

Foreign Aids, Exchange Rate Volatility and Agricultural Output in Nigeria

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Abstract

The paper examined the effect of foreign aid and exchange rate volatility on agricultural output in Nigeria 1986-2022. The study used secondary data and employed Generalized Autoregressive Conditional Heteroskedasticity for data estimation. The result from the GARCH showed that trade openness and domestic loan to agriculture had a direct and considerable impact on agricultural output increase at a significant level of 5%. This therefore, implies that 1% increase in trade openness and domestic loan to agriculture bring about 42.9% and 0.7% increase in agricultural output growth respectively. Also, foreign aid to agriculture and exchange rate were non-significant at 5% significant level with each having a direct and inverse relationship on agricultural output growth. Furthermore, The ARCH and GARCH results confirmed a favorable and insignificant impact on agricultural output growth, indicating that the model's selected variables do not exhibit volatility clustering. The study recommends that Nigeria government must ensure that there is more inflow of foreign aids into agricultural sector through declaration of state of emergency in the sector.

Keywords: Agricultural output growth, Foreign aids, exchange rate, trade openness.

1. Introduction

Nigeria is one of the developing nations that is still trailing behind in terms of economic growth and development across all spheres of the economy. In term of resources, the continent is naturally endowed, according to Omorogiuwa, *et al.*, (2014), Nigeria is natural blessed with a well-fertile land for agrarian and livestock. Earlier than the large-scale discovery of oil, agricultural output was the mainstay of Nigerian economy. Nwanji, Lawal, Asamu, and Inegbedion (2019) reveal that in the 1960s, agricultural sector contributed lion share to government's coffers with approximately 75% to federal government earning then. The discovery of oil in large quantity after the civil war in 1967-1970 has led to the deserting of agricultural sector. For instance, there was world food crisis in 2007 and 2008 respectively, which severely hit developing countries. In view of this, Jamalipour, Farsi and Ghorbani (2016) remark that agricultural sector is capable of reducing the severity of malnutrition in developing countries and increase government revenue through export of agricultural products.

The causes of the slowing in the rise of agricultural production have been the subject of extensive discussion. Verter (2017) identifies lack of investment by both private and government in agricultural sector as the core factor responsible for decline in agricultural sector in developing. Alabi (2014) supported the above claims and remarks that the public's domestic agricultural spending and overseas agricultural aid are the two components that could facilitate increase in agricultural productivity. Also, According to Falade, Aladejana, and Oluwalana (2018), the fall in sectoral contribution to GDP is due to the local financial markets' inability to raise enough money. Falade, *et al.* (2018) contends that external assistance is necessary for significant development in every area of the

economy. Given this, Jamalipour *et al.* (2016) notes that external aids of both resources and technical know-how are needed to advance on agricultural output which are often largely inadequate domestically.

According to Yiew and Lau (2018), foreign aids is the transfer of cash or resources to developing countries from industrialized countries or international financial institutions (IFIs). This is due to the severe volatility of their income streams and mono-economy, less developed nations (LDCs) like Nigeria are linked to exchange rate volatility. For instance, according to Onyango (2014), exchange rate volatility is inimical to economic growth and other macro-economic indices especially a mono-economy.

There is no doubt that Nigeria is very rich in agricultural resource base. Ideba, Iniobong, Otu and Ito (2014) posit that agriculture productivity prospered Nigerian economy than oil discovery. Many developmental projects were recorded through earning from agricultural export amongst are Cocoa house in Ibadan, Liberty Stadium, Premier Hotel and many more. National Bureau of Statistics, According to NBS (2015), this industry is the single largest employer of labor forces and the most significant non-oil economic sector. In view of this, Kalibata (2010) opined that foreign aid can provide the answers that African farmers need, including better roads to connect them to markets, better inputs, better seeds and soils, agribusiness loans and private sector investments to promote growth, infrastructure to lower their estimated 40–60% post-harvest losses, and education and technology to combat climate change.

