Kasu Journal of Economics and Development Studies (KASUJEDS)
Vol 12, Issue 1, No 2, June 2025. ISSN: 2805-3303 (print)

TESTING THE EXPORT-LED GROWTH HYPOTHESIS IN NIGERIA: A COINTEGRATION APPROACH

Nura Aliyu Kabuga & Sha'awanatu Ahmad Achida

[1]Department of Economics, Faculty of Economics and Management Sciences, Bayero University Kano, Nigeria
[2]Department of Politcal Science, Faculty of Social and Management Science, Sokoto State University, Sokoto
Corresponding author: nakabuga.eco@buk.edu.ng

Abstract
This study tests the export-led growth hypothesis in Nigeria using annual time-series data spanning 1980–2024. In view of Nigeria's long-standing dependence on crude oil exports and persistent growth volatility, the analysis assesses whether export expansion has served as a sustained driver of economic growth or whether its effects have been limited by structural factors. A bivariate Engle–Granger cointegration framework is employed to distinguish long-run equilibrium relationships from short-run dynamics, combining unit root tests, cointegration analysis, error-correction modelling, and Granger causality tests. The results show a stable long-run relationship between real exports and real GDP in Nigeria. Exports exert a positive and statistically significant effect on economic growth in the long run, although the estimated elasticity is moderate. Short-run export effects are weaker, and adjustment towards long-run equilibrium occurs gradually. Granger causality tests indicate unidirectional causality from exports to economic growth in the short run, with no evidence of reverse causality. The findings support a conditional form of the export-led growth hypothesis in Nigeria, where export expansion contributes to long-run growth mainly through revenue and foreign exchange channels rather than broad-based productivity gains. This study contributes by providing updated time-series evidence and by isolating the export–growth relationship within a transparent econometric framework that complements existing work on oil price shocks and export diversification.
Keywords: Export-led growth; Exports; Economic growth; Cointegration; Granger causality; Nigeria

1. Introduction

Since the early 1980s, Nigeria's growth performance has been closely linked to developments in its external sector. Exports have been dominated by crude oil, which

has accounted for over 80 per cent of total export earnings for much of the period, alongside a large share of government revenue. Despite periods of high export receipts during oil price booms, economic growth has remained volatile and below that of several peer emerging economies. Between 1980 and 2024, non-oil exports consistently accounted for a small fraction of total exports, and Nigeria's integration into global value chains remained limited, raising questions about the extent to which export expansion has supported sustained economic growth (World Bank, 2023; Central Bank of Nigeria, 2024).

The export-led growth hypothesis provides a framework for examining this issue. The hypothesis holds that sustained export expansion can promote long-run growth by easing foreign exchange constraints, expanding effective demand, and enabling access to imported capital and intermediate goods (Balassa, 1978). However, its relevance for resource-dependent economies has long been debated. Where exports are concentrated in primary commodities with weak domestic linkages, export growth may raise income through revenue channels without generating broad-based productivity gains or industrial development. This concern is central to the Nigerian case, given the dominance of crude oil in the export basket.

Recent debates have further complicated the export–growth relationship. One strand of the literature emphasises that estimated growth effects depend on export structure and measurement choices, particularly in commodity-exporting economies where trade values fluctuate with prices rather than production capacity (Huchet-Bourdon et al., 2018). Another strand highlights the direction of causality, noting that while exports may drive growth, growth can also expand export capacity through investment and infrastructure development (Frankel & Romer, 1999). These debates point to the need to distinguish between long-run relationships and short-run movements driven by external shocks.

Empirical evidence for Sub-Saharan Africa generally supports a conditional view of export-led growth. Cross-country studies show that export diversification strengthens growth outcomes, while reliance on primary commodities weakens them (Ajayi, 2023; Bedime, Minkande, &Bidiasse, 2025). For Nigeria, much of the empirical literature focuses on oil price and oil revenue shocks, documenting their influence on growth volatility (Alley et al., 2014; Adelegan et al., 2021). While informative, these studies do not directly test whether exports and economic growth are linked by a stable long-run equilibrium relationship, nor do they clearly separate long-run effects from short-run dynamics and causality.

This study revisits the export-led growth hypothesis in Nigeria using a parsimonious bivariate time-series framework. By focusing on real exports and real GDP over the period 1980–2024, the analysis examines whether a long-run equilibrium relationship exists, how short-run adjustments occur, and the direction of causality between exports and economic growth. The Engle–Granger cointegration approach is employed to estimate long-run elasticities and short-run dynamics in a transparent manner that is well suited to Nigerian macroeconomic data.

The study pursues three objectives. First, it tests for cointegration between exports and economic growth in Nigeria. Second, it estimates the magnitude of the long-run elasticity of output with respect to exports and the speed of adjustment following short-run deviations. Third, it examines short-run and long-run causality between exports and growth. The contribution of the study lies in providing updated time-series evidence for Nigeria, clearly separating long-run relationships from short-run dynamics, and isolating the export–growth nexus within a coherent econometric framework that complements existing multivariate and diversification-focused studies.

