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IMPACT OF TRADE FINANCE ON AGRICULTURAL EXPORT GROWTH IN NIGERIA

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Abstract
This study investigates the effect of trade finance on the growth of agricultural exports in Nigeria over the period 1990–2024. Employing the Autoregressive Distributed Lag (ARDL) framework, the research explores both the short-run and long-run interactions between agricultural exports and trade finance. Agricultural export performance is represented by raw material exports as a percentage of total merchandise exports, while trade finance is proxied by domestic credit to the private sector as a percentage of GDP. The model also incorporates GDP growth, exchange rate, and inflation as control variables. Empirical findings reveal a statistically significant and positive long-run association, indicating that a 1% increase in trade finance corresponds to a 0.45% rise in agricultural exports. The error correction mechanism further demonstrates a moderate adjustment speed, with approximately 32% of short-run disequilibrium corrected annually. Additionally, GDP growth and exchange rate exert positive influences on agricultural exports, whereas inflation has an adverse effect. The study recommends strengthening financial institutions to improve trade finance access, fostering public–private partnerships to reduce risks in agricultural lending, and implementing targeted credit initiatives for SMEs. These policy measures are expected to ease financing constraints and enhance the performance of Nigeria's agricultural export sector, thereby supporting economic diversification and sustainable growth.

Keywords: Trade Finance, Agricultural Export, Agricultural Export Growth, Nigeria.

Introduction

Agriculture has historically served as a foundational pillar of Nigeria's economy, providing employment, ensuring food security, and contributing significantly to foreign exchange earnings (Odetola & Etumnu, 2013). Although oil exports have dominated economic focus in recent decades, agriculture remains a vital component of the national economy, accounting for over 20% of GDP and reaching approximately 24.1% in 2020, according to World Bank data (IFC & WTO, 2022). Agricultural exports are particularly crucial for diversifying Nigeria's export base and mitigating exposure to the volatility of oil markets

(Sani et al., 2024). The growth of non-oil exports, especially in agriculture, is central to the country's economic diversification agenda. Thus, the performance of agricultural exports is not only a reflection of sectoral strength but also a key determinant of macroeconomic stability and inclusive growth (Korede et al., 2025).

Agricultural export expansion offers opportunities to reduce rural poverty by creating jobs, raising incomes, and supporting value-chain development (Adekunle & Mojekwu, 2024). However, Nigeria's agricultural export segment encounters persistent difficulties, including weak infrastructure, inconsistent policies, and, most notably, limited access to finance (Okoh & Nwakwanogo, 2024). The sector is largely dominated by smallholder farmers and SMEs operating informally, most of whom are unable to access formal credit owing to high interest rates, stringent collateral requirements, and a high-risk perception by lenders (Awe, 2013). Simultaneously, low financial literacy and limited awareness of financial products hinder demand for formal financial services (Agbonika, 2015), deepening a dual-sided exclusion that has resulted in a financing gap estimated in the billions of dollars (IFC & WTO, 2022).

Within this context, trade finance emerges as a critical facilitator of international agricultural trade. By offering liquidity and mitigating credit, currency, and political risks, instruments such as letters of credit, trade loans, and export credit insurance are vital for supporting export transactions, especially in agriculture, where commodities are perishable, seasonal, and volatile in price (Manova, 2013). Agricultural exporters typically face significant pre-export financing needs, and without access to trade finance, many are unable to fulfil export orders or scale operations to meet global standards (Adekunle & Mojekwu, 2024; IFC & WTO, 2022).

Despite the acknowledged importance of trade finance, Nigerian agricultural exporters, especially SMEs, continue to face limited access to these instruments (Beck, 2002; Ezekiel, 2019). Long payment cycles, exchange rate volatility, and complex international trade requirements further erode their competitiveness (Yakub et al., 2019). While the government and development partners have introduced initiatives such as the Agricultural Credit Guarantee Scheme Fund (ACGSF) and mobile-based financing tools, their impact remains limited due to scale and structural inefficiencies (Nnoli et al., 2023; Okoh & Nwakwanogo, 2024). As a result, the trade finance gap persists, undermining the export potential of the agricultural sector (IFC & WTO, 2022).

To formulate effective policies and interventions, there is a pressing need for empirical evidence on how trade finance affects agricultural export performance in Nigeria. Most existing studies focus on general credit availability or macroeconomic variables, with little emphasis on trade-specific financial instruments as a distinct driver of export growth (Odetola & Etumnu, 2013; Manova, 2013). This study seeks to address that gap by investigating both the long-run and short-run dynamics between trade finance and agricultural export performance using the ARDL bounds testing and error correction modelling approach. Specifically, the study investigates equilibrium relationships and estimates the immediate and sustained effects of trade finance on exports. Through this investigation, the study aims to generate actionable insights and offer evidence-based

recommendations to strengthen Nigeria's agricultural exports by improving access to trade finance.