Wong and Lee (2016) and Reaz *et al.* (2017) reveal that when countries maintain a relatively stable exchange rate, it boosts economic growth and stabilize other macro-economic indices within the economy system. According to Onyango (2014), fluctuating exchange rate makes investment decisions risky and unclear, which has a disruptive effect on macroeconomic performance. However, a shift from imported commodities to domestic goods typically results from the depreciation of the exchange rate due to outside influences from the government's perspective. Thus, through a change in the terms of trade, this causes income to be diverted from importing countries to exporting countries, and this usually has an effect on the economic growth of both the exporting and importing countries. Despite these facts, there is currently a dearth of research on foreign aid, exchange rate volatility and agricultural productivity in developing nations, particularly in Nigeria. Most of the existings studies focused on the relationship between foreign aid and agricultural output while the studies excluded the voliatility of the foreign aid in Nigeria economy. The current contribution aims to close this gap. In light of this, the goal of this study is to ascertain how foreign aid and currency rate volatility affect Nigerian agriculture.

2 Theoretical and Empirical Literature

Solow (1956) opines that exogenous growth contributes to the theory of economic growth and Capital Accumulation. According to Swan (1956), one of the key tenets of neoclassical economic theory is that external factors drive economic growth. The hypothesis holds that advancements in technology drive growth independently of economic forces. The rate of labor-augmenting technological advancement is determined by one or more exogenous (also known as external) factors, and the neoclassical model states that this rate will affect the long-term rise in production per worker. The model predicts that over time, all economies with similar technology should see a convergence in the rates of productivity growth (Solow, 1991).

Olaoye, (2022) examine the impact of exchange rate fluctuations on the Nigeria Agricultural sector. The study used ARDL techniques and found that exchange rates had a short-term negative impact on agricultural output. On the other hand, exchange rates had a

statistically significant positive long-term impact on agricultural output. Verter (2017) used conventional least square and granger causality methodologies to assess the effects of agricultural foreign aid on Nigerian agriculture out of numerous studies on the relationship between foreign aid and agricultural output. The finding shows that the effectiveness of the nation's crops is positively impacted by foreign support to agricultural-related operations. Ssozi, et al. (2019) conducted a similar study to investigate the impact of foreign aid on agriculture in sub-Saharan African nations using two-step system and the Generalized Method technique. The results showed that, generally speaking, agricultural productivity and development assistance had a beneficial association. However, there is a substitution impact between the production of industrial and food crops when analyzed by main agricultural recipient sectors.

Abiola, (2022) investigated the impact of exchange rate reforms of agricultural output in Nigeria. The study made use of Structural Vector Autoregression in analyzing the data. acreage and lending rates were positively related to agricultural output and agricultural labour and exchange rate were positively related to agricultural output. This study generalized the impact of agricultural foreign aid on agricultural growth across multiple sub-Saharan. An empirical analysis was carried out by Eze (2020) between 1982 and 2017 to examine the long-term relationship between agricultural and Nigeria's manufacturing industry production. The result shows that crop productivity and manufacturing industry output were shown to be positively correlated, as demonstrated by the Granger causality test. Although there was a positive and significant relationship in the short- and long-run estimations, the long-run divergence from the vector error correction model suggested that gains in agricultural productivity are not restored to equilibrium, given that macroeconomic influences distort the linkage.

Dangok and Ige (2020) investigated how fluctuations in exchange rates affected the cost of agricultural commodities in Nigeria between 2000 and 2018. The Non-linear Autoregressive Distributed Lag (NARDL) approach was used in the study. The study's findings demonstrated a strong and advantageous correlation between agricultural commodity prices and fluctuations in the exchange rate, both positively and negatively. Results also showed that while RGDP had a beneficial impact on agricultural commodity prices, inflation rate had a negative one.

In summary, studies like Dangok and Ige, (2020) and Alegwu (2018) used NARDL and VECM techniques to determine rate of exchange volatility which could not identify the existence of exchange rate volatility. For this reason, this present study intends to fill the gap in literature by using Garch (1,1) model to achieve the above stated objectives. In addition, studies like Eze (2020), Verter (2017) and Alabi (2014) have explicitly studies agricultural, foreign aid and others macroeconomic variable. One gap that seems obvious is scanty of study on foreign aid, exchange rate volatility and agricultural output in developing countries such as Nigeria. This creates vacuum for the current study, which examine the relationship between agricultural output in Nigeria, currency rate volatility and foreign aid.