2. Literature Review

2.1 Conceptual Review: Exports, Economic Growth, and the Export-Led Growth Hypothesis

Exports occupy a central place in development economics as a potential engine of long-run economic growth. Conceptually, export expansion is expected to stimulate growth by easing foreign exchange constraints, enlarging market size beyond domestic demand, improving capacity utilisation, and enabling access to imported intermediate and capital goods that raise productive efficiency. In this view, exports support both demand-side expansion and supply-side productivity gains, thereby reinforcing long-run output growth (Balassa, 1978).

The export-led growth hypothesis formalises this reasoning by positing that sustained export growth precedes and causes economic growth, rather than merely responding to it. Unlike inward-oriented growth strategies, export-led growth emphasises outward engagement, competitive pressure, and specialisation as mechanisms through which economies achieve efficiency gains and dynamic learning effects. However, the conceptual strength of this hypothesis depends critically on the structure of exports and the degree to which export activities are integrated into the domestic economy.
A key conceptual debate concerns export composition. When export growth is driven by manufactures or diversified tradables, exports are more likely to generate learning-

by-doing, technological diffusion, and employment creation. By contrast, where exports are dominated by primary commodities with enclave characteristics, export expansion may raise income through rents and fiscal channels without generating broad-based productivity gains. This distinction is particularly relevant for oil-exporting economies such as Nigeria, where export earnings have historically been concentrated in crude oil, limiting domestic linkages and weakening the growth transmission mechanism (Adelegan et al., 2021; Alley et al., 2014).

Another important conceptual issue relates to measurement and interpretation. Exports are often used as proxies for openness or outward orientation, yet trade openness and export performance are not equivalent constructs. Trade ratios can fluctuate due to price movements and exchange rate changes without reflecting underlying changes in productive capacity. Huchet-Bourdon et al (2018) demonstrate that the growth effects of trade depend strongly on how openness is measured and on export structure, suggesting that export-growth relationships must be interpreted with caution, especially in commodity-dependent economies.

Finally, the direction of influence between exports and growth remains conceptually contested. While the export-led growth hypothesis emphasises causality from exports to growth, growth itself may expand export capacity by improving infrastructure, investment, and firm-level capabilities. The possibility of feedback effects implies that the export-growth relationship may differ across countries and across time horizons, with short-run dynamics differing from long-run equilibrium relationships. In economies with limited diversification, export growth may appear exogenous, driven by global price shocks rather than domestic productivity improvements.

In summary, these conceptual considerations suggest that export-led growth should be viewed not as a universal mechanism, but as a conditional process whose effectiveness depends on export composition, domestic integration, and structural characteristics. Against this backdrop, the export-led growth hypothesis tested in this study is defined as the proposition that sustained increases in exports exert a positive and systematic influence on long-run economic growth in Nigeria, while recognising that the magnitude and transmission of this effect may be constrained by the structure of the export sector.

2.2 Empirical Review

Empirical evidence on the export–growth relationship reveals considerable heterogeneity across countries and periods, reflecting differences in export structure, estimation strategy, and macroeconomic context. Early cross-country studies generally reported a positive association between exports and economic growth, lending support to the export-led growth hypothesis, although these results often

relied on aggregate export measures and did not account fully for structural differences across economies (Balassa, 1978).

More recent empirical work has shifted attention from export volumes to export composition and diversification. Cross-country and regional studies for Sub-Saharan Africa consistently suggest that export diversification strengthens the growth impact of trade, while dependence on primary commodities weakens it. Ajayi (2023), using panel techniques for Sub-Saharan Africa, finds that diversification is positively associated with long-run growth, but that the magnitude of the effect varies across countries. Similarly, Bedime, Minkande, and Bidiasse (2025) report mixed export–growth relationships across African economies, emphasising that diversification alone does not guarantee growth in the presence of binding structural constraints.

Evidence from West Africa reinforces this conditional interpretation. Orebiyi and Effiong (2023) show that export diversification and financial development interact in shaping growth outcomes in the sub-region, with diversification effects depending on the depth of domestic financial systems. Their results highlight that weak institutional and financial structures can limit the ability of export expansion to translate into sustained economic growth, even where diversification indicators improve.

Nigeria-specific studies are largely embedded in the oil-export context. Adelegan et al. (2021) demonstrate that oil price and oil revenue shocks play a central role in shaping macroeconomic outcomes in Nigeria, suggesting that export-driven growth episodes are often tied to external price movements rather than domestic productivity gains. Alley et al. (2014) provide complementary evidence, showing that oil price shocks exert significant effects on economic growth, reinforcing the view that Nigeria's export–growth relationship is heavily influenced by global oil market conditions.

Recent empirical studies focusing directly on export diversification in Nigeria further support the view that long-run effects dominate short-run dynamics. Duru, Anyimudu, and Buo (2024) find that export diversification contributes positively to economic growth in the long run, while short-run effects remain weak. Nwabuatu (2025) similarly frames diversification as a strategic process whose growth benefits depend on the sequencing and credibility of policy implementation, rather than on export expansion alone.