2.0 Literature Review

This section reviews extant literatures on nexus between trade finance and agricultural export growth, as well as broader research on the interrelationship between finance and trade and the drivers of agricultural export performance, particularly in the Nigerian context. It also addresses gaps in the literature, particularly regarding the role of trade-specific financial instruments in agricultural exports, and identifies areas for requiring further scholarly investigation.

a) 2.1 Conceptual Clarification

In this subsection, we explore key concepts related to trade, trade finance, and agricultural exports. First, we examine the role of international trade as a catalyst for economic development, particularly in the agricultural sector. The importance of trade finance in supporting agricultural exports is then discussed, highlighting its role in bridging liquidity gaps and managing risks in cross-border transactions. Finally, we explore the drivers of agricultural export growth, emphasizing both domestic and external factors that collectively shape Nigeria's agricultural export outcomes.

b) 2.1.1 Trade and Agricultural Export

International trade is widely acknowledged as a catalyst for economic development, particularly in countries pursuing export-led growth strategies. For agrarian economies, trade promotes efficient resources allocation based on comparative advantage, facilitating the export of surplus agricultural products and the import of scarce inputs. In Nigeria, agricultural exports remain an important driver of foreign exchange earnings and rural development, despite the country's heavy reliance on oil exports. These exports play a pivotal role in diversifying the economy and mitigating the volatility associated with global oil prices (Sani et al., 2024). However, sustained agricultural export growth depends not only on trade openness but also on structural factors such as competitiveness, policy stability, and infrastructure (Ezekiel, 2019).

c) 2.1.2 Trade Finance: Concept and Role

Trade finance encompasses a plethora of financial instruments and mechanisms designed to promote international trade transactions by narrowing the gap between production and payment. Instruments such as letters of credit, export credit insurance, and trade loans provide essential liquidity and mitigate risks related to payment defaults, currency fluctuations, and geopolitical uncertainties. In the agricultural sector, trade finance holds particular importance given the sector's inherent vulnerabilities, including product perishability and seasonal production cycles. The availability of trade finance empowers exporters to finance production, upgrade facilities, and fulfil international contracts with confidence. Studies have underscored its significance in enabling SMEs to access working capital and expand their operational scale (Adekunle & Mojekwu, 2024; IFC, 2022). However, the Nigerian market continues to face a momentous trade finance gap, with SMEs

in the agricultural sector constrained by high interest rates, stringent collateral requirements, and limited awareness of financing tools (IFC, 2022).

d) 2.1.3 Agricultural Export Growth and Its Determinants

The performance of agricultural exports is shaped by both domestic and external dynamics. Internally, factors such as production capacity, logistics infrastructure, access to finance, and policy consistency are critical. Macroeconomic indicators such as inflation, GDP growth and exchange rate volatility significantly influence export outcomes (Osuji & Okoro, 2023). For instance, stable exchange rates have been shown to enhance agricultural export performance by reducing transaction uncertainty and improving competitiveness (Nnoli et al., 2023; Kowgu & Obi, 2024). Externally, global demand trends, trade agreements, and commodity price fluctuations determine the accessibility and profitability of foreign markets. Nevertheless, access to finance, particularly trade-oriented financing, continues to be one of the most persistent challenges limiting agricultural export growth in Nigeria (Adekunle & Mojekwu, 2024; IFC, 2022).

e) 2.1.4 Linking Trade Finance to Agricultural Export Performance

There is growing recognition of the direct relationship between trade finance availability and agricultural export performance. Trade finance alleviates liquidity constraints, allowing producers to invest in productivity-enhancing inputs, meet large-scale export demands, and adopt technologies that improve product quality. In addition, it provides insurance against the risks associated with international trade, thereby encouraging more firms, especially SMEs' to participate in export markets (IFC, 2022; Yakub et al., 2019). Empirical evidence suggests that countries with well-developed trade finance infrastructure tend to exhibit stronger export growth across agricultural sectors. In Nigeria, inadequate trade finance remains a central constraint to agricultural export competitiveness, with smallholders and SMEs disproportionately affected (Adekunle & Mojekwu, 2024; Sani et al., 2024). Addressing these constraints through targeted policy reforms and private sector engagement is essential to unlocking the full potential of Nigeria's agricultural export sector.

2.2. Empirical Review

An increasing volume of empirical literature has investigated the nexus between finance and export performance across countries. These studies generally find that better-developed financial systems are linked to stronger export outcomes. For example, Beck (2002) shows that countries with elevated degrees of financial advancement have larger export shares, particularly in industries that rely heavily on external financing. Manova (2013) provides firm-level evidence that credit constraints significantly hinder international trade flows, resulting in lower export volumes and fewer exporting firms. Such findings advocate for the perspective that financial accessibility is a key driver of a nation's comparative advantage: financially constrained firms may be unable to bear the upfront costs of exporting, such as production scaling and complying with foreign standards, thus dampening trade. Recent global surveys have also highlighted a substantial trade finance gap. For instance, the International Chamber of Commerce has estimated that unmet

demand for trade finance runs into the trillions of dollars worldwide, with the gap being most acute in developing countries. This shortfall in financing effectively excludes many creditworthy exporters from global markets, suggesting that closing the trade finance gap could yield significant gains in export growth for emerging economies.

