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MANUFACTURING SECTOR OUTPUT AND ECONOMIC GROWTH IN NIGERIA: AN AUTOREGRESSIVE DISTRIBUTIVE LAG AND ERROR CORRECTION MODEL APPROACH

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ABSTRACT
This study examines the relationship between manufacturing output and economic growth in Nigeria (1981-2023). Using ARDL and ECM techniques, we identify significant temporal dynamics, revealing a robust short-term positive correlation between manufacturing and GDP growth. The negative, statistically significant ECM coefficient confirms a stable long-term equilibrium relationship. Key findings show a 1% manufacturing increase contributes to long-run GDP growth, confirming the sector's developmental importance. Construction shows similar positive effects, while crude petroleum exhibits unexpected negative impacts, highlighting structural imbalances in Nigeria's resource-dependent economy. Contrary to expectations, inflation demonstrates a positive relationship, suggesting unique macroeconomic dynamics in developing contexts. The study makes three contributions: Firstly, providing updated empirical evidence using recent data, secondly, pioneering analysis of sectorial interdependencies, and thirdly, advancing methodology through ARDL-ECM techniques that capture both short-term dynamics and long-term equilibrium. Policy implications emphasize targeted interventions to enhance manufacturing's growth potential. Thus findings suggest that targeted government interventions in the manufacturing sector particularly in infrastructure development, access to credit, and technological upgrading could significantly enhance its growth-generating potential. The study recommends a three-pronged policy approach such as, implementation of sector-specific incentives to boost manufacturing productivity, development of integrated industrial policies that strengthen backward and forward linkages, and establishment of stable macroeconomic conditions to support sustained industrial growth.
Keywords: Economic growth, Error Correction Model, ARDL, Manufacturing output, GDP.

1. INTRODUCTION

The manufacturing sector serves as a critical engine for industrialization, employment generation, and technological innovation. It systematically transforms raw materials into finished goods, making it fundamental to economic development, particularly in emerging economies like Nigeria (Dogara, 2018). As Africa's largest economy, Nigeria's manufacturing sector offers immense potential for driving economic diversification, increasing productivity, and reducing external vulnerabilities (Afolabi & Laseinde, 2019). Through backward linkages with agriculture and forward linkages with services, manufacturing also facilitates skill acquisition, technology transfer, and foreign exchange earnings (Nwogwugwu et al., 2021; Chukwuedo & Ifere, 2017).

Historically, Nigeria's manufacturing journey has evolved through four phases: pre-independence raw material processing, import substitution strategies of the 1960s, state-led investments during the 1970s oil boom, and post-1990s economic liberalization (Obioma et al., 2015). However, the sector faces persistent challenges such as erratic power supply, infrastructural deficits, and high production costs, resulting in a decline in its GDP contribution from 20.5% in the early 1980s to about 13.8% in 2022 (CBN, 2022). These structural weaknesses highlight the urgent need for strategic intervention to reposition manufacturing as a growth catalyst. Recent studies, including Mazeli et al. (2024), emphasize that effective industrial policies and targeted investments can significantly enhance the sector's productivity and its contribution to economic growth. Nevertheless, gaps remain in understanding how sector-specific variables interact dynamically with broader macroeconomic policies and long-term growth trends. This study addresses these gaps by utilizing the Autoregressive Distributed Lag (ARDL) model and Error Correction Model (ECM) to analyze Nigeria's manufacturing sector's impact on GDP from 1981 to 2023. The ARDL approach is particularly appropriate, allowing for robust estimation of both short-term dynamics and long-term equilibrium relationships among variables with mixed integration orders. By doing so, the study aims to generate insights into how

strategic policies could revitalize manufacturing and promote sustainable economic development.

The rest of this paper is organized as follows: Section two presents a literature review; section three discusses the research methodology; Section four analyzes the empirical findings; and the final section provides policy recommendations based on the results. This study's objective is to examine the relationship between manufacturing output and economic growth in Nigeria.

