EXPORT DYNAMICS AND GROWTH STRUCTURE IN NIGERIA: A DISAGGREGATED APPROACH

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Abstract

This study investigates the disaggregated impact of exports on economic growth in Nigeria between 1986 and 2023. Utilizing the Johansen's cointegration tests and an error-correction mechanism (ECM) within a vector autoregressive framework, we established a stable long-run relationship among GDP, crude oil exports, agricultural raw materials, manufacturing and service exports, and the exchange rate. Short-run dynamics indicate that exports of agricultural raw materials and exchange rate have a significant negative effect on growth, however manufacturing exports exert a significant positive effect. Service exports and crude oil exports exhibit an insignificant positive relationship with GDP. Impulse response functions indicate that non-oil export shocks produce positive GDP responses that gradually diminish, whereas oil export shocks result in sustained negative impacts. Variance decomposition reveals that by the 10th forecast year, GDP's own innovations account for 69% of the forecast error variance, while contributions from manufacturing (1%), agriculture (7%), services (16%), and exchange rate (5%) increase over time; the share attributed to crude oil remains below 1%. The findings emphasize the necessity of value-added export strategies, enhanced diversification into non-oil sectors, and focused public-private partnerships to support sustainable growth.

Keywords: Export dynamics; Economic growth; ECM; Nigeria

JEL Codes: C22, C32, F14, F43, O47

1. INTRODUCTION

Exports play a pivotal role in the economic performance of a country through improving her balance of payments, generating foreign exchange, and stimulating overall growth and development. No nation operates in complete economic independence, and international trade channels critical foreign capital flows that underpin public and private investment. With trade transactions conducted in foreign currencies, Nigeria's exports significantly enhance government revenue and serve as the main channel for foreign exchange earnings.

At independence, Nigeria's export profile was primarily characterized by agricultural commodities, including cotton, groundnut, palm products, and cocoa, in addition to minerals such as tin and columbite, as well as hides, skins, and cattle.

Collectively, these non-oil exports represented above two-thirds of the total export revenues and contributed up to 80 percent to GDP while employing over 70 percent of the labor force (Bankole & Fasina, 2025). The 1970s oil boom led to a monocultural economy: by the early 1980s, crude oil, characterized as light, sweet, and highly valued in global markets, accounted for approximately 96 percent of Nigeria's export revenue. The excessive dependence on this factor rendered the economy vulnerable to significant fluctuations, resulting in the recession initiated by the global oil price decline in late 2015.

Given these negative effects, researchers and policymakers suggest expanding into non-oil exports, believing that areas like agriculture, manufacturing, and services can help in achieving steady growth. The agricultural sector has the potential to enhance foreign earnings via primary commodity exports, thereby financing essential development projects. Despite the rhetoric, Nigeria's export composition continues to be oil-based, with non-oil exports experiencing an average growth of only 2.3 per percent from 1960 to 1990. Additionally, the share of non-oil exports in total exports decreased significantly from 66 percent to 3 percent during this time frame (Ogun, 2004). Recent data indicate that non-oil exports have maintained an average share of 2.52 per percent from 2003 to 2015, despite intensified policy efforts to expand them (CBN, 2018).

Previous studies on non-oil exports in developing countries, like those in Saudi Arabia, Iran, Nigeria, and Cameroon, have mostly treated the non-oil sector as a single group, ignoring the unique roles of areas like manufacturing, solid minerals, transport, information and communication, utilities, and financial services. This study uses the theory of unbalanced growth, focusing on how different sectors connect, to divide exports into four categories: crude oil, agricultural raw materials, manufacturing, and services. This study utilizes the theory of unbalanced growth, emphasizing sectoral linkages, to categorize exports into four groups: crude oil, agricultural raw materials, manufacturing, and services. It examines their individual and collective effects on Nigerian economic growth from 1986 to 2023. This approach seeks to identify the segments of the export base that offer the most potential for promoting diversification and sustainable development.

2. LITERATURE REVIEW

Crude oil exports refer to the shipment of unrefined petroleum products, which has constituted Nigeria's primary revenue source since the discovery of oil over forty years ago. This category assesses the proportion of crude oil within the country's total exports. Oil exports, while dominant, have shown variability in their contribution to growth; they constituted 33 percent of exports in 1970 and increased to 67 percent by 2010 (CBN, 2018). Oil and natural gas export revenues have consistently resulted in balance of payments surpluses and significant government income. Approximately 80 percent of the proceeds funds government operations, 16 percent is allocated for administrative costs, and a mere 4 percent is returned to investors. However, due to corruption, only 1 percent of the population genuinely benefits (Odularu, 2008).

Non-oil exports include all goods and services sold internationally, excluding crude oil and natural gas. This sector encompasses agriculture; industry, including solid minerals and manufacturing; and services such as transport, communications, trade, finance, insurance, and tourism (Akeem, 2011). Key subcategories include agricultural exports, representing Nigeria's traditional export base, such as cocoa, rubber, oil palms, coffee, and cotton (CBN, 2018); manufactured exports, which consist of agro-allied products such as cocoa butter; groundnut cake; wood products; and industrial goods (textiles, chemicals, beverages, fertilizers, soaps, plastics, and processed skins). Service exports, including education, healthcare, tourism, and professional services, incur low freight costs; however, they encounter issues related to payment security and the protection of intellectual property. Additionally, remittances from Nigerians employed overseas provide foreign exchange, despite concerns regarding brain drain (CBN, 2018).