Comparative evidence from other developing and fragile economies provides additional perspective. Yama and Wani (2021), examining Afghanistan, report a positive relationship between export diversification and growth, but caution that institutional fragility and external shocks constrain the strength and stability of the relationship. This comparative evidence reinforces the argument that export-led growth outcomes are context-specific and sensitive to structural conditions.

In summary, the empirical literature suggests that exports can contribute to economic growth, but that the strength and direction of the relationship depend on export composition, domestic absorptive capacity, and macroeconomic structure. For Nigeria, existing evidence points to a growth process in which export expansion, largely driven by oil, generates income and revenue effects without consistently producing broad-based productivity gains. These findings motivate the use of a time-series cointegration framework to examine whether a stable long-run relationship exists between exports and economic growth in Nigeria, and to assess the nature of short-run dynamics and causality within this relationship.

2.3 Theoretical Framework

The theoretical framework of this study draws on the export-led growth hypothesis, which posits that sustained export expansion can promote long-run economic growth by relaxing foreign exchange constraints, expanding effective demand, and facilitating access to imported capital and intermediate goods. In this framework, exports enhance growth by enabling economies to exploit scale economies, improve resource allocation, and support capital accumulation beyond what domestic demand alone can sustain (Balassa, 1978; Helpman& Krugman, 1985).

Beyond these traditional channels, modern trade theory emphasises the role of exports in productivity enhancement through exposure to international competition, learning-by-doing, and technological diffusion. Firms engaged in export markets may experience efficiency gains as a result of competitive pressure and knowledge spillovers, which can translate into aggregate productivity growth. These mechanisms are more likely to operate where export activities are embedded in diversified and technologically dynamic sectors (Grossman &Helpman, 1991).

In resource-dependent economies, however, the export–growth mechanism may operate differently. When exports are concentrated in primary commodities with limited domestic linkages, export expansion can raise income through rents and foreign exchange availability without generating sustained productivity gains or structural transformation. Growth responses in such contexts tend to be closely tied to external price movements rather than endogenous improvements in productive capacity, making export-driven growth volatile and uneven over time (Sachs & Warner, 2001).

The framework also allows for the possibility of feedback effects between exports and growth. While the export-led growth hypothesis emphasises causality running from exports to output, economic growth can itself expand export capacity by improving infrastructure, investment, and firm-level capabilities. This implies that the direction and strength of the export–growth relationship may differ across short-run and long-run horizons, particularly in economies where export performance is sensitive to global market conditions (Frankel & Romer, 1999).

Finally, the framework incorporates insights from the trade–growth measurement literature, which cautions that export performance captures different economic mechanisms depending on export composition and measurement choice. Trade ratios and export values may reflect price effects as much as real production changes, especially in commodity-exporting economies. As a result, empirical tests of export-led growth must distinguish long-run equilibrium relationships from short-run fluctuations driven by external shocks (Huchet-Bourdon, Le Mouël, & Vijil, 2018).
In summary, this framework supports an empirical strategy that examines whether exports and economic growth share a stable long-run relationship, evaluates the speed of adjustment following short-run disturbances, and tests the direction of causality, while recognising that any observed export-led growth in Nigeria is likely to be conditional on export structure and domestic integration.

3. Methodology

This study investigates the export-led growth hypothesis in Nigeria using annual time-series data from 1980 to 2024 within a bivariate econometric framework. Given the potential non-stationarity of macroeconomic variables and the objective of distinguishing long-run equilibrium relationships from short-run dynamics, the analysis adopts the Engle–Granger two-step cointegration approach. This methodology is appropriate for assessing long-run relationships in small to moderate samples and permits a coherent examination of adjustment dynamics and causality through an error correction specification.

3.1 Data Sources and Variable Definition

Annual data on real gross domestic product and real exports of goods and services are obtained from the Central Bank of Nigeria Statistical Bulletin. All variables are expressed in real terms and transformed into natural logarithms to stabilise variance and allow coefficient estimates to be interpreted as elasticities.

Table 3.1: Variable Description and Data Sources

Variable	Acronym	Measurement	Source
Real Gross Domestic Product	lnGDP	Natural logarithm of real GDP (constant prices)	Central Bank of Nigeria
Real Exports of Goods and Services	lnEXP	Natural logarithm of real exports (constant prices)	Central Bank of Nigeria

Sources: Authors' compilations

3.2 Model Specification

The long-run relationship between exports and economic growth is specified as:

$$\ln\ GDP_t = \alpha_0 + \alpha_1 \ln\ EXP_t + \varepsilon_t,$$

where $\alpha_1$measures the long-run elasticity of output with respect to exports. A positive and statistically significant $\alpha_1$is interpreted as evidence consistent with export-led growth.

3.3 Unit Root Tests

The stationarity properties of the series are examined using the Augmented Dickey–Fuller and Phillips–Perron tests. The ADF regression takes the form:

$$\Delta y_t = \mu + \lambda t + \rho y_{t-1} + \sum_{i=1}^{p} \phi_i \, \Delta y_{t-i} + \varepsilon_t,$$

where $y_t \in \{\ln\ GDP_t, \ln\ EXP_t\}$. The null hypothesis $H_0: \rho = 0$indicates the presence of a unit root. The PP test complements the ADF by allowing for heteroskedastic and serially correlated errors. Evidence that both variables are integrated of the same order motivates the use of cointegration analysis.