3 Methodology

The study methodology is based on the secondary data from 1986 to 2022 and the study adopted Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model technique for data analysis. The study uses descriptive statistics and trend analysis as preliminary test on the data for the study.

3.1 Model Specification

This research uses Verter's (2017) model which reveals that lack of investment by both private and government in agricultural sector are the core factor responsible for decline

in agricultural sector in developing. Therefore, the basic model for Verter (2017) is given below in functional form;

Model 1

$$NAP = f(ODAA, TDCLA, FER, CC) \dots\dots\dots (1)$$

Where; NAP = Net agricultural (crop) production, ODAA = Official Development Assistance to Agricultural Production, TDCLA = The growth rate of all domestic commercial loans to agriculture expressed as a natural log, FER = Fertilizer Consumption (tonnes), CC= Climate Change (CO₂ emissions)

Therefore, the Verter (2017) model is modified below in a functional model equation to capture objective one and two, the model is re-specified below:

Model 2

$$AGRIO = f(ODAA, REXCH, TRAO, DOLA) \dots\dots\dots (2)$$

Where; AGRIO = Agricultural Output growth (%), ODAA= Official development assistance to agriculture, REXCH =Real Exchange Rate, TRAO= Trade Openness, DOLA =domestic loan to agriculture

Where equation (2) assumes its econometric form as:

$$AGRIO = \Omega_0 + \Omega_1 ODAA - \Omega_2 REXCH + \Omega_3 TRAO + \Omega_4 DOLA + \mu_t \dots\dots\dots (3)$$

The *a priori* expectation for equation (3) is given below:

Official Development Assistance to Agriculture (ODAA): Official development assistance to agriculture is expected to increase the agricultural output growth, thus, the expected sign is positive coefficient. $\frac{\Delta AGRIO}{\Delta ODAA} > 0$

The Real Exchange Rate (REXCH): It is anticipated that the real exchange rate will slow the development in agricultural output, thus, the expectation of a negative co-efficient. $\frac{\Delta AGRIO}{\Delta REXCH} < 0$

Trade Openness (TRAO): Theory seems to be silence on the sign of trade openness. Therefore, two tailed assumptions are used, thus, there is expectation of a negative and positive influence on agricultural output growth. $\frac{\Delta AGRIO}{\Delta TRAO} < 0$

Domestic Loan to Agriculture (DOLA): Positive signs are anticipated for domestic loans to agriculture. Therefore, The production of the agricultural sector tends to increase with an increase in domestic loans to agriculture. $\frac{\Delta AGRIO}{\Delta DOLA} > 0$

Table 1: Measurement of Variables

Variable	Measurement
AGRIO	The total amount of agricultural output expressed as a percentage of GDP.
ODAA	The total amount of agriculture-related official development aid.
REXCH	The official naira to US dollar exchange rate (N/\$)
TOP	The total amount of goods and services imported and exported expressed as a percentage of the GDP.
DOLA	The total amount borrowed domestically for farming.

Sources: Central Bank of Nigeria (CBN), Statistical Bulletin 2019, International Monetary Fund (2020) and World Bank Indicator (2017)

3.2 Method of Data Analysis

The Johansen co-integration test and the Augmented Dickey Fuller unit root test were used in the study as preliminary tests for the time-series data of the variables that have been identified in the model. The trend of the variables was described using descriptive

statistics, and the degree or severity of volatility on Nigeria's agricultural output was examined using Garch (1, 1) models.

3.3 Justification for the use of the Techniques

This study employs the use of Augmented Dickey Fuller (ADF) unit root test decision rule to test for stationary of the time series data. The paper employed Garch (1, 1) Technique, based on Generalized Autoregressive Conditional Heteroskedasity modeled (Bollerslev, 1986). The impact of fluctuating exchange rates on Nigeria's agricultural output is estimated using the model. By expanding on the work of Engle & Bollerslev (1986) framework, Bollerslev established the GARCH model, which has gained popularity since the early 1990s.

