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IMPACT OF INFLATION ON MANUFACTURING SECTOR OUTPUT IN NIGERIA (1986-2024)

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Abstract

This research explores the impact of inflation on manufacturing sector output in Nigeria from 1986 to 2024, employing the Autoregressive Distributed Lag (ARDL) model. Findings indicate the presence of a long-term equilibrium relationship among the variables examined. In the long run, both inflation and interest rates exert a statistically significant negative effect on manufacturing output, whereas credit allocation targeted at the manufacturing sector demonstrates a positive and significant contribution. In the short run, the error correction term (ECMt) is negative and statistically meaningful, confirming model stability. Moreover, inflation rate (INF) continues to have a dampening effect on Manufacturing Sector Output (MSO). Conversely, interest rates (INT) and sectoral allocation of credit to manufacturing sector (SCM) positively affect MSO in the short term. Based on these results, it is recommended that the Central Bank of Nigeria (CBN) implement firm monetary policies to curb inflation through strategic interest rate adjustments and enhanced control over money supply. Furthermore, the Ministry of Finance should adopt fiscal strategies aimed at price stabilization by lowering production costs—such as offering subsidies for energy and essential raw materials.

Keywords: Inflation rate, relationship, Products, credit

Introduction

Achieving modest inflation commonly known as price stability is a key economic objective shared by both advanced and emerging economies. It is widely recognized as the central goal of monetary policy in many countries around the world. This is grounded in the idea that economies experiencing high inflation are prone to endure its economic repercussions. For instance, inflation refers to a persistent rise in the overall prices of goods and services within an economy over a given period. According to Chegwe, Ayewumi, and Ehiedu (2025), inflation can influence the manufacturing sector by affecting the return on investment, although their study found that the effect was not statistically significant. Despite this, they emphasize the importance of maintaining stable inflation rates to promote an enabling environment for investment. The study recommends that inflation be managed through sound economic policies to ensure that manufacturing firms remain attractive to investors and competitive in the market. In an economy experiencing inflation, the level of prices increases, signifying a decline in the monetary purchasing capacity, while the real value of money as a means of exchange erodes. If this condition goes unaddressed, it could have negative impacts on the economy. This is why many macroeconomic strategies in various economies frequently focus on attaining price stability to enhance the monetary purchasing capacity (Kasidi, 2021). According to Olisah (2022), Price stability refers to a condition in which the overall price level within an economy remains relatively steady over time, without experiencing substantial increases or decreases as reflected in indicators such as the Consumer Price Index (CPI) or the Harmonized Index of Consumer Prices (HICP).

Inflation is commonly measured using three main indicators: The Consumer Price Index (CPI), the Wholesale Price Index (WPI), and the Gross National Product (GNP) implicit deflator. Among these, the CPI is widely employed by central banks—such as the Central Bank of Nigeria (CBN)—as a key tool for tracking changes in the general price level.



Inflation is driven by numerous elements such as fluctuations in demand, alterations in the costs of raw materials, government regulations, and variations in exchange rates. Demand-pull inflation is the type that arises from shifts in demand. It takes place when there is a spike in demand for a broad range of goods throughout an economy, resulting in price increases. Conversely, Cost-push inflation happens when prices go up due to rising production expenses, like raw materials and wages. The need for products remains steady while the availability of products decreases because of increased production expenses. Consequently, higher production costs are transferred to consumers through increased prices of finished goods. (Alfa, Alexander, & Ikubor, 2024).

While inflation can influence the economy broadly, its effects can be particularly pronounced in the manufacturing industry. The manufacturing industry is the sector that is involve in the transforming and enhancing raw materials into end products. By converting these raw materials into finished products, the manufacturing industry is enhancing value within the production chain. This enhanced value raises the cost of end products, turning production into a highly lucrative segment of the business process. Examples of sectors within Nigeria's manufacturing domain encompass companies that participated in manufacture of food products, production of drinks, production of tobacco items, production of fabrics, production of clothing and Production of leather and associated goods. These companies primarily focus on finished products.