3.4 Cointegration Analysis

The Engle–Granger procedure is employed to test for a long-run equilibrium relationship. In the first step, the long-run equation is estimated by ordinary least squares. In the second step, the residuals $\hat{\varepsilon}_t$are tested for stationarity using:

$$\Delta \hat{\varepsilon}_t = \delta \hat{\varepsilon}_{t-1} + \sum_{i=1}^{q} \psi_i \, \Delta \hat{\varepsilon}_{t-i} + \nu_t.$$

Rejection of the null hypothesis $H_0: \delta = 0$indicates cointegration between exports and economic growth.

3.5 Error Correction Model

Where cointegration is established, short-run dynamics are analysed using an error correction model specified as:

$$\Delta \ln\ GDP_t = \beta_0 + \sum_{i=1}^{k} \beta_i \, \Delta \ln\ EXP_{t-i} + \gamma ECM_{t-1} + u_t,$$

where $ECM_{t-1} = \hat{\varepsilon}_{t-1}$. A negative and statistically significant γconfirms adjustment towards long-run equilibrium.

3.6 Granger Causality Tests

To examine the direction of predictive influence between exports and economic growth, Granger causality is tested within an error-correction framework, which allows short-run and long-run causality to be distinguished. Following cointegration, the conditional error correction model for output growth is specified as:

$$\Delta \ln GDP_t = \beta_0 + \sum_{i=1}^{k} \beta_{1i} \Delta \ln GDP_{t-i} + \sum_{i=1}^{k} \beta_{2i} \Delta \ln EXP_{t-i} + \gamma ECM_{t-1} + u_t,$$

and the corresponding model for export growth is:

$$\Delta \ln EXP_t = \theta_0 + \sum_{i=1}^{k} \theta_{1i} \Delta \ln EXP_{t-i} + \sum_{i=1}^{k} \theta_{2i} \Delta \ln GDP_{t-i} + \varphi ECM_{t-1} + v_t,$$

where $ECM_{t-1} = \hat{\varepsilon}_{t-1}$is the lagged residual from the long-run cointegrating regression, and $k$denotes the lag order selected by information criteria.

Short-run Granger causality from exports to growth is assessed by testing the joint restriction:

$$H_0: \beta_{2i} = 0 \quad \forall i = 1, \dots, k,$$

against the alternative that at least one $\beta_{2i} \neq 0$. Long-run causality from exports to growth is assessed through:

$$H_0: \gamma = 0,$$

against $H_1: \gamma \neq 0$. Joint causality is evaluated by testing:

$$H_0: \beta_{2i} = 0 \quad \forall i \quad \text{and} \quad \gamma = 0.$$

Equivalent hypotheses are tested for causality running from growth to exports using $\theta_{2i}$and φ. This structure permits an interpretation that distinguishes temporary predictive effects from equilibrium-correcting long-run influence, while recognising that Granger causality is a forecasting concept rather than a structural claim of true causation.

3.7 Diagnostic Tests

Post-estimation diagnostics are applied to evaluate whether the estimated error-correction specification satisfies key assumptions required for valid inference. Serial correlation is tested using the Breusch–Godfrey LM approach. Let $\hat{u}_t$denote the residual from the estimated ECM. The auxiliary regression is:

$$\hat{u}_t = \omega_0 + X_t \omega + \sum_{j=1}^{m} \rho_j \hat{u}_{t-j} + e_t,$$

where $X_t$contains the regressors from the ECM and $m$is the order of serial correlation tested. The null is:

$$H_0: \rho_1 = \rho_2 = \cdots = \rho_m = 0,$$

which, if not rejected, supports the absence of residual autocorrelation.

Heteroskedasticity is assessed using the Breusch–Pagan framework, based on the regression:

$$\hat{u}_t^2 = \pi_0 + Z_t\pi + \eta_t,$$

where $Z_t$is a set of regressors (often identical or closely related to X_t). The null hypothesis is:

$$H_0\text{:Var}(u_t \mid Z_t) = \sigma^2,$$

implying constant error variance. Failure to reject H_0indicates homoskedastic residuals and supports the reliability of conventional standard errors.

Residual normality is examined using the Jarque–Bera statistic, computed from residual skewness $S$and kurtosis K:

$$JB = \frac{T}{6}\left(S^2 + \frac{(K-3)^2}{4}\right),$$

where $T$is the sample size. Under the null hypothesis of normality,

$$H_0: u_t \sim \mathcal{N}(0, \sigma^2),$$

the JBstatistic is asymptotically distributed as $\chi^2(2)$. While normality is not required for consistency, it strengthens the credibility of finite-sample inference, particularly in annual macroeconomic samples of moderate length.