Economic growth, measured by Gross Domestic Product as the primary metric for economic output is an increase in an economy's ability to produce goods and services. Nominal GDP assesses production at current market prices, while real GDP modifies values to a constant base year, thereby accurately reflecting changes in volume (Pritzker, Arnold & Moyer, 2015). Consequently, an increase in GDP, regardless of whether it is assessed in nominal or real terms, signifies improved economic performance (Agarwal, 2019; Amadeo, 2019).

Exports are recognized as significant drivers of economic growth. Ricardo (1817) highlighted the advantages of foreign trade, while Singh (2010) demonstrated that trade enhances productivity and growth relative to its share of economic activity. Nigeria transitioned from an import substitution model to an export-led strategy, implementing policies including tax holidays, subsidies, preferential loans, and market facilitation to encourage domestic industries to produce beyond local demand for international sales (Todaro & Smith, 2011).

Since the 1970s, economies that have adopted export promotion strategies initially, the Four Tigers, followed by the second wave of the Newly Industrialized Countries (NICs), and more recently, India, Mexico, and Brazil, have experienced significantly faster growth compared to their protectionist counterparts. These economies have successfully secured essential foreign exchange, alleviated balance-of-payments pressures, and generated job opportunities (Todaro & Smith, 2011). Moreover, trade expansion raises GDP and per capita income when paired with necessary structural and institutional reforms. Frankel & Romer, 1999, observed that international trade consistently delivers net gains and stimulates further growth.

Exports are essential for economic development, serving both as a source of foreign exchange and a stimulus for domestic activity. Historically, Nigeria’s export policies shifted from import substitution to diversification following the oil glut of the early 1980s. Panic-driven measures such as the Economic Stabilization Act of 1982, the Buhari/Idiagbon counter-trade policy, and the Babangida-era Structural Adjustment Program, underscored the perils of over-reliance on oil. Prior to the dominance of oil, agriculture represented approximately 80 per percent of export earnings and 75 per percent of GDP. Since 1970, however, oil exports have

constituted an average of 90 per percent of foreign exchange receipts, resulting in the neglect of the agricultural sector and increased vulnerability of external accounts to price fluctuations.

In response to this imbalance, successive administrations have aimed to enhance non-oil exports and diversify the productive base such as the establishment of the Nigerian Export Promotion Council (NEPC) to coordinate export efforts. Babangida's 1986 export promotion policies, termed "first best" and "second-best," provided incentives to improve the global competitiveness of non-oil goods. Statistical evidence indicates limited progress: non-oil exports increased from 5.8 percent of total exports in 1986 to 8.6 percent in 1988, subsequently declining to 1.9 percent by 1992. This marginal progress underscores the necessity for more sustained and structurally integrated diversification strategies.

2.1. EMPIRICAL EVIDENCES FROM DEVELOPED COUNTRIES

Pérez-Rodríguez (2025) examined the export–growth relationship in OECD countries using updated quarterly data and advanced long-memory techniques. He found that export-led growth is *conditional* rather than automatic in developed economies. According to him, exports still enhance output growth, but the effect is strongest in high-value sectors such as technology, digital services, engineering, and pharmaceutical products. He argued that structural maturity in OECD countries reduces the traditional impact of goods exports, making service exports and knowledge-based industries the main drivers of modern growth.

Ikram (2025) analyzed exports, foreign direct investment (FDI), and economic growth in high-income economies and concluded that export growth alone is insufficient without innovation capacity. His work shows that countries with strong R&D expenditures, patents, and technological upgrading experience stronger spillover effects from exports. In his view, exports matter most when they are embedded within dynamic global value chains (GVCs) that enhance domestic productivity.

Adelakun, Ojo, and Mpungose (2025) compared European and African regional blocs but highlighted that developed countries in Europe benefit significantly from service exports and diversified manufacturing structures. Their results indicate that economies with high product sophistication experience more stable long-run export–growth relationships, reinforcing the idea that maturity of export structure determines the strength of growth impact.

Recent empirical studies from developed economies consistently highlight the role of export sophistication, technological capability, and product diversification as key drivers of long-term growth dynamics. For instance, Hansson and Lundqvist (2021) examined export composition across EU countries and found that economies with a larger share of high-technology exports experienced stronger productivity growth and more resilient macroeconomic structures. Their findings emphasize that the quality of exports, rather than volume alone, determines growth sustainability. Similarly, Peralta and Wong (2022) analyzed export dynamics in

Canada and Australia and concluded that knowledge-intensive exports accelerate growth by stimulating innovation-driven spillovers into domestic industries.

Moreover, Carter and Mihaylov (2023) argued that export diversification moderates the effects of external shocks in developed economies, particularly during post-pandemic recovery. Their study on OECD countries found that economies relying less on commodity-based exports experienced smoother growth transitions after COVID-19 disruptions. Likewise, Elson and Kramar (2024) showed that the United States' shift toward digital and advanced-manufacturing exports substantially strengthened its structural growth indicators, reinforcing the idea that structural transformation and export upgrading are inseparable. A more recent panel study by Ricci and Morales (2025) emphasized that export competitiveness in developed countries is significantly influenced by exchange-rate stability and domestic innovation spending—two factors that jointly determine long-run growth dynamics.

