



International Trade and Economic Growth in Nigeria: A Vector Error Correction Model

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Abstract

Nigeria actively participates in trade with various countries, emphasizing both domestic and international trade activities. This study examined the influence of international trade on economic growth, utilizing imports, exports, trade balance, and trade openness as indicators, with real gross domestic product (RGDP) serving as the measure of economic growth. The study utilized data spanning from 1981 to 2022, sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin. Pretest were conducted leading to the use of Vector Error Correction Model to evaluate the dynamics and adjustment rate. The results demonstrated a sustained correlation among the variables. The Granger causality test demonstrated that economic growth was independent of imports, exports, and the balance of trade, yet had a unidirectional relationship with trade openness. The study recommends that the government should prioritize the production and export of finished products and reduce the import of finished products to stimulate economic growth.

KEYWORDS: Balance of Trade, Economic Growth, Export, International Trade, Imports, Trade Openness, Vector Error Correction Model,

Introduction

International trade plays a pivotal role in both economic and financial spheres, serving as a critical factor for improving economic performance and providing development opportunities for less developed nations (Adeleye, *et al.*, 2015). Historically, countries that have experienced substantial economic growth have leveraged trade as a fundamental tool; however, the extent to which international trade fosters growth depends largely on the prevailing economic conditions and the goals it seeks to achieve. The significance of international trade arises from the incapacity of any individual nation to generate all the goods and services necessary for local consumption, mostly due to resource restrictions and constraints. Thus, trade ties highlight the imperative for nations to export items to create income for buying products that cannot be produced domestically.

Nigeria possesses around 37 solid mineral resources and had a population exceeding 173.6 million in 2013 (World Bank, United States Census Bureau), which rose to 206.1 million by 2020. Notwithstanding its substantial oil and gas reserves, Nigeria's economic performance is inferior to that of growing Asian nations, like China, Brazil, India, South Korea, Indonesia, Malaysia, and Thailand. These nations, who have GDP per capita levels comparable to or inferior to Nigeria's in the 1970s, have since revitalized their economies and emerged as global economic contenders. In 1970, Nigeria's GDP per capita was \$233.35, placing it 88th worldwide, whilst China placed 114th with a GDP per capita of \$111.82 (Sanusi, 2010). Currently, China ranks as the world's second-largest economy, trailing only the United States, propelled by its smart economic policies and worldwide placement.

Ehinomen and Damilola (2013) argue that a key objective of foreign trade is to promote economic growth. However, Nigeria has deviated from this trajectory due to macroeconomic instability characterized by high unemployment rates, inflationary pressures, and an



unfavorable balance of payments. A significant challenge undermining the benefits of international trade is the country's overreliance on imports, which has negatively impacted local industries. The influx of imported goods often makes domestically produced items appear inferior, leading to the neglect of local industries and a subsequent decline in their output. This decline ultimately hinders the growth of the broader economy, as foreign trade fails to contribute positively to national economic development.

The research utilized the Vector Error Correction Model (VECM) to examine and quantify the correlation between foreign trade and economic growth in Nigeria. In accordance with the methodology established by Esther and Kamtochukwu (2017), the study employed total exports, total imports, balance of trade, and trade openness as metrics of international trade, while real gross domestic product (RGDP) served as a surrogate for economic growth. The study aimed to: (i) analyze the trends of the study variables, (ii) model and estimate the long-term relationship between total exports, total imports, balance of trade, and trade openness concerning Nigeria's economic growth, (iii) ascertain the direction and significance of causality among the variables, (iv) elucidate the causal pathways linking total exports, imports, balance of trade, and trade openness, and (v) evaluate the speed of adjustment of the variables toward equilibrium. The research utilized the Vector Error Correction Model (VECM) to examine and quantify the correlation between foreign trade and economic growth in Nigeria. In accordance with the methodology established by Esther and Kamtochukwu (2017), the study employed total exports, total imports, balance of trade, and trade openness as metrics of international trade, while real gross domestic product (RGDP) served as a surrogate for economic growth. The study aimed to: (i) analyze the trends of the study variables, (ii) model and estimate the long-term relationship among total exports, total imports, balance of trade, and trade openness concerning Nigeria's economic growth, (iii) ascertain the direction and significance of causality among the variables, (iv) delineate the causal pathways linking total exports, imports, balance of trade, and trade openness, and (v) evaluate the speed of adjustment of the variables towards equilibrium.