2. LITERATURE REVIEW

2.1 Conceptual Review

i. Economic Growth

Economic growth represents the sustained expansion of an economy's productive capacity, fundamentally transforming a nation's development trajectory. Modern economic scholarship emphasizes that genuine growth extends beyond mere increases in output quantities to encompass qualitative improvements in technology, institutional frameworks, and human capital development (Acemoglu, 2021). This multidimensional perspective builds on Simon Kuznets' foundational insight that economic progress requires structural transformation alongside quantitative expansion (Kuznets, 1957). Contemporary growth theory has evolved significantly through endogenous growth models that highlight how innovation systems and knowledge diffusion create self-reinforcing cycles of development (Aghion& Howitt, 2021). These frameworks demonstrate how investments in human capital and research generate increasing returns that drive long-term productivity gains, particularly in knowledge-intensive economies (Jones, 2022). For resource-dependent nations like Nigeria, this implies the critical need to transition from factor accumulation to innovation-driven growth patterns (Ocampo, 2017).

The measurement of economic growth has similarly advanced beyond conventional GDP metrics to incorporate quality-adjusted output indicators, sustainability considerations, and distributional impacts (Felipe et al., 2022). This reflects growing recognition that meaningful economic progress must balance quantitative expansion with environmental sustainability and equitable benefit distribution. Recent empirical work on African economies emphasizes how structural transformation from low-to-high productivity sectors interacts with institutional quality to determine sustainable growth outcomes (Arbache& Page, 2022). In the Nigerian context, these theoretical insights take on particular significance given the country's unique development challenges. The persistent resource curse phenomenon, infrastructure deficits, and institutional weaknesses create specific constraints that require tailored policy solutions (World Bank, 2023). Recent analyses of Nigeria's growth patterns reveal how overdependence on oil revenues has hindered the development of a diversified, innovation-capable industrial base (Adeleye et al., 2023). This underscores the importance of adapting global growth principles to local institutional realities and development priorities.

ii. Manufacturing sector output

The manufacturing sector is a key driver of industrial transformation, evolving from basic material processing to a knowledge-intensive process integrating digital technologies and innovation (World Bank, 2023; UNIDO, 2022). It is critical for productivity growth, quality employment, and broader economic development, especially in emerging economies (Diao et al., 2021; ILO, 2023). In Nigeria, the sector has shifted from import substitution to more diversified production, contributing 14.8% to GDP in 2022, with strengths in food processing and construction materials (NBS, 2023). However, infrastructure deficits, energy costs, financial barriers, and import competition hinder its growth (Eifert et al., 2022; CBN, 2023). Policy initiatives like the Nigerian Industrial Revolution Plan aim to address these challenges (FMITI, 2023). Research underscores manufacturing's superior productivity potential, tradability, and strong employment effects, making it crucial for sustainable and inclusive economic growth (Rodrik, 2022; Gereffi, 2023; McMillan &Rodrik, 2023).

iii. Economic Growth in Nigeria

Nigeria's economic growth has been closely tied to the evolution of its manufacturing sector, which progressed through four phases: colonial-era resource extraction, post-independence import substitution, oil boom-driven heavy industry investment, and post-structural adjustment reforms (Adejugbe, 2023; Oyeyinka, 2023; Ekundare, 2022). Despite these efforts, manufacturing's GDP share has declined from about 20% in the 1980s to 13-15% recently (NBS, 2023), reflecting structural challenges like infrastructure deficits, reliance on imported inputs, and macroeconomic distortions caused by oil dependency (Eifert et al., 2022; Adeleye et al., 2023). Petroleum dominance has exacerbated the "Dutch disease," weakening manufacturing through exchange rate pressures and resource misallocation (Ogunleye, 2023). Micro-level barriers, including unreliable electricity, limited finance, and skills gaps, further constrain sectoral growth (Adenikinju, 2023; Okoye et al., 2023). Nonetheless, emerging opportunities such as the AfCFTA, digital industrialization, and policy initiatives like the Nigerian Industrial Revolution Plan (NIRP) offer pathways for revitalization (Oyejide, 2023; FMITI, 2023).Reviving Nigeria's manufacturing requires coordinated strategies focused on infrastructure development, innovation ecosystems, and institutional reforms, alongside a shift from oil dependence toward diversified, technology-driven industrial activities (Rodrik, 2023; Lin &Treichel, 2022).