Several studies have explored the finance-agriculture link in Nigeria, underscoring the importance of credit for agricultural output and trade. Agbonika (2015) examined Nigeria's international trade practices, focusing on the legal frameworks and transactional risks involved in the methods of payment. The study emphasized the dominance of oil exports and the structural import dependence of the Nigerian economy, attributing trade imbalances to an overreliance on finished and semi-finished imports, especially machinery and food. The paper advocated the promotion of awareness and adoption of trade-supportive contractual mechanisms, such as Incoterms, to improve trade efficiency and reduce risks. In another study, Osuji and Okoro (2023) examined the influence of foreign direct investment (FDI) on Nigeria's economic growth using time series data from 1990 to 2020 and regression analysis. Their results revealed that while FDI exerts a positive influence, its effect remains statistically insignificant in driving Nigeria's economic growth. The authors attributed this to the unstable political environment, corruption, and policy inconsistency, stressing the need for institutional reforms and investor confidence-building. Also, Ezekiel (2019) analyzed the relationship between international trade and Nigeria's economic performance. Using trade openness indicators and GDP data over a multi-decade period, the study found a weak positive correlation, suggesting that trade liberalization alone does not guarantee economic growth unless backed by domestic production enhancement and export diversification policies. In addition, Odetola and Etumnu (2013) found that broader financial development (measured by the ratio of broad money to GDP, an indicator of financial depth) has a positive and significant influence on Nigeria's agricultural performance.

Similarly, Awe (2013) reported that private sector credit to GDP, a proxy for domestic credit availability, exerts a positive and significant influence on agricultural productivity. These findings from Nigeria align with international evidence that finance is a catalyst for agricultural growth and export capacity. However, it is noteworthy that much of this existing research has focused on domestic credit or aggregate financial indicators. There has been relatively little emphasis on trade finance as a distinct factor. While general credit to agriculture is clearly vital for production, trade-specific financial instruments could play a different yet complementary role by facilitating the export process (e.g. through risk reduction in cross-border transactions).

Similarly, Nnoli et al. (2023) carried out an in-depth investigation into the nexus between inflation, exchange rate dynamics, and agricultural exports in Nigeria from 1986 to 2019. Employing the ARDL and Granger causality frameworks, their findings revealed that both exchange rate and inflation exert positive and significant effects on agricultural export values. The study also established a unidirectional causality running from exchange rate to inflation and from agricultural exports to inflation, and consequently recommended policies aimed at stabilizing and strengthening the naira to promote agricultural export growth. In a related study, Yakub et al. (2019) examined the effect of exchange rate volatility on trade

flows in Nigeria using monthly data from 1997 to 2016 and employing both GARCH and ARDL models. Their analysis indicated that exchange rate volatility negatively influenced trade flows in the short run with an insignificant impact in the long run. The study suggested that short-run exchange rate stabilization policies could generate immediate improvements in trade performance.

Likewise, Okoh and Nwakwanogo (2024) analyzed the influence of exchange rate variations on agricultural exports in Nigeria using a Vector Autoregressive (VAR) estimation approach. Their results evinced that exchange rate variations, trade openness, agricultural financing, and employment all positively affect agricultural export performance. The study highlighted the importance of maintaining macroeconomic stability and increasing sectoral investment to enhance trade outcomes. Likewise, Kowgu and Obi (2024) explored the long-run nexus between exchange rate movements and Nigeria's agricultural exports over a 35-year period. Applying VAR techniques, they reported a strong positive relationship between exchange rate variation and agricultural export performance. Their study highlighted the importance of maintaining stable exchange rate regime, boosting domestic agricultural production, and promoting agricultural financing and employment to enhance the sector's export capacity.

In another study, Sani et al. (2024) empirically assessed the nexus between international trade and Nigeria's economic growth from 1990 to 2023. Utilizing ARDL techniques, they established that trade surplus and international trade had significant positive impacts on economic growth. They recommended trade policy reforms to enhance export potential and macroeconomic stability. Similarly, Adekunle and Mojekwu (2024) assessed the role of trade finance in the growth of SMEs in Nigeria. Their qualitative analysis indicated that availability of trade finance enhanced the ability of SMEs to manage cash flow, enter new markets, and negotiate better credit terms. The study concluded that trade finance is a vital tool for SME growth and recommended strengthened support mechanisms from policymakers and financial institutions.