2.2. EMPIRICAL EVIDENCES FROM DEVELOPING AND EMERGING COUNTRIES

Empirical evidence in developing countries consistently demonstrates that the composition and sophistication of exports significantly influence growth outcomes. Jarreau and Poncet (2012) illustrate that from 1997 to 2009, provinces in China that specialize in high-tech goods experienced greater growth than those concentrating on low-value exports, with productivity gains primarily benefiting domestic firms rather than foreign-led processing trade. Raiher et al. (2017) show that in Brazil's small regions from 2000 to 2010, exports based on technology level have bigger differences in productivity and create positive benefits for non-exporting sectors, especially in areas that are already well connected to global markets.

Research on commodity-exporting regions highlights the dual function of natural resources and economic integration. Chang et al. (2013) found that energy exports, along with deeper political, economic, and social globalization, jointly accelerated GDP growth in five South Caucasus countries from 1990 to 2009. In contrast, Sultan and Haque (2018) report a long-run positive relationship between oil exports and output in Saudi Arabia, highlighting a growth-enhancing role for government consumption while noting a dampening effect from imports. These findings indicate that, even for resource-rich states, trade openness and institutional integration serve as essential drivers of growth.

Foreign direct investment (FDI) frequently enhances export activity; however, its effects may vary depending on the specific context. Szkorupová (2014) employs VECMon Slovakia economy from 2001 to 2010, and that found FDI and exports have a positive long-term impact on GDP. Conversely, Goh et al. (2017) employ a bootstrap method. The ARDL test done for certain Asian countries shows that there is not a steady long-term connection between FDI and exports to GDP, indicating that other factors like local institutions or market structures affect these relationships.

In resource-dependent countries, the evidence regarding diversification into non-oil sectors is mixed, yet generally supportive. In Saudi Arabia, Muhammed (2004) and Aljebrin (2017) established that non-oil exports significantly enhance real per capita income and non-oil GDP, exhibiting rapid adjustment following shocks. Iran's

experience, however, differs. Tabari and Nasrollahi (2010) identify a negative link between non-oil exports and GDP. In contrast, Rasulbakshi and Mohseni (2010), Monir and Ebrahim (2010), and Hamed (2012) report positive long-term effects of both oil and non-oil exports on GDP, with non-oil benefits typically emerging after longer time lags. Noula et al. (2013) report that in Cameroon, coffee, and banana exports drive growth, whereas cocoa exports exhibit an insignificant impact, highlighting the necessity of product-level analysis.

Panel studies indicate diverse causality patterns and their associated policy implications. Ekanayake (1999) identifies bi-directional causality between exports and growth in seven out of eight Asian countries from 1960 to 1997, with Malaysia demonstrating a distinct pattern of export-led growth. India's mineral exports, industrial production, and GDP constitute a long-term equilibrium system characterized by feedback loops from growth to exports (Sahoo et al., 2014). However, targeted initiatives, such as Ghana's Free Zones program, have occasionally exhibited suboptimal performance. Aboagye et al. (2017) demonstrate that these zones may exhibit a negative correlation with GDP in the absence of comprehensive institutional support. These studies emphasize that the linkages between exports and growth are contingent upon export diversification, technological content, domestic absorptive capacity, and complementary policies.

Khatri and Obeng (2021) found that Asian developing economies that diversified into manufactured exports, such as Vietnam and Bangladesh recorded stronger and more stable growth than those reliant on primary exports. Their results highlight the centrality of export upgrading in shaping growth structures. Conversely, Mwangi and Tadesse (2022) established that many African countries remain vulnerable due to high dependence on raw commodity exports; their analysis showed that export concentration exacerbates growth volatility.

Additional evidence from Latin America suggests that structural bottlenecks limit the capacity of exports to drive growth. Salvador and Ruiz (2023) analyzed Chile, Peru, and Ecuador and found that although export revenues increased between 2018 and 2022, the effects on long-term growth were weakened by weak industrial linkages and poor value-addition capacity. In contrast, Rahman and Liu (2024) demonstrated that in Malaysia and Thailand, export diversification into electronics and machinery had strong positive effects on productivity, employment, and structural transformation. Panel results by Yusuf and Karim (2025) further revealed that institutional quality remains a critical mediator; countries with sound regulatory systems benefit more from export-led growth than those with governance instability.

2.3. EMPIRICAL EVIDENCE FROM NIGERIA

Empirical evidence on export growth nexus have grown tremendously in Nigeria, while Usman (2010) affirmed a significant positive relationship, Ogbonna (2010) argued that their impact remained marginal. Similarly, Kolawole and Okodua (2010) identified a long-run positive influence of FDI on non-oil exports, though policy shocks had delayed effects. Adebile and Amusan (2011) highlighted cocoa exports' potential to boost GDP, stressing that inconsistent policies undermine the agricultural sector's contribution. Akeem (2011) noted that lagged non-oil exports

and the inflation have a positive influence on GDP. On non-oil exports, Asanebi (2007) observed that despite policy attention, non-oil exports had an insignificant impact on Nigeria's Gross National Product.