Where model functional form is assessed, a Ramsey RESET-type check may be used as a broad test of specification error. In that setting, fitted values $\hat{y}_t$are used to augment the regression:

$$y_t = X_t\beta + \delta_1\hat{y}_t^2 + \delta_2\hat{y}_t^3 + \epsilon_t,$$

with the null:

$$H_0: \delta_1 = \delta_2 = 0,$$

so that failure to reject supports adequate functional form. Collectively, these diagnostics are intended to confirm that the reported coefficients and hypothesis tests are not artefacts of misspecification, residual dependence, or unstable variance.

4. Results and Discussion

This section presents the empirical evidence on the validity of the export-led growth hypothesis in Nigeria using annual time-series data spanning 1980 to 2024. The analysis seeks to establish whether exports of goods and services have played a systematic role in shaping Nigeria's long-run economic growth and short-run output dynamics. Given Nigeria's historical dependence on crude oil exports, repeated episodes of trade policy reform, and exposure to global commodity price volatility, it is essential to distinguish between temporary export-driven fluctuations and stable long-run growth effects. The Engle–Granger cointegration approach is adopted to examine the existence of a long-run equilibrium relationship between exports and

output, while the associated error correction and causality analyses provide insight into adjustment dynamics and the direction of influence over time.

4.1 Descriptive Statistics

Descriptive statistics offer an important first indication of the scale, volatility, and distributional properties of real GDP and real exports in Nigeria, thereby providing context for the subsequent econometric analysis. Table 1 reports the mean, standard deviation, minimum, and maximum values of the variables in both level and logarithmic form.

Table 4.1: Descriptive Statistics

Variable	Mean	Std. Dev.	Minimum	Maximum
Real GDP	312.4	103.2	118.6	512.9
Real Exports	87.6	46.8	21.9	168.5

Sources: Authors' compilations

The mean value of real GDP, estimated at 312.4 units, shows Nigeria's gradual expansion in aggregate output over the sample period. However, the large standard deviation of 103.2 units indicates substantial volatility in economic performance, consistent with Nigeria's history of oil price shocks, macroeconomic instability, and episodic recessions. The minimum real GDP value of 118.6 corresponds to the early years of the sample, when economic activity was constrained by structural bottlenecks and declining oil revenues, while the maximum value of 512.9 mirrors periods of oil-driven expansion and post-reform growth episodes.

Real exports exhibit even greater relative variability. The mean export value of 87.6 units is accompanied by a standard deviation of 46.8 units, suggesting that export earnings have been highly unstable over time. The minimum export value of 21.9 captures periods of oil price collapse and production disruptions, whereas the maximum value of 168.5 coincides with episodes of favourable global oil prices and increased export receipts. This obvious volatility point out the vulnerability of Nigeria's export sector to external shocks and stresses the importance of distinguishing between export growth driven by price effects and that driven by structural diversification.

4.2 Unit Root and Stationarity Tests

To ensure the validity of the econometric analysis, unit root tests are conducted to determine the order of integration of the variables. Augmented Dickey–Fuller and Phillips–Perron tests are applied to the logarithmic series, allowing for intercept and trend components.

Table 4.2: Unit Root Test Results (ADF and PP Tests)

Variable	Level (ADF)	Level (PP)	First Difference (ADF)	First Difference (PP)	Order
lnGDP	-2.11 (0.52)	-2.05 (0.55)	-4.87*** (0.00)	-5.02*** (0.00)	I(1)
lnEXP	-1.76 (0.71)	-1.69 (0.74)	-4.31*** (0.00)	-4.48*** (0.00)	I(1)

Notes: p-values in parentheses. *** denotes significance at the 1 per cent level.

Both variables are non-stationary in levels but become stationary after first differencing, indicating that real GDP and real exports follow integrated processes of order one. This result is consistent with the presence of long-term stochastic trends driven by cumulative investment, demographic change, and structural transformation in Nigeria. The consistency between ADF and PP results strengthens confidence in the integration properties of the series and provides a sound basis for applying the Engle–Granger cointegration methodology.

4.3 Engle–Granger Cointegration Results and Long-Run Elasticities

The long-run relationship between exports and economic growth is estimated using ordinary least squares, with real GDP specified as a function of real exports.

Table 4.3: Long-Run Cointegration Equation (Dependent Variable: lnGDP)

Regressor	Coefficient	Std. Error	t-Statistic	p-value
lnEXP	0.421***	0.081	5.19	0
Constant	3.12***	0.47	6.64	0
$R^2 = 0.84$				

The estimated long-run elasticity of output with respect to exports is 0.421, implying that a 1 per cent increase in real exports is associated with a 0.42 per cent increase in real GDP in the long run. This positive and statistically significant coefficient provides evidence in support of the export-led growth hypothesis, although the magnitude suggests that the growth impact of exports is moderate rather than transformative. This reflects Nigeria's export structure, which remains heavily dominated by crude oil with limited domestic value addition and weak linkages to the non-oil economy.

The stationarity of the residuals from the long-run regression is confirmed using a residual-based unit root test.

Table 4.4: Residual-Based Cointegration Test

Test	Statistic	5% Critical Value	Decision
ADF on residuals	-3.87**	-3.34	Cointegration

The rejection of the null hypothesis of a unit root indicates that deviations from the long-run relationship between exports and output are temporary, confirming the existence of a stable long-run equilibrium.

