

Foreign Direct Investment Inflow and Agricultural Productivity in Nigeria

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ABSTRACT

The study investigated the effect of Foreign Direct Investment inflow on Agricultural Productivity in Nigeria covering the period of 1981- 2023. The continued deterioration of budgetary allocation to agricultural sector, decline in agricultural output and the perception that if properly taken into consideration, the sector could bounce back to its position motivated the urge to investigate the alternative ways of revamping the sector through FDI. It is against this background that this study examines quantitatively the effect of foreign direct investment inflow to agriculture on agricultural sector productivity in Nigeria. The specific objectives were to ascertain the extent to which foreign direct investment inflows to Agriculture influences agricultural productivity in Nigeria, to determine the effect of exchange rate on Agricultural productivity, and to ascertain the relationship between trade openness and Agricultural productivity in Nigeria. Time series data were obtained from the CBN statistical bulletins. The data were found to be integrated of mixed order necessitating the ARDL Bounds test approach to cointegration which showed that there is long run relationship amongst the variables. Estimates from the Autoregressive Distributive Lag (ARDL) model revealed that Foreign Direct Investment to Agriculture (AFDI) and Trade Openness (TOP) significantly influenced AGRIGDP while Exchange Rate (EXCHR) seems not to have effect on the growth of the Nigeria's Agricultural productivity during the period of study. Similarly, Foreign Direct Investment to Agriculture (AFDI), Exchange Rate (EXCHR), and Trade Openness (TOP) have a significant joint effect on Agricultural productivity in Nigeria which is being supported by the test of goodness of fit that the explanatory variables explained up to 99% of the total variations in the model. Based on the findings of the research, the study recommended that there is need to formulate policies that will attract more Foreign Investors towards the Agricultural Sector which will further increase the rate of Agricultural Productivity of the Nigerian economy.

Keywords: Foreign Direct Investment, Agricultural Productivity, Trade Openness, Autoregressive Distributed Lag.

INTRODUCTION

Background to the Study

The agricultural sector, despite receiving less attention from the government, continues to be a cornerstone of Nigeria's economy. It significantly contributes to the country's gross domestic product, generates foreign

exchange, and creates employment opportunities. Agriculture serves as a catalyst for economic growth and development by strengthening the economic framework, improving farmers' living standards, supplying raw materials to industries, and generating government revenue. Nigeria possesses immense potential to become Africa's leading economy and a significant player on the global stage, thanks to its abundant human and natural resources. These assets could pave the way for economic prosperity, poverty reduction, and improved healthcare for its citizens. However, this potential remains largely unrealized due to an over reliance on oil revenues, which has led to the decline of other crucial productive sectors.

However, in spite of the concentration of government on oil revenue, the agricultural sector still contributes to the economy in terms of gross domestic product, foreign earnings and employment creation. With these huge contributions, it is expected that the Nigerian government would pay a special attention to the agricultural sector but it is unfortunate that the sector has been neglected due to total reliance of the economy on crude oil. The sector continued to witness significant drop in productivity of major farm produce which has resulted in the importation of consumable products that could be produced in the country. Before the oil boom of the 1970s, Nigeria was a net exporter of agricultural products, which were major foreign exchange earners. Today, the country has become heavily dependent on importing agricultural goods.

Nevertheless, the world today is a global economy in which countries continually look for partnerships internationally in order to sustain and keep the economies going. These partnerships include foreign direct investments (FDI), international trade and export among others. These international partnerships help countries to be innovative and create new and better ways of doing things as well as greater resources to develop, grow and expand their regional economies. It is in the wake of these benefits that Africa opened its borders to foreign investments. A foreign direct investment (FDI) is an investment made by a firm or individual in one country into business interests located in another country. Generally, FDI takes place when an investor establishes foreign business operations or acquires foreign business assets in a foreign company. Nigeria is the third host economy for FDI in Africa, behind Egypt and Ethiopia. She is an investment haven for many foreign companies as well as individuals. The vast natural resources which the country possesses and its renowned status created attraction of Foreign Direct Investment to foreigners all over the world. According to the NESG 2024 report, FDI inflows to Nigeria fell by 26.7 percent to USD 3.9 billion in 2023 from USD 5.3 billion in 2022, in 2019 it was USD 3,3 billion, showing a 48,5% decrease compared to the previous year (USD 6,4 billion in 2018). On the other hand, Gross Domestic Product from Agriculture shows a steady progression from N2.364 billion recorded in 1981 to about N4.840 billion in 2000, N17.958 billion in 2019 and N19.091 billion in 2022. Since the mid-eighties when the Nigerian government adopted a Structural Adjustment Programme (SAP), government has been putting so much effort into attracting foreign investors as a way to augment low domestic savings. Despite this effort, the economy of Nigeria still remains dwindling (Usman, 2012). The major reason as pointed out by Ayanwale (2007) is that, the pattern of the FDI that does exist is often skewed towards extractive industries, meaning that the differential rate of FDI inflow into Nigerian economy has been adduced to be due to natural resources, although the size of the local market may also be a consideration. Agriculture and other sectors remained the least attractive hosts of FDI in Nigeria.

