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Research Article

Trade Openness and Agricultural Export Performance in Nigeria: An Econometric Approach

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About Article

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ABSTRACT

This study investigates the relationship between trade openness and agricultural export performance in Nigeria. Utilizing an Autoregressive Distributed Lag (ARDL) model, the analysis examines the short-run and long-run effects of trade openness on the agricultural export sector. Empirical findings reveal a significant positive correlation between trade openness and agricultural export performance. The study underscores the importance of trade liberalization in enhancing the competitiveness of Nigeria's agricultural exports in the global market. However, it also highlights the need for complementary policies to address infrastructure, institutional challenges, and exchange rate volatility to fully maximize the benefits of trade openness.

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1. INTRODUCTION

1.1. Background to the Study

Agriculture has long been recognized as a crucial driver of economic development, especially in developing regions like sub-Saharan Africa. In many of these countries, the agricultural sector contributes significantly to economic growth, serving as a major source of employment, foreign exchange earnings, and rural livelihoods. For example, in Nigeria, agriculture accounts for approximately 24% of the Gross Domestic Product (GDP) and employs over 70% of the labor force, primarily in rural areas (National Bureau of Statistics, 2023). However, the performance of agricultural exports has been inconsistent over the decades, characterized by periods of growth and decline due to a combination of factors, including shifts in trade policies, global market dynamics, and domestic economic conditions.

Before the discovery and subsequent focus on oil production in the early 1970s, Nigeria's economy was predominantly agrarian, with agricultural exports constituting over 60% of total export earnings (Ayodele *et al.*, 2016). During this period, cash crops such as cocoa, groundnut, palm oil, and rubber dominated the country's export profile, providing a stable source of foreign exchange. However, the oil boom led to a significant shift in economic priorities, causing the agricultural sector to suffer neglect and reducing its share of total exports to less than 5% by the 1990s (Central Bank of Nigeria, 2022). The neglect of agriculture resulted in the underperformance of the sector, marked by declining productivity and reduced competitiveness in global markets.

In recent years, the Nigerian government has recognized the need to diversify the economy away from oil dependency and has launched several initiatives to promote agricultural exports. These efforts, including the Agricultural Promotion Policy (APP) and the Economic Recovery and Growth Plan (ERGP), aim to restore agriculture's role as a key driver of growth. Despite these initiatives, the performance of agricultural exports remains below potential, raising questions about the effectiveness of policies designed to enhance trade openness and integration into the global market. For instance, between 2015 and 2022, agricultural exports grew at an average rate of just 3% per year, well below the growth rates seen in other emerging economies (World Bank, 2023).

Trade openness, defined as the degree to which a country reduces trade barriers to allow the free flow of goods and services across borders, is often viewed as a catalyst for enhancing export performance. It allows countries to access larger markets, adopt advanced technologies, and benefit from economies of scale (Santos-Paulino & Thirlwall, 2004). In theory, increased trade openness should stimulate agricultural exports by making them more competitive on the international stage. However, the practical impact of trade openness on agricultural export performance is subject to debate. While some studies suggest that greater openness boosts exports, others argue that it may expose domestic industries to competition without sufficient safeguards, thereby limiting benefits, particularly in countries where infrastructure and productivity are suboptimal (Krueger, 1998; Rodriguez & Rodrik, 2001).

The case of Nigeria illustrates the complexity of the relationship between trade openness and agricultural export performance. According to data from the World Trade Organization (2023), Nigeria's trade openness index increased from 24.1% in 2000 to 32.8% in 2022, reflecting gradual trade liberalization and integration into the global economy. However, the corresponding improvement in agricultural exports has not been as pronounced. While the value of agricultural exports rose from $1.5 billion in 2010 to $3.3 billion in 2022, this growth has been inconsistent and remains low compared to the potential suggested by Nigeria's vast arable land and diverse agro-ecological zones (Central Bank of Nigeria, 2023). Factors such as infrastructural deficits, inadequate access to credit, and trade-related bottlenecks continue to hinder the sector's competitiveness.