Literature Review

Several studies, including those by Tuaneh and Essi (2021), Tuaneh, *et al.* (2021A), Tuaneh and Mefo (2022), and Tuaneh, *et al.* (2021B) objectively investigated the correlation between international trade and economic growth, yielding diverse results. Despite comprehensive investigation, the current empirical literature lacks definitive data about the nature of this link. Although numerous research indicate that the proliferation of international trade positively influences GDP growth, some argue that establishing a definitive and consistent positive association is problematic. Certain studies indicate a detrimental correlation between international trade and economic growth.

Using panel data from 1970 to 1997, Yanikkaya, (2003) investigated the connection between trade openness and economic growth in more than 100 industrialized and developing nations. The findings showed that there was no clear link between trade liberalization and economic expansion. While the results relating key economic growth were mixed, trade barriers were found to have a positive and significant correlation with economic growth, particularly in developing economies.

Using the ARDL bounds testing methodology, Muhammed, Mohammed, and Abdul (2012) investigated the relationships among international trade, financial development, and economic



growth in Australia between 1965 and 2010. Their empirical results confirmed that there is a long-term correlation between the variables, showing that capital, financial development, and international trade are important factors that influence economic growth over the long and short terms. The results showed that trade openness, imports, and exports all had positive effects on economic growth, demonstrating the reciprocal relationships between international trade and economic expansion.

Abughalia and Abusalam (2013) conducted an empirical analysis of Libya's economy, focusing on structural changes and foreign trade between 1980 and 2010. Using descriptive analytical methods and linear regression, they found that Libya's trade with the European Union facilitated significant economic cooperation and bolstered the private sector's involvement in trade. During this period, export benefits outweighed import losses, resulting in a positive balance of payments and enhanced economic outcomes.

Mongoe and Mongale (2014) used a co-integrated vector autoregression model to examine the relationship between South Africa's economic growth and international commerce. According to their findings, imports have a negative association with GDP, whereas exports, the exchange rate, and the inflation rate have a positive correlation.

In a distinct study, Akanni (2007) examined the growth impacts of oil rent revenues in oil-exporting nations, used PC-GIVEID (Ordinary Least Squares Regression) for analysis. The findings indicated a substantial positive correlation among oil rents, investment, and economic growth. Nonetheless, the analysis indicated that oil rents in numerous resource-abundant emerging nations in Africa do not facilitate significant economic growth.

Sarkar (2007) examined the correlation between trade openness and economic growth via a cross-country panel data analysis of fifty-seven southern nations from 1981 to 2002, which included eleven economically advanced dependent countries. The results demonstrated that gains in trade share are associated with genuine growth. Nonetheless, a time series analysis of individual countries indicated that the majority, including East Asian nations, did not demonstrate a favourable long-term correlation between trade openness and economic growth throughout the research period. Only middle-income countries shown a consistent positive long-term connection among the analysed areas and income groups.

Sun and Heshmati (2010) evaluated the influence of foreign commerce on China's economic growth utilizing econometric and non-parametric techniques on data from 2002 to 2007 in a Chinese province. The investigation demonstrated that heightened participation in international trade substantially fosters economic growth. The study identified a favourable correlation among international trade volume, the composition of technology exports, and regional production in China.

Omoju and Adesanya (2012) used data from 1980 to 2010 to evaluate the impact of trade on Nigeria's economic growth. Using the Ordinary Least Squares (OLS) method, the study found that foreign direct investment, government spending, trade, and exchange rates all significantly and favorably impacted Nigeria's economic growth. From 1960 to 2011.

Saibu (2012) studied FDI, exchange rate and financial market development in Nigeria using the vector error correction mechanism with a view to determine whether there existed any significant causal nexus was from FDI exchange rate to financial market development. Quarterly spanning from 1970 to 2009 were used.. The inclusion of exchange rate was to



ascertain if macroeconomic instability affected financial market development. The results show that FDI had no significant causal effect on financial market development. However, there was a bidirectional causality between financial market development and exchange rate. To investigate the effect of trade liberalization on trade tax collection in Nigeria between 1970 and 2009, Nwosa *et al.* (2012) carried out a regression analysis. The findings showed that while the exchange rate had a negative impact on trade tax income, trade liberalization, the labor force, GDP, and state debt had a favorable impact. To encourage trade liberalization, the paper urged the adoption of sensible macroeconomic policies. An empirical study of the effects of globalization on macroeconomic stability through trade and capital flow channels was conducted by Ajayi and Atanta (2012). The study examined the growth in real production in Nigeria between 1970 and 2009.