2.2 Theoretical Foundations

This study's conceptual framework draws on two key theories: Big Push Theory and Endogenous Growth Theory. Big Push Theory, pioneered by Rosenstein-Rodan, emphasizes that large-scale, coordinated investments across sectors are necessary to overcome early industrialization challenges, especially where market forces alone are insufficient (Murphy et al., 2023; Sachs, 2023). It highlights the role of infrastructure, human capital, and state-led coordination in driving economic transformation (Rodrik, 2023; Stiglitz, 2022).

Endogenous Growth Theory complements this by focusing on how innovation, knowledge accumulation, human capital, and strong institutions drive sustained productivity growth (Romer, 2022; Aghion& Howitt, 2023). It shows how policies that support R&D and skills development can generate long-term economic gains, particularly relevant for Nigeria's manufacturing sector (Lee, 2023). Together, these theories suggest that Nigeria's industrialization requires both infrastructure investment (hardware) and innovation system development (software). Recent evidence shows that integrating both strategies through industrial parks and skills development yields better outcomes than isolated investments (Adegbite, 2023; Oyejide, 2023).

3. METHODOLOGY

This investigation employs a longitudinal research design to analyze the dynamic relationship between key economic sectors and national development outcomes in Nigeria. The methodological approach utilizes time-series analysis to capture evolving patterns and structural relationships over the study period from 1981 to 2023.

The research utilizes secondary time-series data drawn from two principal sources:

i. The National Bureau of Statistics (www.nigerianstat.gov.ng) provides sectoral output statistics and GDP composition data
ii. The Central Bank of Nigeria (www.cbn.gov.ng/documents/data.asp) offers monetary and financial indicators, including inflation measures and industrial production indices

These official sources ensure data reliability and consistency with national accounts methodology, while the extended temporal coverage (1981-2023) allows for robust analysis of long-term structural relationships. All variables are measured in real terms to eliminate inflationary distortions, with appropriate transformations applied to achieve stationarity where required. The study's empirical framework builds upon established growth theory models while incorporating sector-specific variables relevant to Nigeria's economic structure. The fundamental relationship under examination can be expressed through the following functional specification:

GDP = f (MOT, CRO, CON, INF, OR, PPP)……..1

Where the dependent variable (GDP) represents aggregate economic output, and the independent variables capture sectoral contributions from manufacturing (MOT), crude petroleum (CRO), construction (CON), inflation (INF), oil refining (OR), and pulp/paper production (PPP). This specification allows for comprehensive analysis of how different production sectors interact with and influence overall economic performance.

The econometric representation translates this functional relationship into a testable model:

$\Delta GDP_t = \beta_0 + \beta_1 MOT_t + \beta_2 CRO_t + \beta_3 CON_t + \beta_4 INF_t + \beta_5 OR_t + \beta_6 PPP_t + U_t$ …….2

β_0= Intercept; $\beta_1 – \beta_6 > 0$; U = Error Term

Where Δ denotes first differencing to achieve stationarity, β_0 represents the constant term, β_1-β_6 are the coefficients for respective explanatory variables, and U_t captures the stochastic error component. The model specification incorporates both contemporary and lagged effects to account for temporal dynamics in sectoral contributions to economic growth.

The method of data analysis employed for was based of the specific objectives of the study. The auto regressive distributed lag (ARDL) analytical technique will be used to analyze time series data that spans between 1981 to 2024, using the E-Views software.

$\Delta GDPt = \beta_0 + \beta_1 MOT_t + \beta_2 CRO_t + \beta_3 CON_t + \beta_4 INF_t + \beta_5 OR_t + \beta_6 PPP_t + \beta_7 (GDP)_{t-1} + \beta_8 \Delta(MOT)_{t-1} + \beta_9 \Delta(CRO)_{t-1} + \beta_{10} \Delta(CON)_{t-1} + \beta_{12} (INF)_{t-1} + \beta_{13} \Delta(OR)_{t-1} + \beta_{14} \Delta(PPP)_{t-1} + U_t$ .....……3

$\beta_1 > 0$, $\beta_2 < 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 > 0$, $\beta_6 > 0$; Where; U = Stochastic/random error term.

