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Foreign exchange fluctuations on the performance of agricultural export in Nigeria

Udoh, Francis Sylvanus[1]✉
Inim, Victor Edet[2]
Ityav, Doofan Lynda[3]


(✉ Corresponding Author)

[1]*Department of Business Administration, Nile University of Nigeria, Abuja, Nigeria.*
Email: slyosly79@gmail.com
[2]*Department of Accounting, Nile University of Nigeria, Abuja, Nigeria.*
Email: victor.inim@nileuniversity.edu.ng
[3]*Department of Business Administration, Nasarawa State University, Keffi, Nigeria.*
Email: lityav@ymail.com

Abstract

The study examines the effect of foreign exchange fluctuation on the performance of agricultural export in Nigeria. Despite the emphasis place on foreign exchange, the agricultural export in Nigeria is still not performing well. Time frame was from 1986 to 2021 and the adopted research design was ex post facto, in which the tool of analysis employed was the ARDL, ECM method, co-integration and unit root test as finding revealed that foreign exchange fluctuation on the performance of agricultural volume and value added has negative and insignificant effect in Nigeria. While foreign exchange fluctuation on the performance of agricultural capacity utilization has a positive and significant impact. Giving this finding, recommendations are that Nigerian government should moderate and regulate the rate of exchange activities in order to make certain that it brings about better performance in the agricultural sector. Also, she should strongly attempt to make better the stand of the economy internationally with other nations of the world in order to expand the market for Nigerian agricultural exports. Finally, the government should change the focus of its policy in direction to the external agricultural sector and making sure that it adds in the most favourably way to output performance. As an intentional policy, the government should give support to rural area agriculture by which investors in distinct communities and commodities should be encourage to set up agricultural industries, which will be solely on local raw materials comprising equipment and machines.

Keywords: Capacity utilisation and value added, Foreign exchange rate, Output.
JEL Classification: B27; Q13; Q14; Q17.

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Contents

Contribution of this paper to the literature
This study concentrated on the overall effect of foreign exchange fluctuation and agricultural export. However, none of these studies used output, capacity utilization and value added to measure agricultural export. Also, the study window is from 1986 to 2021. Based on these identifications, the study contributes to literature.

1. Introduction

The rapidly increasing global economy in today's world with a constantly changing technology and the laws of trade internationally, has affected the way exchange rate plays its role in valuing farm equipment and production. For many years, the role of exchange rates as an integral part of agricultural economics was overlooked (Kristinek & Anderson, 2002). It was Schuh (1974) in his work titled the role of exchange rates in agricultural trade that brought this topic to bare. His evidence in support of the idea is that the drop in agricultural exports due to their relative expense in other nations was caused by the overvalued dollar. His view was that while many variables affect agriculture, the exchange rate plays a role in all aspects of agriculture (Kristinek & Anderson, 2002).

Nigeria got her independence in 1960 and during this period, agriculture played a dominant role in her economy, but it was soon taken for granted because the government gave it a very little support. This little support provided by government for agricultural development was concentrated on export crops like cocoa, groundnut, palm produce, rubber and cotton as self-sufficiency in food production seemed not to pose any problem worthy of public attention (FMOAWARD, 2018).

The agriculture in Nigeria started witnessing some problems and these issues were clearly evident from rising food prices, increasing food supply short-fall and declining foreign exchange earnings from agricultural exports. However, not much rational concern was shown because the problems were thought to be the temporary effects of a series of crises which eventually culminated in the civil war (1967 – 70) (FMOAWARD, 2018).

After 1960, from 1970 to 1979, the agricultural situation worsened in Nigeria as a result of rising food import bills, widening food supply-demand gaps and sharp decrease in government revenue from agriculture, in foreign exchange earnings from agricultural exports. The situation was further compounded by the residual effects of the civil war, severe droughts in some parts of the country, government fiscal and monetary policies and above all, an "oil boom" which created serious distortions in the economy and accelerated the rate of migration of labour from agriculture (FMOAWARD, 2018).

As stated by Abolagba, Onyekwere, Agbonkpolor, and Umar (2010) between 1970 and 1974, agricultural exports as a percentage of total exports fell from about 43 percent to slightly over 7 percent. Export of agricultural produce in the mid 1970s to the mid 1980s in Nigeria witnessed a sharp decrease by 17 percent. Abolagba et al. (2010) emphasized the fact that Nigeria has lost its role as one of the world's leading exporters of agricultural commodities.

