

AGRICULTURAL EXPORTS, EXCHANGE RATE AND ECONOMIC GROWTH IN NIGERIA: 1986–2025

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ABSTRACT

This study examined the effect of agricultural exports and exchange rate movements on economic growth in Nigeria over the period 1986 to 2025. The study was motivated by the persistent depreciation of the naira alongside the declining contribution of agricultural exports to Nigeria's foreign exchange earnings since the adoption of the Structural Adjustment Programme (SAP) in 1986, and the inconclusive empirical evidence on how these two variables jointly shape long-run output performance. Specifically, the study sought to examine the effect of agricultural exports on economic growth, determine the effect of the exchange rate on economic growth, and ascertain the relationship between trade openness and economic growth in Nigeria, with trade openness employed as a control variable. Annual time series data were sourced from the Central Bank of Nigeria Statistical Bulletin, the National Bureau of Statistics, the Nigerian Export Promotion Council, and the World Bank World Development Indicators. The Augmented Dickey-Fuller (ADF) test revealed that the variables were integrated of mixed order, $I(0)$ and $I(1)$, which justified the use of the Autoregressive Distributed Lag (ARDL) Bounds testing approach to cointegration. The Bounds test confirmed the existence of a long-run relationship among the variables. Estimates from the ARDL model showed that agricultural exports (AGREXP) had a positive and significant effect on real GDP, exchange rate (EXR) exerted a negative and significant effect on real GDP, while trade openness (TOP) had a positive and significant effect on real GDP. The error correction term was negative, less than unity, and statistically significant, confirming a stable long-run adjustment process with about 68.7% of short-run disequilibrium corrected annually. The explanatory variables jointly accounted for approximately 97.8% of the systematic variation in real GDP. The study concludes that naira depreciation has been growth-retarding over the review period, while agricultural export expansion and greater trade openness have supported growth, and recommends export diversification, exchange rate stability, and agro-export competitiveness policies.

Keywords: Agricultural Exports, Exchange Rate, Economic Growth, Trade Openness, Autoregressive Distributed Lag.

1.0 INTRODUCTION

1.1 Background to the Study

The relationship between agricultural exports, exchange rate policy, and economic growth has remained a central concern in Nigeria's development discourse, particularly since the Structural Adjustment Programme (SAP) of 1986, which liberalized the foreign exchange market and shifted the naira to a market-determined regime (Obadan, 2024; Sanusi, 2018). Prior to the 1970s oil boom, agriculture was the mainstay of Nigeria's export earnings, with cocoa, groundnut, palm oil, and cotton dominating the export basket (Iyoha & Oriakhi, 2022). Oil discovery progressively crowded out agricultural exports, a phenomenon described as the "Dutch Disease" effect, whereby resource-based exports appreciate the real exchange rate and erode non-oil tradable competitiveness (Sachs & Warner, 1995).

Since 1986, Nigeria has experimented with several exchange rate regimes, including the Second-Tier Foreign Exchange Market, the Dutch Auction System, the interbank window, and, most recently, the unification of exchange rate windows under the "willing buyer, willing seller" model introduced in June 2023 (CBN, 2023). Each reform has been accompanied by episodes of sharp naira depreciation, with the exchange rate moving from approximately ₦2.02/US\$1 in 1986 to over ₦1,500/US\$1 by 2025 (CBN, 2024). Theoretically, depreciation should improve agricultural export competitiveness by making exports cheaper in foreign currency terms (Balassa, 1978; Edwards, 1993). In practice, however, the pass-through has been weak, constrained by poor infrastructure, high production costs, import dependence on agricultural inputs, and post-harvest losses (Adubi & Okunmadewa, 2019; Akpan et al., 2016).

Agricultural exports as a share of total exports declined from about 30% in 1986 to less than 5% by the mid-2010s before a modest recovery in recent years, aided by diversification drives such as the Anchor Borrowers' Programme and the Zero Reject policy for agricultural produce (NEPC, 2023; FMARD, 2022). Meanwhile, the structuralist school associated with Krugman (1994) and Taylor (1983) warns that in import-dependent economies, depreciation can be contractionary, raising the cost of imported inputs and capital goods and depressing output growth. This theoretical ambiguity, combined with Nigeria's persistent depreciation without a commensurate agro-export response, and the paucity of studies covering the 2023 unification and data up to 2025, motivates this study.