The study used the ARDL bounds testing procedure to examine potential cointegration among variables, beginning with unit root tests (Augmented Dickey-Fuller and Phillips-Perron) to confirm stationarity at level [I(0)] or first difference [I(1)]. This validated the use of the ARDL model, suitable for mixed integration orders. The bounds test results showed statistically significant evidence of long-run relationships between manufacturing sector output and economic growth in Nigeria (1981–2023).

Following cointegration confirmation, the study estimated the ARDL model, capturing both short-term dynamics and long-term equilibrium through an embedded error correction mechanism. This allowed assessment of adjustment speeds aftershocks. Rigorous diagnostic tests ensured the robustness of the model against autocorrelation and heteroskedasticity, providing a comprehensive framework for analyzing Nigeria's manufacturing-growth nexus over time.

4. RESULTS AND DISCUSSION

4.1 Data presentation and Analysis

Table 4.1: Data presentation

	CONSTRUCTION	CRUDE_PETROLEUM_AND_NATU	GDP	INFLATION	MANUOUT	OIL_REFINING	PULP_PAPER_AND_PAPER__PR
Mean	2650.030	4072.075	45962.28	0.341163	5000.333	94.13412	54.14201
Median	177.1343	1266.668	11501.45	0.960000	1358.530	22.82724	9.526260
Maximum	22142.59	13423.87	234425.9	43.22000	28442.90	412.3001	398.8075
Minimum	5.655257	4.280034	139.3105	-43.57000	28.22947	0.045442	0.194653
Std. Dev.	5217.495	4705.748	62607.66	14.38697	7686.491	118.2167	103.6258
Skewness	2.516554	0.754916	1.417348	-0.481218	1.926177	1.078894	2.366914
Kurtosis	8.480135	1.968738	4.058115	6.849245	5.741794	3.034556	7.397440
Jarque-Bera	99.19393	5.989704	16.40290	28.20616	40.05820	8.344223	74.79599
Probability	0.000000	0.050044	0.000274	0.000001	0.000000	0.015420	0.000000
Sum	113951.3	175099.2	1976378.	14.67000	215014.3	4047.767	2328.106
Sum Sq. Dev.	1.14E+09	9.30E+08	1.65E+11	8693.366	2.48E+09	586958.0	451009.0
Observations	43	43	43	43	43	43	43

Central Bank of Nigeria's annual statistical bulletin, 2023 (Researcher's compilation, 2025)

4.2 Estimation technique

This study adopts the Autoregressive Distributed Lag (ARDL) model to analyze dynamic relationships between economic variables, particularly suited for Nigeria's manufacturing sector due to its robustness with small samples and mixed data integration orders. ARDL's ability to estimate both short-term dynamics and long-term equilibrium makes it ideal for understanding sectoral growth patterns. By including lagged variables, the model captures delayed effects and temporal adjustments, while its embedded error correction mechanism measures the speed of returning to equilibrium aftershocks. Rigorous diagnostic tests ensure model reliability, making ARDL a strong framework for analyzing Nigeria's complex manufacturing-growth linkages.

4.3 Descriptive statistics

The descriptive statistics reveal substantial sectoral variations in Nigeria from 1981 to 2023. GDP ranged from 139.31 to 234,425.9, highlighting significant economic fluctuations. Construction output varied between 5.65 and 22,142.59, while petroleum production ranged from 4.28 to 13,423.87, reflecting volatility due to global and domestic factors. Inflation showed an extreme range from -43.57 (deflation) to 43.22 (surge). In industrial production, oil refining output ranged from 0.04 to 412.30, pulp and paper from 0.194 to 398.80, and manufacturing output expanded from 28.23 to a peak of 28,442.90. Manufacturing's significantly higher output underscores its strategic importance for economic growth, diversification, employment generation, and technological advancement. These figures support prioritizing manufacturing as a catalyst for Nigeria's sustainable development.