According to FAOSTAT (2017) in 1961, Nigeria exported 197,000 tonnes of cocoa beans. In 1970, it went up to 304,000 tonnes and gradually went down to 153,000 tonnes in 1980. However, this number rose up to a staggering 485,000 tonnes in 2006, and unfortunately decreased to 248,000 tonnes in 2014. Natural rubber was exported to the tune of 58,000 tonnes in 1961 and subsequently increased to 147,000 tones in 1990 and in 2014 151,000 tonnes FAOSTAT (2017).

One of the important factor of world trade is exchange rate, which has received much notice in the circumstances of world imbalances. The subject of exchange rate fluctuation came to be a topical issue in Nigeria because it is the goal of every economy to have a stable rate of exchange with its trading partners (Slowe, 2013). In Nigeria, this aim was not achieved not minding the way the government went on underestimating the naira and okayed the Structural Adjustment Programme (SAP) in 1986. Not achieving this success, placed the Nigerian agricultural export under participating in a constant exchange rate fluctuation. The major goal of SAP was the reorganizing of the production base of the economy with a positive inclination for the production of agricultural export. The foreign exchange reforms that facilitated a cumulative depreciation of the effective exchange rate were expected to increase the domestic prices of agricultural exports and hence boost domestic production (Slowe, 2013). A serious impediment on economy development is fluctuation, which makes investment riskier and more problematic. Potential investors will invest in a foreign location only if the expected returns are high enough to cover for the currency risk (Gerardo & Felipe, 2002).

On this note, if foreign exchange is properly curtailed or kept low to agriculture, it will help agriculture export in Nigeria perform better and contribute to her Gross Domestic Product GDP of the economy. Despite the improvement of agricultural products in Nigeria, the performance of agricultural export is below expectation as a result of high exchange rate. The major problem however, is that the floating exchange rate from its inception, frequency and instability of the exchange rate movements and fluctuation has raise concerns over the effect of such movements on the performance of trade flows of agricultural export. It is on this basis that the work examines foreign exchange fluctuation on the performance of agricultural export in Nigeria.

Previous studies such as Adekunle, Tiamiyu, Odugbemi, and Ndukwe (2019) who investigated from 1981 to 2016 how the dynamics of real exchange rate affect performance of agriculture in Nigeria using the Nonlinear Autoregressive Distributed Lag (NARDL) method found a negative relationship between both variables. Also, Akinbode and Ojo (2018) who determined the effect of exchange rate volatility on Nigeria's agricultural export performance using annual data from 1980-2015, employed Generalized Autoregressive Conditional Heteroscedasticity (GARCH-1,1) model which was used to generate the exchange rate volatility series and subsequently incorporated into the Autoregressive Distributed Lag (ARDL) Model for determining factors affecting agricultural exports (cocoa and rubber), found an insignificant effect between both variables. However, none of these studies used output, capacity utilisation and value added to measure agricultural export. Also, the study window is from 1986 to 2021. Based on these identifications, the study fills a research gap.

The main purpose of this work was to examine the effect of foreign exchange fluctuation on the performance of agricultural export in Nigeria. Other related purposes are: to evaluate the effect of foreign exchange fluctuation on the performance of agricultural export volume in Nigeria: to examine the effect of foreign exchange fluctuation on

the performance of agricultural export capacity utilization in Nigeria and to determine the effect of foreign exchange fluctuation on the performance of agricultural export value added in Nigeria.

The hypotheses of the study are stated in null forms and tested from the purposes of the work:

Ho1: Foreign Exchange Fluctuation has no significant effect on the Performance of agricultural export Volume in Nigeria

Ho2: Foreign Exchange Fluctuation has no significant effect on the Performance of agricultural export Capacity Utilization in Nigeria

Ho3: Foreign Exchange Fluctuation has no significant effect on the Performance of agricultural export Value Added in Nigeria

1.1. Concept of Foreign Exchange

When the currency of a country is giving out for the currency of another country at any rate is known as exchange rate. The external value of each currency is reflected in the country's economic conditions in general and the purchasing power of the currency relative to that of other currencies in particular (Ani, Ugwunta, & Okanya, 2013). In other word, for international traders with a given price, the major source of uncertainty is the exchange rate at which they can translate their sales revenue in foreign currency into local currency (Adubi & Okunmaadewa, 2009).

1.2. Concept of Agricultural Export

Export of agricultural products are better motivation made available by various governments on products intended for other country market to support increased in global or other economy trading. In accordance, export agriculture refers to money granted by the state which are subject to chance on export performance. They may take the form of, for example, cash payments, disposal of government stocks at below-market prices, subsidies financed by producers or processors as a result of government actions such as assessments, marketing subsidies, transportation and freight subsidies, and subsidies for commodities contingent on their incorporation in exported products (FTIS, 2019).