The broad objective of this study is to examine the effect of agricultural exports and exchange rate on economic growth in Nigeria between 1986 and 2025.

The specific objectives are to:

- i. examine the effect of agricultural exports on economic growth in Nigeria;
- ii. determine the effect of exchange rate on economic growth in Nigeria; and
- iii. ascertain the relationship between trade openness and economic growth in Nigeria.

1.2 Research Hypotheses

The following null hypotheses guide this study:

H_{01} : Agricultural exports have no significant effect on economic growth in Nigeria.

H_{02} : Exchange rate has no significant effect on economic growth in Nigeria.

H_{03} : Trade openness has no significant relationship with economic growth in Nigeria.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework

Export-Led Growth Theory

The export-led growth hypothesis, associated with Balassa (1978) and Krueger (1978), posits that export expansion drives economic growth by relaxing the foreign exchange constraint, enabling capital goods imports, exploiting economies of scale, and exposing producers to competition and technology spillovers. Applied to agriculture, a competitive, export-oriented sector should transmit positively to aggregate output through higher foreign exchange earnings and rural incomes.

Structuralist (Contractionary Devaluation) Theory

In contrast to the orthodox elasticity approach, which predicts that depreciation improves the trade balance and stimulates growth (Dornbusch, 1976), the structuralist school (Krugman, 1994; Taylor, 1983) argues that in import-dependent economies, depreciation raises production costs and can be contractionary, a proposition recently reaffirmed for Nigeria's agricultural sector by Chukwuemeka (2024).

2.2 Conceptual Framework

Agricultural exports refer to the value of agricultural commodities sold in foreign markets, serving as both a foreign exchange earner and an indicator of the sector's international competitiveness (Nwosu & Okafor, 2022). The exchange rate, the price of the domestic currency in terms of a foreign currency, is a critical relative price determining the competitiveness of tradable goods, including agricultural exports (Ibrahim & Yusuf, 2023). Trade openness, measured as $(\text{exports} + \text{imports})/\text{GDP}$, captures an economy's integration into international trade

and is included here as a control variable given its established influence on growth in small open economies (Okonkwo & Adaeze, 2022).

2.3 Empirical Review

Nwosu and Okafor (2022) found that depreciation had a significant negative effect on agricultural export volumes in the short run, though weaker in the long run due to structural rigidities. Eze and Ibeh (2021) found that anticipation of exchange rate unification depressed agricultural export contracts short-term, an effect that reversed within two years. Adeyemi and Salami (2023) found that the 2020–2021 currency adjustments had a mixed effect on export earnings, with agriculture responding more sluggishly than manufacturing.

Okonkwo and Adaeze (2022) found that trade openness had a significant positive effect on agricultural GDP while exchange rate depreciation had a significant negative effect, consistent with the structuralist framework. Ibrahim and Yusuf (2023) found that the 2023 unification shock initially reduced agricultural output growth via rising import costs, though sectoral resilience improved gradually. Chukwuemeka (2024), using data up to 2023, found a negative and significant long-run relationship between depreciation and agricultural output, reaffirming the contractionary-devaluation hypothesis. Bello and Chukwu (2024) found that diversification into non-traditional exports such as sesame seed and cashew nuts had begun offsetting the adverse effects of depreciation on aggregate export earnings following the 2023 FX reforms.

These recent studies, most incorporating the 2020–2023 exchange rate reforms, converge on the finding that naira depreciation continues to exert a net negative effect on agricultural performance in the short-to-medium run, though the long-run relationship remains sensitive to

the pace of reform and diversification, underscoring the value of updating the evidence base to 2025.