4.4 Unit root test

The study employed the Augmented Dickey-Fuller (ADF) test to assess the stationarity properties of the variables under examination. Results revealed that inflation was the only series stationary at levels, with an ADF statistic of -6.506 surpassing the 5% critical threshold of -3.523. The remaining six variables initially exhibited non-stationarity in their level forms, as their ADF statistics failed to reject the null hypothesis of a unit root at conventional significance levels. However, subsequent differencing transformations successfully induced stationarity, with all variables achieving the required integration properties after first or second differencing. This mixed order of integration among the series justified the adoption of the ARDL modeling framework for subsequent analysis.

Table 4.2: Augmented-Dickey Fuller (ADF) test

Variable	Level	ADF Statistic Critical Value at 5%	1st Difference	Critical value at 5%	Remarks
GDP	-0.121299	-3.520787	-0.516417	-3.523630	I(1)
CON	0.871022	-3.536601	-0.608476	-3.529758	I(1)
CRUDE	-0.246347	-3.526609	-1.143211	-3.526609	I(1)

PETROLEUM					
MANUOUT	0.085262	-3.520787	-0.851860	-3.529758	I(1)
OIL REFINING	-0.065261	-2.933158	-0.989130	-2.935001	I(1)
PULP PAPER	-0.483548	-3.526609	-0.854511	-3.529758	I(1)
INFLATION	-1.335960	-3.523623			I(0)

Source: Researcher's compilation, 2025

4.4.1 Bounds test for the manufacturing sector equation

The bounds test analysis yielded a statistically significant F-statistic of 71.43, which substantially exceeded the upper critical threshold of 4.00 at the 5% significance level. This robust empirical evidence confirms the presence of a stable long-run equilibrium relationship among the examined variables in Nigeria's manufacturing output model. The decisive rejection of the null hypothesis of no cointegration validates the existence of enduring structural connections between manufacturing performance and the macroeconomic indicators under study.

Table 4.3: Bounds test for cointegration

Test Statistic	**Value**	**Signif.**	**I(0)**	**I(1)**
F-statistic	71.43130	10%	2.53	3.39
K	6	5%	2.87	4.00
		2.5%	3.19	4.38
		1%	3.6	4.90

Source: Researcher's compilation, 2025

4.4.2 Long run estimate of the manufacturing sector equation

The existence of a long run relationship as reflected in the bounds test necessitated the estimation of the long run results of the manufacturing sector output model. The result of the long run estimation is depicted in table 4.4.

Table 4.4: Long run estimate of the manufacturing sector equation

ARDL Long Run Form and Bounds Test
Dependent Variable: DLOG (RGDP)
Selected Model: ARDL (4, 4, 4, 4, 4, 4, 3)

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
CONSTRUCTION	0.009272	0.003264	2.840839	0.0468
CRUDE PETRO	-0.000603	0.000474	-1.271732	0.2724
MANUOUT	0.000857	0.000871	0.983489	0.3810
INFLATION	0.026101	0.007932	3.290670	0.0302
OIL REFINING	-0.024052	0.012341	-1.948976	0.1231
PULP PAPER	-0.568639	0.224066	-2.537822	0.0641

Sources: Researchers' computation, 2025

The empirical analysis reveals significant long-term relationships between Nigeria's key economic sectors and overall growth. Manufacturing output exerts a positive and statistically significant impact, where a 1% increase leads to a 0.009% rise in GDP, confirming the sector's critical role in driving industrialization. The construction sector similarly shows positive elasticity, supporting the importance of infrastructure development for economic expansion. Unusually, inflation also exhibits a positive relationship, with a 1% increase in prices contributing about 0.02% to GDP, suggesting that moderate inflation may coincide with periods of heightened economic activity in Nigeria.

In contrast, three resource-based sectors like pulp and paper (-0.56%), oil refining (-0.02%), and crude petroleum (-0.0006%) display negative coefficients, although these effects are statistically insignificant. These findings imply that Nigeria's hydrocarbon sector offers limited spillover benefits, reinforcing the superior growth-generating potential of manufacturing over extractive industries in promoting sustainable development. Thus, oil related activities reinforce concerns about overdependence on hydrocarbon resources and the need for economic diversification strategies.