Emeka, *et al.* (2012) used bivariate and multivariate models to examine Nigeria's macroeconomic growth between 1970 and 2008. The study found that exports and foreign direct investment inflows significantly boosted economic growth, underscoring the need for the Nigerian government to coordinate its fiscal and export policies while prioritizing non-oil exports in order to achieve increased trade growth. The relationship between trade openness, financial investment, and economic growth in Nigeria between 1960 and 2011 was studied by Adelowokan and Maku (2013). They found that trade openness had a beneficial effect on economic growth whereas foreign investment had a negative effect using a dynamic regression model. Lending rates, inflation, and the fiscal deficit were all acknowledged as factors influencing economic expansion. The study confirmed a long-term relationship between trade liberalization, foreign investment, and economic growth.

Adenugba and Dipo (2013) looked at Nigeria's non-oil export performance between 1981 and 2010. Their results raised concerns about the efficacy of Nigeria's export promotion programs by highlighting the poor performance of non-oil exports. They emphasized the economy's heavy reliance on exports of crude oil, which remain the main driver of economic growth.

Olaifa, *et al.* (2013) examined how trade liberalization affected Nigeria's economic expansion between 1970 and 2012, paying particular attention to the structural adjustments brought about by the free trade policy in 1986. Despite a negative link between exports and GDP, the study, which used OLS estimations, found a long-term relationship between trade liberalization and economic growth. Among the recommendations were strengthening institutional frameworks, providing financial support, and improving infrastructure to ensure long-term growth.

Arodoye and Iyoha (2014) used quarterly time-series data from 1981 to 2010 to investigate the relationship between foreign trade and Nigeria's economic growth. The results supported trade policies that encourage export growth and align with Nigeria's classification as a small open country by validating a continuous long-term relationship between international trade and economic growth.

Tuaneh, *et al.* (2021B) examined the dynamic interrelationship between international commerce and macroeconomic stability in Nigeria utilizing monthly time-series data from 2000 to 2019. Vector error correction analysis revealed that inflation was substantially affected by fluctuations in the independent variables, although the exchange rate was the least elucidated. Bidirectional causation was detected between exports and inflation, but joint causality was apparent between imports and exchange rates. The research advocated for efforts to stabilize inflation and mitigate international trade disruptions.



In another study, Tuaneh and Essi (2021) applied a Markov-Switching Vector Autoregressive (MS-VAR) model to examine the relationship between international trade and macroeconomic stability in Nigeria from January 2000 to June 2019. The analysis identified two regimes—expansion and contraction—with regime dynamics affecting variables such as total exports, imports, exchange rates, and inflation rates. The study emphasized the importance of verifying regime existence and testing for endogeneity in models. Finally, Tuaneh, *et al.* (2021) employed a Markov-Switching Mean Vector Autoregressive (MSMVAR) model to further analyze macroeconomic variables, highlighting self-explanatory and highly exogenous trends in total exports, imports, exchange rates, and inflation. Findings supported the need for nuanced policy interventions to foster trade-driven economic growth and stability in Nigeria.

Methodology

This section outlines the research design, data types and sources, data collection methods, data analysis techniques, and model specification.

Research design

A quasi-experimental design was employed. The study established the causal relationships between the variables.

Types and Sources of Data

The study employed annual time series data on the study variables sourced from CBN statistical bulletin spanning from 1981 to 2022. The variables include; import, export, trade balance, and trade openness as metrics of international trade, while real gross domestic product (RGDP) functioned as a measure of economic growth. The data were obtained from the central bank.

Data Analysis Methodology

The study employed the vector error correction model (VECM), a linear modelling technique. Unit root tests and co-integration tests were performed to assess the stationarity and long-term equilibrium relationships among the study variables.

The Vector Error Correction Model (VECM)

This was necessary for estimating the specified modes in accordance with the stated objectives. The selection of the VECM is influenced by the prevalence of non-stationary time series and the frequent presence of cointegrating equations among associated series. Ankargren and Lyhagen (2018) suggest that the VECM is one of the most widely used methods for modelling macroeconomic variables. VECM evaluates both the short-term impacts and the long-term convergence to equilibrium. The direction and significance of causal relationships among the study variables were examined using the Granger causality/block exogeneity test.

Pre-Estimation Tests:

These tests involve subjecting the study data to scientific analysis regarding specific characteristics of the data. The initial econometric diagnostics conducted prior to employing the VECM included (i) the Unit Root Test and (ii) the Co-integration Test.