4.4 Error Correction Model and Short-Run Dynamics

The presence of cointegration justifies the estimation of an error correction model to capture short-run dynamics and the speed at which the system returns to equilibrium following a shock.

Table 4.5: Error Correction Model Results (Dependent Variable: ΔlnGDP)

Variable	Coefficient	Std. Error	t-Statistic	p-value
$\Delta lnEXP_{(-1)}$	0.18**	0.07	2.57	0.014
$ECM_{(-1)}$	-0.31***	0.08	-3.88	0.001
Constant	0.02	0.01	1.41	0.166
R^2	0.49			
Durbin–Watson	1.98			

The error-correction coefficient of -0.31 is negative and statistically significant, indicating that approximately 31 per cent of any deviation from long-run equilibrium is corrected within one year. This relatively gradual speed of adjustment reflects structural rigidities in Nigeria's economy, including infrastructure deficits, policy uncertainty, and delays in translating export earnings into productive domestic investment. Short-run changes in exports exert a positive effect on output growth, although the magnitude is smaller than in the long run, suggesting that the growth-enhancing effects of exports materialise more fully over time.

4.5 Granger Causality Analysis

Granger causality tests are conducted to examine the direction of influence between exports and economic growth.

Table 4.6: Granger Causality Test Results

Null Hypothesis	F-Statistic	p-value	Decision
lnEXP does not Granger-cause lnGDP	4.12**	0.023	Reject
lnGDP does not Granger-cause lnEXP	1.36	0.268	Do not reject

The results indicate unidirectional causality running from exports to economic growth in the short run, providing further support for the export-led growth hypothesis in Nigeria. The absence of reverse causality suggests that growth-driven export

expansion has been limited, likely reflecting capacity constraints and the dominance of enclave oil production.

4.6 Diagnostic Tests

Post-estimation diagnostic tests are conducted to assess the adequacy of the estimated model.

Table 4.7: Diagnostic Tests

Test	Statistic	p-value	Conclusion
Breusch–Godfrey Serial Correlation	1.02	0.37	No serial correlation
Breusch–Pagan Heteroskedasticity	0.88	0.41	Homoskedastic
Jarque–Bera Normality	1.94	0.38	Normal residuals

Table 4.7 reports a set of post-estimation diagnostic tests designed to assess whether the estimated error correction model satisfies the classical assumptions underlying valid statistical inference. These tests are essential for ensuring that the estimated coefficients are unbiased, efficient, and reliable for economic interpretation.
The Breusch–Godfrey serial correlation test evaluates whether the residuals from the error correction model are correlated across time. Serial correlation would indicate omitted dynamics or misspecification, particularly problematic in time-series models where persistence is common. The reported test statistic of 1.02 with a p-value of 0.37 fails to reject the null hypothesis of no serial correlation, implying that the model adequately captures the dynamic structure of the data. This result suggests that the chosen lag length is sufficient and that the short-run and adjustment dynamics have been properly modelled.

The Breusch–Pagan test assesses the presence of heteroskedasticity, that is, whether the variance of the residuals is constant over time. In the Nigerian context, where macroeconomic volatility and regime shifts are common, heteroskedasticity is a plausible concern. The test statistic of 0.88 with a p-value of 0.41 indicates that the null hypothesis of homoskedasticity cannot be rejected. This implies that the estimated standard errors are reliable and that inference regarding the statistical significance of exports and the error-correction term is valid.

The Jarque–Bera test examines whether the residuals are normally distributed, which is particularly important in small and medium samples for the validity of t- and F-statistics. The reported statistic of 1.94 with a p-value of 0.38 suggests that the

residuals do not deviate significantly from normality. This further strengthens confidence in the reported hypothesis tests and coefficient estimates.

Taken together, the diagnostic results indicate that the error correction model is well specified and that the empirical findings regarding the export–growth relationship are not driven by econometric pathologies. This validation is especially important given the long sample period and Nigeria's exposure to multiple structural and external shocks.

4.8 Discussion of Findings

The empirical results presented in this study provide clear evidence in support of the export-led growth hypothesis in Nigeria, while at the same time drawing attention to the structural conditions that have governed the export–growth relationship over the past four decades. The existence of a stable long-run cointegrating relationship between exports and real GDP indicates that export performance and economic growth in Nigeria have moved together over time, despite substantial short-run volatility. This outcome is consistent with established trade and growth theory, which emphasises the role of exports in easing foreign exchange constraints, supporting capital accumulation, and facilitating access to imported intermediate and capital goods (Balassa, 1978).

However, the estimated long-run elasticity of approximately 0.42 suggests that the contribution of exports to economic growth has been positive but limited in magnitude. This result reflects the structure of Nigeria's export sector, which remains overwhelmingly dominated by crude oil. While oil exports generate substantial foreign exchange earnings, their enclave nature restricts backward and forward linkages with the domestic economy. Consequently, export expansion does not translate proportionately into broad-based productivity gains or sustained industrial development. This interpretation is consistent with Nigeria's oil revenue experience documented by Adelegan et al. (2021) and Alley et al. (2014), who show that oil-driven export and revenue shocks tend to generate short-lived growth responses without durable structural transformation.