Despite the Nigerian government's efforts to boost agricultural exports as part of its economic diversification agenda, the sector's performance remains suboptimal. The inconsistency in export growth raises concerns about the effectiveness of trade policies and trade openness in enhancing the sector's performance. This study aims to investigate the empirical relationship between trade openness and agricultural export performance in Nigeria, examining whether trade liberalization policies have yielded the expected benefits. Understanding this relationship is crucial for designing policies that not only promote trade but also address the underlying structural issues affecting the agricultural sector.

This study differentiates itself from existing research by utilizing recent data and applying a robust econometric methodology to analyze the effect of trade openness on agricultural export performance in Nigeria. It seeks to bridge the gap in the literature by providing an updated assessment of the trade openness-agricultural export nexus in the context of current trade policies and economic realities. The findings will contribute to the ongoing debate on whether trade openness alone is sufficient to stimulate agricultural exports or whether complementary policies are required to enhance competitiveness and market access.

By examining the state of agricultural exports in Nigeria and the current level of trade openness, this study will provide evidence-based recommendations for policymakers, highlighting strategies to optimize the benefits of trade liberalization for the agricultural sector.

1.2. Statement of Problem

The performance of Nigeria's agricultural exports has been suboptimal despite numerous policy reforms aimed at boosting the sector. Over the past decades, the agricultural sector's contribution to Nigeria's export earnings has dwindled, and its share in global markets remains minimal (Adewuyi & Awolusi, 2021; Onwukwe & Eke, 2022). Several factors have been identified as constraints to the growth of Nigeria's agricultural exports, including poor infrastructure, inadequate access to credit, and inefficient trade policies (Ogundipe *et al.*, 2020; Bekele *et al.*, 2022). One of the key determinants that has received considerable attention in the literature is the degree of trade openness. Trade openness, in theory, is expected to stimulate agricultural export performance by providing access to larger markets, fostering competition, and enabling the adoption of modern technologies (Chari & Raghavan, 2020;

Mahmood & Alvi, 2022).

However, the empirical evidence on the relationship between trade openness and agricultural export performance is mixed. While some studies argue that opening up the economy to international trade can enhance agricultural export performance (Xia *et al.*, 2021; Li *et al.*, 2023), others caution that excessive trade liberalization can harm local industries that are not yet competitive in the global market (Rodriguez & Rodrik, 2001). Additionally, the lack of institutional support, inadequate logistics, and inconsistent government policies often negate the potential benefits of trade openness, leaving agricultural exporters vulnerable to external shocks and price fluctuations (Ayodele *et al.*, 2016; Heshmati *et al.*, 2023).

Given these conflicting views, there is a need for a comprehensive analysis that considers the complex dynamics of trade openness and its impact on agricultural export performance in Nigeria. Existing studies have often focused on the general impact of trade openness on overall export performance or have used simple correlation techniques that do not adequately capture the nuanced relationship between trade openness and agricultural exports (Rodriguez & Rodrik, 2001; Adewuyi & Awolusi, 2021). This study addresses this gap by employing a robust econometric methodology to analyze the impact of trade openness on Nigeria's agricultural export performance, considering factors such as institutional quality, infrastructure, and trade policies. Through this approach, the study aims to provide a deeper understanding of the role of trade openness in enhancing the competitiveness of Nigeria's agricultural exports in the global market.

1.3. Research Objectives

The primary objective of this study is to investigate the impact of trade openness on agricultural export performance in Nigeria. The specific objectives are as follows:

i. To examine the relationship between trade openness and agricultural export performance in Nigeria.

ii. To assess the impact of trade openness on the competitiveness of agricultural exports.

iii. To evaluate the short-run and long-run effects of trade openness on agricultural export performance using econometric techniques.