However, Onodugo, et al., (2013) revealed a weak impact of non-oil exports on growth. Adenugba and Sotunbo (2013) reinforced this view by showing that Nigeria's economy remains overly reliant on oil, with diversification efforts yielding limited results. Conversely, Ulakpa (2013) found that non-oil exports significantly drive economic growth, although government expenditure was not impactful. Aladejare and Saidi (2014) found that non-oil exports significantly affect growth both in the short and long term. Abogan, Akinola, and Baruwa (2014) reported a moderate positive effect, noting that prevailing policies had not sufficiently encouraged the sector. Ijirshar (2015) found that non-oil exports and growth are balanced over the long-term using co-integration analysis, while Ogunjimi, Aderinto, and Ogunro (2015) found a significant negative impact.

Oruta (2015) corroborated the role of non-oil exports on economic growth, supported by stable macroeconomic conditions. Kawai (2017) confirmed a co-integration relationship but questioned the robustness of the non-oil export-led growth narrative. Anthony-Orji et al. (2017) noted an insignificant positive effect of non-oil exports on capital formation, though their impact on growth was significant. Onuorah (2018) emphasized the role of agricultural exports (e.g., yam, maize, cassava, and groundnut) in GDP growth. Olawale (2018) highlighted the positive long-run effect of non-oil exports while warning against the sector's decline in the absence of strategic policy interventions. Some studies, such as Ewetan and Okodua (2012), considered both oil and non-oil exports. They concluded that diversification and infrastructure development are crucial for sustaining growth. Adesoji and Sotubo (2013) doubted the efficacy of Nigeria's export promotion strategies, citing continued dependence on oil. Raheem (2016) found that while oil exports had a negative relationship with growth, non-oil exports exhibited a positive one, with both types of exports showing long-run causality with GDP.

Recent Nigerian empirical studies during this period overwhelmingly affirm the dominance of crude oil exports while emphasizing the limited structural impact of the export sector on growth. Adebayo and Ojo (2021) found that oil exports positively influence GDP in the short run but exert negligible long-run effects due to volatility and weak domestic productive linkages. Building on this, Olanrewaju (2022) showed that non-oil exports, particularly agricultural and manufactured exports have significant long-run growth effects, suggesting that export diversification is essential for sustainable growth.

Research during the post-pandemic recovery period intensified the focus on disaggregation. Eze and Okonkwo (2023) applied a disaggregated time-series model and found that agricultural exports support growth through employment and rural income channels, whereas solid mineral exports remain largely insignificant due to low value addition. Umar and Ibrahim (2024) also showed that fluctuations in crude oil export prices continue to influence Nigeria's growth structure, crowding out incentives for developing the non-oil sector. A more recent study by Bankole and

Fasina (2025) confirmed that Nigeria's heavy reliance on oil exports hampers structural transformation; they argued that increasing manufactured exports could enhance productivity, reduce vulnerability to external shocks, and strengthen long-run growth trajectories.

Even fewer studies have employed a comprehensive sectoral breakdown to examine disaggregated impacts. This study, thus explicitly analyze the joint impact of oil and non-oil exports to Nigeria's economic growth. It introduces a more nuanced classification of export categories, including crude oil exports (as a proxy for oil exports), agricultural raw materials, manufactured goods, commercial services, and financial services exports. This disaggregation will allow for a clearer understanding of emerging export sectors, particularly services, and their influence on growth dynamics.

3. METHODOLOGY

3.1. THEORETICAL FRAMEWORK

Empirical studies in economics are generally based on theoretical foundations that offer guidance, justification, and uniqueness to research endeavors. This study is underpinned by the Solow growth theory, a fundamental component of the neoclassical growth framework. The Solow model delineates a functional relationship between economic output and factor inputs, highlighting the significance of capital accumulation, labor force growth, and technological advancement in facilitating long-term economic growth.

This research is theoretically supported by the application of the Solow model, as demonstrated in studies like Barro (1990), which integrated public revenue and expenditure variables into the growth framework. Subsequent work by Futagami et al. (1993) built upon this foundation, demonstrating the impact of various elements of public finance and sectoral outputs on economic performance. Barro's adaptation of the Solow model is pertinent to this study, offering a theoretical framework for analysis.

The Solow model has been extensively applied in growth literature, as evidenced by studies such as Levine and Zervos (1996), Obstfeld (1994), particularly utilizing the production function approach. This framework posits that output growth rate is influenced by three primary factors: the growth rate and quality of labor input, adjusted for labor income share; the growth rate and quality of capital input, adjusted for capital income share; and variations in total factor productivity (TFP), which reflect technological advancements and efficiency improvements. This theoretical framework supports the analysis of the contributions of disaggregated export components, specifically oil and non-oil exports, to Nigeria's economic growth. Consequently, the aggregate production function of the country is defined as follows:

$$Y = f(L, K, A) \ldots\ldots (1)$$

Y= Gross domestic product (GDP), L= labour force, K = capital stock, A= total factor productivity (TFP) of growth in output.

3.2. MODEL SPECIFICATION

Guided by the Solow growth model and building on the theoretical framework previously discussed, this study develops an empirical model to examine the effects of oil and non-oil exports on economic growth in Nigeria. In line with the production function approach, output (proxied by RGDP) is modeled as a function of key export components and an intervening variable, exchange rate, which is known to influence international trade performance.