1.3. Concept of Performance

Taticchi, Balachandran, Botarelli, and Cagnazzo (2008) stated that firm performance is the value, which is produced as a result of a certain activity. Each firm is established in order to fulfil specific purposes. When all performance factors are effectively utilised, turn out worth gets larger or astronomical than the expected worth, thus making the firms to survive or live longer. Competitive markets and the dynamics very likely become better of their performance so as to grow their profits and market value of the firm. The production process since the mid1980s have been controlled by the firm. In this aspect, firms became aware of that keeping up with continuously changing conditions is possible only by understanding firm performance, and they aimed for healthy growth (Taticchi et al., 2008).

1.4. Empirical Review

Shuabiu, Usman, and Çavuşoğlu (2021) examines nexus among Competitively Valued Exchange Rates, Price level, and Growth Performance in the Turkish Economy; New insight from the Global Value Chains (GVCs) is investigated using annual data from 1980 to 2020 within the framework of the ARDL bound test, Bayer and Hanck Cointegration (BHC) test, and ECM. It was revealed that the relationship among the variables used induced economic performance and external trade competitiveness both in the short and long run.

Due to a lack of data, Adekunle et al. (2019) looked into the potential asymmetric impact of real exchange rate changes on agricultural performance in Nigeria from 1981 to 2016. They decided to use the Nonlinear Autoregressive Distributed Lag (NARDL) approach. The ARDL unit root test was used to establish the use of both stationary and nonstationary variables. After accounting for several additional factors, the limits test for co-integration indicates that there is no long-term relationship between the variables. Results indicated that the study's key foundations were that it found both positive and negative relationships between the two variables.

Using annual data from 1980 to 2015, Akinbode and Ojo (2018) analyze the impact of exchange rate fluctuation on Nigeria's agricultural export performance. To identify factors influencing agricultural exports, the Autoregressive Distributed Lag (ARDL) Model was utilized to produce the exchange rate volatility series using the Generalized Autoregressive Conditional Heteroscedasticity (GARCH-1,1) model (cocoa and rubber). The Bounds test demonstrated a long-term link among the variables. This indicates that neither the long-term nor the short-term volatility of the currency rate has any beneficial effects on export.

2. Theoretical Framework

2.1. Clarks' Neoclassical Theory

The Clarks (1973) model, which assesses the relationship between exchange rate volatility and trade flows, is the theoretical framework that best fits this study. It is predicated on a competitive company without market power that produces just one commodity and sells it exclusively to one overseas market without importing any intermediate inputs. Since it is assumed that there are no hedging options, such as through advance sales of the foreign currency export sales, the company converts the revenues of its exports at the current exchange rate, which varies in an unpredictable manner. Furthermore, because it is expensive to change the scale of production, the firm decides on its output before the exchange rate is realized. As a result, it is unable to adjust its output in response to favorable or unfavorable changes in the profitability of its exports caused by changes in the exchange rate. In this case, the exchange rate is the sole cause of the firm's profit unpredictability, and risk has a negative impact on the firm's managers, thereby reduced output and hence lower exports occur as a result of increased exchange rate volatility without a corresponding change in average level, reducing risk exposure. Similarly, Koren and Szeidl (2003), states that exchange rate volatility should have an impact on trade volumes due to the exchange rate's correlation with other macroeconomic variables.

3. Methodology

Ex-post facto was the adopted research design, because the events the researcher is studying had already taken place. This design can also be applicable for studies geared toward ascertaining the cause-effect association between the independent and dependent variables (Onwumere, Onodugo, & Ibe, 2013). Evaluating the cause – effect relationships is the significant point of this study; hence, the data are time series, gotten from Central Bank of Nigeria (CBN) statistical bulletins and NBS, where inflation and interest rate are introduced as control variables covering the period 1986 - 2021. The annualised secondary data was analysed using the Autoregressive Distributed lag (ARDL) and Error Correction Mechanism (ECM), as well as employing the co-integration method to test for the long-run effect among the series. In other words, the underlining postulation is that all variables are integrated of order 1 or I (1).