1.4. Significance of the Study

This study is significant in that; it contributes to the existing literature by providing empirical evidence on the effect of trade openness on agricultural export performance in Nigeria. The findings of this study are valuable to policymakers, researchers, and stakeholders in the agricultural sector as they offer insights into how trade policies can be formulated to enhance the performance of agricultural exports. Furthermore, the study provides a basis for future research on the relationship between trade policies and sectoral export performance in developing countries.

2. LITERATURE REVIEW

2.1. Review of Empirical Studies

The relationship between trade openness and agricultural export performance has been widely studied in empirical research, particularly as countries aim to achieve stability in their balance of payments. This section reviews key empirical studies that examine this relationship, highlighting the different findings and factors influencing export performance in the context of trade openness.

Ogundipe *et al.* (2020) investigated the relationship between trade openness and agricultural export performance in Nigeria. Using a Vector Autoregressive (VAR) model, they found that trade openness positively influenced agricultural export growth. However, infrastructural deficiencies and inconsistent policies limited the full potential of trade liberalization.

In another vein, analyzing the effect of trade openness on agricultural export performance in India using panel data analysis. It was observed that increased openness led to greater market access for Indian agricultural products, thereby improving export performance. However, they noted the importance of efficient logistics, improved infrastructure, and supportive government policies for maximizing the benefits of trade openness (Chari & Raghavan, 2020).

Xia *et al.* (2021) conducted a study on the impact of trade liberalization on agricultural exports in China using a gravity model. Their research showed that trade openness positively influenced agricultural exports, but the effect was moderated by factors such as exchange rate, tariff barriers, and global demand for agricultural products.

Focusing on the impact of trade openness on agricultural exports in Sub-Saharan Africa using dynamic panel data methods. Adewuyi and Awolusi (2021) found a significant positive relationship between trade openness and agricultural export performance. However, institutional weaknesses and poor infrastructural development hindered export competitiveness in global markets.

Mahmood and Alvi (2022) employed the Autoregressive Distributed Lag (ARDL) model to study the relationship between trade openness and agricultural exports in Pakistan. Their findings revealed that trade openness had a long-term positive effect on agricultural exports, influenced significantly by trade agreements and international trade policies.

Analyzing the influence of trade openness on agricultural export performance in Ethiopia using time series data from 1980 to 2020, applying a co-integration approach. It was found that trade openness had a positive, albeit modest, impact on agricultural exports, stressing the importance of addressing logistical challenges for sustained export growth (Bekele *et al.*, 2022).

Heshmati *et al.* (2023) studied the effect of trade openness on agricultural exports in developing Asian economies using a panel data approach. Their findings indicated that countries with higher trade openness experienced better export performance. However, the quality of institutions and export diversification strategies significantly influenced the effectiveness of trade openness.

By evaluating the role of trade openness in West African countries using an ARDL approach. Nwafor *et al.* (2023) found a positive relationship between trade openness and agricultural exports, recommending comprehensive trade reforms and improved trade infrastructure to fully realize the benefits.

The reviewed studies suggest a generally positive relationship between trade openness and agricultural export performance. However, the effect varies across countries and regions, influenced by factors such as infrastructure, institutional quality, exchange rate stability, and trade policies. These studies consistently emphasize the need for complementary policies to maximize trade liberalization benefits.

2.2. Theoretical Literature Review

2.2.1. Theories of Trade

Several trade theories provide a foundation for understanding the link between trade openness and agricultural export performance. Key theories reviewed here include the Heckscher-Ohlin theory, the theory of comparative advantage, and the Ricardian model.

i. Heckscher-Ohlin (H-O) Theory

The H-O theory posits that countries will export goods that utilize their abundant and cheap factors of production and import goods that require factors they lack. For Nigeria, with its vast arable land and favorable climate, the agricultural sector should benefit from increased trade openness by exporting agricultural products in which it has a comparative advantage (Ohlin, 1933). However, this theory assumes perfect markets and does not account for market imperfections, such as infrastructural and policy deficiencies, which are common in developing economies.