Thus, the baseline of the model is specified as:

$$RGDP = f(OLEX_t, NOLEX_t, EXR_t) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where:$RGDP$ = Real Gross Domestic Product at time t, $OLEX_t$= Oil Export at time t, $NOLEX_t$ = Non-Oil Export at time t and EXR_t= Exchange Rate at time t.

To capture the effect of both oil and non-oil exports on Nigerian economic growth, the functional relationship is specified below.

$$RGDP = f(OLEX_t, AGRICX_t MANUX_t, SERVX_t, EXR_t) \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where Non-Oil exports = (Agric export, Manufacturing Exports, Service Export)

To facilitate econometric estimation, the above functional form is transformed into a linear econometric model as follows:

$$RGDP = \beta_0 + \beta_1 lnOLEX_t + \beta_2 AGRICX_t + \beta_3 MANUX_t + \beta_4 SERVX_t + \beta_5 EXR_t + U_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where:lndenotes the natural logarithm (used to linearize relationships and stabilize variance); β_0 = Intercept term; β_{1-5} = Elasticities of $RGDP$ with respect to independent variables and U_t= Error term. This study utilized annual time series data from 1986 to 2023 for Nigeria sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin (2024) and the World Development Indicators (WDI, 2024).

Table 1. *The measurement of data*

S/N	Variables	Measures	Sources
1.	$RGDP$	GDP constant local currency unit	WDI (2024)
2.	$OLEX$	Total fuel exports % of Merchandise exports	CBN (2024)
3.	$AGRICX$	Output of agricultural raw materials exports % of Merchandise exports	WDI (2024)
4.	$MANUX$	Output of manufactures exports % of Merchandise exports	WDI (2024)
5.	$SERVX$	Aggregate service Output of exports % of service exports	WDI (2024)
6.	EXR	Exchange rate	WDI (2024)

Source: *Author's computation, 2025*

4. RESULTS AND DISCUSSION

4.1. DESCRIPTIVE ANALYSIS

The summary statistics of the variables employed in the study are presented in Table 2. As shown, there exists a high level of internal consistency among all the series, with their mean and median values falling well within the observed minimum and maximum values. This suggests that the data is relatively stable over time and free from significant outliers. Also, the standard deviations indicate that the actual values of the series do not deviate from their respective meanings.

The variables examined include Real Gross Domestic Product (RGDP), Crude Oil Exports (OILX), Agricultural Raw Materials Exports (AGRICX), Manufactured Exports (MANUX), Services Exports (SERVX), and the Exchange Rate (EXR). The deviations among these variables do not show substantial variability, confirming the compact nature of their distributions.

Regarding distributional characteristics, RGDP, AGRICX, MANUX, SERVX, and EXR exhibit positive skewness, implying that the right-hand tail (higher values) of their distributions is longer. In contrast, OILX is negatively skewed, indicating a longer left-hand tail. This means that for OILX, lower-than-average observations are more frequent than higher ones.

All variables exhibit leptokurtic distributions, with kurtosis values greater than zero, implying heavier tails compared to normal distribution. However, while RGDP and AGRICX have kurtosis values greater than three indicating peaked distributions with heavy tails OILX, MANUX, SERVX, and EXR have kurtosis values less than three, suggesting flat and near-normal distributions.

Finally, the Jarque-Bera test for normality supports the hypothesis that all series are normally distributed at the 10% significance level. This statistical evidence provides further justification for employing standard econometric techniques in analyzing the relationships among these variables.

Table 2. *Descriptive Analysis Result*

	RGDP	OILX	AGRICX	MANUX	SERVX	EXR
Mean	0.04193	95.5047	1.218428	2.526412	0.14186	92.3522
Median	0.04345	96.4549	0.750585	2.225443	0.10193	114.889
Maximum	0.33736	104.927	7.268343	6.685777	0.87109	253.492
Minimum	-0.1075	84.0389	0.005945	0.024477	-0.681	1.75452
Std. Dev.	0.07346	5.31649	1.659806	1.80566	0.37025	72.1188
Skewness	1.64049	-0.2372	2.422074	0.697171	0.03397	0.17621
Kurtosis	9.82748	2.18488	8.603351	2.680786	2.49508	1.92034
Jarque-Bera	76.5058	1.18593	73.15108	2.728116	0.34608	1.71984
Probability	0.00624	0.05269	0.00324	0.006321	0.08411	0.02232
Sum	1.34167	3056.15	38.98969	80.84519	4.53958	295.527

Sum Sq. Dev.	90.1672	876.216	85.40368	101.0726	4.24956	16.1235
Observations	32	32	32	32	32	32

Source: Author's computation, 2025

4.2. CORRELATION ANALYSIS

Table 3 presents the correlation matrix which indicates that the correlation coefficients of the variables are positive except agricultural raw material export which is negatively correlated with economic growth. Explicitly, the correlation between the variables is less than 0.70, hence, there is no tendency for multi-collinearity among such variables.