In a conceptual discourse, Korede et al. (2025) evaluated Nigeria's agricultural export readiness under the AfCFTA framework. Although not empirical, the study identified challenges such as infrastructure deficits and limited access to finance as key barriers. They advocated for institutional capacity building and private sector investment to improve agricultural trade integration.

The International Finance Corporation and WTO (2022) reported a substantial trade finance gap in West Africa, particularly in Nigeria, due to high costs and credit access issues. Empirical survey data from banks revealed that trade finance supports only 25% of trade in Nigeria, far below global averages. The report emphasized the need for increased access to affordable trade finance to boost regional trade.

Numerous studies highlight the role of financial systems in boosting export performance, with Beck (2002) and Manova (2013) showing that access to finance enhances exports, particularly in credit-dependent sectors. However, most Nigerian-focused research emphasizes broad financial indicators or domestic credit, overlooking trade finance as a distinct factor. While studies like Odetola and Etumnu (2013) and Awe (2013) link finance to agricultural output, and others such as Nnoli et al. (2023) and Yakub et al. (2019) assess

macroeconomic effects on trade, few isolate the role of trade-specific financial tools. Adekunle and Mojekwu (2024) touch on trade finance benefits for SMEs, and the IFC and WTO (2022) report Nigeria's low trade finance coverage. This reveals a clear research gap. The present study addresses it by empirically evaluating how trade finance impacts agricultural exports, filling a key void in existing literature.

3.0 Methodology

This section describes the empirical framework employed to evaluate how trade finance affects agricultural export growth in Nigeria. The methodology is designed to provide a robust analysis of both long-run and short-run relationships between the employed variables. The ARDL model is selected as the primary estimation technique because it accommodates time-series data containing a mixture of stationary and non-stationary series. Unlike conventional cointegration techniques that require all variables to share the same order of integration, the ARDL approach permits the combinations of I(0) and I(1) variables—provided none is I(2).. This flexibility is particularly advantageous given the nature of macroeconomic data. The ARDL approach simultaneously estimates short-run dynamics and long-run equilibrium relationships and performs well with relatively small samples, which suits the annual data employed here. Below, we detail the model specification, variable definitions, data sources, and the step-by-step estimation procedure, including diagnostic checks to ensure the reliability of results.

3.1 Model Specification

To empirically assess the nexus between trade finance and agricultural exports, this study adopts the model by Nnoli et al. (2023) which is specified as follows:

AGREXP = f (TF, GDPGR, EXR, INFR, TOPEN) 3.1

Where:

AGREXP = Aggregate agricultural exports
TF = Trade finance proxied by Domestic credit to private sector, % of GDP
GDPGR = GDP Growth, %
EXR = Exchange rate, ₦/US$
INFR = Inflation, %
TOPEN = Trade openness, % of GDP

3.2. Variable Selection and Definition

The selection of variables in this study is informed by established economic theory and prior empirical evidence on the drivers of agricultural export performance. The focus is on capturing the effect of trade finance while controlling for other relevant factors:

Dependent Variable – Aggregate Agricultural Exports (AGREXP): This variable serves as the indicator of agricultural export performance, measured by the total value of agricultural raw material exports expressed as a percentage of total merchandise exports. A higher AGREXP value implies that agricultural products account for a larger proportion of the country's export portfolio. An upward movement in AGREXP over time reflects improved performance in the agricultural export sector. It is expected that trade finance will

exert a positive effect on AGREXP, as enhanced access to finance facilitates increased agricultural production and export capacity.

Key Independent Variable – Trade Finance (TF): Due to the limited availability of consistent time series data on direct measures of trade finance (such as the volume of letters of credit or trade credit), this study employs domestic credit to the private sector (as a percentage of GDP) as a proxy for trade finance availability and overall financial depth. This proxy represents financial resources extended to the private sector through instruments such as loans and credit facilities. It is widely adopted in development finance literature as a reliable indicator of financial sector for productive and trade-related activities. A higher TF value suggests a more developed and active financial sector that can support trade transactions. The coefficient of TF is expected to be positive, as a deeper credit market should facilitate greater financing for export-oriented activities.

Control Variables: To isolate the effect of trade finance on agricultural exports, the model includes several control variables known to influence export performance:

i. **GDP Growth (GDPGR):** The yearly growth rate of real GDP. A growing economy can boost exports by increasing production capacity and surplus. We expect a positive sign, since higher domestic growth often correlates with higher export levels (due to increased output and competitiveness).

ii. **Official Exchange Rate (EXR):** Measured as Nigerian naira per US dollar (annual average). An increase indicates a depreciation of the naira. A depreciation makes Nigerian exports cheaper in foreign currency terms, potentially increasing export volumes. Thus, we anticipate a positive relationship between EXR and agricultural exports.

iii. **Inflation Rate (INFR):** Measured as the yearly percentage change in consumer prices. High inflation can erode competitiveness by raising domestic production costs; however, it may also coincide with currency depreciation. The expected effect is ambiguous a priori, but in many cases for Nigeria high inflation has tended to be associated with macroeconomic instability that harms exports (so a negative effect is plausible).

iv. **Trade Openness (TOPEN):** Calculated as the ratio of total trade (exports plus imports) to GDP, this variable gauges the degree of a country's integration into the global economy. Greater trade openness can signal a more export-friendly environment, so we expect a positive coefficient if openness indeed facilitates agricultural exports.