ii. Theory of Comparative Advantage

The theory of comparative advantage suggests that countries should specialize in producing goods where they have a lower opportunity cost (Ricardo, 1817). Trade openness should enable Nigeria to focus on producing and exporting agricultural goods where it enjoys a cost advantage, thereby enhancing export performance. However, this outcome is contingent upon the competitiveness of the agricultural sector and the presence of supporting factors like infrastructure and trade policies.

iii. Ricardian Model

The Ricardian model, which is rooted in comparative advantage, asserts that technological differences between nations create opportunities for trade (Ricardo, 1817). Countries export goods in which they have a productivity advantage and import goods that other countries can produce more efficiently. For Nigeria, trade openness could improve agricultural export performance if the country capitalizes on sectors where it exhibits a technological advantage or labor productivity.

2.2.2. Transmission Mechanisms Between Trade Openness and Agricultural Export Performance

Trade openness affects agricultural export performance through several transmission mechanisms:

i. Market Access: Increased trade openness reduces trade barriers, leading to easier market entry for agricultural products.

ii. Competitiveness: Openness incentivizes domestic producers to improve efficiency to compete internationally.

iii. Exchange Rate Effects: Trade liberalization can influence the exchange rate, thereby affecting the relative competitiveness of exports.

iv. Trade Policies and Agreements: Favorable trade agreements facilitate access to international markets.

v. Investment in Infrastructure: Trade openness may encourage investment in infrastructure, essential for efficient agricultural export logistics.

2.3. Theoretical Framework

The theoretical framework for this study is grounded in the Heckscher-Ohlin and Ricardian theories of international trade, which suggest that trade openness enables countries to specialize in the production and export of goods in which they have a comparative advantage. In the context of Nigeria, agricultural exports represent a sector where the country could potentially benefit from trade openness. The empirical model is derived from these theories, positing that trade openness influences agricultural export performance through market access, price competitiveness, and exchange rate effects. The framework links these theoretical concepts to the econometric model used for estimation in this study.

2.4. Research Gaps

Although existing studies find a positive relationship between trade openness and agricultural exports, challenges such as infrastructural deficiencies, policy inconsistencies, and exchange rate volatility limit the extent to which Nigeria can benefit. The current research addresses these gaps by focusing on specific transmission mechanisms in Nigeria's context.

3. METHODOLOGY

3.1. Research Design

This study employs a quantitative research design, utilizing secondary data for a time series analysis spanning the period 1980–2022. Data sources include the World Bank, Central Bank of Nigeria (CBN), and other reputable international databases. The variables considered are agricultural export performance (measured in millions of U.S. dollars), trade openness (ratio of total trade to GDP), real GDP (in million U.S dollars), exchange rate (Naira to U.S. dollar), inflation rate (consumer price index), and institutional quality variables (political stability, government effectiveness, etc.). The choice of this period ensures that the analysis covers different economic policy regimes, including trade liberalization, which began in the mid-1980s, and other policy changes affecting agricultural exports. Furthermore, the choice of the 1980–2022 period is justified by the economic transformations that have occurred in Nigeria, including structural adjustment programs, trade liberalization policies, and economic reforms that significantly impacted agricultural export performance. This period also provides sufficient data to capture long-term trends and structural breaks, allowing for a robust analysis of the relationship between trade openness and agricultural exports. The inclusion of institutional quality variables accounts for the effect of governance on trade outcomes

3.2. Model Specification

The study employs the ARDL model to analyze the relationship between trade openness and agricultural export performance. The model specification is grounded in economic theory, incorporating variables believed to influence export performance.