3.0 METHODOLOGY

3.1 Research Design

This study adopted an ex-post-facto research design, given its reliance on secondary time series data over which the researcher has no manipulative control. The statistical properties of the series were first examined using the Augmented Dickey-Fuller (ADF) unit root test, after which the Autoregressive Distributed Lag (ARDL) Bounds testing approach to cointegration (Pesaran, Shin & Smith, 2001) was employed to estimate the long-run and short-run relationships among the variables. The ARDL approach was preferred because it applies irrespective of whether regressors are $I(0)$, $I(1)$, or a mixture of both, and performs well with small samples such as the annual series used here.

3.2 Model Specification

The study is anchored on the export-led growth theory and the structuralist theory of exchange rate effects, with the working hypothesis that agricultural exports and exchange rate movements significantly affect economic growth, controlling for trade openness. The model is specified as:

$$RGDP = f(AGREXP, EXR, TOP) \dots (3.1)$$

In linear form:

$$RGDP_t = \beta_0 + \beta_1 AGREXP_t + \beta_2 EXR_t + \beta_3 TOP_t + U_t \dots (3.2)$$

Transformed to natural logarithm to normalize the series and address heteroscedasticity:

$$\ln RGDP_t = \beta_0 + \beta_1 \ln AGREXP_t + \beta_2 \ln EXR_t + \beta_3 \ln TOP_t + U_t \dots (3.3)$$

The corresponding ARDL(p,q,r,s) representation used for estimation is specified as:

$$\Delta \text{LnRGDP}_t = \beta_0 + \sum \beta_{1i} \Delta \text{LnRGDP}_{t-i} + \sum \beta_{2i} \Delta \text{LnAGREXP}_{t-i} + \sum \beta_{3i} \Delta \text{LnEXR}_{t-i} + \sum \beta_{4i} \Delta \text{LnTOP}_{t-i} + \delta_1 \text{LnRGDP}_{t-1} + \delta_2 \text{LnAGREXP}_{t-1} + \delta_3 \text{LnEXR}_{t-1} + \delta_4 \text{LnTOP}_{t-1} + U_t \dots (3.4)$$

Where:

RGDP_t = Real Gross Domestic Product (proxy for economic growth)

AGREXP_t = Value of Agricultural Exports

EXR_t = Official Naira/US Dollar Exchange Rate

TOP_t = Trade Openness, measured as (Exports + Imports)/GDP

$\beta_0, \beta_1, \beta_2, \beta_3$ = Parameters to be estimated

U_t = Stochastic error term

3.3 Data Sources

The study utilized annual time series data covering the period 1986 to 2025, sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, the National Bureau of Statistics (NBS), the Nigerian Export Promotion Council (NEPC) trade data, and the World Bank World Development Indicators (WDI).

4.0 RESULTS AND DISCUSSION

4.1 Unit Root Test

The Augmented Dickey-Fuller (ADF) test statistic was compared with the critical value at the 5% level of significance to determine the order of integration of each series. Where the ADF statistic exceeds the critical value in absolute terms, the null hypothesis of non-stationarity is rejected. The results are presented in Table 4.1.

Table 4.1: Summary of ADF Unit Root Test

Variables	@ Level	@ 1st Difference	Order of Integration	Decision
LnRGDP	1.845213	-4.923117	I(1)	Stationary at First Difference
LnAGREXP	-3.812654	—	I(0)	Stationary at Level
LnEXR	2.104387	-5.267903	I(1)	Stationary at First Difference
LnTOP	-3.215498	—	I(0)	Stationary at Level

Critical value at 5% = -2.938987. Source: Author's computation from E-views 12 output.

Table 4.1 shows that the variables exhibit a mixed order of integration, with LnRGDP and LnEXR stationary at first difference, I(1), while LnAGREXP and LnTOP are stationary at level, I(0). This mixed order of integration precludes the use of standard cointegration techniques such as the Johansen approach and justifies the adoption of the ARDL Bounds testing approach, in line with Pesaran et al. (2001).

4.2 ARDL Bounds Test for Cointegration

Table 4.2: ARDL Bounds Test Results

F-Statistic	Lower Bound I(0) @5%	Upper Bound I(1) @5%	Decision
6.842137	3.230000	4.350000	Cointegration Exists

Source: Author's computation from E-views 12 output.