3.1. Model Specification

Giving the theoretical review, the econometric model employed in this study to examine the effect of foreign exchange fluctuation on the performance of agricultural export in Nigeria will be formulated following the study of Umaru, Sa'idu, and Musa (2013) and Karimi and Husyin (2015) with modification by including real exchange rate, agricultural export volume, agricultural export capacity utilisation and agricultural value added to the contribution to GDP. Thus, the model for this study was specified as:

$$AVC = f(RFE, INF, INT) \quad (1)$$

$$AGCU = f(RFE, INF, INT) \quad (2)$$

$$AGVA = f(RFE, INF, INT) \quad (3)$$

Equation 1, 2 and 3 above presents the dependent variable Agricultural export proxy by Agricultural Volume, Agricultural Capacity Utilization and Agricultural Value Added as a function of the independent variable, given as Real Foreign Exchange and control variables of Inflation rate and interest rate.

Where:

AVC = Agricultural volume (Output).

AGCU = Agricultural capacity utilization.

AGVA = Agricultural value added.

RFE = Real foreign exchange.

INF = Inflation rate (Control variable).

INT = Interest rate (Control variable).

Incorporating our effect of foreign exchange fluctuation on agricultural export performance relationship into the unrestricted ARDL model framework so as to obtain the conditional (restricted) ARDL steady-state model (which was accomplished by applying Ordinary Least Square (OLS) methods to estimate the general ARDL model), of the form:

$$\Delta AVC_t = \alpha_0 + \sum_{i=1}^{m} \alpha_1^i \, \Delta AVC_{t-i} + \sum_{j=0}^{n} \alpha_2^i \, \Delta RFE_{t-j} + \sum_{k=0}^{o} \alpha_3^i \, \Delta INF_{t-k} + \sum_{m=0}^{P} \alpha_4^i \, \Delta INT_{t-k} + \lambda_1 AVC_{t-1} + \lambda_2 RFE_{t-1} + \lambda_3 INF_{t-1} + \lambda_4 INT_{t-1} + \varepsilon_t \quad (4)$$

$$\Delta AGCU_t = \alpha_0 + \sum_{i=1}^{m} \alpha_1^i \, \Delta AGCU_{t-i} + \sum_{j=0}^{n} \alpha_2^i \, \Delta RFE_{t-j} + \sum_{k=0}^{o} \alpha_3^i \, \Delta INF_{t-k} + \sum_{m=0}^{P} \alpha_4^i \, \Delta INT_{t-k} + \lambda_1 AGCU_{t-1} + \lambda_2 RFE_{t-1} + \lambda_3 INF_{t-1} + \lambda_4 INT_{t-1} + \varepsilon_t \quad (5)$$

$$\Delta AGVA_t = \alpha_0 + \sum_{i=1}^{m} \alpha_1^i \, \Delta AGVA_{t-i} + \sum_{j=0}^{n} \alpha_2^i \, \Delta RFE_{t-j} + \sum_{k=0}^{o} \alpha_3^i \, \Delta INF_{t-k} + \sum_{m=0}^{P} \alpha_4^i \, \Delta INT_{t-k} + \lambda_1 AGVA_{t-1} + \lambda_2 RFE_{t-1} + \lambda_3 INF_{t-1} + \lambda_4 INT_{t-1} + \varepsilon_t \quad (6)$$

$\lambda_1 - \lambda_4$ = Long run multipliers.

k = Belonging to identified best lags orders of the variables entering ARDL-ECM.

$\alpha_1 - \alpha_4$ = coefficients of short run dynamics.

t = time.

Δ = First difference operator.

α_0 = Intercept or drift operator.

ε_t = Error term.

Following position of Menike (2016) the relationship between foreign exchange fluctuations and agricultural exports is specified as:

$$\Delta AVC_t = \alpha_0 + \sum_{i=1}^{m} \alpha_1^i \, \Delta AVC_{t-i} + \sum_{j=0}^{n} \alpha_2^i \, \Delta RFE_{t-j} + \sum_{k=0}^{o} \alpha_3^i \, \Delta INF_{t-k} + \sum_{m=0}^{p} \alpha_4^i \, \Delta INT_{t-k} + \delta ect_{t-1} + \varepsilon_t \quad (7)$$

$$\Delta AGCU_t = \alpha_0 + \sum_{i=1}^{m} \alpha_1^i \, \Delta AGCU_{t-i} + \sum_{j=0}^{n} \alpha_2^i \, \Delta RFE_{t-j} + \sum_{k=0}^{o} \alpha_3^i \, \Delta INF_{t-k} + \sum_{m=0}^{p} \alpha_4^i \, \Delta INT_{t-k} + \delta ect_{t-1} + \varepsilon_t \quad (8)$$

$$\Delta AGVA_t = \alpha_0 + \sum_{i=1}^{m} \alpha_1^i \, \Delta AGVA_{t-i} + \sum_{j=0}^{n} \alpha_2^i \, \Delta RFE_{t-j} + \sum_{k=0}^{o} \alpha_3^i \, \Delta INF_{t-k} + \sum_{m=0}^{p} \alpha_4^i \, \Delta INT_{t-k} + \delta ect_{t-1} + \varepsilon_t \quad (9)$$

Equations 4 to 9 above presents the logged dependent variable Agricultural export proxy by Agricultural Volume, Agricultural Capacity Utilization and Agricultural Value Added as a function of the independent variable, given as Real Foreign Exchange and control variables of Inflation rate and interest rate.