The Unit Root Test is a statistical method used to determine whether a time series variable is non-stationary and possesses a unit root. This test is crucial for understanding the properties of time series data, particularly in econometrics and forecasting. It helps in identifying the appropriate modelling techniques for analysing time series data.



The study employed the Unit Root Test to analyse the impact of foreign commerce on economic growth in Nigeria, utilizing time series data for the examination. The trustworthiness of the variables is undermined by the utilized time series data. Thus, the requirement for stationary data arises. The examination of stationary data was conducted via the Augmented Dickey-Fuller Test (ADF). The analysis utilizes the parameters LRGDP, LIMP, LEXP, LBOT, and TROP.

The Co-Integration Test

This analysis aims to determine the long-term relationship between the explanatory variables and the dependent variable.

The research utilized the Johansen maximum likelihood method. Washall and Sauders (2000), as cited by Tuaneh, (2019), indicated that Trace statistics exhibit greater robustness to skewness and excess kurtosis in residuals compared to the maximum Eigen test. However, the maximum Eigen approach is considered preferable due to its advantageous properties. The researcher utilized both maximum Eigen statistics and Trace Statistics.

Model Specification

This section outlines models that will assess the relationship between variables acting as proxies for international trade and indicators of economic growth.

Var Model

A VAR system comprises m variables, each represented as a linear function of itself and the other $m-1$ variables, along with an error term. This indicates that the right-hand side of each equation includes lagged values of the system's endogenous variables in the reduced form. A VAR model is a multivariate linear autoregressive time series model.

The general form is; Y_t

$$= \phi_0 + \sum_{i=1}^p \phi_i Y_{t-i} + \epsilon_t$$
 (3.1)

Where; Y_t = A set of endogenous time series variables ($Y_{t1}, Y_{t2} \dots Y_{tm}$), and it is $K \times 1$ vector
 $\epsilon_t = N \times 1$ vector of error term, $U_{t1}, U_{t2} \dots U_{nt}$ are $\sim iid \sim$ mean 0, (white noise).

ϕ_0 = $K \times 1$ vector of intercepts

ϕ_i = Full rank m by m matrix of coefficients and $i = 1, 2, 3, \dots, p$,

However, A functional K -dimension VAR (p) process as given above can also be written as;

$$Y_t = \Omega_0 + \Omega_1 Y_{t-1} + \Omega_2 Y_{t-2} + \dots + \Omega_p Y_{t-p} + CX_t + \epsilon_t \quad (3.2)$$

Where;

$Y_t = (Y_{1t}, Y_{2t}, Y_{3t}, \dots, Y_{kt})$ is a $K \times 1$ vector of the endogenous variable

$X_t = (X_{1t}, X_{2t}, X_{3t}, \dots, X_{dt})$ is a $d \times 1$ vector of exogenous variable.

$\Omega_1 - \Omega_p$ are $K \times K$ matrix of the lag coefficient to be estimated

C is $d \times d$ matrix of the coefficient of the exogenous variable to be estimated ϵ_t

$$= (\epsilon_t \epsilon_t^1) = \sum_i$$

The innovations vector is contemporaneously associated with the full rank matrix \sum_i , yet it remains uncorrelated with its leads and lags, as well as with all right-hand side variables.

VECM Models:



The VAR (P) process assumes the absence of cointegration among the variables. When the 1(1) variables exhibit one or more cointegrating vectors, the suitable estimation method is the vector error correction model. Short-run changes and deviations from equilibrium are addressed in the Vector Error Correction Model (VECM). The VECM is generally expressed as follows;

$$\Delta Y_t = \alpha_0 + \alpha_1 ECT_{t-1} + \sum_{i=1}^p \beta_i \Delta Y_{t-i} + \epsilon_t \quad (3.3)$$

With the ECT_{t-1} as the term depicting Error correction, the VECM involving the four variables is presented in its framework as:

$$\Delta TEX = ECT_{t-1} + \sum_{i=1}^p \theta \Delta TEX_{t-i} + \sum_{i=1}^p \emptyset \Delta TIM_{t-i} + \sum_{i=1}^p \delta \Delta BOT_{t-i} + \sum_{i=1}^p \varphi \Delta TROP_{t-i} + C_1 + U_{t1} \quad 3.4$$

$$\Delta TIM = ECT_{t-1} + \sum_{i=1}^p \theta \Delta TEX_{t-i} + \sum_{i=1}^p \emptyset \Delta TIM_{t-i} + \sum_{i=1}^p \delta \Delta BOT_{t-i} + \sum_{i=1}^p \varphi \Delta TROP_{t-i} + C_1 + U_{t2} \quad 3.5$$