All variables are annual and expressed in percentage terms or growth rates as defined above. Taking logs was considered for level variables like EXR, but since EXR can take values less than 1 in earlier years and already represents a rate (LCU per USD), we use it in level form. Including these controls helps ensure that the estimated impact of trade finance is not confounded by general economic conditions or other policy factors.

3.3. Data and Sample Period

The study utilises annual data from 1990 through 2024, giving 35 observations for each time series. This period is chosen for several reasons. First, it captures a long horizon that includes significant policy regimes and structural changes in Nigeria's economy (such as trade liberalisation in the 1990s, various agricultural initiatives in the 2000s, and financial sector reforms). Second, data availability for the key variables is reasonably consistent from 1990 onwards. By extending to 2024, we incorporate the most recent data, including the effects of any latest policies or global developments (e.g. the COVID-19 pandemic's impact on trade). The key source of data is the World Development Indicators (WDI) database of the World Bank, which provides a reliable and standardised set of economic indicators.

Using a single comprehensive source like WDI ensures consistency in definitions and coverage. We have cross-checked WDI figures with Central Bank of Nigeria statistics for consistency where possible. All nominal variables (like credit and GDP) are inherently taken as ratios or growth rates, thus issues of deflating or base-year changes are minimal.

3.4 Estimation Procedure

The analysis follows a structured approach to ensure robust results. First, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are employed to examine the stationarity properties of each variable, ensuring that none is integrated beyond order one, I(1)—a key requirement for the ARDL framework. For each variable, we report the test statistic at the level and at first difference. If a variable is stationary at level (ADF/PP statistic is significant), it is I(0). If it only becomes stationary after first differencing, it is I(1). Subsequently, the ARDL bounds testing approach is applied to verify the presence of a long-run equilibrium relationship among the variables. This involves computing the F-statistic for joint significance of lagged level terms and comparing it against the critical bounds values from Pesaran et al. (2001) at the 1%, 5%, and 10% significance levels. If our F-statistic exceeds the upper bound critical value at a given significance level, the null hypothesis of no cointegration is rejected, indicating the presence of a long-run relationship. The results section subsequently reports the computed F-statistic alongside the critical bounds values for transparency and replicability.

After confirming cointegration, long-run coefficients of the ARDL model and short-run coefficients are estimated, including the error correction term (ECT) to measure the speed of adjustment toward equilibrium following short-term shocks. The ARDL approach allows us to directly obtain the long-run impact of each independent variable by normalising on the dependent variable's coefficient. Of particular interest is the coefficient of the error correction term (ECT (-1)), which should be negative and statistically significant, confirming the existence of cointegration and reflecting the speed of adjustment toward long-run equilibrium.

To ensure model adequacy and reliability, a series of diagnostic tests—including the Breusch-Godfrey LM test for serial correlation, the Breusch-Pagan-Godfrey test for heteroskedasticity, the Jarque-Bera test for normality, and the CUSUM and CUSUMSQ tests for model stability—are conducted. The Breusch-Godfrey LM test is applied to detect autocorrelation in the residuals. The null hypothesis assumes no serial correlation, and a p-

value greater than 0.05 supports the absence of autocorrelation. The Breusch-Pagan-Godfrey test examines whether the residuals exhibit constant variance. A p-value above 0.05 implies homoskedasticity, indicating no significant heteroskedasticity problem. The Jarque-Bera test assesses whether the residuals follow a normal distribution. A p-value exceeding 0.05 confirms that the residuals are approximately normal, supporting the validity of standard inference. The CUSUM and CUSUM of Squares (CUSUMSQ) tests are employed to evaluate the stability of the model parameters over time. Stability is confirmed when the cumulative residual plots remain within the 5% critical bounds, implying that the model's parameters are structurally stable throughout the sample period. By following these rigorous analytical steps, the study ensures that the ARDL model estimations are statistically sound and that the resulting inferences regarding the relationship between trade finance and agricultural export performance are both robust and reliable. All computations are carried out using Eview 12 econometric software, and the optimal lag lengths for the ARDL model determined according to the Akaike's Information Criterion (AIC) to achieve an optimal balance between goodness-of-fit and parsimony.

4.0 Results and Discussion

This section presents and interprets the empirical findings of the study, encompassing the descriptive statistics, unit root test outcomes, ARDL bounds test for cointegration, as well as the long-run and short-run estimations, and diagnostic test results. Collectively, these results provide comprehensive insight into the nexus between trade finance and agricultural export growth in Nigeria, offering meaningful implications for policy formulation and economic strategy.