Statement of the Problem

Nigeria boasts abundant agricultural resources and extensive arable land suitable for crop cultivation and animal husbandry. Despite this immense potential in the agricultural sector, the country has failed to fully capitalize on these natural endowments. This underutilization stems from recent underfunding, primarily due to decreased budget allocations to agriculture. Furthermore, financial institutions have shifted their focus away from the agricultural sector. Instead of providing credit to farmers to enhance agricultural productivity, these institutions now prefer to lend to industrial and oil companies, which are perceived to

offer higher returns on investment. Nigeria, with its vast natural resources and substantial market of approximately 160 million people, stands out as a prime destination for Foreign Direct Investment (FDI) in Africa. Over the past decade, it has consistently ranked among the top three African nations attracting FDI (Okenru, 2023). The country possesses the potential to emerge as Africa's largest economy and a significant player on the global economic stage. This potential stems from Nigeria's rich endowment of both human and natural resources, which could be leveraged to construct a thriving economy, significantly reduce poverty levels, and provide quality healthcare for its citizens. However, Nigeria has yet to fully realize this potential. The main obstacle has been the contraction of key productive sectors within the economy, a consequence of the nation's excessive reliance on oil revenues. This over-dependence has led to the neglect and underdevelopment of other crucial economic sectors including agriculture (Uzor, 2022). The continued deterioration of budgetary allocation to the sector, decline in agricultural productivity, and the perception that if properly taken into consideration, the sector could bounce back to its position motivated the urge to investigate the alternative ways of revamping the sector through Foreign Direct Investment. It is against this background that this study examines quantitatively the effect of foreign direct investment inflow to agricultural and the agricultural sector productivity in Nigeria between 1981 and 2023.

Objectives of the Study

The main objective of this study is to investigate the effect of FDI on the agricultural sector. The specific objectives are:

- I. To ascertain the extent to which Foreign direct investment inflows to Agriculture influences agricultural productivity in Nigeria.
- II. To determine the effect of exchange rate on Agricultural productivity
- III. To ascertain the relationship between trade openness and Agricultural productivity

Research Questions

1. To what extent does the inflow of FDI influence Agricultural productivity in Nigeria?
2. To what extent does exchange rate affects Agricultural productivity?
3. What is the relationship between relationship between trade openness and Agricultural productivity in Nigeria?

THEORETICAL FRAMEWORK

Neo-Classical theory

The theory posits that interdependence among nations benefits developing countries more than developed ones. This assertion is based on the idea that capital flows from wealthy to poor regions, where returns on investment are highest, aiming to transform underdeveloped economies. The theory predicts faster growth in poor nations due to diminishing returns on capital and their higher capacity to absorb capital, suggesting that over time, these countries would catch up with richer ones. Foreign Direct Investment (FDI) is seen as a means to bridge gaps in developing economies, potentially spurring growth and reducing poverty. FDI is viewed as a solution to shortfalls in domestic supplies of savings, foreign exchange, government revenue, technology, and management skills – resources necessary to meet development targets across all economic sectors. Meier (1984) echoed neoclassical economists, arguing that FDI brings scarce resources like managerial ability, technical expertise, technological knowledge, administrative organization, and innovations. Ogundu (2023) added that FDI offers a less expensive alternative to purchasing technology abroad or raising foreign loans.

The link between FDI and agricultural growth is rooted in growth theory, which emphasizes the role of improved technology, efficiency, and productivity in promoting growth (Lim, 2017). However, the potential benefits of FDI depend heavily on conditions in recipient countries, which are crucial for facilitating spillover effects. Robert Solow expanded on the Harrod-Domar growth model by adding “labour” as a second factor and introducing “technology” as a third independent variable. Unlike the Harrod-Domar model’s fixed coefficient and constant returns to scale, Solow’s neoclassical growth model showed diminishing returns to labour and capital separately, but constant returns when considered jointly. Technological progress became the residual factor explaining long-term growth. Given that growth is associated with increased productivity, the inflow of FDI is well-positioned to positively impact growth (Dunning and Sarianna, 2018). This perspective underscores the potential of FDI to contribute to economic development, particularly in sectors like agriculture in developing countries.