The short-run dynamics reinforce this interpretation. Although changes in exports exert a statistically significant positive effect on output growth in the short run, the magnitude of the effect is relatively small, indicating that immediate growth responses to export expansion are weak. The error-correction term suggests a gradual speed of adjustment, with only about one-third of deviations from long-run equilibrium corrected within a year. This slow adjustment process reflects persistent structural rigidities in the Nigerian economy, including infrastructure deficits, limited absorptive capacity, and delays in converting export earnings into productive domestic investment. Similar patterns of weak short-run effects and gradual adjustment have

been reported in regional and cross-country studies on export diversification in Sub-Saharan Africa (Ajayi, 2023; Bedime, Minkande, &Bidiasse, 2025).

The Granger causality results provide further insight into the nature of the export–growth relationship. The evidence of unidirectional causality running from exports to economic growth in the short run indicates that export expansion has generally preceded output growth in Nigeria, rather than economic growth driving export expansion through supply-side capacity effects. Importantly, this result should not be interpreted as evidence of sustained export-led industrialisation. Instead, it reflects Nigeria's historical experience in which growth episodes have been closely linked to exogenous export shocks, particularly fluctuations in international oil prices, rather than endogenous improvements in export competitiveness. This pattern contrasts with findings for economies where export diversification and manufacturing expansion generate feedback effects between exports and growth.

Evidence from comparative developing-country and regional studies further supports this interpretation. Studies on export diversification in Sub-Saharan Africa and other developing economies, including Ajayi (2023), Bedime et al. (2025), and Yama and Wani (2021), consistently indicate that the growth effects of exports depend critically on export composition and diversification. In Nigeria and the wider West African sub-region, reliance on primary commodity exports has been shown to weaken both short-run and long-run growth effects, while diversification into non-oil sectors strengthens growth outcomes (Duru, Anyimudu, & Buo, 2024; Orebiyi& Effiong, 2023).

Overall, the findings suggest that exports have played a role in Nigeria's long-run economic growth, but not in a manner consistent with the strong form of the export-led growth hypothesis observed in industrialising East Asian economies. Instead, Nigeria's experience reflects a revenue-driven export–growth relationship, constrained by export concentration, limited domestic integration, and slow structural transformation. This study contributes to the literature by providing updated time-series evidence for Nigeria and reinforcing the view that export expansion alone, without sustained diversification and structural change, is insufficient to generate long-term economic growth in resource-dependent economies.

5. Conclusion and Recommendations

This study examined the export-led growth hypothesis in Nigeria using annual time-series data spanning 1980 to 2024 within a bivariate Engle–Granger cointegration framework. The empirical strategy combined descriptive analysis, unit root testing, cointegration analysis, error-correction modelling, Granger causality testing, and post-estimation diagnostics.

The descriptive statistics revealed substantial volatility in exports relative to aggregate output, reflecting Nigeria's heavy reliance on crude oil exports and exposure to

external price shocks. Unit root tests confirmed that real exports and real GDP are integrated of order one, thereby justifying the application of cointegration techniques. The Engle–Granger results provided evidence of a stable long-run relationship between exports and economic growth, with exports exerting a positive and statistically significant influence on output in the long run. However, the magnitude of the estimated elasticity suggests that the growth impact of exports has been moderate rather than transformative.

Short-run dynamics, captured through the error-correction model, indicated that deviations from long-run equilibrium are corrected gradually, with a relatively slow speed of adjustment. Granger causality tests revealed unidirectional causality running from exports to economic growth in the short run, with no evidence of reverse causality. Diagnostic tests confirmed that the estimated models are well specified and that the reported results are robust to standard econometric scrutiny.

5.1 Conclusion

The empirical findings of this study provide qualified support for the export-led growth hypothesis in Nigeria over the period 1980 to 2024. Exports have played a statistically and economically significant role in shaping Nigeria's long-run growth trajectory, but their contribution has been constrained by structural features of the economy. The dominance of oil exports, limited domestic value addition, and weak production linkages have restricted the extent to which export expansion translates into broad-based and sustained economic growth.

The evidence of unidirectional causality from exports to growth suggests that export expansion has historically acted as an exogenous driver of output fluctuations rather than being endogenously generated by domestic growth processes. This pattern contrasts with the experience of more diversified economies, where export expansion and growth tend to reinforce each other. Nigeria's experience therefore aligns more closely with a weak or conditional form of export-led growth, where exports matter for growth, but their effectiveness depends on export composition, absorptive capacity, and structural transformation.

5.2 Recommendations

The empirical results of this study support a set of targeted policy recommendations aimed at strengthening the growth-enhancing role of exports in Nigeria.

First, export policy should move beyond a focus on export volume and place greater emphasis on export composition. The moderate long-run elasticity of growth with respect to exports indicates that increasing oil export receipts alone is unlikely to generate sustained growth. Policies that actively promote diversification into non-oil exports, particularly in manufacturing and agro-processing, are more likely to enhance

domestic value addition and strengthen linkages between the export sector and the wider economy.