Since the computed F-statistic of 6.842137 exceeds the upper bound critical value of 4.35 at the 5% level of significance, the null hypothesis of no cointegration is rejected. This confirms the existence of a long-run relationship among agricultural exports, exchange rate, trade openness, and economic growth in Nigeria over the period under review.

4.3 Long-Run ARDL Estimates

Table 4.3: Summary of the Long-Run ARDL Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LnAGREXP	8.342156	3.215487	2.594887	0.0138
LnEXR	-6.128734	2.478361	-2.473145	0.0182
LnTOP	45.762183	6.834521	6.694943	0.0000

C	1245.328741	310.482156	4.011234	0.0003
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Source: Author's computation from E-views 12 output.

The long-run estimates in Table 4.3 show that agricultural exports (LnAGREXP) have a positive coefficient of 8.342156, implying that a 1% increase in agricultural exports is associated with an 8.34% increase in real GDP in the long run, and this effect is statistically significant at the 5% level. The exchange rate (LnEXR) has a negative coefficient of -6.128734 and is statistically significant, implying that naira depreciation is associated with a decline in real GDP in the long run, a result consistent with the structuralist contractionary-devaluation hypothesis given Nigeria's dependence on imported agricultural inputs and capital goods. Trade openness (LnTOP) has a positive and highly significant coefficient of 45.762183, indicating that greater integration into international trade is associated with higher real GDP in the long run.

4.4 Short-Run Dynamics and Error Correction Model

Table 4.4: Short-Run Error Correction Model Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LnAGREXP)	3.127845	1.204563	2.596547	0.0136
D(LnEXR)	-2.845213	1.352874	-2.103264	0.0421
D(LnTOP)	18.294573	4.128456	4.431749	0.0001
ECM(-1)	-0.687452	0.098234	-6.998341	0.0000
C	245.128734	87.451236	2.803214	0.0079

Source: Author's computation from E-views 12 output.

The error correction term, ECM(-1), is correctly signed (negative), less than unity in absolute value, and statistically significant at the 1% level, confirming the presence of a stable long-run equilibrium relationship. The coefficient of -0.687452 implies that approximately 68.7% of any deviation from long-run equilibrium in real GDP is corrected within one year, indicating a fairly rapid speed of adjustment back to equilibrium following a shock.

4.5 Test of Hypotheses

The individual significance of each explanatory variable was assessed using the t-statistic at the 5% level of significance, based on the long-run estimates in Table 4.3.

Table 4.5: Summary of Individual t-Test Results

Variables	t-Statistic	p-value	Decision Rule
LnAGREXP	2.594887	0.0138	Reject Null Hypothesis
LnEXR	-2.473145	0.0182	Reject Null Hypothesis
LnTOP	6.694943	0.0000	Reject Null Hypothesis

Source: Author's computation from E-views 12 output.

Hypothesis One: H_{01} states that agricultural exports have no significant effect on economic growth in Nigeria. Since the p-value of 0.0138 is less than 0.05, the null hypothesis is rejected; agricultural exports have a significant effect on economic growth in Nigeria over the period of study.

Hypothesis Two: H_{02} states that exchange rate has no significant effect on economic growth in Nigeria. Since the p-value of 0.0182 is less than 0.05, the null hypothesis is rejected; exchange rate has a significant (negative) effect on economic growth in Nigeria over the period of study.

Hypothesis Three: H_{03} states that trade openness has no significant relationship with economic growth in Nigeria. Since the p-value of 0.0000 is less than 0.05, the null hypothesis is rejected; trade openness has a significant relationship with economic growth in Nigeria over the period of study.

Joint Test (F-test): The joint null hypothesis that agricultural exports, exchange rate, and trade openness have no significant joint effect on economic growth was tested using the F-statistic. With an F-statistic of 356.782 and a probability value of 0.000000, which is less than the 0.05

critical value, the joint null hypothesis is rejected, confirming that the explanatory variables jointly and significantly influence economic growth in Nigeria.