The output of manufacturing sector is the items that are created from transformed production inputs at a given time. In other word, it is the number of products manufactured within a particular timeframe evaluated in weeks, months, or years. For instance, a production company creating a single product, its yield might be merely the count of units of that product generated in each time span, like a month or a year. The results of the manufacturing industry could also be abstract, like professional services.

Recent years, producers have encountered growing challenges in adapting to dynamic market demands, evolving consumer preferences, and rising operational expenses. The surge in inflation has intensified these pressures, driving up the cost of essential goods and services for both businesses and households. According to Wosu and Aturuchi (2024), the manufacturing sector in particular has struggled under the weight of escalating input costs, compounded by heavy reliance on imported materials. Many firms lack the agility and financial resilience to swiftly adjust to inflationary shocks, making it increasingly difficult to preserve profit margins and maintain output levels.

The manufacturing industry in Nigeria has historically exhibited a low degree of capacity utilization, leading to a limited impact on the Gross Domestic Product. (Ojo, 2020). This inadequate capacity utilization has also caused a decrease in manufacturing output and advancement, which has been linked to Nigeria's persistent reliance on the external sector for importing critical production inputs (Wosu & Aturuchi, 2024). The import of inputs was likewise influenced by the shortage of foreign currency, which had over time led to reduced productivity in the manufacturing industry.

A growing body of recent research continues to explore the complex relationship between inflation and economic growth, particularly within the Nigerian context. While earlier studies have broadly examined the macroeconomic implications of inflation, more recent analyses—such as those by Justine (2025) and the Manufacturers Association of Nigeria (2025)—highlight the nuanced effects of inflation on specific sectors. These studies reveal that although inflation may not always have a statistically significant long-term impact on overall economic output, it poses substantial challenges for sub-sectors like manufacturing. For instance, high inflation, coupled with interest rate volatility and exchange rate instability, has been shown to erode profit margins, increase production costs, and hinder industrial output growth. This shift in focus underscores the need for targeted inflation management strategies that address sector-specific vulnerabilities, particularly in manufacturing, where cost pressures and import dependence remain persistent obstacles to sustainable growth

While several studies—both within Nigeria and globally—have analyzed the nexus between inflation and manufacturing sector performance using variables such as the inflation rate, manufacturing output,

consumer price index, interest rate, productivity, and exchange rate, few—if any—have considered the role of sectoral credit allocation in this relationship. To the best of the author's knowledge, this research fills that gap by examining how credit distribution across sectors influences the impact of inflation on Nigeria's manufacturing output.

Literature Review

Conceptual Review

Inflation

Inflation refers to a sustained increase in the general price level of goods and services within an economy over time, leading to a decline in the purchasing power of money. This erosion of purchasing power affects consumer behavior, investment decisions, and overall macroeconomic stability. Traditionally, inflation has been attributed to monetary expansion—when the money supply grows faster than the economy's capacity to produce goods and services, resulting in more money chasing fewer goods.

Recent studies have expanded the understanding of inflation beyond traditional monetary explanations, incorporating structural and external factors. Oladejo et al. (2025) emphasize that inflation remains a critical macroeconomic variable requiring close monitoring to ensure financial stability and growth. Their study on Nigeria highlights the limited effectiveness of monetary policy in curbing food inflation due to external shocks such as climate variability and supply chain disruptions. They advocate for a comprehensive approach that integrates monetary policy with agricultural reforms and regulatory oversight.

Jácome et al. (2025) explore the legacy of high inflation in shaping central bank behavior under inflation targeting regimes. They argue that countries with a history of high inflation tend to adopt more aggressive monetary policies to anchor expectations, even as central bank credibility improves. This path-dependence underscores the long-term impact of inflationary experiences on policy frameworks. Abdullahi (2023) investigates the impact of inflation on Nigeria's economic growth using time series data from 1990 to 2022. His findings reveal a negative long-run relationship between inflation and growth, with causality running from economic performance to inflation. The study attributes recent inflationary pressures to fuel subsidy removal, exchange rate devaluation, and insecurity in food-producing regions.