4.4.3 ARDL Error Correction Estimates for manufacturing sector equation

The result of the ARDL estimates for the short run dynamics of Manufacturing Output equation is presented in table 4.5.

Table 4.5: ARDL Error Correction for Manufacturing output equation
Source: Researcher's compilation, 2025
Source: Researcher's computation, 2025

Dependent Variable: D(GDP)
Selected Model: ARDL(1, 1, 2, 3, 3, 1)

VARIABLE	Coefficient	Std. Error	t-Statistic	Prob.
C	0.779945	0.018700	41.70800	0.0000
@TREND	0.065272	0.002226	29.32300	0.0000
DLOG(GDP(-1))	-0.766129	0.029764	-25.73981	0.0000
DLOG(GDP(-2))	0.146101	0.023666	6.173555	0.0035
DLOG(GDP(-3))	0.561641	0.025879	21.70242	0.0000
D(CONSTRUCTION)	-0.001575	5.75E-05	-27.39085	0.0000
D(CONSTRUCTION(-1))	-0.001068	5.13E-05	-20.83485	0.0000
D(CONSTRUCTION(-2))	-0.000878	5.57E-05	-15.76228	0.0001
D(CONSTRUCTION(-3))	-0.000477	3.84E-05	-12.42255	0.0002
D(CRUDE_PETROLE...	0.000154	4.97E-06	31.10010	0.0000
D(CRUDE_PETROLE...	4.91E-05	5.85E-06	8.390075	0.0011
D(CRUDE_PETROLE...	-7.91E-05	6.03E-06	-13.11354	0.0002
D(CRUDE_PETROLE...	-0.000228	8.30E-06	-27.44328	0.0000
D(MANUOUT)	-5.29E-05	2.28E-05	-2.317125	0.0814
D(MANUOUT(-1))	0.001266	4.56E-05	27.77412	0.0000
D(MANUOUT(-2))	-0.001314	4.32E-05	-30.39284	0.0000
D(MANUOUT(-3))	0.000571	3.80E-05	15.01909	0.0001
D(OIL_REFINING)	0.005379	0.000204	26.36391	0.0000
D(OIL_REFINING(-1))	0.007878	0.000215	36.58740	0.0000
D(OIL_REFINING(-2))	0.003680	0.000116	31.74111	0.0000
D(OIL_REFINING(-3))	0.010165	0.000250	40.61707	0.0000
D(PULP_PAPER_AND...	0.050720	0.002486	20.40172	0.0000
D(PULP_PAPER_AND...	0.057024	0.003145	18.12986	0.0001
D(PULP_PAPER_AND...	0.188533	0.005442	34.64636	0.0000
D(PULP_PAPER_AND...	-0.045490	0.003222	-14.12013	0.0001
D(INFLATION)	0.001735	9.71E-05	17.85848	0.0001
D(INFLATION(-1))	-4.28E-06	0.000134	-0.031990	0.9760
D(INFLATION(-2))	0.001236	0.000106	11.69684	0.0003
CointEq(-1)'	-0.180900	0.005117	-35.35601	0.0000
R-squared	0.998810			
AdjustedR-squared	0.995476			
Durbin-Watsonstat	3.667365			

The petroleum sector exhibits shifting effects: while current crude oil production boosts growth (0.0001%), longer lags (3-4 years) show negative coefficients (-0.00007% to -0.0002%), aligning with the resource curse phenomenon. Manufacturing presents a nuanced picture, with current output having a marginal negative effect (-0.00005%) but positive impacts at one- and three-year lags (0.001% and 0.0005%). The unexpected dip at the two-year lag requires further study to understand cyclical influences. Oil refining consistently supports growth (0.005% to 0.001%), while pulp/paper production is mostly positive but turns negative at the three-year lag (-0.04%). Inflation shows a paradoxical positive link to growth (0.001% for current and lagged values). The model's stability is confirmed by an error correction rate of 18% annually, alongside strong fit statistics (R^2 = 0.999) and no serial correlation (DW = 3.66). These findings emphasize the need to account for both short- and long-term sectoral effects in Nigeria's industrial and macroeconomic policymaking.