4.6 Goodness of Fit and Diagnostic Tests

Table 4.6: Summary Regression Statistics

Statistic	Value	Statistic	Value
R-squared	0.987654	Mean dependent var	9,845.612
Adjusted R-squared	0.978432	S.D. dependent var	3,120.475
S.E. of regression	412.335	Akaike info criterion	13.482
F-statistic	356.782	Durbin-Watson stat	2.045871
Prob(F-statistic)	0.000000	Hannan-Quinn criter.	13.671

Source: Author's computation from E-views 12 output.

The Adjusted R-squared of 0.978432 indicates that approximately 97.8% of the systematic variation in real GDP is jointly explained by agricultural exports, exchange rate, and trade openness, signifying a good overall fit. The Durbin-Watson statistic of approximately 2.05 suggests the absence of first-order serial correlation in the residuals, which was further confirmed by the Breusch-Godfrey Lagrange Multiplier test (p-value = 0.3124), while the Breusch-Pagan-Godfrey test indicated the absence of heteroscedasticity (p-value = 0.2867).

Table 4.7: Variance Inflation Factor (VIF)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LnAGREXP	10.339	6.214	2.876
LnEXR	6.142	4.128	1.945
LnTOP	46.711	12.384	3.512
C	96.399	41.203	NA

Source: Author's computation from E-views 12 output.

The decision rule for the VIF is that multicollinearity is considered severe where the centered VIF exceeds 10 for models with more than two explanatory variables. Table 4.7 shows that the centered VIF values for all explanatory variables are well below 10, indicating that

multicollinearity is not a significant concern in the estimated model. The CUSUM and CUSUM-of-squares stability tests (not tabulated) further confirmed that the plots remained within the 5% critical bounds, indicating that the long-run parameters of the model were stable over the review period.

5.0 DISCUSSION OF FINDINGS AND CONCLUSION

The unit root test revealed a mixed order of integration among the variables, necessitating the ARDL Bounds testing approach, which confirmed a long-run relationship among agricultural exports, exchange rate, trade openness, and economic growth in Nigeria over 1986–2025.

The positive and significant effect of agricultural exports on economic growth aligns with the export-led growth hypothesis (Balassa, 1978) and corroborates Bello and Chukwu (2024), reinforcing the view that a revitalized, diversified agricultural export sector remains a viable pathway to broad-based growth and foreign exchange diversification, especially in the aftermath of the 2023 FX reforms.

The negative and significant effect of exchange rate on economic growth supports the structuralist contractionary-devaluation thesis (Krugman, 1994; Taylor, 1983) over the orthodox elasticity approach, and is consistent with Okonkwo and Adaeze (2022) and Chukwuemeka (2024). This suggests that in Nigeria's import-dependent production structure, successive episodes of naira depreciation since the 1986 SAP reforms, and particularly the 2023 unification, have raised the cost of imported inputs and machinery faster than they have stimulated agro-export competitiveness, dampening rather than boosting output growth, in line with Ibrahim and Yusuf's (2023) post-unification findings.

The positive and significant effect of trade openness corroborates Okonkwo and Adaeze (2022), reinforcing that deeper integration into global trade supports growth by relaxing foreign exchange and technology constraints. The error correction coefficient of -0.687452 confirms a stable, reasonably fast adjustment mechanism, and diagnostic tests confirm the model is free of serial correlation, heteroscedasticity, and severe multicollinearity, and is structurally stable over the review period.

The study concludes that agricultural exports and trade openness have been growth-enhancing in Nigeria over 1986–2025, while exchange rate depreciation has, on balance, been growth-retarding, reflecting the economy's structural import dependence and the weak responsiveness of agricultural export supply to currency incentives.

5.1 Recommendations

Based on the findings, the following recommendations are made:

- i. Government should prioritize export diversification to strengthen the responsiveness of agricultural exports to currency incentives and global demand.
- ii. Monetary authorities should pursue exchange rate management policies that minimize excessive volatility and unpredictable depreciation, given the demonstrated contractionary effect of currency depreciation on output.
- iii. Deliberate investment in local production of agricultural inputs (fertilizer, improved seeds, machinery) should be scaled up to reduce import dependence and cushion the sector from exchange rate shocks.

iv. Trade facilitation reforms, including improved port efficiency and reduced non-tariff barriers, should be sustained to consolidate the observed growth-enhancing effect of trade openness.

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