In summary, inflation is driven by both demand-side and supply-side factors, including monetary expansion, fiscal shocks, and structural inefficiencies. Persistent inflation undermines economic growth, distorts investment decisions, and affects consumer welfare. Effective inflation control requires coordinated monetary, fiscal, and sectoral policies.

Manufacturing Sector

The manufacturing sector plays a pivotal role in economic development by transforming raw materials into finished goods through physical and chemical processes. Traditionally defined as the modification of materials to add value (UN DESA, 2011), manufacturing has evolved significantly in recent years due to technological advancements, policy reforms, and global market shifts.

Recent literature highlights a dynamic transformation in Nigeria's manufacturing landscape. Famuyiwa (2025) identifies six key trends reshaping the sector: digital transformation, automation, supportive government policies, local sourcing, sustainability, and strategic partnerships. Manufacturers are increasingly adopting data analytics, real-time monitoring, and robotics to enhance efficiency and reduce waste. These innovations not only improve product quality but also enable faster responses to market demands.

Government initiatives such as tax breaks, subsidized loans, and industrial parks have created a more conducive environment for local production. Emphasis on local sourcing has grown in response to



global supply chain disruptions, encouraging firms to rely on indigenous raw materials and suppliers. Sustainability is also gaining traction, with manufacturers implementing energy-efficient processes and waste reduction strategies to lower long-term costs and environmental impact.

According to Lagos Free Zone (2025), Nigeria's automotive industry has seen renewed growth through the National Automotive Industry Development Plan (NAIDP). Companies like Innoson, Nord Automobiles, and Phoenix Renewables have established assembly plants, contributing to job creation and technological advancement. Despite challenges such as currency devaluation and the exit of multinational firms like Unilever and Procter & Gamble, opportunities remain for new entrants to fill market gaps in consumer goods manufacturing.

UNIDO (2025) reports that globally, manufacturing is rebounding post-pandemic, with high-tech sectors leading the charge. Digital twins, hybrid workplaces, and regulatory shifts—especially in carbon tracking—are redefining production strategies. These trends are mirrored in Nigeria, where strategic partnerships with international firms are facilitating technology transfer and market expansion.

Definition and Measurement of Variables

Manufacturing Sector Output (MSO): is the aggregate worth of products generated by the manufacturing industry. Usually expressed in billions of US dollars, it is quantified in monetary terms. **The inflation rate (INF):** is the phenomenon characterized by the increase in the average price level of goods and services, which subsequently diminishes purchasing power. This is quantified by the percentage change in the Consumer Price Index (CPI) over a specified period.

Sectoral Allocation of Credit to Manufacturing Sector (SCM): This is the total amount of credit that financial institutions have given to the manufacturing sector. Money is used to measure it, typically in billions of US dollars.

Real Interest Rate (RINR): This is the actual cost of borrowing after being adjusted for inflation. A percentage is used to measure it.

Theoretical Review

Classical theory of Inflation

The classical theory of inflation, attributed to early economists such as Adam Smith (1776), David Ricardo (1956), and John Stuart Mill (1808), posits that persistent inflation arises from an excessive supply of money relative to the demand for goods and services. This theory, often referred to as the "quantity theory of money," emphasizes the direct relationship between money supply and the general price level. It suggests that when the money supply grows faster than the economy's productive capacity, inflation is the inevitable consequence.

Bergevin and Laidler (2010) expanded on this framework by proposing a dual-track approach to monetary policy. Their model, inspired by the European Central Bank's "two-pillar" strategy, combines conventional macroeconomic indicators—such as output, unemployment, and wage trends—with independent assessments of monetary conditions. They advocate for establishing a "reference value" for money growth, which serves as a benchmark for evaluating inflationary pressures. Deviations from this reference value, while not necessarily prompting immediate policy shifts, should be acknowledged and analyzed to maintain policy coherence.

Recent literature continues to affirm the relevance of classical inflation theory while integrating modern analytical tools. Jackson (2024) revisits the classical framework in his study on the economic theory of inflation, incorporating mathematical models such as the Fisher Equation and Adaptive Expectations Model to quantify inflation dynamics. He emphasizes that while demand-pull and cost-push factors remain influential, the foundational premise of money supply driving inflation still holds explanatory power in contemporary economies.