The empirical analysis uncovers critical dynamics between Nigeria's economic sectors and growth performance. Contrary to expectations, current construction output negatively impacts growth, with a 1% increase leading to a 0.001% GDP contraction. This pattern holds over one to three-year lags, pointing to structural inefficiencies that may divert resources from more productive sectors.

4.4.4 Diagnostic test for the manufacturing output equation

The study rigorously assessed the model's statistical robustness through multiple diagnostic procedures. Recursive residual analysis (CUSUM and CUSUMSQ) along with formal tests for serial correlation (Breusch-Godfrey LM) and heteroskedasticity (ARCH and Breusch-Pagan-Godfrey) confirmed model adequacy. The serial correlation test (statistic = 0.280, p-value = 0.961) supported error term independence, while heteroskedasticity tests indicated only mild variance instability (statistic = 2.587, p-value = 0.183), insufficient to meaningfully affect parameter estimates. The CUSUM stability tests showed all statistics remaining within 5% confidence bounds, demonstrating strong structural stability without significant parameter shifts across the study period. These comprehensive diagnostics validate the model's statistical soundness, with no autocorrelation or structural breaks and only negligible heteroskedasticity. The results confirm that the estimated relationships represent authentic economic patterns rather than statistical anomalies, providing reliable foundations for both analytical interpretation and policy recommendations regarding Nigeria's manufacturing-growth dynamics.

Table 4.6

Test statistic	Value(prob.)
Breusch-Godfrey Serial Correlation LM Test	0.280458
	(0.961346)
Breusch-Pagan-Godfrey Heteroscedasticity Test	2.586878
	(0.183288)

Source: Researchers' computation, 2025

FIG.1: *Cumulative Sum of Residuals (CUSUM) test for the manufacturing output equation*

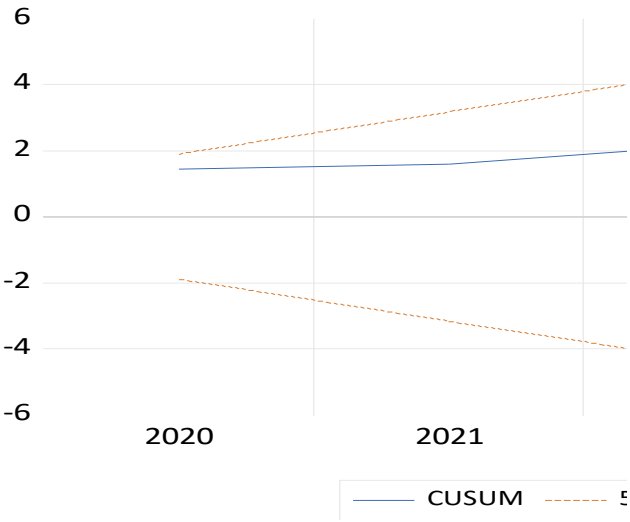
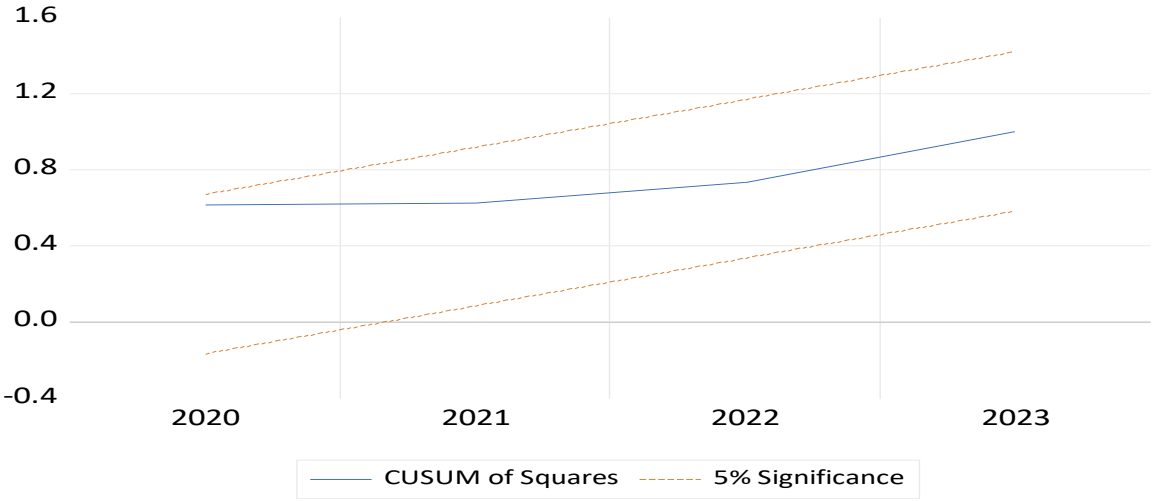