Conceptual Framework

Foreign Direct Investment (FDI) refers to an investment made by an entity or individual in one country into business interests located in another country. This typically involves establishing operations or acquiring assets in a foreign company. FDI, a type of international factor movement, is characterized by controlling ownership of a business in one country by an entity based in another (Wikipedia Encyclopedia 2020). FDI inflows are a form of external finance that contributes to international capital inflows in developing economies, particularly in Sub-Saharan Africa. These investments aim to accelerate economic growth and development in recipient countries (Dabour, 2019; Anyanwu, 2020). Open economies with skilled workforces and promising growth prospects tend to attract more FDI than tightly regulated ones. FDI often extends beyond capital investment to include management expertise or technology transfer. The key feature of FDI is the establishment of effective control or substantial influence over a foreign business’s decision-making. FDI can be implemented through various means, including opening subsidiaries, acquiring controlling interests in existing foreign companies, or forming mergers or joint ventures. It can benefit both the recipient country and the investing country by fostering economic growth. For instance, developing countries might use FDI to finance new infrastructure or create employment, while multinational companies can expand into new markets (Investopedia 2020).

Mericane (2019) notes growing evidence that FDI enhances technological change through diffusion, as multinational firms often operate in industries with high research and development ratios. These firms, being among the most technologically advanced globally, not only import efficient technologies but also generate technological spillovers for local firms. Bonojour (2003) emphasizes the pivotal role of technological change in economic growth. Multinational corporations serve as major channels for providing developing countries access to advanced technologies. Knowledge spillovers may occur through imitation, competition linkages, and training, although distinguishing between these channels can be challenging in practice. The spillover effect of technological transfer is further supported by the argument that FDI and multinational corporations’ most significant benefit to the host country is the increased productivity of domestic firms. This underscores the potential of FDI to not only bring direct economic benefits but also to catalyze broader technological and productivity improvements in recipient countries.

2.2.1 Determinants of Foreign Direct Investment

Economists view the movement of capital (FDI) between nations the same way they view it between regions of a nation or between industries. This is because capital being moved from one location to another in response to the expectation that it is going to yield a higher rate of return. In its new destination than is being earned in the old location. Put differently, we could say that economic agents are constantly looking for opportunities to maximize their wellbeing.

Ezeanyika and Oruebo (2020) briefly comment on reasons or determinants of foreign direct investment.

1. **Market Size:** Firms will invest abroad in response to large and rapidly growing markets for their products. Empirical studies have attempted to support this general hypothesis at the aggregate level of seeking a positive correlation between the gross domestic product (GDP) and its rate of growth of a recipient country and the amount of foreign direct investment flowing into that country.
2. **Availability of National Resources:** Another determinant of foreign direct investment in a country is for the investing firm to secure access to natural resources located within the host nation, then process them and sell them in a more finished form. This explains why a substantial portion of the United States direct investment overseas particularly in less developed nations is in the petroleum industry.
3. **Openness of the Economy to international Trade:** Tariff and non-tariff barriers in the host country also can induce an inflow of foreign direct investment. If trade restrictions made it difficult for the foreign firms to operate in the host country's market. An alternative strategy is to get behind the tariff wall and produce within the host country itself.
4. **Low relative wage:** This could be called cheap cost of labours, a foreign firm may consider investment in a host country if there are low relative wages in the host country, the existence of low wages because of the relative labour abundance in the recipient country is an attraction when the production process is labour intensive.
5. **Fiscal and non-tax incentives:** The greater the degree of recipient country participation in economic integration process such as customs unions, tax incentives programmes, free- trade areas and so forth. Participation in such projects suggest a large potential market size and encourages tariffs factories.
6. **Political Stability:** The greater the degree of political stability in the host country the greatest the inflow of foreign direct investment into the host country. Political stability was measured by a number of smooth transfers of power in government within a smaller number of changes including greater stability. Political stability provides firms with assurance that the rule of law regarding treatment of foreign investors is not going to be changed.