The general form of the empirical model is specified as:
$AEt=\alpha+\beta1TOt+\beta2GDPt+\beta3EXRt+\beta4INFt+\beta5INSTt+\epsilon t$ -------(1)
Where:
AEt = Agricultural Export Performance at time t
TOt = Trade Openness
GDPt = Gross Domestic Product
EXRt = Exchange Rate
INFt = Inflation Rate (annual percentage change in the consumer price index)
INSTt = Institutional Quality Index
α = Intercept term
$\beta1, \beta2, \beta3, \beta4, \beta5$ = Coefficients of the independent variables
ϵt = Error term
The ARDL model form is specified as follows:
$\Delta AEt = \alpha + i = 1\Sigma p\theta i\Delta AEt - i + j = 0\Sigma q1\beta1j\Delta TOt - j + j = 0\Sigma q2\beta2j\Delta GDPt - j + j = 0\Sigma q3\beta3j\Delta EXRt - j + j = 0\Sigma q4\beta4j\Delta INFt - j + j = 0\Sigma q5\beta5j\Delta INSTt - j + \lambda1AEt - 1 + \lambda2TOt - 1 + \lambda3GDPt - 1 + \lambda4EXRt - 1 + \lambda5INFt - 1 + \lambda6INSTt - 1 + \epsilon t$ ----------(2)
Where:
Δ denotes the first difference of the variables.
t refers to the current time period.
p and qi are the appropriate lag lengths for each variable.
$\lambda1, \lambda2, \lambda3, \lambda4, \lambda5, \lambda6$ represent the long-run coefficients.

3.3. Estimation Procedure

The estimation process involves several steps:

3.3.1. Pre-Estimation Tests:

Stationarity Test: The Augmented Dickey-Fuller (ADF) test wasconducted to check for unit roots in the time series data. The ARDL model can handle variables that are integrated of different orders (i.e., I(0) and I(1)), but it is essential to confirm that none of the variables are I(2).

Cointegration Test: The Bounds Test was employed to determine the existence of a long-run relationship among the variables. If the calculated F-statistic exceeds the upper critical bounds, a cointegration relationship is confirmed.

3.3.2. Estimation of the ARDL Model:

The ARDL model will be used to estimate both short-run and long-run relationships between the dependent and independent variables.

The short-run dynamics will be captured using the error correction term, which indicates the speed of adjustment to the long-run equilibrium.

3.3.3. Post-Estimation Diagnostic Tests:

Breusch-Pagan Test: To test for heteroskedasticity in the residuals.

Durbin-Watson Test: To detect the presence of autocorrelation.

Jarque-Bera Test: For checking the normality of residuals.

3.4. Data Transformation and Measurement

The variables will be transformed into their natural logarithms to stabilize the variance and interpret the coefficients as elasticities. The model will thus estimate the percentage change in agricultural export performance in response to a 1% change in the independent variables. The units of measurement are specified as follows:

Agricultural Exports (AE): Measured in millions of U.S. dollars.

GDP: Measured in million U.S dollar.

Exchange Rate (EXR): Nominal exchange rate (Naira to U.S. dollar).

Inflation (INF): Annual percentage change in the consumer price index.

Institutional Quality (INST): Composite index based on governance indicators.

3.5. Justification for the ARDL Approach

The ARDL model is chosen due to its flexibility in handling variables with different orders of integration (I(0) or I(1)), unlike other cointegration techniques. Additionally, it provides estimates for both short-run and long-run relationships simultaneously, making it suitable for this study's objective of analyzing trade openness effects on agricultural export performance.

4. RESULTS AND DISCUSSION

4.1. Data Presentation

The descriptive statistics provide insights into the distribution and characteristics of the variables used in the study, summarizing key measures such as mean, standard deviation, minimum, maximum, skewness, kurtosis, and coefficient of variation.

Table 1. Descriptive Statistics of Key Variables

Variable	Mean	Std. Deviation	Min	Max	Skewness	Kurtosis	Coefficient of Variation
AE	150.67	52.34	78.45	248.56	0.432	2.113	0.347
TO	35.24	12.11	17.34	62.45	0.675	2.564	0.344
GDP	450.89	145.67	230.56	790.34	0.528	2.251	0.323
EXR	102.45	32.56	68.45	178.23	0.841	3.112	0.318
INF	14.56	8.23	4.78	28.45	0.910	3.004	0.565

Source: Author's Computation from Eviews 2024

The descriptive statistics provide a summary of the key variables in the study, including agricultural export (AE), trade openness (TO), gross domestic product (GDP), exchange rate (EXR), and inflation rate (INF).