4. Data Analysis and Results

4.1. Testing for Unit Root

Data from time series are generally described by a stochastic pattern that can be eliminated by differentiation. Therefore, the unit root is a test of the non-stationary or stationary existence of the data employed in this description. This is to find out whether there is a spurious or nonsensical relationship between foreign exchange fluctuation and performance of agricultural export in Nigeria. Thus, as shown in Table 1, the study employed Augmented Dickey-Fuller (ADF) techniques to test and verify the series unit root property and model stability.

Table 1. Unit root of 1st and 0 order test result of the variables.

Variable	ADF test statistics		
	ADF	Critical value	Order of integration
AVC	-6.978246	-4.309824	I (1)
AGCU	-3.508251	-3.207094	I (1)
AGVA	-5.840353	-4.252879	I (1)
INT	-4.204566	-3.580623	I (1)
INF	-3.707572	-3.562882	I (0)
RFE	-3.477945	-3.204699	I (0)

Note: The tests include intercept and trend.

From Table 1 it could be observed that the results from ADF showed that four of the variables (which are AVC, AGCU, AGVA and INT) are integrated at order one; while two of the variables (which are INF and RFE) are integrated at order zero.

The variables which were found to be stationary at first difference, have their ADF test statistics as: -6.978246, -3.508251, -5.840353, -4.204566; and they were found to be greater than the critical values of: -4.309824 (at 1%); -3.207094 (at 10%); -4.252879 (at 1%); -3.580623 (at 5%) respectively.

4.2. Co-integration Test (Bound Test Approach) Results

If there is equilibrium relationship or a long term in variables, it means that they are co-integrated. To avoid false or fake regression situations there must be a pre-test. Table 2 presents the summary results of ARDL bounds test for Co-integration for the three models (agricultural volume model, agricultural capacity utilization model; and for agricultural value-added model) using Akaike Information Criterion (AIC) recommended lags.

Table 2. Bound test-co-integration results of lower ($I(0)$) and upper bound ($I(1)$).

AVC-model	F-statistic	3.642942			Decision
	Significance	5%	$I(0)$	2.39	Co-integrated
			$I(1)$	3.38	
AGCU-model	F-statistic	3.793283			Co-integrated
	Significance	10%	$I(0)$	2.39	
			$I(1)$	3.38	
AGVA-model	F-statistic	15.31406			Co-integrated
	Significance	5%	$I(0)$	2.39	
			$I(1)$	3.38	

Note: ** significant at 5%.

Foreign currency rates and AVC have a long-run or equilibrium relationship, according to the co-integration test result from Table 2. This was shown by the F-statistic value of 3.642942, which at the 5% level of significance was found to be greater than the lower (I(0)) and upper bound (I(1)) critical values of 2.39 and 3.38, respectively.

The F-statistic value of 3.793283, which is greater than the lower (I(0)) and upper bound (I(1)) critical values of 2.39 and 3.38, respectively, and also at the 5% significant level, revealed the existence of a co-integrating connection between foreign exchange rates and AGCU.

Finally, the F-statistic value of 15.31406 is greater than the lower (I(0)) and upper bound (I(1)) critical values of 2.39 and 3.38 respectively at the 5% significant level, providing evidence of a co-integrating relationship between foreign exchange rates and AGVA. The analysis consequently comes to the conclusion that the independent and dependent variables have a long-term, or equilibrium, connection in Nigeria during the time period under consideration; as a result, the study moves forward using error correction models.

4.3. Model Estimation and Results Evaluation

The study has established that there is a co-integrating connection between foreign exchange fluctuation and performance of agricultural export in Nigeria; as such, the study moves to calculate the long-run models and error correction. The ARDL-ECM result examines in what manner the ARDL model changes to the long-run equilibrium. The study utilised a general-to-specific modelling approach to derive a satisfactory reduced short-run dynamic policy captured in Table 3, 4, and 5.

Hypothesis one: Foreign Exchange Fluctuation and Performance of agricultural export Volume in Nigeria.