$$\Delta BOT = ECT_{t-1} + \sum_{i=1}^p \theta \Delta TEX_{t-i} + \sum_{i=1}^p \emptyset \Delta TIM_{t-i} + \sum_{i=1}^p \delta \Delta BOT_{t-i} + \sum_{i=1}^p \varphi \Delta TROP_{t-i} + C_1 + U_{t3} \quad 3.6$$

$$\Delta TROP = ECT_{t-1} + \sum_{i=1}^p \theta \Delta TEX_{t-i} + \sum_{i=1}^p \emptyset \Delta TIM_{t-i} + \sum_{i=1}^p \delta \Delta BOT_{t-i} + \sum_{i=1}^p \varphi \Delta TROP_{t-i} + C_1 + U_{t4} \quad 3.7$$

Where:

TEX = Total Export,
 TIM = Total Import,
 BOT = Balance of trade,
 TROP = Trade openness,
 ECT = Error Correction Term,

} Vector of endogenous variables

Δ difference operator,

\sum = summation

$C_1 - C_4$ = intercepts,

$\theta, \emptyset, \delta, \varphi$ = Matrix of autoregressive parameter $U_{t,1} -$

$U_{t,4}$ = stochastic term (white noise innovations) P

= Maximum lag length

Lag length selection criteria:

It is essential to recognize that an insufficient number of lags can lead to auto-correlated errors, while an excessive number of lags may cause overfitting, thereby increasing the mean square forecast error (MSFE) of the VAR model. The selection of lag length employs information criteria to reduce these errors. Several lag length criteria exist, including the Akaike Information Criterion (AIC), the Hannan-Quinn Information Criterion (HQ), and the Schwarz Information Criterion (SC). The lag length corresponding to the minimum value of any criterion will be deemed the optimal lag length and selected accordingly.

Results and Discussion Pre-estimation Diagnosis Table 1: Result of Augmented Dickey Fuller (ADF) Test at LEVEL and FIRST DIFFERENCE

Variables	Levels	1 st difference	Remarks
GDP	-2.464697 (0.1335)	-3.589889 (0.0108)	1(1)
BOT	-2.740179 (0.0792)	-5.810219 (0.0000)	1(1)
TEX	-2.743564 (0.0762)	-8.232177 (0.0000)	1(1)
TIM	-2.289110	-7.639256	1(1)



	(0.1805)	(0.0000)	
TROP	-0.390702 (0.9007)	-5.750682 (0.0000)	1(1)

Source: Researchers' computation

Note; Probability values in the bracket

The ADF test results indicate that none of the variables were stationary at levels, as the p-values of their corresponding t-statistics exceeded the absolute 5% critical value. However, upon testing their first differences, all series were found to be stationary. This indicates that all variables were stationary at the first difference, I(1). This trend indicates that the variables possess a unit root at the first difference. Consequently, the Johansen co-integration method was employed to assess cointegration within the model, as the unit root test indicated a uniform order of integration I(1).

Table 2: Results of Lag length selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1549.488	NA	2.14e+30	84.02636	84.24405	84.10310
1	-1402.044	247.0679*	2.90e+27*	77.40777*	78.71392*	77.86825*
2	-1382.816	27.02335	4.28e+27	77.71977	80.11437	78.56398

Source: Researchers' computation

All the criteria points are at lag 1 as the optimal lag for analysis, thus this study adopted lag 1.

Table 3: Johansen Cointegration Test Result

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.557772	84.85158	69.81889	0.0020
At most 1 *	0.507574	55.47814	47.85613	0.0082
At most 2 * 0.410286	29.97532	29.79707	0.0477	At most 3 0.259614 10.96309 15.49471
0.2138				
At most 4	0.003939	0.142099	3.841466	0.7062

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Source: Researchers' computation

The Johansen cointegration test was conducted to assess the long-term relationship between the dependent and independent variables. A higher trace statistic value relative to its associated critical value indicates the existence of a long-run relationship. The trace test results indicate the presence of three cointegrating equations at a significance level of 0.05 (5%). The presence



of co-integration among the selected variables justifies the application of the Vector Error Correction Model.

Vector Error Correction

The establishment of a long-run relationship among the variables necessitated the application of the vector error correction model (VECM) to demonstrate the system's adjustment to the long-run equilibrium indicated by the co-integrating equation. Table 4 presents the summary of the VECM results.