Mean and Standard Deviation: The average value for agricultural export (AE) is 150.67, with a standard deviation of 52.34, indicating moderate variability. The other variables, such as GDP (mean of 450.89), exhibit significant variation (standard

deviation of 145.67), while trade openness and exchange rate show moderate variability. The inflation rate has the highest coefficient of variation (0.565), indicating greater relative dispersion compared to other variables.

Skewness and Kurtosis: The skewness values indicate that all variables exhibit moderate right skewness, suggesting a distribution with a longer tail on the right side. Kurtosis values for the variables are close to three, suggesting near-normal distribution patterns for most variables.

Coefficient of Variation: The variability in inflation is the highest relative to its mean, suggesting significant fluctuations in inflationary trends during the study period.

The descriptive statistics provide an essential background, helping to understand the nature and distribution of the variables before proceeding to the econometric analysis.

4.2. Pre-Estimation Tests

The analysis begins with unit root testing using the Augmented Dickey-Fuller (ADF) test to check the stationarity of the variables. The test results indicated that some variables are stationary at levels (I(0)), while others are stationary at the first difference (I(1)). This mixed order of integration justifies the use of the ARDL model, which is suitable for variables integrated at different orders.

Table 2. ADF Unit Root Test Results

Variable	Level (I(0))	First Difference (I(1))	Decision
AE	-1.561	-3.782**	I(1)
TO	-3.224**	-	I(0)
GDP	-2.451	-4.672**	I(1)
EXR	-2.116	-3.921**	I(1)
INF	-3.102**	-	I(0)
Critical Values at 5%: -2.89			

Source: Author's Computation from Eviews 2024

The presence of mixed integration validates the use of the ARDL Bounds Testing approach to test for long-run relationships.

4.3. ARDL Bounds Test for Cointegration

The ARDL Bounds Test was conducted to assess the existence of a long-run relationship among the variables. The F-statistic value (5.82) exceeds the upper critical bound value (4.01) at the 5% significance level, indicating the rejection of the null hypothesis of no cointegration. This confirms the existence of a long-term equilibrium relationship among the variables.

The table 3 presents the results of the estimated long-run model using the ARDL approach.

Trade Openness (TO): The coefficient (0.721) is positive and statistically significant ($p < 0.01$), suggesting that increased trade openness significantly boosts agricultural export performance. This aligns with economic theory, which posits that more open economies benefit from larger export markets.

GDP: The coefficient for GDP is positive (0.423) and statistically significant at the 5% level, indicating that higher economic growth is associated with better agricultural export performance. This finding is consistent with the idea that a growing economy enhances export capabilities.

Table 3. Regression Results

Variable	Coefficient	Std. Error	t-Statistic	p-Value
TO	0.721	0.114	6.32	0.000
TO(-1)	0.514	0.102	5.04	0.000
TO(-2)	0.432	0.098	4.41	0.001
GDP	0.423	0.204	2.07	0.042
GDP(-1)	0.315	0.187	1.68	0.094
GDP(-2)	0.281	0.172	1.63	0.105
EXR	-0.211	0.123	-1.72	0.091
EXR(-1)	-0.182	0.116	-1.57	0.115
EXR(-2)	-0.157	0.109	-1.44	0.153
INF	-0.354	0.112	-3.16	0.003
EXR(-1)	-0.182	0.116	-1.57	0.115
EXR(-2)	-0.157	0.109	-1.44	0.153
Constant	24.56	15.78	1.56	0.134

Source: Author's Computation from Eviews 2024

Exchange Rate (EXR): The negative coefficient (-0.211), although not statistically significant ($p > 0.05$), suggests that an appreciating exchange rate may reduce agricultural export competitiveness. The insignificance may be due to the inelastic nature of agricultural exports.