GARCH (1, 1) specification takes the form:

$$Y_t = X_t \theta + \varepsilon_t \quad \dots\dots\dots (4)$$

$$\sigma_t^2 = \omega + \alpha \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2 \quad \dots\dots\dots (5)$$

Where; ω = is the constant term weighted variance over the long run;

ε_{t-1}^2 = Information regarding volatility from the preceding time period, expressed as the squared residual's lag from the mean equation (the ARCH term).

σ_{t-1}^2 = is the predicted deviation for the previous period: (the term GARCH).

The formula for conditional variance is as follows:

$$\sigma_{AGRIO}^2 = \omega + \alpha \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2 + \sum_{j=0}^p \gamma_j Y_{t-j} \quad \dots\dots\dots (6)$$

Summing the GARCH and ARCH terms is a general method for estimating volatility.

Low volatility is found when $\alpha + \beta$ is less than 0.5.

The structural link between volatility and its determinants is given below, order to assess the volatility clustering in the GARCH (1 1) model.

$$\sigma_{AGRIO}^2 = \omega + \alpha \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2 + \sum_{j=0}^p \gamma_j Y_{t-j} \quad \dots\dots\dots (7)$$

Where: Y = ODAA, REXCH, TRAO, DOLA.

4 Data Analysis and Discussion of Findings

This deals with the interpretations and discussions of the research findings. This shows the descriptive statistics, unit root testing and co-integration, GARCH result and diagnostics test.

4.1 Descriptive Statistics

Table: 1 Descriptive Statistics

	AGRIO	ODAA	EXCH	TRAO	DOLA
Mean	0.243702	0.036189	108.0126	4.112323	1016.070
Median	0.232418	0.015663	119.7686	0.350668	0.005887
Std. Dev.	0.042638	0.046704	91.70817	22.05004	5924.556
Skewness	1.151425	1.392759	0.669105	5.570272	5.570485
Jarque-Bera	10.18936	11.48452	2.630162	1369.607	1369.746
Probability	0.609629	0.309208	0.268453	0.000000	0.320010
Observations	34	34	34	34	34

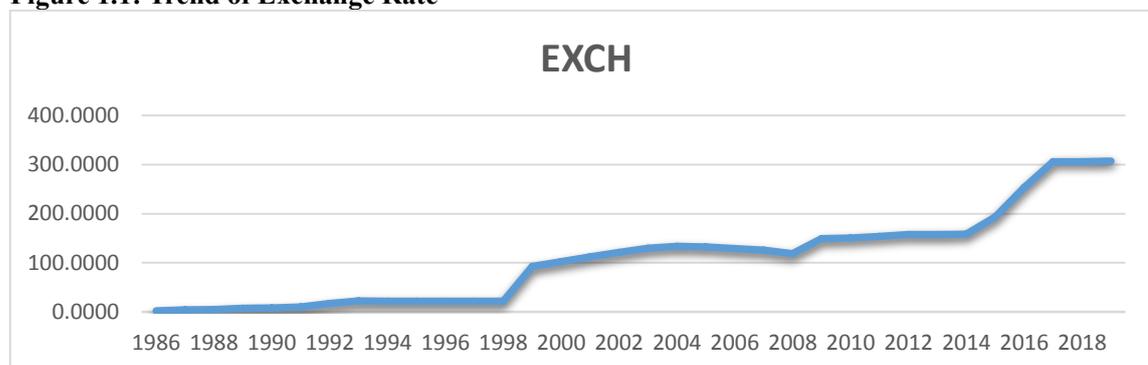
Source: Author's Computation (2023)

From Table 1 shows the descriptive statistics of agricultural output growth, foreign aid to agriculture, exchange rate, trade openness and domestic loan to agriculture. From the result above, DOLA has the highest mean value, followed by EXCH and TRAO While AGRIO and ODAA with the lowest mean value. And also the median value revealed that EXCH has the highest median value, followed by TRAO, AGRIO, ODAA and DOLA. According to the standard deviation result, DOLA, EXCH, TRAO, ODAA, and AGRIO have the highest values around the mean. Additionally, AGRIO, ODAA, EXCH, and DOLA

were shown to have a normally distributed series by the Jarque-Bera test statistics, as indicated by their respective p-values being greater than 5%. This implies that there was equa-variance in the current changes in agriculture, currency rates, and domestic loans to agriculture.