Table 3. *Correlation Matrix*

	RGDP	OILX	AGRICX	MANUX	SERVX	EXR
RGDP	1	0.40486	-0.580974	0.629847	0.386829	0.27767
OILX	0.40486	1	-0.648469	-0.595248	0.160327	-0.6639
AGRICX	-0.580974		1	0.238776	-0.143619	0.41916
MANUX	0.629847			1	0.036091	0.62647
SERVX	0.386829				1	-0.1058
EXR	0.27767					1

Source: Author's computation, 2025

4.3. UNIT ROOT TEST

The Augmented Dickey-Fuller (ADF) test to rigorously assess the time series characteristics of the variables specified in the model. Conducting this test is imperative to determine the order of integration of each variable, thereby ensuring the appropriateness of subsequent econometric analyses. The unit root test results, which reveal the integration properties of the individual variables, are reported in Table 4.

Table 4: *ADF Unit Root Test Result*

Variables	Test Statistics	Critical Values 5%	P-values	Order
logRGDP	-5.517062	-2.967767	0.0043***	I(1)
Log(OILX)	-5.346532	-2.967767	0.0005***	I(1)
Log(AGRICX	-5.862222	-2.971853	0.0002***	I(1)
Log(MANUX)	-3.321254	-2.967767	0.0632*	I(1)
Log(SERVX)	-3.507374	-2.967767	0.0100**	I(1)
EXR	-4.043532	-2.967014	0.0232***	I(1)

Source: Author's Computation, 2025.

***, **, * represent the probability value of each level of significance at 1%, 5% and 10% respectively

Table 4 indicates that all the variables (RGDP, OILX, AGRICX, MANUX, SERVX, and EXR) are stationarity after first differencing, suggesting that they are integrated of order I(1). Consequently, the null hypothesis of non-stationarity for each of the variables is rejected.

4.4. JOHANSON CO-INTEGRATION TEST

Having established that all variables being integrated of order one, the Johansen–Juselius technique was utilized to assess long-run equilibrium relationships among RGDP, oil exports, the non-oil export sub-components (agricultural raw materials, manufacturing, services), and the exchange rate. The trace statistics and maximum eigen-value indicate four cointegrating vectors, rejecting the null hypothesis of no cointegration at the 5 per cent significance level. This confirms the existence of stable long-run linkages among these variables, thereby mitigating the risk of spurious or inconsistent estimates that arise when non-stationary series are regressed in levels.

Table 5: *Johanson Co-integration Result*

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value	P-val	Max-Eigen stat	Critical Value	P-val
None *	0.986042	100.4904	69.81889	0.0000	72.61943	33.67687	0.0000
At most 1 *	0.962520	64.31726	47.85613	0.0007	55.82695	27.58434	0.0000
At most 2 *	0.759857	32.86544	29.79707	0.0215	24.25085	21.13162	0.0176
At most 3	0.337048	18.52326	19.49471	0.1349	26.98789	34.2646	0.2046
At most 4 *	0.220461	4.613394	3.841466	0.0317	4.233901	3.841466	0.0396
At most 5 *	0.384133	49.09602	46.85613	0.0442	19.47652	12.52672	0.0341

Source: Author's computation, 2025.

4.5. ERROR CORRECTION MODEL

Having established that the variables are stationary and cointegrated, we can estimate both an over-parameterized and a parsimonious ECM. The ECM addresses the loss of long-run information inherent in differencing by incorporating an error correction term derived from the long-run cointegrating relationship, guided by economic theory and statistical significance. This term captures the speed at which RGDP returns to its equilibrium after a shock, quantifying the share of the previous period's disequilibrium that is adjusted in the current period. In the over-parameterized specification (Table 6), only the contemporaneous coefficient on agricultural raw-materials exports and the first lag of oil exports are statistically significant at 5% prompting us to move to the more streamlined, parsimonious ECM.

Table 6. *Over-Parameterized ECM*

VAR	**COEF**	**S.E**	**T-Stat**	**P-val**
C	0.000542	0.001197	0.703545	0.4102
D(RGDP(-1))	0.053281	0.322975	0.161843	0.8731
D(OilX)	0.031858	0.035695	0.892520	0.3833
D(AgricX)	0.999104	0.001335	748.3965	0.0000
D(ManuX)	0.004100	0.002236	1.833085	0.0825
D(ServX)	-0.000110	0.001443	-0.076485	0.9398
D(EXR)	-6.32E-05	3.97E-05	-1.591309	0.1280
ECM(-1)	-1.034861	0.459059	-2.254309	0.0362

R-Squared	0.999978	Durbin-Watson stat.1.990526
F-stat	40484.95	Prob (F-stat)0.000000

Source: Author's computation, 2025

Table 7. *Parsimonious Error Correction Mechanism*

Dependent Variable: RGDP				
Variable	Coeffi	S.E	T-Stat	Prob
C	0.000661	0.001017	0.650532	0.5215
D(RGDP(-2)	-0.234918	0.133175	-1.763979	0.0905
D(OilX)	0.030832	0.030232	1.019856	0.3180
D(AgricX)	0.999176	0.001169	854.4666	0.0000
D(ManuX)	0.004733	0.001715	2.759527	0.0109
D(ServX (-1)	0.001636	0.001307	1.251139	0.2229
D(EXR)	-6.89E-05	2.94E-05	-2.344278	0.0277
ECM(-1)	-0.974094	0.159002	-6.126292	0.0000
R-Squared	0.979977	F-statistic	65.504	
Adjusted R-squared	0.969962	Prob (F-stat)	0.000000	
F-statistic	65.504	Durbin-Watson stat.	1.961181	

Source: Author's computation, 2025

The adjusted R^2 reveals that 97% of the variation in GDP is accounted for by oil exports, non-oil exports (agricultural raw materials, manufacturing, and services exports), and the exchange rate. The value of F-statistic (65.5), which is significant at the 1% level (0.0000), confirms the joint significance of these variables as determinants of economic growth. The standard error of 0.200 suggests that, in approximately two-thirds of the cases, the predicted RGDP values deviate by about 20% from the actual values. Additionally, the ECT is negative, statistically significant, and indicates a 97% speed of adjustment toward long-run equilibrium.