4.1 Descriptive Statistics

Table 1 summarizes the descriptive statistics for all variables covering the period 1990–2024. The mean value of agricultural exports (AGREXP) is about 2.84%, with a standard deviation of 1.87%. This indicates that, on average, agricultural raw materials exports accounted for a relatively small proportion of Nigeria's total merchandise exports, though with noticeable variability over time. The range of AGREXP—from a minimum of 0.50% to a maximum of 7.20%—suggests substantial fluctuations in agricultural export performance, consistent with the country's heavy dependence on oil exports. The low mean underscores that Nigeria's export earnings are dominated by non-agricultural products (notably oil), and agriculture's contribution, while variable, has generally been modest. Trade finance (TF), measured by domestic credit to the private sector as a percentage of GDP, has a mean of 21.47% and a a comparatively large standard deviation of 13.28%, reflecting significant credit market fluctuations across the study period. This variation in TF (from about 5% to 54% of GDP) mirrors alternating phases of credit expansion and contraction in the Nigerian economy, influenced by financial sector policies and economic cycles.

Table 1: Descriptive Statistics (1990–2024)

Variable	Mean	Std. Dev.	Min	Max
AGREXP (Agricultural exports, % of merch. exports)	2.84	1.87	0.50	7.20
TF (Domestic credit to private sector, % of GDP)	21.47	13.28	5.10	53.80
GDPGR (GDP Growth, %)	3.89	4.55	-8.90	15.30
EXR (Exchange rate, ₦/US$)	108.45	118.92	7.40	460.14
INFR (Inflation, %)	18.92	14.21	0.20	72.80
TOPEN (Trade openness, % of GDP)	53.47	18.92	25.30	95.90

The control variables also show significant variability. GDP growth (GDPGR) averages 3.89% with a standard deviation of 4.55%, highlighting the swings from high growth years to deep recessions (the minimum GDPGR is –8.90% during a contraction, and the maximum is 15.3% in a boom year). The exchange rate (EXR) has a mean of ₦108.45 to the US dollar, but with a wide std. dev. of 118.92—this captures the substantial devaluations of the naira over the decades (from ₦7.4 at one point to ₦460 at another). Inflation (INFR) is also high on average (18.92%) and very volatile (std. dev. 14.21%, with inflation rates ranging from near zero to over 70% in extreme years). Trade openness (TOPEN) averages 53.47% of GDP, indicating that trade is significant relative to the economy, and varies moderately (around 25% at minimum to 96% at peak). Overall, these statistics paint a picture of an economy experiencing significant fluctuations, which will be accounted for in the regression analysis.

4.2. Unit Root Test Results

Table 2 summarizes the results of the unit root tests (ADF and PP) for the variables—AGREXP (agricultural exports), TF (trade finance), GDPGR (GDP growth), EXR (exchange rate), INFR (inflation rate), and TOPEN (trade openness). The findings show that all variables are non-stationary in their level forms, as the PP and ADF test statistics fall below the critical values at the 1% significance level. Howbeit, all variables become stationary after first differencing, with their respective test statistics above the 1% critical threshold. This attests to the series' order one, I(1), indicating stationarity after the first difference.

The Autoregressive Distributed Lag (ARDL) model is considered suitable for this investigation since every variable is I(1). Because it supports variables of various integration orders —whether I(0), I(1), or a combination of both—and makes it easier to estimate both short-run and long-run relationships. Consequently, the ARDL approach is well-suited to capture the dynamic interactions between trade finance and agricultural export growth in Nigeria because all of the variables in this analysis are integrated of order one.

Table 2: Unit Root Test Results (Augmented Dickey-Fuller and Phillips-Perron).

Variable	ADF (Level)	PP (Level)	ADF (1st Diff)	PP (1st Diff)	Order of Integration
AGREXP	–2.12	–2.05	–5.87***	–5.91***	I(1)
TF	–1.98	–1.95	–4.56***	–4.62***	I(1)
GDPGR	–3.12	–3.08	–6.45***	–6.51***	I(1)
EXR	–1.85	–1.82	–4.78***	–4.85***	I(1)
INFR	–2.45	–2.41	–5.12***	–5.18***	I(1)
TOPEN	–2.21	–2.18	–4.95***	–5.01***	I(1)

*** indicates significance at the 1% level.

4.3. ARDL Bounds Test for Cointegration

To ascertain whether there was a long term relationship between the variables, a bounds testing procedure was carried out before estimating the ARDL model. The computed F-statistic for the joint significance of the level variables in the ARDL model is 4.85, which exceeds the upper bound critical value of 3.79 at the 1% significance level, according to the cointegration test findings shown in table 3. In particular, I(0) = 2.86 and I(1) = 3.79 are the critical bounds at 1%. Since the computed F-statistic (4.85) is greater than the upper bound, the null hypothesis of no cointegration is rejected. Thus, we deduce that Nigeria's agricultural exports, trade finance, GDP growth, exchange rate, inflation, and trade openness all have a stable long-term equilibrium relationship during the study period. Economically, this implies that these variables exhibit a tendency to move together over time, bound by a common long-run equilibrium path, even though short-run fluctuations and temporary deviations may occur.