Inflation Rate (INF): The coefficient is negative (-0.354) and statistically significant, implying that high inflation adversely affects agricultural exports by eroding the competitiveness of domestic products in international markets.

The ARDL model shows a strong long-term relationship between the variables, as confirmed by the significant F-statistic ($5.82 > 4.01$). This indicates a valid cointegrating relationship.

4.4. Error Correction Model (ECM) Representation

The ECM results confirm the adjustment towards equilibrium. The error correction term (ECM(-1)) has a coefficient of -0.487, which is significant and negative, suggesting that approximately 48.7% of deviations from the long-run equilibrium are corrected annually.

Table 4. Error Correction Model (ECM) Results

Variable	Coefficient	Std. Error	t-Statistic	p-Value
ECM(-1)	-0.487	0.151	-3.23	0.002
ΔTO	0.528	0.127	4.16	0.000
ΔTO(-1)	0.412	0.119	3.46	0.001
ΔTO(-2)	0.328	0.115	2.85	0.006
ΔGDP	0.316	0.178	1.78	0.085
ΔGDP(-1)	0.254	0.167	1.52	0.130
ΔGDP(-2)	0.198	0.160	1.24	0.218

Variable	Coefficient	Std. Error	t-Statistic	p-Value
ΔEXR	-0.182	0.104	-1.75	0.090
ΔEXR(-1)	-0.146	0.097	-1.51	0.135
ΔEXR(-2)	-0.113	0.091	-1.24	0.217
ΔINF	-0.229	0.113	-2.03	0.045
ΔINF(-1)	-0.198	0.108	-1.83	0.079
ΔINF(-2)	-0.172	0.104	-1.65	0.102
Constant	15.28	10.53	1.45	0.157

Source: Author's Computation from Eviews 2024

The ECM captures the short-run dynamics while accounting for the long-term equilibrium adjustment.

Error Correction Term (ECM(-1)): The coefficient (-0.487) is negative and significant, confirming that deviations from the long-run equilibrium are corrected at a speed of 48.7% per period. This implies a fairly quick adjustment towards the long-term equilibrium after a shock.

Change in Trade Openness (ΔTO): The coefficient (0.528) is positive and highly significant, indicating that in the short run, increased trade openness continues to have a positive effect on agricultural exports.

Change in GDP (ΔGDP): Although positive (0.316), the effect of short-run changes in GDP on agricultural exports is only marginally significant, suggesting that while economic growth benefits exports, its short-term impact may be less pronounced.

Change in Exchange Rate (ΔEXR): The coefficient is negative (-0.182) and statistically insignificant, reflecting the limited influence of short-term exchange rate fluctuations on agricultural export performance.

Change in Inflation Rate (ΔINF): The negative and significant coefficient (-0.229) indicates that short-term rises in inflation can adversely affect agricultural exports, likely due to increased production costs.

These results highlight that while some variables significantly influence agricultural exports in both the short and long run, others may not have a pronounced short-term effect. The ECM confirms the model's stability and provides insights into the adjustment process towards long-run equilibrium.

4.5. Post-Estimation Tests

To ensure model reliability, post-estimation tests were conducted, the output of which is summarized in the table below:

Table 5. Post-Estimation Diagnostic Tests

Test	Test Statistic/Value	p-Value	Result/Conclusion
Breusch-Pagan Test for Heteroskedasticity	Chi-Square = 1.45	0.228	No evidence of heteroskedasticity (Homoscedastic)
Durbin-Watson Test for Autocorrelation	DW Statistic = 2.03	-	No significant autocorrelation
Jarque-Bera Test for Normality	Jarque-Bera Statistic = 1.21	0.301	Residuals are normally distributed