Furthermore, Jácome et al. (2025) explore how historical inflation experiences shape central bank behavior under inflation targeting regimes. Their findings suggest that countries with a legacy of high inflation tend to adopt more aggressive monetary policies, consistent with classical theory's emphasis on controlling money supply to stabilize prices. They argue that past inflationary episodes cast a long shadow on policy formulation, reinforcing the need for vigilant monetary management

Empirical Review

Recent analyses reveal that Nigeria's manufacturing sector continues to grapple with inflation-induced challenges. According to the Manufacturers Association of Nigeria (MAN), nominal manufacturing output surged by 34.9% to ₦33.43 trillion in the second half of 2024. However, this increase was largely attributed to inflationary pressures rather than real growth, as real output rose by only 1.7% year-on-year. The sector's capacity utilization improved marginally to 57.0%, but persistent inflation, high energy costs, and weak consumer demand continued to constrain performance.

Ugwoke (2025) conducted a time series analysis using the Autoregressive Distributed Lag (ARDL) bounds testing approach to examine the impact of inflation on manufacturing output in Nigeria. The study found that inflation had a negative effect on manufacturing sector output, although the relationship was statistically insignificant. The author recommended policy interventions to promote local raw material sourcing and improve access to credit for manufacturers.

Chegwe, Ayewumi, and Ehiedu (2025) investigated the impact of inflation on investment returns in Nigeria's manufacturing sector using regression analysis on data from 2013 to 2024. Their findings revealed that inflation did not have a statistically significant effect on investment returns. However, they emphasized the need for stable inflation rates to maintain investor confidence and recommended further research into other macroeconomic variables that may influence manufacturing investment outcomes.

A 2025 report by Vanguard highlighted that the cost of sales for top manufacturing firms rose by 90.6% in 2024, driven by inflation, foreign exchange volatility, and rising input costs. Despite efforts at backward integration, many firms remained heavily reliant on imported raw materials, further exposing them to inflationary shocks.

The Nigerian Manufacturing Sector Outlook (2025) by Global Financial Digest projected a potential 10% growth in the sector, contingent on foreign exchange stability and easing inflation. Industry leaders noted that improved infrastructure, revised power pricing, and supportive government policies could mitigate inflationary pressures and enhance sector performance. Sub-sectors such as food processing and textiles demonstrated resilience amid macroeconomic headwinds.

Methodology

Theoretical Framework

This study is underpinned by the Classical Theory of Inflation, which originates from the Quantity Theory of Money (QTM) as developed by prominent classical economists such as Adam Smith (1776), David Ricardo (1956), and John Stuart Mill (1808). The theory contends that inflation is intrinsically a monetary phenomenon, emerging when the growth in the money supply outpaces the expansion of real output in the economy.

According to the Quantity Theory of Money, expressed in the equation:

$$MV = PQ$$

Where:

M = Money Supply

V = Velocity of Money

P = Price Level

Q = Output

An increase in the money supply (M), assuming velocity (V) and output (Q) are constant, leads to a

proportional increase in the general price level (P), which is inflation. Classical theorists argue that managing the money supply is key to controlling inflation, which in turn affects macroeconomic stability and sectoral performance such as that of manufacturing.

Incorporating this theoretical foundation, Bergevin and Laidler (2010) extended the classical view by introducing the Two-Pillar Policy Framework. They suggest that inflation monitoring should combine traditional macroeconomic indicators (like output gaps and wage trends) with direct analysis of monetary aggregates to detect early inflationary pressures. This framework justifies the use of monetary and fiscal policies to achieve price stability, which is critical for enhancing manufacturing output. Given the study's focus on inflation, interest rates, and sectoral credit allocation as determinants of manufacturing output, the Classical Theory provides an apt lens. The theoretical underpinning also justifies the adoption of the ARDL framework, as it enables the assessment of both short-term dynamics and long-run equilibria among macroeconomic variables—aligning with the Classical Theory of Inflation's recognition of lagged and differential impacts of monetary expansion across sectors.