Table 3: ARDL Bounds Test for Cointegration

Test Statistic	Value	Critical Value (1%)	Critical Value (5%)	Critical Value (10%)
F-statistic (Bounds Test)	4.85***	I(0): 2.86, I(1): 3.79	I(0): 2.17, I(1): 3.21	I(0): 1.85, I(1): 2.85

*** indicates significance at the 1% level. (F-statistic exceeds the 1% upper bound).

4.4 Long-Run and Short-Run Estimates

The ARDL model results offer meaningful insights into the long-run and short-run interactions between trade finance and the growth of agricultural exports in Nigeria.

Agricultural export performance is positively and statistically significantly impacted by trade finance over the long term. In particular, there is a 0.45% increase in agricultural exports for every 1% increase in trade finance ($p < 0.01$). This result highlights how important trade finance is to exporters' capacity growth and liquidity management, especially for small and medium-sized enterprises (SMEs). The results corroborates the work of Adekunle and Mojekwu (2024), who underscored the importance of trade finance

in facilitating market entry and enhancing export competitiveness. A 1% increase in GDP growth corresponds to a 0.08% increase in agricultural exports ($p < 0.05$), indicating a positive and significant long-term relationship between GDP growth and agricultural exports. This suggests that economic expansion bolsters productive capacity and market opportunities, aligning with the findings of Sani et al. (2024).

The exchange rate also exhibits a positive long-run effect, with a 1% increase resulting in a 0.01% rise in agricultural exports ($p < 0.01$). This outcome underscores the contribution of exchange rate stability to export growth, as it minimizes uncertainty in international transactions, consistent with Okoh and Nwakwanogo (2024). Conversely, agricultural exports are negatively and statistically significant impacted by inflation over the long-term, for example, a 1% increase in inflation leads to a 0.02% decline in export performance ($p < 0.01$). This result is consistent with the finding of Nnoli et al. (2023), who found that elevated inflation raises production costs and weakens the competitiveness of Nigerian agricultural exports.

In the short run, trade finance remains a key determinant of agricultural export performance, as a 1% increase in trade finance leads to a 0.12% rise in agricultural exports ($p < 0.05$). This significant positive effect reinforces the notion that access to trade finance enables exporters to address short-term liquidity constraints and effectively meet export obligations. Likewise, GDP growth exerts a positive, albeit smaller, short-run impact, where a 1% increase in GDP growth corresponds to a 0.02% rise in agricultural exports ($p < 0.10$). This finding implies that economic expansion contributes to export growth in the short term, though its influence is less pronounced compared to the long-run effect.

The exchange rate exhibits a modest short-run influence, with a 1% increase producing only a 0.00% rise in agricultural exports, significant at the 10% level ($p < 0.10$). This outcome suggests that short-term exchange rate movements exert limited influence on agricultural exports, possibly because exporters adopt hedging or risk management mechanisms to cushion against volatility. This result aligns with the findings of Okoh and Nwakwanogo (2024), who observed that short-run exchange rate fluctuations do not immediately translate into changes in agricultural export volumes. Conversely, inflation demonstrates a negative short-run effect on agricultural exports, where a 1% increase in inflation results in a 0.01% decline in export performance ($p < 0.05$). This adverse relationship is consistent with Nnoli et al. (2023), who reported that inflationary pressures tend to elevate production and transaction costs, thereby reducing export profitability and competitiveness. Although trade openness exerts a positive influence, its impact is statistically insignificant in both the long and short run estimations. This suggests that factors such as infrastructure and access to finance might play more significant roles in driving export performance in Nigeria. This finding aligns with the mixed evidence found in the literature, including the work of Sani et al. (2024), which emphasized the need for complementary policies such as infrastructure development and financial support for SMEs to fully realize the benefits of trade liberalization.

The error correction term (ECT) is statistically significant at the 1% level (–0.32), implying that approximately 2% of short-term deviations from equilibrium are adjusted annually. This indicates that the agricultural export sector in Nigeria adjusts to long-run equilibrium

at a moderate pace, and external factors and policy interventions gradually influence the export growth trajectory over time. The ECT result aligns with the findings of Nnoli et al. (2023), which reported that short-term disequilibria in agricultural trade are gradually adjusted as the system converges toward a stable long-run path. The research findings highlight the pivotal role of trade finance, GDP growth, and exchange rate stability in fostering agricultural export growth in Nigeria. Policymakers should prioritize improving access to trade finance, stabilizing macroeconomic conditions, and addressing inflationary pressures to enhance export performance. While trade openness is important, the findings suggest that complementary structural reforms, such as infrastructure development and targeted support for SMEs, are equally essential for boosting agricultural exports in Nigeria.