Second, the slow speed of adjustment observed in the error-correction model points to structural bottlenecks that delay the transmission of export earnings into productive investment. Addressing infrastructure deficits, especially in power, transport, and logistics, would improve the responsiveness of domestic output to export expansion. Such investments would reduce transaction costs and enhance the competitiveness of non-oil export sectors.

Third, the absence of reverse causality from growth to exports suggests persistent supply-side constraints that limit Nigeria's ability to convert economic expansion into increased export capacity. Policies aimed at improving productive capabilities, including support for technological upgrading, skills development, and access to finance for export-oriented firms, would help create a more mutually reinforcing relationship between growth and exports over time.

Finally, greater policy coherence between trade, industrial, and macroeconomic policies is essential. Stable exchange rate management, predictable trade policy regimes, and consistent industrial policy frameworks would reduce uncertainty and encourage long-term investment in export-oriented activities. Without such coherence, the growth benefits of export expansion are likely to remain limited and uneven.

In summary, these recommendations suggest that while exports have contributed positively to Nigeria's economic growth, maximising their long-term impact requires deliberate policy efforts to diversify the export base, strengthen domestic productive capacity, and enhance structural transformation.

References

Adelegan, A. E., Otu, E., Enyoghasim, O. M., Uwazie, I. U., Obidike, C. P., Chukwu, N. J., Agu, C. G., Anyanwu, C. K., & Oyeleke, U. S. (2021). Oil price shocks and oil revenue: Investigating the propositions for well-being in Nigeria. *International Journal of Energy Economics and Policy, 11*(5), 59–65.https://doi.org/10.32479/ijeep.10022

Ajayi, K. J. (2023). Impact of export diversification on economic growth in Sub-Saharan Africa (SSA). *South Asian Journal of Social Studies and Economics, 20*(3), 289–299. https://doi.org/10.9734/sajsse/2023/v20i310731

Alley, I., Asekomeh, A., Mobolaji, H., & Adeniran, Y. A. (2014). Oil price shocks and Nigerian economic growth. *European Scientific Journal, 10*(19), 375–391.

Bakari, S., &Mabrouki, M. (2017). Impact of exports and imports on economic growth: New evidence from Panama. *Journal of Smart Economic Growth, 2*(1), 67–79.

Balassa, B. (1978). Exports and economic growth: Further evidence. *Journal of Development Economics, 5*(2), 181–189. https://doi.org/10.1016/0304-3878(78)90006-8

Bedime, J. U., Minkande, J. B., &Bidiasse, H. (2025). Export diversification and economic growth in sub-Saharan Africa: Could there be a mixed relationship? *Journal of African Trade, 12*(1), Article 2.https://doi.org/10.59624/2214-8523.1142

Central Bank of Nigeria. (2024). *2024 Macroeconomic Outlook.* Central Bank of Nigeria.

Duru, S. I., Anyimudu, C. A., & Buo, J. J. (2024). Export diversification and economic growth in Nigeria. *International Journal of Management, Social Sciences, Peace and Conflict Studies, 7*(3), 213–226.

Engle, R. F., & Granger, C. W. J. (1987). Cointegration and error correction: Representation, estimation and testing. *Econometrica, 55*(2), 251–276. https://doi.org/10.2307/1913236

Frankel, J. A., & Romer, D. (1999). Does trade cause growth? *American Economic Review, 89*(3), 379–399.

Grossman, G. M., &Helpman, E. (1991). *Innovation and growth in the global economy*. MIT Press.

Helpman, E., & Krugman, P. R. (1985). *Market structure and foreign trade*. MIT Press.

Huchet-Bourdon, M., Le Mouël, C., & Vijil, M. (2018). The relationship between trade openness and economic growth: Some new insights on the openness measurement issue. *World Economy, 41*(1), 1–18. https://doi.org/10.1111/twec.12586

Narayan, P. K. (2005), Testing the unit root hypothesis when the alternative is a trendbreak stationary process: an application to tourist arrivals in Fiji, *Tourism Economics,*11(3), 351-364.

Nwabuatu, E. N. (2025). Economic diversification strategy and Nigerian GDP growth. *Journal of Business and African Economy, 11*(10), 119–128.

Orebiyi, P. A., & Effiong, U. E. (2023). Export diversification, financial sector development and economic growth: Empirical evidence from West African sub-region. *Studies in Economics and Business Relations, 4*(1), 13–36.https://doi.org/10.48183/sebr.v4i1.365

Pesaran, M. H., Shin, Y., and Smith, R. J. (2001), Bounds Testing Approaches to theAnalysis of Level Relationships, *Journal of Applied Econometrics,* 16, 289-326.

Sachs, J. D., & Warner, A. M. (2001). The curse of natural resources. *European Economic Review, 45*(4–6), 827–838.

World Bank. (2024). *World development indicators*. https://databank.worldbank.org

Yama, M., & Wani, N. U. H. (2021). Nexus between export diversification and economic growth: A case study of Afghanistan. *Kardan Journal of Economics and Management Sciences, 4*(1), 1–24.https://kardan.edu.af/Research/CurrentIssue.aspx?j=KJEMS