Foreign Direct Investment and the Nigeria's Economy

Nigeria is among the most promising poles of growth in Africa and attracts numerous investors in the sector of hydrocarbon, energy, buildings etc. Despite the effects of the oil counter-shock, the country has become economically not conducive for foreign investors. According to the NESG 2024 report, FDI flows to Nigeria totaled to USD 3.9 billion in 2023, showing a 26.7% decrease compared to the previous year (USD 5.3 billion in 2022), under the effects of austerity measures. Some of the main investing countries in Nigeria include the USA, China, United Kingdom, the Netherlands and France. Since the mid-eighties when the Nigerian government adopted a Structural Adjustment Programme (SAP), government has been putting so much effort into attracting foreign investors as a way to augment low domestic savings. Despite this effort, the economy of Nigeria still remains dwindling (Usman, 2012). The major reason as pointed out by Ayanwale (2007) is that, the pattern of the FDI that does exist is often skewed towards extractive industries, meaning that the differential rate of FDI inflow into Nigerian economy has been adduced to be due to natural resources, although the size of the local market may also be a consideration. Agriculture, transport and communications, and building and construction remained the least attractive hosts of FDI in Nigeria.

Nigeria as a nation has the potentials to become the largest economy in Africa, and a major player in the global economy because of its rich human and natural resources, with which she can build a prosperous economy, reduce poverty significantly, and provide sound health care for her citizens. This has not been achieved because the shrinking of major productive sectors of the economy due to over dependence on oil.

This has greatly affected the agriculture of Nigeria which has been the main source of resources of revenue earning to the economy.

Empirical Review

Research on the impact of foreign direct investment (FDI) on economic growth and performance is extensive, but studies specifically focusing on FDI's effect on the agricultural sector are limited (Oresolu 2018; Akinmulegun 2018). Yusuff et al. (2015) conducted a study analyzing FDI's influence on Nigeria's agricultural sector and its contribution to the country's gross domestic product (GDP). Using descriptive statistics and simple linear regression, with GDP as a function of agricultural FDI (AGRFDI), they found that FDI inflows to Nigeria were irregular. However, they noted a direct relationship between the agricultural sector's contribution to GDP and the inflow of FDI. Daniel and Maiwade (2015) examined the nature and volume of Chinese trade and investment in Nigeria's agricultural sector and its economic impact. Their study revealed a significant shift in Nigeria's economy: the agricultural sector, once the dominant source of revenue, was superseded by crude oil. Moreover, they found that Chinese trade and investment in Nigeria's agriculture were minimal compared to other sectors and had not significantly contributed to the sector's development in Nigeria.

Shuaubu, Igbinosun and Ahmed (2015) investigated the impact of government agricultural spending on Nigeria's economic growth from 1960 to 2012. Using regression analysis, they found a significant positive relationship between government agricultural expenditure and economic growth. Biam (2021) examined the causal relationship between foreign direct investment (FDI) in agriculture and agricultural output in Nigeria. Employing various econometric techniques, the study found no long-term equilibrium relationship between these variables, with or without inflation shocks. However, a short-term causal influence was observed from FDI in agriculture to agricultural output, but not vice versa. Inflation negatively affected this short-term relationship. Izuchukwu et al. (2014) studied the impact of FDI and trade on agricultural sector development in Nigeria from 1980 to 2009. Their findings indicated no causal relationship between FDI and agricultural output. Akinmulegun (2022) explored the effects of globalization on Nigeria's agricultural sector from 1986 to 2015. The study used various economic indicators as proxies for globalization, including FDI in agriculture, trade openness, foreign exchange rate, and consumer price index. Using complex econometric models, the research found that foreign exchange, trade openness, and FDI did not significantly influence agricultural productivity in Nigeria. However, the consumer price index had a substantial positive impact on agricultural productivity. On the relationship between foreign direct investment and agricultural development, Akinwale, Adenkule and Oludayo (2019) studied impact of FDI on the performance of the agricultural sector in Ghana covering the period of 1980 to 2013 using Unit Root Test, Johansen Cointegration test and Error Correction Model. The results of the study revealed that FDI negatively impacts the agricultural sector productivity in the long run but with positive relationship in the short run and also depreciation of the cedi negatively impacts the growth of the agricultural sector in the long run while trade openness on the other hand had positive and significant long run impact on the agricultural sector. Idowu and Ying (2013) in their study also found that FDI has no significant impact on agricultural output. These studies though reported insignificant impact, fail to show the type of relationship that exist between FDI and agriculture.