4.2 The Trend Analysis

Figure 1.1: Trend of Exchange Rate



Source: Author's Computation (2023)

The trend analysis of the Nigerian exchange rate from 1986 to 2018 is displayed in Figure 1.1. According to the graph, in 1986, the value of one US dollar was worth 2.02 naira. From that 1986-1988, it was 4.02 and 4.54 naira respectively. Implying increase of 100% in exchange when compare with its value in 1986. From 1989-1991, it was within the range of 1-unit digit with an increase average rate of 65.3% when compared with previous value. For instance, it was 7.39 naira, 8.04 naira and 9.91 naira in 1989-1991 respectively.

The naira's exchange rate to the US dollar took on a new dimension between 1991 and 1999, reaching a two-digit value. In 1991, it was 17.30 naira and 92.69 naira in 1991. This increase may be attributed to many factors which are military policies, external loan and political instability. As 2000, exchange rate of naira was at hundred units. Therefore, indicates unstable and spiral increase in exchange rate. Also, from 2001-2007, there was stability in exchange rate within this period. This could be attributed to favorable policies couple with debt relief of 18 billion US dollar granted to the country in 2006 from her overall reduction debt stock of \$30 billion. Also, exchange rate appreciation was experience in 2008 with a value of 118.57 naira compare with 2007 with a value of 125.83. From 2009-2014, exchange rate was stable. While, from 2015-2022, it was unstable and showing reduction in value of naira in relative to dollars.

4.3 Unit Root Test

The stationarity of the series was tested in this study using the Augmented Dickey Fuller (ADF) unit root test, and the findings are shown below.

Table 2: Unit Root Test Outcomes

Test at Level and Test at first level difference				
Variable	Test Statistic	5% critical value	Order of integration	DECISION
AGRIO	/6.252353/	/2.960411/	I (1)	Stationary
ODAA	/5.227609/	/2.986225/	I (0)	Stationary
EXCH	/4.034116/	/2.957110/	I (1)	Stationary
TRAO	/11.12961/	/2.957110/	I (1)	Stationary
DOLA	/5.744566/	/2.954021/	I (0)	Stationary

*Stationary at 5% Critical Level.

Source: Author's Computation (2023)

The results of the test at level and test at first differences for the Augmented Dickey Fuller (ADF) are displayed in Table 2. The output showed that ODAA and DOLA were stationary at level; while, all other variables such as AGRIO, EXCH and TRAO were stationanary (S) at first level difference. It is implied that the t-statistics for DOLA and ODAA were higher than the critical values at the 5% threshold of significance in absolute terms at level I (0). Additionally, it was determined that AGRIO, EXCH, and TRAO did not exhibit unit root problems at first level difference I (1) based on their t-statistics, which exceed the critical values at the 5% level of significance in absolute terms.

4.4 Test of Johansen Co-Integration

Table 3: Johansen Co-Integration Test

Trace Max-Eingen Statistics				Max-Eingen Statistics		
H ₀	Trace Statistics	Critical value at 5% level	Prob.	Max-Eingen Statistics	Critical value at 5% level	Prob.
None *	102.8557	69.81889	0.0000	63.79732	33.87687	0.0000
At most 1	39.05835	47.85613	0.2580	14.95705	27.58434	0.7516
At most 2	24.10130	29.79707	0.1962	13.79707	21.13162	0.3819
At most 3	10.30422	15.49471	0.2581	9.936823	14.26460	0.2161
At most 4	0.367399	3.841466	0.5444	0.367399	3.841466	0.5444

Source: Author's Computation (2023)

Table 3 displays the Johansen Co-integration test result. AGRIO, ODAA, EXCH, TRAO, and DOLA are found to co-integrate using both Trace and Maximal Eigen statistics. This suggests that the null hypotheses of the co-integrating vector were rejected by the Trace and Maximal Eigen value test statistics, indicating that co-integrating vectors occurred among the variables of interest. As a result, the dependent and independent variables have a long-term equilibrium connection, according to the findings of the study.