Model Specification

This study adapted the model of the Autoregressive Distributed Lag Model (ADL) to investigate the Impact of Inflation on Manufacturing Sector Output in Nigeria (1986-2024).

The Autoregressive Distributed Lag (ARDL) model has become a central tool in dynamic single-equation time series analysis. A particularly compelling reparameterization of this model is the Error Correction (EC) representation, which has gained widespread application in empirical research. This is largely due to the recognition that, for nonstationary variables, the existence of cointegration implies an underlying error-correction process. By differencing the series and constructing linear combinations, nonstationary data can be effectively re-expressed as an EC model with only stationary components (Hassler & Wolters, 2005).

However, the ARDL model that will be used in this study was adapted from the work of Ugwoke (2022). In Ugwoke (2022) study, the functional model of the relationship among the variables was given:

$$\text{MANOP} = F(\text{INF}, \text{EXR}, \text{INT}, \text{SA}) \text{ -----(1)}$$

Where:

MANOP = Manufacturing output

INF = Inflation rate

EXR = Exchange rate

INT = Interest rate

SA = Sectoral allocation of bank credit to manufacturing sector.

In this study however, SA was replaced with sectoral allocation of credit to manufacturing sector (SCM) while exchange rate was excluded. Hence, the ARDL model for this study is given as:

$$MSO_t = \beta_0 + \sum_{i=0}^n \beta_1 MSO_{t-i} + \sum_{i=0}^n \beta_2 INF_{t-i} + \sum_{i=0}^n \beta_3 SCM_{t-i} + \sum_{i=0}^n \beta_4 RINT_{t-i} + \mu_{it} \quad (8)$$

Where;

MSO = Manufacturing sector output

INF = Inflation rate

INT = Interest rate

SCM= sectoral allocation of credit to manufacturing sector.

β_0 = intercept

$\beta_1 - \beta_4$ = partial slopes

$t-i$ = vector of time lag

variables integrated at different orders.

3.3 Types and Sources of Data

Data for the study were obtained from the online database of World Bank Development Indicators (WDI) (2023). The variables on which data were collected are manufacturing sector output (MSO), inflation rate (INF), sectoral allocation of credit to manufacturing sector (SCM) and real interest rate

(RINR). This was be done in order not to deviate from the specific objectives set for this study. MSO was be used as dependent variable while inflation rate (INF), sectoral allocation of credit to manufacturing sector (SCM) and real interest rate (RINR) were the independent variables.

Data Analysis and Discussion of Results

Summary of Statistic

Table 1: Result of Summary Statistic

Variables	MSO	INF	INT	SCM
Mean	2.545727	105.1584	18.25069	2.241154
Median	2.574307	56.73525	17.56917	2.161331
Maximum	3.045457	524.9054	31.65000	2.976835
Minimum	1.879895	0.868947	9.959167	1.600906
Std. Dev.	0.362236	127.3023	4.132433	0.346869
Skewness	0.131778	1.640395	0.817162	0.070775
Kurtosis	1.619880	5.168824	4.629717	2.324560
Jarque-Bera	3.125804	24.49002	8.434404	0.754072
Probability	0.209527	0.000005	0.014740	0.685891

Source: Researcher's Computation

Table 1 presents the summary statistics for the study's variables. The results indicate that the mean values of all variables are positive and generally small, with values below 2, except for inflation (INF) and interest rate (INT). The relatively low standard deviations suggest limited dispersion around the mean, implying that the estimated values closely approximate their true population parameters. Additionally, all variables exhibit positive skewness, indicating a rightward distribution and ruling out the presence of leptokurtosis. The Jarque-Bera test results further show that, at the 5% significance level, all variables—with the exception of INF and INT—follow a normal distribution.