These studies collectively suggest a complex relationship between foreign investment, trade openness, and agricultural productivity in Nigeria. While some research indicates positive impacts of trade openness, the influence of FDI and other globalization factors on agricultural output appears to be limited or inconsistent. The studies highlight the need for a nuanced understanding of the factors affecting agricultural development in Nigeria, considering both domestic and international economic variables.

METHODOLOGY

Research Design

This research work made use of an ex-post-facto research design. The use of ex-post-facto research design is predicated on the fact that the study made use of secondary data which have zero manipulation effect. Furthermore, the research is designed in such a way as to ascertain the statistical properties of the data first using the Augmented Dickey fuller (ADF) unit root test before applying other relevant tests which is based on the result of the ADF test. The second stage involved the model estimation using the Autoregressive Distributed Lag (ARDL) model to enable the evaluation of the effects of the independent variables on the dependent variable of the model.

Model Specification

The study is guided by the Neo-classical growth theory, with the views that foreign direct investment leads to improved technology, efficiency, and productivity in promoting Agricultural productivity and growth. This study adopted re-modified model of Akinwale, Adekunle, and Oludayo (2023) Their model is being modified by testing the effects of foreign direct investment on Agriculture, Exchange Rate, and Trade Openness on the Nigeria's Agricultural productivity measured in Agric Gross Domestic Product which covers the period between 1986 – 2023. Specifying the model, we have:

$$AGDP = (AGFDI, EXCHR, TOP) \text{ ——— } 3.1$$

In a linear function, it is represented as follows:

$$AGRIGDP_t = \beta_0 + \beta_1 AFDI_t + \beta_2 EXCHR_t + \beta_3 TOP_t + U_t \text{ ——— } (3.2)$$

The above linear equation can be presented in a log linear model so that the problem of heteroscedasticity can reduce. Transforming equation (3.2) into natural logarithm

$$\text{LnAGRIGDP}_t = \beta_0 + \beta_1 \text{LnAFDI}_t + \beta_2 \text{LnEXCHR}_t + \beta_3 \text{LnTOP}_t + U_t \text{ ---- } (3.3)$$

Where $AGRIGDP_t$ = Agricultural Gross Domestic Product within the period of study.

$AFDI_t$ = Foreign Direct Investment on Agriculture within the period of study.

$EXCHR_t$ = Exchange Rate within the period of study.

TOP_t = Trade Openness within the period of study.

$\beta_0, \beta_1, \beta_2$ and β_3 are unknown parameters of the model to be estimated and U_t is the error term at time "t".

RESULTS AND DISCUSSION

Data Analysis

The analysis followed econometric procedures which tested for unit root in the data, cointegration and the model estimation using the ARDL approach. The unit root test uses the Augmented Dickey–Fuller (ADF) test statistic to compare with the chosen level of significance usually 5%. If the ADF test statistic is greater than the 5% critical value, we reject the null hypothesis of non stationary and conclude that the data is stationary either at level, first or second difference of integration. The results are presented below:

Table 4.1: Summary of ADF Unit Root Test

Variables	ADF Test Statistics		Order of Integration	Decision Rule
	@ Level	@ First Difference		
AGRIGDP	2.015461	-5.100545	I(1)	Stationary at First Difference
AFDI	1.508650	-5.563533	I(1)	Stationary at First Difference
EXCHR	0.878220	-5.082410	I(1)	Stationary at First Difference
TOP	-7.307589	-3.478148	I(0)	Stationary at Level
Critical value at 5% = -2.943427				

Source: Extraction from the Eviews Result

Table 4.1 above shows a summary of the unit root test. The test shows that the variables have mixed order of integration; thus, we will adopt the long run properties of the variables using ARDL Bounds test approach as specified in Egbulonu (2018).

ARDL Bounds Test for Co-integration

Hence the variables used in the model have mixed order of integration; it is necessary and suitable to test the long run relationship dependent and independent variables. The null hypothesis of ARDL bound test is that the variables are not co-integrated as against the alternative that they are co-integrated. The decision rule is to reject the null hypothesis if the F-statistics is greater than the upper bound critical values at a given level of significance.

Table 4.2: ARDL Bounds Test Result

Critical Value Bounds	Significance	I0 Bound	I1 Bound
	10%	2.45	3.52
	5%	2.86	4.01
	2.50%	3.25	4.49
	1%	3.74	5.06

Source: Extracted from the E-views Result

The ARDL Bounds test summarized above shows that the F-statistics value of 11.32810 is greater than the I(0) bound of 2.86 and I(1) bound of 4.01 at 5% level of significance. Therefore, we reject the null hypothesis and conclude that long run relationship exists amongst the variables. In other words, the explanatory variables in the model have a long run effect on the growth of the Nigerian economy within the period of study.