4.5 GARCH(1, 1) Results

Table 4: GARCH Result (Dependent Variable: AGRIO)

R ² = 0.640854 ; Adjusted R ² = 0.549937; Durbin-Watson stat = 1.873353				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
ODAA	0.730387	0.401692	1.894072	0.0713*
EXCH	-0.000305	0.000527	-0.579592	0.5622
TRAO	0.429005	0.204979	2.092922	0.0098**
DOLA	0.007400	0.001964	3.767821	0.0010**
Constant	0.302209	0.135173	2.235711	0.0254**

** & * indicate statistically significant at 5% & 10% significance level

Source: Author's Computation (2023)

The Generalized Auto Regressive Conditional Heteroscedasticity (GARCH) model was presented in Table 4. The ODAA coefficient result, as indicated by the p-value that was less than the p-value of 0.10 at the conventional level, shows a positive association to agricultural output growth and is statistically significant at the 10% significance level. Statistically, this implies that 1% increase in foreign aid to agriculture sector in Nigeria brought about 73.0% increases in agricultural output growth (provided that all factor affecting agricultural output growth is held constant), the result agrees with findings of (Abiola, 2022). Based on the derived co-efficient value, it can be inferred from the findings that the effect of ODAA during the years under consideration was substantial, suggesting that the effect is robust. This result has two economic ramifications and this finding is consistent with the specified a priori predictions. First, more inflow of foreign aid in term of loan, aid and other conventional aids directed toward agricultural sector like farming, fishing, farm machinery and others increase productivity in agricultural sector which directly influence its contribution to gross domestic product annually. Additionally, supporting the

agricultural sector promotes food security, allowing the nation's population to have access to wholesome food that satisfies their dietary requirements and food preferences for an active and healthy lifestyle. Research such as Verter (2017), De Souza (2015), Alabi (2014), John et al. (2018), and others came to the same result and demonstrated that ODAA increases productivity in the agricultural sector.

With a p-value at both the 0.5 and 0.10 levels, the exchange rate coefficient is non-significant and has a negative sign. The statistical result suggests that the exchange rate decelerates the growth in agricultural output while keeping other variables constant. Studies carried out by Alegwu *et al.* (2018), Jamalipouret *al.* (2016) and Oyinbo *et al.* (2014) confirmed an inverse and significant relationship between the duo; while, study carried out by Adekunle and Innocent (2018) confirmed a direct and significant effect between the duo. The exchange rate's negative sign is consistent with the a priori expectation of the investigation. The real exchange rate type, and length of study years have contributed to the exchange rate's non-significant results. For example, Adekunle and Innocent (2018) used the real exchange rate, whereas this analysis used the monthly average official exchange rate of the naira in relation to the US dollar.

According to the results, trade openness positively correlates with increase in agricultural output and is statistically significant at the 5% conventional threshold. This result was consistent with the priori prediction. There are numerous reasons for the importance of commercial openness. First, the sector's productivity rises in response to the demand for basic items like agricultural products for export. Also, provisions of infrastructural facilities for agricultural product through proceeds received from exportation of crude oil encourage productivity in the sector. The finding was consistency with the study of Olufayo and Fagile (2014) that established a direct and significant effect between trade openness and agricultural production.

The result of DOLA showed a positive coefficient and significance effect on agricultural output growth judging from the estimated *p-value* which was less than the significance level at 5%. The economic interpretation of this show that accessibility to loan by farmer couple with low interest on loans to agricultural sector by deposit money banks (DMBs) within Nigerian over the years in view influenced productivity of range of goods and services product in agricultural sector.