The ect(-1) depicts adjustment of the speed to bring back the long run in the activity model coming after an interruption. The coefficient of the estimated ect(-1) equals -0.5601 puts forward a prompt speed of adjustment back to the long-run equilibrium. The coefficient is appropriately signed and to a greater degree significant at the 1 percent significance level. This hugely significant ect is emphasised fact of the existence of a stable long-term relationship.

Table 3. Auto-regressive distributive lag regression result.

Dependent variable: D(AVC)				
ARDL error correction regression				
Variable	**Coefficient**	**Std. error**	**T-statistic**	**Prob.**
D(AVC(-1))	-0.7055	0.184346	-3.82706	0.0123
D(RFE)	9.164678	1.482621	6.181402	0.0016
D(RFE(-1))	-0.98868	1.094113	-0.90363	0.4076
D(RFE(-2))	4.472565	1.236556	3.616953	0.0153
D(INF)	9.212627	2.723365	3.38281	0.0196
D(INF(-1))	-11.9096	2.45619	-4.8488	0.0047
D(INF(-2))	7.366478	2.241361	3.28661	0.0218
D(INT)	-14.3228	3.202153	-4.47287	0.0066
D(INT(-1))	21.32017	3.551261	6.003549	0.0018
D(INT(-2))	21.43774	3.505539	6.115392	0.0017
CointEq(-1)*	-0.560133	0.087799	-6.379758	0.0014
R-squared	0.841708	Mean dependent var		0.85
Adjusted R-squared	0.611466	S.D. dependent var		2.836829
F-statistics (and P-value)	9.768266 (0.00002)	Akaike info criterion		4.257852
Durbin-Watson stat	2.007263	Schwarz criterion		5.066691

Note: * $p < 0.1$.

The coefficient of determination (R-square) indicates that the model was reasonably fit in prediction. It showed that 84.17% changes in AVC were unanimously owed to RFE, INF and INT, while 15.83% not included variations was represented as the error term.

The overall importance of regression model, which is the F-statistic reveal a significant result as examined. The value of the F-statistic captures it at 9.76 and its associated value of 0.000002 at 5% level was found to be significant.

It is further proof in the result that among the variables, there is absence of autocorrelation as proven by Durbin Watson (DW) statistic of 2.00. It showed that the data can be depended upon and are impartial.

Hypothesis Two: Foreign Exchange Fluctuation and Performance of agricultural export Capacity Utilization in Nigeria.

Table 4. ARDL regression result.

Dependent variable: D(AGCU)				
ARDL error correction regression				
Variable	**Coefficient**	**Std. error**	**T-statistic**	**Prob.**
D(AGCU(-1))	-0.45659	0.094461	-4.83358	0.0013
D(RFE)	-6.02E-05	0.000361	-0.16661	0.8718
D(RFE(-1))	0.002052	0.000488	4.204631	0.003
D(RFE(-2))	-0.00069	0.000517	-1.33548	0.2185
D(RFE(-3))	0.001405	0.000497	2.827868	0.0222
D(INF)	-0.0029	0.000633	-4.5786	0.0018
D(INF(-1))	0.00344	0.000834	4.12341	0.0033
D(INF(-2))	0.003392	0.000708	4.793683	0.0014
D(INF(-3))	0.003382	0.000742	4.556027	0.0019
D(INT)	85.12271	17.93108	4.747215	0.0015
D(INT(-1))	45.25082	10.14136	4.462009	0.0021
D(INT(-2))	37.72435	12.42301	3.03665	0.0161
D(INT(-3))	30.40713	10.16939	2.990065	0.0173
CointEq(-1)	-0.38839	0.056976	-6.81672	0.0001
R-squared	0.930433	Mean dependent var		-0.03316
Adjusted R-squared	0.845958	Standard deviation dependent var		4.213092
F-statistics (and P-value)	8.2556 (0.000)	Akaike info criterion		4.142062
Durbin-Watson stat	2.22199	Schwarz criterion		4.966539

The Error Correction Model (ECM) parameter is negative, less than unity and significant at 5% level as expected. The ECM is an error correction term in the model to restore back equilibrium, and validates that there exists a long run equilibrium relationship among the variables. The value of the ECM is 38.83%, meaning that the system corrects (or adjusts to) equilibrium in the following year at speed of 38.83% which is good.

To show the elucidatory capacity of the model and the reliability of the estimates, the coefficient of determination (R-square) was deployed. It indicates how the model was in a sensible way fit in forecasting. It emphasized that 93.04 percent alterations to AGCU were collectively due to RFE, INF and INT, at the same time 6.96% represents the white noise.