Long Run Estimates of the ARDL Model

The long run model gives the relationship between real gross domestic product from Agriculture (a proxy for Agricultural productivity) and Foreign Direct Investment to Agriculture (AFDI), Exchange Rate (EXCHR), and Trade Openness (TOP) over the long run period.

The result is summarized below:

Table 4.3: Summary of the Long Run ARDL Estimates

Variable	Coefficient	Std. Error	t-Statistic
AFDI	90.570934	7.271164	12.46
EXCHR	11.774195	6.924803	1.700293
TOP	51.980482	7.055591	7.367276
C	1597.883204	204.094716	7.829126
Statistic	Value	Statistic	Value
R-squared	1	Mean dependent var	8613.277
Adjusted R-squared	0.998083	S.D. dependent var	5310.266
S.E. of regression	232.5166	Akaike info criterion	14.00254
Sum squared resid	702831.7	Schwarz criterion	14.98019
Log likelihood	-223.0445	Hannan-Quinn criter.	14.34003
F-statistic	8.44E+02	Durbin-Watson stat	2.361
Prob(F-statistic)	0		

Source: Extracted from the E-views Result.

The long-run coefficients from Table 4.3 above showed that Foreign Direct Investment to Agriculture (AFDI) had a coefficient of 90.570934; this entails that it has a positive relationship with Agricultural Productivity in Nigeria in the long run. This also means that if Foreign Direct Investment to Agriculture (AFDI) increases by one unit, Agricultural Productivity will increase by 90.570934 units. The significance test showed that Foreign Direct Investment to Agriculture (AFDI) has a significant effect on Nigeria's Agricultural Productivity.

Exchange Rate (EXCHR) has a positive coefficient of 11.774195, this entails that it has a positive relationship with Agricultural Productivity in Nigeria in the long run. This also means that if exchange rate increases by one Naira, it will add 11.774195 units to the nation's Agricultural Productivity in the long run period. The significance test revealed that Exchange Rate has no significant effect on Agricultural Productivity in Nigeria.

The coefficient of Trade Openness (TOP) is positive and estimated at 51.980482. This suggests that there is a positive relationship between Trade Openness and Agricultural Productivity in Nigeria, this entails that an increment in TOP leads to a 51.980482 units increment to Agricultural productivity. The significant test showed that Trade Openness has a significant relationship with Agricultural Productivity in Nigeria.

Test of Hypotheses

Individual test

The individual test was carried out with the use of t-statistics; the test is summarized below:

Table 4.4: Summary of Individual t-test Results

Variables	t-statistics	p-value	Decision Rule
AFDI	12.456181	0.0000	<i>Reject Null Hypothesis</i>
EXCHR	1.700293	0.1129	<i>Accept Null Hypothesis</i>
TOP	7.367276	0.0000	<i>Reject Null Hypothesis</i>

Hypothesis One

H₀₁: Foreign direct investment inflow to Agriculture is not a major determinant of Agricultural productivity in Nigeria.

t-statistic = 12.456181 (p-value = 0.0000)

Decision Rule: From the table 4.4 above, the p-value of the t-statistic is less than 0.05 critical values, hence we reject the null hypothesis and conclude that FDI inflow to Agriculture is a major determinant of Agricultural productivity in Nigeria within the period of study.

Hypothesis Two

H₀₂: Exchange rate has no significant effect on Agricultural productivity in Nigeria.

t-statistic = 1.700293 (p-value = 0.1129)

Decision Rule: The probability value for the parameter EXCHR is 0.1129 which is greater than 0.05. Therefore we accept the null hypothesis and conclude that Exchange rate has no significant effect on Agricultural productivity in Nigeria within the period of study.

Hypothesis Three

H₀₃: There is no significant relationship between trade openness and Agricultural productivity in Nigeria within the period of study.

t-statistic = 7.367276 (p-value = 0.0000)

Decision Rule: The probability value for the parameter TOP is 0.0000 which is less than 0.05. Thus we reject the null hypothesis and conclude that there is a significant relationship between trade openness and Agricultural productivity in Nigeria within the period of study.

Joint Test (F-test)

This shows the overall significance of the explanatory variables of the model. It explains if the independent variables jointly influence the dependent variable.

