizenship Behaviour Among Employees of Public Universities in Enugu and Anambra States, Nigeria. International journal of finance, accounting and management studies , 2 (7) 40-55

Manafa, G.U, Okeke, O.C & Atueyi C.L (2022) strategic thinking and performance of foam industry in Anambra State. *African Journal of Business and Economic Development, 2 (4) 53-69*

Ogbanje, E. C. & Salami, A. O. (2022). Impact of foreign direct investment on Nigeria's agricultural sector (1981 to 2019). *International Journal of Environment, Agriculture and Biotechnology,* 7(4), 161-171.

Ogbanje, E. C. & Salami, A. O. (2022). Impact of foreign direct investment on Nigeria's agricultural sector (1981 to 2019). *International Journal of Environment, Agriculture and Biotechnology,* 7(4), 161-171.

Oguejiofo N.D and Manafa, G.U, (2025) stress foot print and employee productivity in selected manufacturing firms in Anambra State. Humanities management, arts, education and the social science research 13 (1)

Ogunnubi, H. A., Oladejo, C. O. & Ugwu, C. J. (2026) Foreign Direct Investment, Agricultural Output and Nigeria's Economic Growth. *International Journal of Economics and Business Administration 15(2), 125-146*

Owutuamor, Z. B. & Arene, C. J. (2018). The impact of foreign direct investment (FDI) on agricultural growth in Nigeria (1979-2014). Review of Agricultural and Applied Economics, 21(1), 40-54.

Ozawa, T. & Castello, S. (2003). FDI and endogenous growth: IB perspectives. International business and the eclectic paradigm: Developing the OLI framework, 74-90.

Rahman, M. C., Rahaman, M. S., Sarkar, M. A. R. & Islam, M. A. (2024). Foreign direct investment and agricultural output nexus in Bangladesh: An autoregressive distributed lag approach. *Journal of Agriculture and Food Research*, 15(3), 1-9.

Roberts, M. & Setterfield, M. (2007). What is endogenous growth theory. Economic Growth: New Directions in Theory and Policy, Cheltenham, Edward Elgar, 14-31

Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, 94(5), 1002-1037.

Sultana, Z. & Sadekin, M. N. (2023). The impact of FDI on the agriculture sector: A case study from Bangladesh. Heliyon, 9(12), 1-9.

Umar, Z. (2024). Harnessing innovation in agriculture: driving productivity and food security in Nigeria. *International Journal of Financial Research and Management Science*, 4 (4) 45-89