4.6 Measuring the Volatility Effect

Table 5: Estimation of Volatility Index

Variable	Coefficient	Std.Error	Z-Statistics	Prob.
ARCH (-1)	0.150000	0.378840	0.395946	0.6921
GARCH (-1)	0.600000	0.803985	0.746282	0.4555
Constant	0.000756	0.001688	0.447908	0.6542

Source: Author's Computation (2023)

The ARCH and GARCH results showed a positive and non-significant effect on agricultural output growth judging from the *p-value* of both variables that were greater than 0.05 and 0.10 significance levels. For ARCH results, it had a value of 15.0%; while, that of GARCH result was 60.0%. Thus, the findings imply absence of volatility clustering among foreign aid to agriculture, exchange rate, trade openness and domestic loan to agriculture. The implication of this finding is that the volatility on exchange rate does not necessary expose Nigeria's agricultural sector to external shocks. The non-significance of both ARCH and GARCH could be attributed to the fact that agricultural sector is mainly primary

production sector.

5 Conclusion and Recommendations

This study examined the effect of foreign aid and exchange rate volatility on agricultural output in Nigeria from 1986 to 2022. The descriptive statistics confirmed that average domestic loan to agriculture has the highest contribution to agricultural output growth, while foreign aid to agriculture is considered low. The findings from this study confirmed that agriculture, trade openness and domestic loan to agriculture had a direct and significant effect on agricultural output growth with exchange rate having inverse and non-significant effect on it. This study therefore, concludes that foreign aid, economy liberation and domestic loan to agriculture promote agricultural output in Nigeria. While a change in exchange rate volatility significantly decelerates agricultural output growth. Also, exchange rate volatility does not necessary expose Nigeria's agricultural sector to external shocks.

The study recommend government to seek for more foreign aids to boost productivity in agricultural sector and create food security. Therefore, government should give a clarion call to developed countries on the issues in order to boost local production of agricultural productivity. Policy makers should formulate policies that would encourage more inflow of agricultural needs in terms of machinery, expertise and others through international organization like Non-Governmental Organization (NGO) to agricultural sector. The apex bank must ensure that domestic loan assigned to agricultural sector has lowest interest rate compare to the real sector. This could be achieved by ensuring that lending interest rate to the agricultural sector of the economy is kept at affordable level that would encourage investment and make agricultural sector investment more attractive for both ordinary Nigerians and other prospect investors. Apex bank should ensure exchange rate stability within the economy.

References

- Abiola, A. (2022). The impact of exchange rate on agricultural output in Nigeria: A Structural Vector Autoregression Approach. *ACU Journal of Social and Management Sciences*, 2(1). 1-24.
- Adekunle, W. & Innocent, N. C. (2018). The impact of exchange rate dynamics on agricultural output performance in Nigeria. *Munich Personal RePEc Archive, MPRA Paper No. 87750*, 1-21.
- Alabi, R. A. (2014). Impact of agricultural foreign aid on agricultural growth in sub-Saharan Africa: A Dynamic Specification. *African Growth and Development Policy (AGRODEP) Working Paper, 0006*, July.
- Alabi, R. A. (2014). Impact of agricultural foreign aid on agricultural growth in Sub-Saharan Africa. *African Growth & Development Policy Modeling Consortium (AGRODEP Working Paper 0006)*.
- Alegwu, F. O., Aye, G. C. & Asogwa, B. C. (2018). Effect of real exchange rate volatility on agricultural products export in Nigeria. *AGRIS on-line Papers in Economics and Informatics*, 10(3), 3-15.
- Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity. *Journal of econometrics*, 31(3), 307-327.
- Dangok, M. D. & Ige, O. T. (2020). Exchange rate volatility and agricultural commodity prices i Nigeria (2000-2018). *International Journal of Business, Economics and Management*, 7(5), 290-300.
- De Souza, J. P. (2015). *Essays on Growth Complementarity Between Agriculture and Industry in Developing Countries*. University of Massachusetts Amherst.
- Eze, S. O. (2020). Empirical evidence of a long-run relationship between agriculture and