From the parsimonious model, oil exports with a two-year lag positively and significantly influence economic growth indicating 1% increase leads to a 3% rise in RGDP. Agricultural raw material exports in the current year significantly increase economic growth by 99% per 1% increase. Manufacturing exports also show a positive and significant effect, with a 1% rise contributing 0.47% to RGDP growth. Conversely, services exports with a two-year lag negatively impact growth, 1% increase leads to a 0.3% decline, due to substandard service export quality. Finally, the exchange rate negatively and significantly affects GDP, where a 1% increase results in a 6.89% reduction in economic growth, reflecting an increase in exchange rate which leads to currency devaluation effects.

4.6. IMPULSE RESPONSE FUNCTION

Figure 1 shows how real GDP reacts over time to one-unit shocks in each non-oil export component and the exchange rate. When agricultural raw materials exports receive a one-unit impulse, real GDP initially rises, reaching its maximum

positive response of 0.15 coefficient units in period 2. In period 3 it dips by 0.06 units, but aside from that trough the response remains positive throughout the horizon.

A similar pattern holds for manufacturing exports. A one-unit increase in manufacturing exports boosts real GDP by 0.29 units in period 2, then produces a modest negative response of 0.04 units in period 3. Beyond that slight downturn, the effect on GDP stays positive in subsequent periods.

Services exports generate the largest swing: a one-unit shock yields a 1.81-unit rise in real GDP in period 2, followed by a 0.06-unit decline in period 3. Except for that brief dip, the impulse pushes GDP higher on every horizon. Also, a one-unit increase in the exchange rate leads to a 0.02-unit increase in real GDP in period 2. In the following periods the response hovers around zero, with only negligible negative values, indicating a neutral effect after the initial positive spike.

Finally, In the case of oil exports, the response of real GDP to crude oil exports is consistently negative throughout the periods observed. There is no positive response recorded, as the highest level remains at 0.00 coefficient units on the vertical axis. The lowest (most negative) response reaches -2.21 coefficient units, indicating a significant adverse effect.

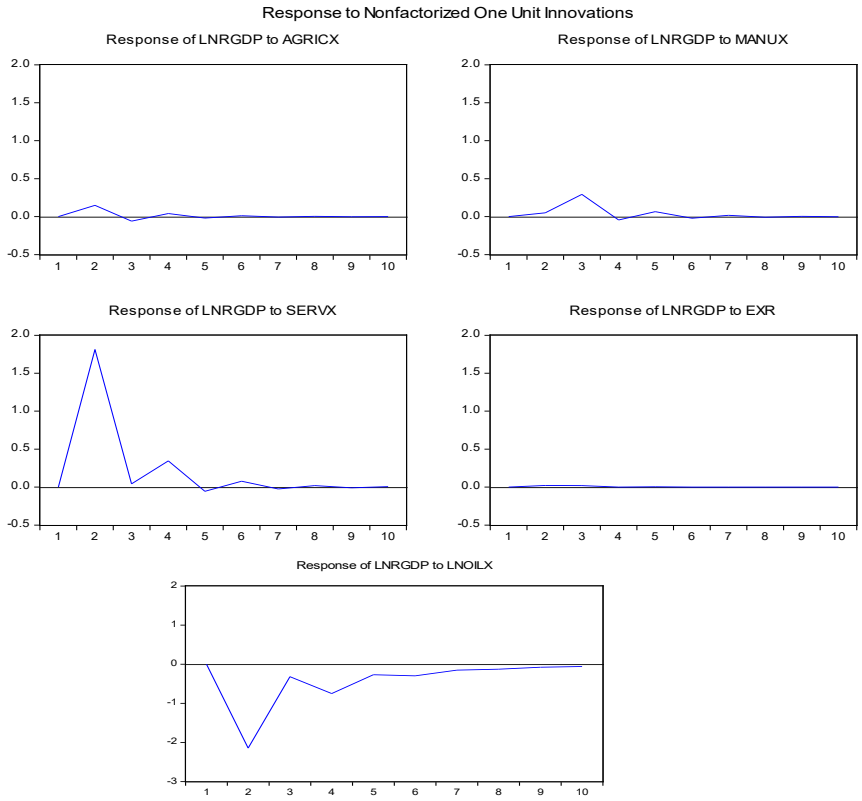

Figure 1. *Impulse Response Function result*
Source: *Author's Computation, 2025.*

4.7. VARIANCE DECOMPOSITION

The variance decomposition analysis provides insights into the extent to which shocks from both non-oil and oil export components contribute to the forecast error variance of real GDP over time. Table 8 presents the results, highlighting the relative importance of agricultural raw materials exports, manufacturing exports, services exports, exchange rate, and crude oil exports influencing real GDP.