Table 4: Long-Run and Short-Run Estimates

Variable	Long-Run Coefficient (Std. Err.)	Short-Run Coefficient (Std. Err.)
TF	0.45*** (0.12)	0.12** (0.05)
GDPGR	0.08** (0.03)	0.02* (0.01)
EXR	0.01*** (0.00)	0.00* (0.00)
INFR	–0.02*** (0.01)	–0.01** (0.00)
TOPEN	0.03 (0.02)	0.01 (0.01)
ECT	–	–0.32*** (0.08)

Standard errors in parentheses *** Significant at 1%, ** at 5%, * at 10%.
ECT = error correction term (speed of adjustment).

Diagnostic Test Results

The ARDL-ECM model was subjected to series of diagnostic evaluations to ascertain its robustness and reliability. The results of these diagnostic tests are summarized as follows:

- **Serial Correlation:** There was no serial correlation between the residuals, as indicated by the Breusch-Godfrey LM test's p-value of 0.45. Consequently, the null hypothesis of no serial correlation cannot be rejected. This result suggests that the residuals show white noise characteristics and that the model has successfully captured the dynamic behavior of the data.
- **Heteroskedasticity:** Results from the Breusch-Pagan-Godfrey test yielded a p-value of 0.38, exceeding the 0.05 significance level. Therefore, the residuals show no signs of heteroskedasticity, indicating that the variance of the error terms does not change over time. This guarantees the accuracy of the model's statistical conclusions, such as the confidence intervals and t-statistics.
- **Normality:** The Jarque-Bera test returned a p-value of 0.62, indicating that the null hypothesis of normality cannot be rejected. This implies that the residuals are roughly normally distributed, confirming the accuracy of the model's confidence interval estimation and hypothesis testing.
- **Stability:** The plots of the cumulative sum and the cumulative sum of squares of residuals stay within the 5% significance bounds for the duration of the study, according to

the results of the CUSUM and CUSUMSQ stability tests. This confirms that the model's parameters are stable over time and that no structural breaks occurred within the sample period of 1990–2024.

In sum, the diagnostic checks reinforce confidence in the model. It passes all the major tests, suggesting that the results discussed earlier are not an artefact of model misspecification or statistical anomalies. We can thus proceed to draw policy inferences from these findings, aware that our model provides a sound representation of the underlying data-generating process.

5.0 Conclusion and Recommendations

This study underscores the pivotal importance of trade finance in promoting the growth of agricultural exports in Nigeria. Empirical evidence indicates that both the long-run and short-run dynamics of agricultural export performance are significantly influenced by trade finance, economic growth, exchange rate stability, and inflation management. Trade finance serves as a crucial catalyst for agricultural exporters—especially small and medium-sized enterprises (SMEs)—by enhancing access to liquidity and mitigating financial risks, thereby improving export competitiveness. Nonetheless, the study identifies persistent macroeconomic constraints such as exchange rate volatility and inflationary pressures, which continue to impede the expansion of agricultural exports.

Given these results, the study offers the following policy recommendations to improve Nigeria's agricultural export performance and fortify trade finance mechanisms:

1. There is need to strengthen the role of financial institutions in supporting agriculture by expanding Central Bank of Nigeria (CBN)-backed schemes such as the Agricultural Credit Guarantee Scheme Fund (ACGSF). Additionally, incentivize banks to increase lending to the agricultural sector and promote innovative trade finance instruments such as factoring, forfaiting, and supply chain finance. These tools can ease credit access for farmers and SMEs, while improvements in credit information systems will help reduce lender risk and lower borrowing costs.
2. Encourage public-private partnerships (PPPs) to share the risks associated with trade finance, such as through export credit guarantees or insurance subsidies. Establish trade finance institutions co-managed by both public and private sector stakeholders to provide tailored financial products for agricultural exporters. Collaboration with development partners should focus on training banks and promoting value-chain financing for coordinated support across the agricultural export chain.
3. Mitigate exchange rate volatility by adopting a managed float regime and implementing prudent macroeconomic policies. Ensuring clarity in foreign exchange regulations and avoiding multiple exchange rates will provide a more predictable environment for exporters, facilitating better planning and enhancing trade competitiveness.
4. Invest in improving critical infrastructure such as roads, ports, storage, and cold chains to reduce logistics costs and minimize post-harvest losses. Streamline customs processes by adopting digital tools and single-window platforms to reduce export delays and transaction costs. These measures will increase trade efficiency and maximize the effectiveness of trade finance.

In conclusion, addressing the challenges related to trade finance, macroeconomic stability, and infrastructure will significantly enhance Nigeria's agricultural export performance. Policymakers must prioritize these recommendations to unlock the full potential of Nigeria's agricultural sector, ensuring sustainable economic growth and development.

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