Unit Root Test of Stationarity

Table 2: Result of Unit Root Test of Stationarity

Variables	ADF at Level	ADF at 1 st Difference	Order of integration
MSO	0.249411	-5.415497	I(1)
INF	-0.563599	5.650131	I(1)
INT	-4.515684	-6.832950	I(0)
SCM	-3.441441	-5.745571	I(1)

ADF critical value at 5% = -3.548490

Source: Researcher's Computation

Table 2 presents the results of the unit root test for stationarity, conducted using the Augmented Dickey-Fuller (ADF) approach. The findings reveal that MSO, INF, and SCM are non-stationary at level—as their calculated ADF statistics fall below the 5% critical values—but achieve stationarity upon first differencing, indicating they are integrated of order one, I(1). In contrast, INT is stationary at level, suggesting it is integrated of order zero, I(0). This mixture of integration orders satisfies the preconditions for applying the ARDL modeling framework, as recommended by Pesaran et al. (2001), which is suitable for datasets comprising both I(0) and I(1) series.

Lag Selection for Bound Co-integration Test

Table 3: Result of Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-304.2849	NA	525.7545	17.61628	17.79403	17.67764
1	-131.2343	296.6582	0.067093*	8.641959*	9.530730*	8.948763*
2	-104.7254	39.38471*	0.038280	8.041449	9.641235	8.593695
3	-86.22608	23.25623	0.036748	7.898633	10.20944	8.696322

Source: Researcher's Computation

Prior to conducting the bounds co-integration test, it is essential to determine the optimal lag length. Based on the five standard information criteria reported in Table 1, all indicators consistently recommend a lag length of one as the most suitable. Accordingly, this study adopts a one-period lag structure for both the co-integration analysis and the subsequent diagnostic evaluations.

Bound Co-integration Test

Table 4: Result of Bound Co-integration Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Significant.	I0 Bound	I1 Bound
F-statistic	4.481656	10%	2.72	3.77
K		5%	3.23	4.35
		2.5%	3.69	4.29
		1%	4.29	5.61

Source: Researcher's Computation

Co-integration provides a mechanism for reconciling short-run fluctuations with long-run equilibrium relationships among the study's variables. Given that the individual series were found to be non-stationary, their linear combination is expected to yield a stationary outcome in the long run. The F-bound co-integration test produced an F-statistic of 4.48, which exceeds the 5% critical value threshold. Consequently, the null hypothesis of no long-run relationship is rejected in favor of the alternative hypothesis, indicating the existence of a statistically significant long-run equilibrium relationship among the variables.

Long-Run ARDL Model

Table 5: Result of Long-Run ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	-0.170203	0.072938	-0.235856	0.0155
INT	-0.699627	2.721119	-0.257110	0.0093
LSCM	6.265660	19.020443	0.329417	0.0447
C	31.698835	102.087277	0.310507	0.7589

Source: Researcher's Computation

Table 5 presents the long-run estimates from the ARDL model. The findings indicate that inflation (INF) exerts a statistically significant negative influence on manufacturing sector output (MSO) in Nigeria. Specifically, a 1% increase in the inflation rate leads to a 0.17% decrease in manufacturing output. This result suggests that inflation raises the cost of essential inputs—such as raw materials and labor—which compresses profit margins and discourages production. This outcome extends the earlier findings of Ugwoke (2022), Bank-Ola et al. (2020), and Adegbelemi (2018). Similarly, interest rate (INT) also shows a negative and significant relationship with manufacturing output, whereby a 1% rise in interest rates reduces MSO by approximately 0.69%. Higher interest rates increase borrowing costs, thereby discouraging firms from securing loans for production or expansion activities—ultimately constraining sectoral output. This is consistent with the results of Adegbelemi (2018) and Modebe et al. (2016). On the other hand, sectoral credit to manufacturing (SCM) demonstrates a positive and statistically significant impact, where a 1% increase in SCM enhances MSO by 6.26%. This finding underscores the importance of targeted credit allocation in stimulating industrial performance and advancing productive capacity within the manufacturing sector.