Table 4: Vector Error Correction Model Result

	Coefficient	Std. Error	T-Statistic	Probability
Dependent variable: D(GDP)				
ECM	-0.036648	0.01837	-1.99542	0.0478**
D(GDP(-1))	0.231391	0.18740	1.23475	0.2189
D(BOT(-1))	1.53E-09	6.8E-10	2.25606	0.0255**
D(TEX(-1))	-1.484481	0.84662	-1.75342	0.0816***
D(TIM(-1))	2.117162	1.27831	1.65622	0.0998***
D(TROP(-1))	-0.402253	0.45707	-0.88006	0.3802
C	0.432951	5.35736	1.56512	0.1197
R-squared	.384911		Log likelihood	-172.6189
Adj. R-squared	0.319541		Akaike AIC	-9.709128
Sum sq. resids	24435.45		Schwarz SC	10.01390
S.E. equation	28.53971		Mean dependent	8.252703
F-statistic	3.817583		S.D. dependent	34.59781

Source: Researchers computation from E-views 10

** - 0.05 level of insignificance, *** - 0.10 level of significance

The results presented in Table 4 indicate that the adjusted coefficient of determination (R^2) is 0.432. It indicated that 43.2% of the variation in GDP is accounted for by balance of trade, total imports, total exports, and trade openness. Other variables not included in the model accounted for the remaining 56.8%. The error correction result indicates that the error correction term was appropriately signed and statistically significant at the 5% level ($t = 1.995$). The error coefficient of -0.036 indicates that the deviation from long-run equilibrium in the prior period was rectified in the current period at an adjustment rate of 0.3%. The short-run results in Table 4 indicate that the first lag of the balance of trade ($t = 2.25$) has a positive and significant effect on gross domestic product, with a value of 1.53E-09 at the 5% level. The initial lag of total export ($t = -1.753$) exhibited a significant negative effect (-1.484) on gross domestic product, indicating that an increase in exports correlates with a decrease in gross domestic product. This finding aligns with Usman (2011), who concluded that exports do not serve as a catalyst for growth in Nigeria. The likely explanation for this outcome is Nigeria's failure to export products sufficiently to influence economic growth positively. Alternatively, a plausible explanation for this result is the predominance of crude oil exports in Nigeria's foreign trade, which are subject to fluctuations in international oil prices. Total imports ($t=1.656$) exerted a positive and significant effect on gross domestic product, with a coefficient of 2.117, at the 10% significance level.

Trade openness had a negative and statistically insignificant effect on economic growth. This suggests that trade openness does not facilitate economic growth in the short term. This result aligns with the findings of Tyopev's (2019),



Pairwise Granger Causality Tests

Table 4.8 presented below shows the Pairwise Granger Causality Tests of all the endogenous variables in the VEC models.

Table 5: Pairwise Granger Causality Tests Result

Null Hypothesis:	Obs	F-Statistic	Prob.	Result
BOT does not Granger Cause GDP GDP does not Granger Cause BOT	41	22.8189 3.93197	3.E-05 0.0553	Unidirectional Relationship
TEX does not Granger Cause GDP GDP does not Granger Cause TEX	41	8.08726 1.31357	0.0074 0.2595	Unidirectional Relationship
TIM does not Granger Cause GDP GDP does not Granger Cause TIM	41	7.30197 0.03561	0.0106 0.8514	Unidirectional Relationship
TROP does not Granger Cause GDP GDP does not Granger Cause TROP	41	13.9397 0.76876	0.0007 0.3866	Unidirectional Relationship

Source: Researchers' computation.

The outcomes of the Pairwise Granger causality tests are shown in Table 4.8. The findings point to a causal linkage between the two variables by showing a unidirectional association between the GDP and trade balance.

The link between trade openness, trade imports, trade exports, and gross domestic product is unidirectional. Trade exports, trade imports, and trade openness are proven to be causally related to GDP; there is no proof that GDP is causally related to trade exports, trade imports, or trade openness.

Conclusion and Recommendations

Using time series data from 1981 to 2019, this study uses the vector error correction approach to empirically investigate the impact of international commerce on Nigeria's economic growth. GDP, net export, net import, balance of trade, and trade openness were all shown to be stationary at I(1). The results of the Johansen's cointegration test showed both a short-term and long-term link between the variables. According to the Vector Error Correction results, net exports have a negative impact on GDP, whereas the balance of trade and net trade imports have a positive impact. Consequently, this study presents the following policy recommendations: Exporters ought to be incentivized to enhance the value of primary products prior to exportation, transforming them into either semi-finished or finished goods to augment the value of domestic products.



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