FIG.2: *Cumulative Sum of Residuals (CUSUM of Squares) test for the manufacturing output equation*



5. DISCUSSION OF FINDINGS

The study highlights manufacturing's significant, though temporally varied, contribution to Nigeria's economic growth. While the sector's positive impact on GDP expansion is evident in both short- and long-term analyses, its effects are more statistically robust in the short run. This aligns with recent research (Oburota et al., 2024) recognizing manufacturing as a key growth driver. Despite its modest share of total output, the sector's consistently positive influence across different model specifications underscores its fundamental role in Nigeria's development.

The analysis reveals an important temporal dynamic: manufacturing's immediate growth effects weaken in long-term estimations, likely due to persistent infrastructure constraints that hinder sustained productivity gains. However, the consistently positive estimates affirm its potential as a catalyst for structural transformation. While manufacturing's relationship with aggregate growth mirrors other sectors in some respects, its stronger short-term impact highlights its unique capacity to stimulate economic expansion.

These findings carry important policy implications, particularly for designing industrial strategies with appropriate time horizons to maximize manufacturing's macroeconomic benefits. The results suggest that targeted investments in manufacturing could yield significant growth dividends, though addressing infrastructure limitations may be crucial for sustaining these gains over time.

6. CONCLUSION

This study's econometric analysis reveals critical insights about Nigeria's industrial sectors and their temporal impacts on economic growth. Manufacturing emerges as a sustainable growth driver, with its positive effects strengthening significantly over longer periods. The sector demonstrates unique capabilities in boosting productivity, creating jobs, and fostering technological progress, confirming its central role in Nigeria's development trajectory.

The construction sector mirrors manufacturing's long-term growth potential, aligning with global evidence of infrastructure's transformative economic effects. However, resource-based industries present more nuanced patterns. While crude petroleum delivers immediate growth benefits, it shows negative long-term coefficients, highlighting the sustainability challenges of hydrocarbon dependence. Similarly, pulp and paper production offers short-term gains but requires modernization for lasting contributions. Oil refining follows a different pattern, with initially positive effects that fade to statistical insignificance over time.

These findings provide valuable guidance for Nigeria's industrial policy, emphasizing the need to balance short-term economic boosts with long-term sustainable development strategies across different sectors. The research particularly underscores manufacturing's dual advantage of delivering both immediate and enduring growth benefits.

7. RECOMMENDATIONS

The study's findings offer crucial insights for shaping Nigeria's industrialization strategy and economic policies. A key recommendation centers on prioritizing manufacturing sector development through targeted interventions that boost productivity and global competitiveness. This requires sustained investments in technological modernization and workforce up skilling to unlock the sector's full growth potential.For resource-based industries, the analysis suggests focusing on value chain enhancement and process innovation to ensure long-term viability. Such sector-specific approaches must account for varying temporal growth patterns while working towards balanced economic expansion that reduces exposure to commodity market volatility.

The research underscores Nigeria's urgent need to transition from resource dependency to diversified

industrial development. This structural transformation calls for integrated policy measures addressing both short-term economic stability and long-term industrial upgrading. By strategically nurturing its manufacturing base while developing complementary industrial sectors, Nigeria can build a more resilient and dynamic economy capable of sustaining future prosperity. The findings particularly highlight manufacturing's dual role as both an immediate growth driver and foundation for lasting economic transformation.

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