Short-Run ARDL Model

Table 6: Result of Short-Run ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF)	-0.000505	0.000209	-2.409053	0.0240
D(INT)	0.000252	0.005776	0.043610	0.9656
D(LSCM)	0.101029	0.114531	0.882113	0.0365
CointEq(-1)	-0.029337	0.116523	-0.251773	0.0304
R-squared	0.967164		F-statistic	78.54623
			Durbin-Watson stat	2.155076

Source: Researcher's Computation

Table 6 presents the short-run estimates from the ARDL model. The results show that the error correction term (ECMt) is negative and statistically significant at the 5% level, confirming the presence of a stable long-run relationship among the variables. The coefficient of -0.29 suggests that approximately 29% of the previous year's disequilibrium is corrected within the current year, indicating a moderate pace of adjustment toward long-run equilibrium. Additionally, the results indicate that a 1% increase in inflation (INF) reduces manufacturing sector output (MSO) by 0.50%, reaffirming the contractionary effect of inflation in the short run. Interest rate (INT), though positively signed, has an insignificant impact on MSO, implying that its influence on output is not strong in the short term. In contrast, sectoral credit to manufacturing (SCM) exerts a positive and statistically significant influence, with a 1% increase in SCM enhancing MSO by 10%. The R-squared value of 0.96 indicates that 96% of the variation in MSO is explained by the model's independent variables, while the remaining 4% is attributed to other external factors. The high F-statistic confirms the joint significance of the model's parameters, and the Durbin-Watson statistic exceeding 2 suggests evidence of negative autocorrelation in the residuals.

Post-estimation Test

Table 7: Diagnostic Test

Breusch-Godfrey Serial Correlation LM Test

F-statistic	4.387771	Prob. F(2,22)	0.0649
Obs*R-squared	9.694985	Prob. Chi-Square(2)	0.0878

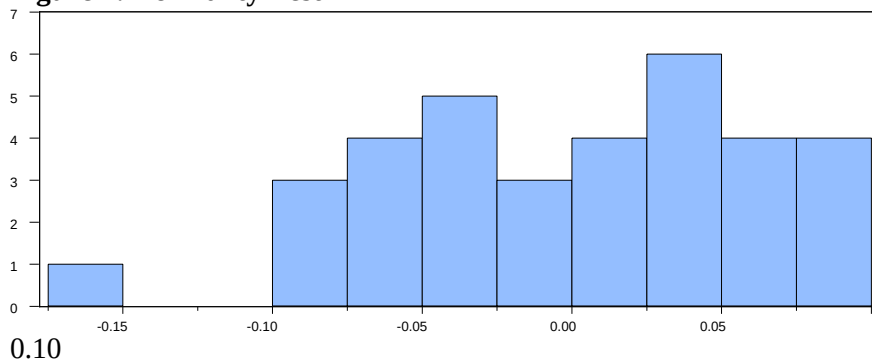
Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.212079	Prob. F(9,24)	0.3331
Obs*R-squared	10.62474	Prob. Chi-Square(9)	0.3023
Scaled explained SS	4.293292	Prob. Chi-Square(9)	0.8911

Source: Researcher's Computation

Table 7 presents the post-estimation diagnostic statistics for the model. The results of the Breusch-Godfrey LM test for serial correlation report probability values of 0.0649 and 0.0878—both exceeding the 5% significance threshold. This indicates that the null hypothesis of no autocorrelation cannot be rejected, suggesting the residuals are free from serial dependence. Similarly, the probability values from the heteroskedasticity tests are also above 0.05, implying that the null hypothesis of homoskedasticity is upheld, and there is no evidence of heteroskedasticity within the model's residuals.