- manufacturing industry output in Nigeria. *Journals.sagepub.com/home/sgo*. 2020: 1–12.
- Falade, A. O. O., Aladejana, S. A. & Oluwalana, F. A. (2018). External debt in Nigeria: How sustainable using Heavily Indebted Poor Countries (HIPC) indicators? *AAU Analof Accounting, Educational and Social Research*, 5(2), 34-43.
- Ideba, E E., Iniobong, E., Otu., W. and Ito, N. (2014), ‘Analysis of Agricultural Public Capital Expenditure and Agricultural Economic Growth in Nigeria,’ *American Journal of Experimental Agriculture*, 4(4), 443-456.
- Jamalipour, M., Farsi, M. M. & Ghorbani, M. (2016). Investigation the impact of exchange rate volatility on the export of agricultural products. *Journal of Agricultural Economics and Development*, 30(1), 3-15.
- John W. M. & Jeffrey, D. S. (2019). Agriculture, aid, and economic growth in Africa. *The World Bank Economic Review*, 33(1), 2019, 1–20.
- Kalibata, A., 2010. Agricultural Aid to Africa is Living Aid. Available on the internet at <http://blog.bread.org/2010/10/listen-to-these-african-voices-as-our-governments-take-action-we-need-the-international-community-to-do-its-part-as-we.html>.
- NBS (National Bureau of Standards). (2015). “National construction contracts and law survey.” (<:: <https://www.thenbs.com/> :: /nbs-national-construction-contracts-and-law-survey-2015).
- Nwanji, T. I., Lawal, A. I., Asamu, F. & Inegbedion, H. (2019). Effects of foreign trade on agricultural output in Nigeria (1981-2018). *International Journal of Mechanical Engineering and Technology (IJMET)*, 10(3), 749–758.
- Olaoye, O. O. (2022). Impact of Exchange Rate Fluctuations on the Nigerian Agricultural Sector. *BVIMSR Journal of Management Research*, 14(1), 1-10.
- Olufayo, M.B; Fagite B.A. (2014). “Exchange Rate Volatility and Sectoral Export of Nigeria: Case of Oil and Non-oil Sectors”. *Journal of Economics and Sustainable Development*, 5, (10), 66-69.
- Omorogiuwa, O., Zivkovic, J., & Ademoh, F. (2014). The role of agriculture in the economic development of Nigeria. *European Scientific Journal*, 10(4), 133–147.
- Onyango, D. W. (2014) The impact of real exchange rate volatility on economic growth in Kenya. Unpublished M.Sc. theses.
- Oyinbo, O., Abraham, F. & Rekwot, G.Z. (2014). Nexus of exchange rate deregulation and agricultural share of agricultural share of Gross Domestic Product in Nigeria. *CBN Journal Applied Statistics*, 15(2), 49-64.
- Reaz, Md., Mahat, F., Dahir, A. M., Sahabuddin, M., Al Mahi A. S., & Md. M. (2017). Exchange rate volatility and financial performance of agriculture firms in Malaysia: An empirical analysis using GARCH, wavelet and system GMM. *Business and Economic Horizons*, 13(3), 409-427.
- Solow, R. M. (1991). Sustainability: an economists perspective.
- Solow, R.M., (1956). A Contribution to the Theory of Economic Growth, *Quarterly Journal of Economics* 70 (1), 65 – 94.
- Ssozi, J., Asongu, S., & Amavilah, V. H. (2019). The effectiveness of development aid for agriculture in Sub-Saharan Africa. *Journal of Economic Studies*, 46(2), 284-305.
- Swan, T.W., (1956). Economic Growth and Capital Accumulation, *Economic Record* 32 (63), 334 – 361.
- Verter, N. (2017). The impact of agricultural foreign aid on agriculture in Nigeria. *Bulg. J. Agric. Sci.*, 23(5), 689–697.
- Wong, H. T., & Lee, H. A. (2016). Exchange rate volatility and exports of Malaysian manufactured goods to China: An empirical analysis. *International Journal of Business and Society*, 17(1), 145-149.
- Yiew, T. H., & Lau, E. (2018). Does foreign aids contribute to or impeded economic growth. *Journal of International Studies*, 11(3), 21-30.