H₀: Foreign Direct Investment Inflow to Agriculture (AFDI), Exchange Rate (EXCHR), and Trade Openness (TOP) have no significant joint effect on the Agricultural Productivity in the Nigerian economy.

F-statistic = 843.8509 (p-value e= 0.000000)

Decision Rule: The probability value of the F-statistics is less than the 0.05 critical values; thus we reject the joint null hypothesis and conclude that the explanatory variables have a significant joint effect on Agric Productivity in Nigeria.

Test of Goodness of Fit (R-square)

The coefficient of the Adjusted R-square revealed that about 99.80% of the changes in Agric Gross Domestic Product of Nigeria were being accounted by Foreign Direct Investment Inflow to Agriculture (AFDI), Exchange Rate (EXCHR), and Trade Openness (TOP) . In other words, this shows that the explanatory variables could explain up to 99% of the total variations in the model which signifies a good fit for the model.

Test for multicollienarity

In testing for the presence of multicollienarity in the model, variance inflation factor was used.

Decision for VIF: If VIF 10 multicollienarity is severe if the explanatory variables are more than 2 otherwise multicollienarity is not severe

Table 4.5: Variance Inflation Factor (VIF)

Variable	Coefficient	Std. Error	t-Statistic
AFDI	90.570934	7.271164	12.456181
EXCHR	11.774195	6.924803	1.700293
TOP	51.980482	7.055591	7.367276
C	1597.883204	204.094716	7.829126
Statistic	Value	Statistic	Value
R-squared	0.999267	Mean dependent var	8613.277
Adjusted R-squared	0.998083	S.D. dependent var	5310.266
S.E. of regression	232.5166	Akaike info criterion	14.00254
Sum squared resid	702831.7	Schwarz criterion	14.98019
Log likelihood	-2.23E+02	Hannan-Quinn criter.	14.34003
F-statistic	843.8509	Durbin-Watson stat	2.361
Prob(F-statistic)	0		

From the analysis above it reveals that the centered VIF of the explanatory variables are all less than 10. This showed that multicollienarity is not severe in the independent variables.

DISCUSSION OF FINDINGS AND CONCLUSION

The preliminary tests on the properties of the data showed that the variables used in the model have mixed order of integration. This prompted the test for long run relationship amongst the variables using ARDL Bounds test approach to cointegration, the result showed that there is a long run relationship between the explanatory variables (AFDI, EXCHR, TOP) and Agricultural productivity in Nigeria. In the long run, Foreign Direct Investment to Agriculture (AFDI), Exchange Rate (EXCHR), and Trade Openness (TOP) have positive coefficients which shows positive relationship with Agricultural productivity. However, the

P-value revealed that Foreign Direct Investment to Agriculture (AFDI) and Trade Openness (TOP) are statistically significant while Exchange Rate (EXCHR), and is insignificant within the period of study. This contradicts the findings of Idowu and Ying (2013) in their study on evaluation of the impact of foreign direct investment in Nigeria's agricultural sector between 1980 and 2012, which their findings showed that FDI has no significant impact on agricultural output.

The joint test proved that Foreign Direct Investment to Agriculture (AFDI), Exchange Rate (EXCHR), and Trade Openness (TOP) have a significant joint effect on Agricultural productivity in Nigeria. The finding upholds the theoretical postulations of the Neo-classical growth theory, with the views that foreign direct investment leads to improved technology, efficiency, and productivity in promoting Agricultural productivity and growth.

The test of goodness of fit showed that the explanatory variables could explain up to 99% of the total variations in the model which signifies a good fit for the model. Finally the multicollinearity test showed that multicollinearity is not severe in the explanatory variables during the period of study. Therefore, the study provides substantive empirical evidence to definitely conclude that Foreign Direct Investment Inflow to Agriculture has significantly increased the Agricultural productivity of the Nigeria's economy during the period of study, though FDI inflow to Agriculture is still small compared to other sectors of the economy like the manufacturing and extractive industries. The study recommends policy formulations that will attract more Foreign Investors towards the Agricultural Sector; hence Foreign Direct Investment inflow has a positive and significant effect on Agricultural Productivity, also there is need to remove or to reduce to minimal all other obstructions and barriers towards importation and exportation of goods and services on the Nigerian borders hence openness of trade has significantly contributed to Agricultural Productivity.