To determine the whole importance of the regression model in the same extent, the F-statistic was used to evaluate it and was revealed that the results are significant. 8.25 captures the value of the F-statistic and its affiliated probability value of 0.000 having been discovered to be significant at 5% level. The Durbin Watson (DW) statistic of 2.22 in the model emphasized that there is absence of autocorrelation between the independent and dependent

variables (as it fell within the acceptable range of 1.5 and 2.4). This proves that unbiased estimates can be depended on to make decision on policy.

Hypothesis Three: Foreign Exchange Fluctuation and Performance of agricultural export Value Added in Nigeria.

The lagged error correction term (ECT(-1)) was considerably statistically significant at 5% less than unity and negative, as expected. The coefficient revealed that once the system is out of equilibrium, it will require an average (high) speed of 34.68% for it to return to a state of long-run equilibrium. The calculated model is reasonably good at making predictions, according to the coefficient of determination (R-square), which was used to assess the goodness of fit of the model. It revealed that RFE, INF, and INT together were responsible for 98.53 percent of changes in AGVA, whereas the error term was able to explain for 1.47 percent of unaccounted fluctuations.

In addition, the full model is likewise significant at the 5% level, according to the F-statistic value of 10.233 and its associated probability value of 0.000. The Durbin Watson (DW) statistic of 2.29 from the model also showed that the variables did not exhibit any autocorrelation. This demonstrated that the estimations were objective and could be trusted for making policy judgments as well.

Table 5. ARDL error correction regression.

Dependent variable: D(AGVA)				
ARDL error correction regression				
Variable	**Coefficient**	**Std. error**	**t-Statistic**	**Prob.**
D(AGVA(-1))	1.037668	0.086699	11.96858	0.0013
D(AGVA(-2))	0.035936	0.056903	0.631519	0.5725
D(AGVA(-3))	-2.63654	0.20328	-12.97	0.001
D(REF)	29.08825	1.894067	15.35756	0.0006
D(REF(-1))	-16.9905	1.243886	-13.6592	0.0008
D(REF(-2))	12.38867	0.987773	12.54202	0.0011
D(INF)	27.31271	2.244818	12.167	0.0012
D(INF(-1))	-29.02	3.057898	-9.49018	0.0025
D(INF(-2))	-25.5089	2.359674	-10.8104	0.0017
D(INF(-3))	-44.9569	2.767935	-16.242	0.0005
D(INT)	9.28747	2.710911	3.425958	0.0417
D(INT(-1))	34.74633	2.701423	12.86223	0.001
D(INT(-2))	-4.44554	3.163681	-1.40518	0.2546
D(INT(-3))	-45.0603	3.766716	-11.9628	0.0013
CointEq(-1)	-0.34682	0.019339	-17.9331	0.0004
R-squared	0.985399	Mean dependent var		0.125625
Adjusted R-squared	0.949709	S.D. dependent var		5.336756
F-Statistics (and P-value)	10.233 (0.000)	Akaike info criterion		3.366169
Durbin-Watson stat	2.29617	Schwarz criterion		4.419666

4.4. Statistical Test of Hypotheses

H_{01}: Foreign Exchange Fluctuation has no significant effect on the Performance of agricultural export Volume in Nigeria.

Table 6. Wald test results on foreign exchange fluctuation and performance of agricultural export volume in Nigeria.

Test statistic	**Value**	**Df**	**Probability**
F-statistic	1.280560	(9, 5)	0.4122
Chi-square	11.52504	9	0.2414

The Wald-test in Table 6 indicated that the calculated F-value for the relationship between Foreign Exchange Fluctuation and the Performance of agricultural export Volume in Nigeria is 1.280560, and its probability value is 0.4122. For the reason that the probability value is greater than 0.05 at 5% level of significance, it means it falls in the region of acceptance and as a consequence, hypothesis one in a null form (H_{01}) was accepted. The result emphasizes that Foreign Exchange Fluctuation has no significant effect on the Performance of agricultural export Volume in Nigeria.

H_{02}: Foreign Exchange Fluctuation has no significant effect on the Performance of agricultural export Capacity Utilization in Nigeria.

Table 7. Wald test results on foreign exchange fluctuation and performance of agricultural export capacity utilization in Nigeria.