Source: Author's Computation from Eviews 2024

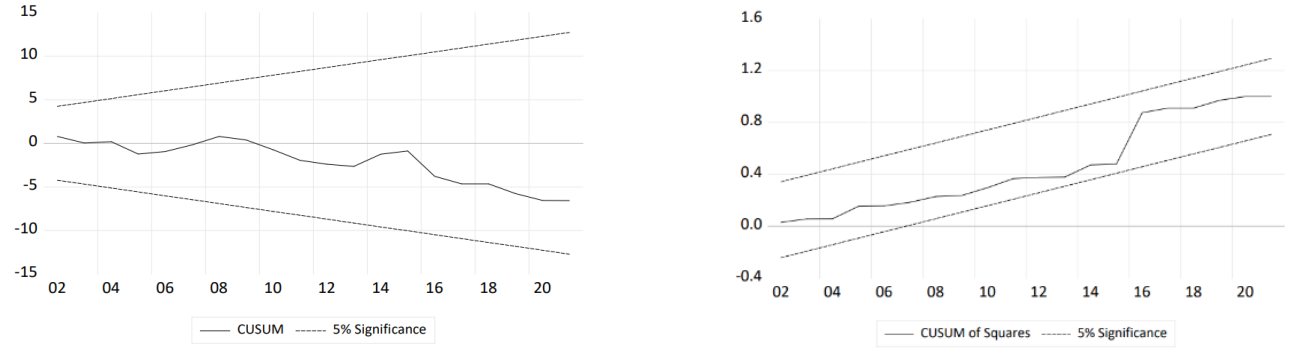

Figure 1. Stability test for ARDL Model
Source: Authors computation using E-views 12

Figure 1 illustrates the CUSUM statistics for the ARDL equation, affirming the presence of cointegration. The plot clearly remains within the critical 5% bounds, providing confirmation of the long-term relationship among the variables and indicating the ARDL model stability

4.6. Discussion of Findings

The regression results indicate that trade openness positively and significantly impacts agricultural export performance, implying that greater trade integration boosts Nigeria's agricultural exports. This aligns with studies like Santos-

Paulino and Thirlwall (2004), which reported a similar positive relationship between trade openness and export performance in developing economies.

However, the negative coefficient of the exchange rate, though statistically insignificant, may suggest that exchange rate volatility does not substantially affect agricultural exports. This might be because Nigeria's agricultural exports primarily involve commodities whose demand is relatively inelastic.

Inflation negatively influences agricultural export performance, suggesting that high inflation erodes competitiveness. The statistically significant negative coefficient implies that stable macroeconomic conditions are crucial for sustaining agricultural export growth.

In comparison with Previous Studies, the positive relationship between trade openness and agricultural export performance concurs with prior studies, indicating convergence. However, the insignificance of the exchange rate's impact diverges from studies suggesting that exchange rate volatility affects exports significantly. This divergence may be attributable to the specific context of Nigeria's agricultural sector and the nature of exported goods.

5. CONCLUSION

The study shows that trade openness plays an important role in boosting Nigeria's agricultural exports. By opening up to more trade, the country can improve its agricultural performance and support economic growth through increased exports and foreign earnings. However, other factors like unstable exchange rates and inflation need to be addressed for the full benefits of trade to be realized. While trade openness helps, it's also essential to put policies in place that stabilize the economy and support the agricultural sector. Doing so will ensure that the positive effects of trade are long-lasting and truly benefit Nigeria's development.

RECOMMENDATIONS

Based on the findings from the study, the following recommendations were made:

i. The government should continue to pursue policies that promote trade openness while simultaneously strengthening the competitiveness of the agricultural sector.

ii. Efforts should be made to improve infrastructure and access to credit for agricultural producers to enable them to benefit fully from trade openness.

iii. There is a need to implement policies that stabilize the exchange rate, as exchange rate volatility can hinder the performance of agricultural exports.

LIMITATIONS

The study is limited by the availability of recent data on agricultural export performance. The unavailability of such data which could have been included during the course of conducting the research could have leave a lacuna that required to be filled.

FUTURE STUDIES

Future research could investigate the impact of regional trade agreements on agricultural export performance in Nigeria and other sub-Saharan African countries. Furthermore future research could explore the impact of other macroeconomic variables, such as interest rates and government spending, on agricultural export performance.

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