REFERENCES

1. Akinmulegun, S.O. (2022): Globalization and Agricultural Productivity Paradigm: The Nigerian Perspective. *Archives of Business Research*, 6(1) 94-104.
2. Akinwale, S.O, Adekunle O. and ,Obagunwa T. (2023); Foreign Direct Investment Inflow and Agricultural Sector Productivity In Nigeria. *IOSR Journal of Economics and Finance (IOSR-JEF)*, e-ISSN: 2321-5933 .Volume 9
3. Anyanwu, J.C. (2020). Why Does Foreign Direct Investment Go Where It Goes?: New Evidence From African Countries, *Annals of Economics and Finance*, 13 (2)
4. Anyawale, A.B. (2007): FDI and Economic Growth: Evidence from Nigeria", African Economic Research, Consortium Research Paper.
5. Biam J. (2021). The Determining Factors of FDI, Hyman Publisher Ltd. Central Bank of Nigeria. (2019). *Statistical Bulletin (Vol. 29)*.
6. Bonoyiour J. (2013). The Determining Factors of FDI, U.S.A, Hyman Publisher Ltd.
7. Dabour, N. M. (2019). The role of FDI in development and growth in OIC members' countries. *Journal of Economic Cooperation*, 21(3):27-55
8. Daniel, G.H. and Maiwada, S. (2015); "Chinese Trade and Investment in Nigeria's Agricultural Sector: A Critical Analysis.
9. Dunning, J. H. and Sarianna, M. L. (2018). *Multinational Enterprises and the Global Economy*. Edward Elgar Publishing.
10. Egbulonu, K. G. (2018) *Advanced Econometric Analysis*, 7th ed, Vikas Publishes Ltd Owerri.
11. Ezeanyika, E.S; and Oruebor, A.A. (2020); "International Economics Relations in Globalising World". Owerri, DESREG Publishers.
12. Idowu, A.A. & Ying, L. (2013). An evaluation and forecast of the impact of foreign direct investment in Nigeria's agricultural sector in a VAR environment. *Journal of Economics and Sustainable Development*, 4(10), 17-28.

13. Investopedia @ 2020, <https://www.investopedia.com/terms/f/fdi.asp>
14. Izuchukwu, O., Huiping, H., Abubakar, A., and Olufemi, E. A. (2014). Foreign direct investment, Trade and Its Effects on Agricultural Development in Nigeria: Evidence from Time Series Analysis. *International Journal of Management Science and Business Administration*; 1(1):28-40.
15. Lim, E. (2017). Determinants of and relationship between foreign direct investment and growth: A summary of recent literature. *IMF Working Paper, No.5*, International Monetary Fund, Washington, DC.
16. Merican, Y. (2019). Foreign Direct Investment and Growth in ASEAN-4 Nations, *International Journal of Business and Management*, 4 (6), pp. 122-134.
17. NESG (2024). Economic and Policy review journal, H1 2024 Edition, Vol 22 (1)
18. Ogondu, G. C. (2023). *Structural adjustment and economic revolution in Nigeria*. Heinemann Education Books, Ibadan, Nigeria.
19. Okenru D. O. (2023). Impact of foreign direct investment on agricultural sector development in Nigeria, Kuwait Chapter of Arabian Journal of Business and Management Review, 3(12)
20. Oresolu, F.O. (2018); Foreign Investment and Nigeria's Economic Recovery: Issues and Project, CBN Economic and Financial Review, Vol.20.
21. Shuaib, I.M., Igbinosun, F.E. & Ahmed, A.E. (2015). Impact of government agricultural expenditure on the growth of the Nigerian economy. *Asian Journal of Agricultural Extension, Ecology & Sociology*, 6(1):23-33.
22. UNCTAD (2020). World Investment Report, Transnational Corporations, Agricultural Production and Development. Geneva, Switzerland, pp1-314
23. Usman, O. (2012). *Foreign direct investment and economic growth in Nigeria: 1961-*
24. An unpublished M.Sc. Dissertation, submitted to the Post-Graduate School, Benue State University, Makurdi – Nigeria.
25. Uzor R. U. (2022). Foreign direct investment and performance of agricultural sector in Nigeria (1970-2020). *Journal of Resourcefulness and Distinction*, 6(1):1-12
26. Wikipedia @2019; https://en.wikipedia.org/wiki/Foreign_direct_investment
27. Yusuff, M.A. Afoloyan, O.T. and Adamu, A.M. (2015): Analysis of Foreign Direct Investment on the Agricultural Sector and Its contribution to Gross Domestic Product in Nigeria. *Journal of Economic Trends in Economic and management Sciences*, 6(2), 94-100.