In the first year, the forecast error variance of real GDP is entirely explained by its own innovations. However, this influence gradually declines over time. By the 10th forecast year, GDP's own shocks account for approximately 69% of the forecast error variance. On this horizon, agricultural raw materials exports contribute about 7%, manufacturing exports 1%, services exports 16%, and the exchange rate 5%. Although none of these variables show persistent dominance each explaining less than 16% individually their growing contributions over time suggest an increasing influence on real GDP in the long run.

In contrast, the variance decomposition analysis for oil exports reveals a minimal impact of crude oil exports on GDP dynamics. Crude oil exports do not exhibit any form of persistence, with their highest historical contribution being just 4%. Throughout the entire 10-year forecast period, shocks from crude oil exports explain less than 1% of the forecast error variance of real GDP. This minimal and constant contribution underscores the limited role of crude oil exports in driving variations in Nigeria's economic growth over the forecast horizon.

Table 8. *Variance Decomposition Result*

Period	S.E.	LNRGDP	LNOILX	AGRICX	MANUX	SERVX	EXR
1	0.787609	100.0000	99.99998	0.000000	0.000000	0.000000	0.000000
2	0.910664	79.19618	99.08191	0.008072	2.364884	16.98916	1.441707
3	0.954930	74.45189	96.45310	2.911134	2.151916	17.75663	2.728425
4	0.984394	72.34804	96.03121	5.460869	2.025513	16.82276	3.342817
5	0.992938	71.49056	95.61211	6.155343	2.013023	16.53455	3.806522
6	0.998722	70.86397	95.49086	6.421450	1.994466	16.50452	4.215594
7	1.004258	70.38321	95.41147	6.652799	1.974315	16.42765	4.562031
8	1.008775	70.03007	95.38158	6.833587	1.962110	16.32452	4.849709
9	1.012288	69.74723	95.36527	6.949434	1.954447	16.25177	5.097119
10	1.015271	69.50498	95.35835	7.029157	1.950279	16.20074	5.314847

Source: *Author's Computation, 2025.*

5. DISCUSSION OF FINDINGS

The findings reveal that agricultural raw material exports exhibit a significant negative relationship with economic growth, indicating an insignificant overall effect. This aligns with Adenugba and Sotubo (2013), who argued that non-oil exports have underperformed, raising concerns about the effectiveness of Nigeria's export promotion strategies and the country's slow progress in economic diversification.

Service exports also show no significant impact on economic growth, consistent with Olawale (2018), who found that export promotion has limited effects in low-income countries. This finding is further supported by Abogan, *et al,* (2014),

who noted that regional trade enhances export diversification away from traditional exports but does not necessarily boost growth.

In contrast, manufacturing exports exert a significant positive impact on economic growth, aligning with a priori expectations. This finding is consistent with that of Adenugba and Dipo (2013), whose study on Saudi Arabia revealed a positive relationship between non-oil exports and economic development.

Furthermore, the results show that oil exports has an insignificant positive effect on economic growth which aligns with the studies of Huseyin et al. (2017), who reported that non-oil sectors contribute more substantially to capital formation and growth in OPEC countries.

With respect to the exchange rate, the study reveals a significant negative impact on economic growth in Nigeria, which corroborates the studies of Onyeranti (2012), who observed an inverse relationship between the exchange rate and capital formation in Egypt; however, it contrasts with the findings of Umar, A., & Ibrahim (2024), who reported a positive relationship between the real exchange rate and economic growth in Nigeria.

The impulse response analysis shows that GDP responses to non-oil export shocks are positive, albeit with varying magnitudes, while responses to oil export shocks are consistently negative. All shocks tend to diminish over time, suggesting some level of economic diversification.

Lastly, the variance decomposition reveals that in the first year, real GDP variations are entirely due to their own innovations. By the 10th forecast year, GDP's own shocks account for 69% of forecast error variance, while agricultural raw material exports, manufacturing exports, services exports, and the exchange rate contribute 7%, 1%, 16%, and 5%, respectively. Crude oil export shocks explain less than 1% of the variance and remain constant over the forecast horizon, underscoring their limited long-term effect on the growth of Nigeria economy.

6. CONCLUSION

This study utilized the Error Correction Mechanism (ECM) technique to examine the empirical relationship between oil exports, non-oil exports, and the growth of Nigeria economy for the period, 1986 to 2023 and found that both oil and non-oil exports enhanced economic growth within the study period.

Based on the findings, the study thereby recommends the pressing need to re-position both oil and non-oil exports by shifting from the export of crude and raw products to value-added, finished goods. This will enhance export earnings and increase the overall contribution of exports to economic growth. Also, government at all levels must intensify efforts to address the structural challenges facing the non-oil export sector and prioritize export diversification, shifting focus from oil to non-oil exports. Finally, strengthening the capital base and productive capacity of the non-oil sector through strategic Public-Private Partnerships (PPP) is vital, as such collaborations will provide the necessary investment and expertise to boost key sectors like agriculture, manufacturing, and mining, which are essential for sustainable economic growth.

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