Figure 1: Normality Test

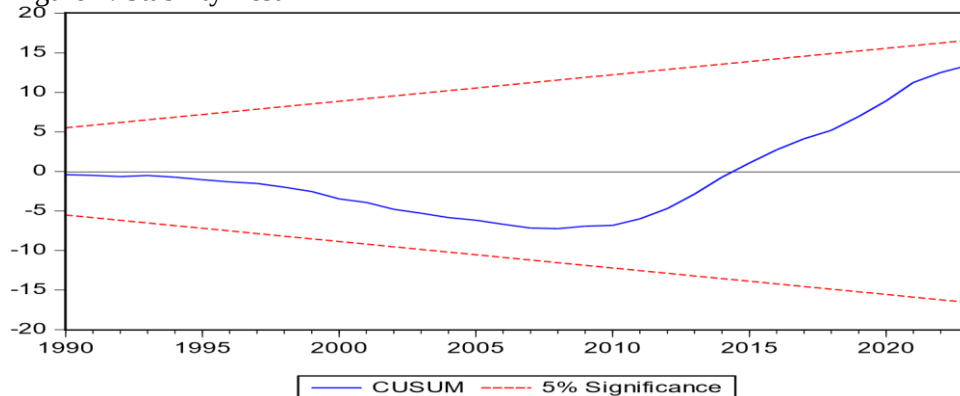


Source: Researcher's Computation

Series: Residuals

Sample	1990	2023
Observations	34	
Mean	5.65e-16	
Median	0.008086	
Maximum	0.098785	
Minimum	-0.160216	
Std. Dev.	0.062956	
Skewness	-0.317955	
Kurtosis	2.621950	
Jarque-Bera	0.775348	
Probability	0.678634	

Figure 2: Stability Test



Source: Researcher's Computation

Table 7 presents the post-estimation diagnostic results for the model. The Breusch-Godfrey LM test for serial correlation reports a probability value of 0.1014, which exceeds the 5% significance level. This implies that the null hypothesis of no autocorrelation cannot be rejected, indicating the absence of serial correlation in the residuals. Similarly, the probability value for the heteroskedasticity test is 0.1370, confirming that the null hypothesis of homoskedasticity holds, and hence, the model's residuals do not suffer from heteroskedasticity. > > Furthermore, the Jarque-Bera test statistic, with a probability of 0.67 as shown in Figure 1, suggests that the residuals are normally distributed. The model also passes the stability test, as evidenced by the CUSUM plot in Figure 2, which remains within the 5% critical bounds. Therefore, it can be concluded that the estimated parameters are stable over the study period, and the model satisfies key diagnostic requirements.

Conclusion and Policy Recommendations

The findings of this study highlight the significant challenges and opportunities within Nigeria's manufacturing sector. Inflation and high-interest rates negatively impact output by increasing production costs, reducing investment, and limiting access to affordable credit. Conversely, sectoral allocation of credit positively influences manufacturing output by providing the necessary financial resources for expansion, technological advancement, and operational efficiency. These results underscore the need for targeted economic policies to address the financial constraints that hinder the growth of the manufacturing sector.

Based on the findings that inflation and interest rates negatively impact manufacturing sector output, while sectoral allocation of credit has a positive effect, it is essential for policymakers particularly the Central Bank of Nigeria (CBN), the Ministry of Industry, Trade, and Investment, and other financial regulatory bodies to implement targeted measures.

First, the CBN should adopt strict monetary policies aimed at controlling inflation through effective interest rate adjustments and improved monetary supply management. Additionally, fiscal policies from the Ministry of Finance should focus on stabilizing prices by reducing production costs, such as providing subsidies for energy and raw materials.

Secondly, to address the negative impact of high interest rates, the CBN and financial institutions should introduce sector-specific lending rates for manufacturers. This could involve creating specialized funding windows or low-interest loan schemes managed by institutions like the Bank of Industry (BOI). Moreover, encouraging financial sector reforms to expand access to non-bank financing options such as bonds, equity financing, or development finance institutions will reduce manufacturers' dependency on high-interest bank loans.

Lastly, to leverage the positive impact of sectoral credit allocation, the government should increase credit quotas specifically targeted at the manufacturing sector. This can be achieved by introducing credit guarantee schemes to mitigate the risk for lenders, thereby encouraging banks to allocate more funds to manufacturing firms. Regular monitoring and evaluation frameworks should also be established to ensure that allocated credits are utilized efficiently for capacity-building, infrastructure investment, and technology upgrades. This multi-faceted approach would stimulate industrial growth, create jobs, and promote overall economic stability in Nigeria.



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