Test statistic	**Value**	**Df**	**Probability**
F-statistic	12.25883	(7, 5)	0.00255
Chi-square	14.25369	5	0.00293

The Wald-test in Table 7, indicated that the calculated F-statistic value for the relationship between Foreign Exchange Fluctuation and the Performance of agricultural export Capacity Utilization in Nigeria was found to be 12.25883 and its probability value was 0.0025. For the reason that the probability value is less than 0.05 or 5% level of significance (and fell in the rejection region), hypothesis 2 in the null (H_{02}) was rejected. The study concludes, Foreign Exchange Fluctuation has a positive and significant effect on the Performance of agricultural export Capacity Utilization in Nigeria.

H_{03}: Foreign Exchange Fluctuation has no significant effect on the Performance of agricultural export Value Added in Nigeria.

Above all, the Wald-test in Table 8, the indicated that the F-value for the relationship between Foreign Exchange Fluctuation and the Performance of agricultural export Value Added in Nigeria was found to be 7.160760; with an associated probability value of 0.0657. Since the probability value is greater than 0.05 or 5percent level of significance, the third null hypothesis (H_{03}) was accepted. The study thus concludes that Foreign Exchange Fluctuation has no significant effect on the Performance of agricultural export Value Added in Nigeria.

Table 8. Wald test results on foreign exchange fluctuation and the performance of agricultural export value added in Nigeria.

Test statistic	Value	Df	Probability
F-statistic	7.160760	(8, 5)	0.0657
Chi-square	85.92912	5	0.0000

5. Discussion of Findings

That Foreign Exchange Fluctuation was seen to have insignificant effect on the performance of agricultural export Volume in Nigeria. This is in agreement with the results of Akinbode and Ojo (2018) whose findings revealed the volatility of exchange rate does not affect export significantly in the long and short-run. This may be to a limited extent ascribed to the inelastic qualities of agricultural commodities' supply most importantly in the short run. It was also exposed that there exists insignificant relationship among agricultural export and GDP, world prices, exchange rate and inflation. The findings further agreed with Omojimite (2014) whose study showed that foreign exchange fluctuations through spread of interest rate was found to have no positive and significant effect on agricultural output in Nigeria.

Furthermore, discovery from the analysis shows that foreign Exchange Fluctuation has a significant effect on the Performance of agricultural export Capacity Utilization in Nigeria. It showed that the significant fundamentals were real exchange rate, real appreciation and depreciation (after some lags), has significant effect on agricultural export capacity utilization in Nigeria (after some lags) in the short run. This aligned with the findings of Shuabiu et al. (2021) whose study showed that there is a relationship among between the variables.

Foreign Exchange Fluctuation has no positive effect on the Performance of agricultural export Value Added in Nigeria. The implication of this findings is that, unstable exchange rates impacted ineffectively on Performance of agricultural export Value Added in Nigeria. This is in agreement with Brownson, Vincent, Emmanuel, and Etim (2012) whose study showed that in both long run and short run, real exports, real external reserves, inflation, and external debt have insignificant negative effects on agricultural productivity, whereas industrial capacity utilization and nominal exchange rate promote agricultural productivity in Nigeria. The study is in line with the Clarks (1973) theory, which views exchange rate and trade flows as a perfect way for firms to earn foreign currency.

6. Conclusion and Recommendation

Empirical result disclosed no effect between foreign exchange fluctuation and agricultural volume, which is the output sector in Nigeria in the long run. The study also concluded that foreign exchange fluctuation does not cause agricultural volume to increase or perform well, which would have led to corresponding increase in agricultural output at 5% level of significance. Also, the second null hypotheses revealed that foreign exchange fluctuation has no negative and insignificant effect on the performance of agricultural capacity utilization in Nigeria. Based on the findings it is established that foreign exchange fluctuation impact on agricultural capacity utilization as its optimum capacity utilization causes foreign exchange to increase in Nigeria within the period of reviewed. Finally, the study concludes that foreign exchange fluctuation does not affect value added in Nigeria. with this, the study concludes that foreign exchange fluctuation does not cause agricultural value added to contribute to the GDP of the economy and that foreign exchange does not influence agricultural sector value added to grow and conclude that their relationship is insignificant and negatively related. Based on these conclusions, the study recommends that Nigerian government should moderate and regulate the rate of exchange activities in order to make certain that it brings about better performance in the agricultural sector. Also, she should strongly attempt to make better the stand of the economy internationally with other nations of the world in order to expand the market for Nigerian agricultural exports. Finally, the government should change the focus of its policy in direction to the external agricultural sector and making sure that it adds in the most favourably way to output performance. As an intentional policy, the government should give support to rural area agriculture by which investors in distinct communities and commodities should be encourage to set up agricultural industries, which will be solely on local raw materials comprising equipment and machines. Hence, this will increase and advanced the market capacity utilization and value added locally.

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