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Impact of Foreign Trade on Manufacturing Sector Growth in Nigeria

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ABSTRACT
This study investigated the impact of foreign trade on manufacturing sector growth in Nigeria, with particular emphasis on three key trade indicators: export intensity, import penetration, and tariff rates. The main objective was to determine how these dimensions of trade openness and policy have influenced the performance of the manufacturing sector between 1986 and 2024. The study employed the Autoregressive Distributed Lag model to assess both the short-run and long-run relationships among the variables, following a unit root and cointegration analysis to confirm the stability and suitability of the data for such estimation. The findings revealed that export intensity had a positive and statistically significant impact on manufacturing growth, suggesting that increasing the country's participation in international markets can support industrial expansion. Import penetration, however, showed a negative and significant impact, highlighting the adverse effect of excessive reliance on foreign goods on domestic production capacity. In contrast, tariff rates were found to exert a positive and significant influence, indicating that moderate and targeted tariff protection could create a more competitive environment for local manufacturers. The error correction mechanism confirmed that deviations from long-run equilibrium are corrected over time, while the model's goodness-of-fit statistics showed a strong explanatory power and no evidence of autocorrelation. Based on these findings, the study recommended that the Federal Ministry of Industry, Trade and Investment, in partnership with the Nigerian Customs Service and the Central Bank of Nigeria, should adopt policies that reduce unnecessary imports of consumer goods. The Nigerian Export Promotion Council, together with export financing institutions such as the Bank of Industry and the Nigerian Export-Import Bank, should provide tailored support to enhance the capacity and competitiveness of non-oil manufacturing exporters. Additionally, the Tariff Technical Committee and the Federal Ministry of Finance should periodically review tariff structures to protect emerging industries while allowing access to critical inputs.

Keywords: *Foreign trade, Manufacturing sector growth, Export intensity, Import penetration, Tariff rates*
JEL Codes: *F14, L60, O24, F13, C32*

I. Introduction

Foreign trade has long been regarded as a key engine of economic transformation, industrial expansion, and technological advancement, particularly in developing economies. Globally, foreign trade serves as a channel for countries to leverage comparative advantage, access wider markets, enhance technological transfers, and integrate into global value chains (World Bank, 2024). In the post-World War II era, global trade liberalization, facilitated by institutions such as the World Trade Organization (WTO), catalysed growth in both developed and developing economies. Over time, countries that successfully embedded foreign trade into their development strategies, such as the Asian Tigers and later China, witnessed substantial manufacturing sector growth and structural transformation (Okeke, 2024). These experiences have highlighted the transformative potential of foreign trade for industrial development.

In Sub-Saharan Africa, however, the impact of foreign trade on manufacturing growth has been more diverse and uneven. While trade openness has increased significantly across the region, with countries reducing tariff barriers and engaging more actively in global trade, the manufacturing sector has often lagged in its response (AfDB, 2024). The region's exports remain heavily concentrated in primary commodities, with limited value addition, and imports are skewed towards manufactured goods and technology-intensive products. This imbalance contributes to trade deficits and exposes domestic

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industries to competitive pressures without adequate support mechanisms. According to the African Development Bank (2024), Sub-Saharan Africa's manufacturing value added as a share of GDP has stagnated around 10%, compared to over 25% in East Asia.

Nigeria, Africa's largest economy and most populous nation, presents a compelling case for analysing the relationship between foreign trade and manufacturing sector growth. Nigeria has undergone significant trade reforms since the mid-1980s, especially following the Structural Adjustment Programme (SAP) of 1986, which sought to liberalize the economy and reduce reliance on oil exports. Foreign trade in Nigeria has since evolved, with varying implications for the manufacturing sector. The country's export intensity, measured as the ratio of exports to GDP , peaked at 37.89% in 1997, reflecting a strong outward orientation, but declined steadily in the 2000s and 2010s, reaching a low of 8.83% in 2020 before rebounding slightly to 16.5% in 2024 (World Bank, 2024; CBN, 2023). Similarly, import penetration, the ratio of imports to GDP, increased from 8.52% in 1986 to a high of 22.93% in 2005, then gradually declined, reaching 11% in 2024 (MacroTrends, 2024). This trend suggests a more restrained openness in recent years, possibly linked to foreign exchange constraints and protectionist policies.

Tariff rates in Nigeria have also seen a dramatic shift over the past four decades. From a high of 91.27% in 1995, tariffs were significantly reduced to single-digit levels by 2005 and have remained relatively low since then, with an applied weighted average tariff rate of 9.5% in 2024 (World Bank, 2024; WTO, 2024). This reduction aligns with broader global trends towards trade liberalization but raises concerns about the vulnerability of local manufacturing to foreign competition, particularly in an environment characterized by infrastructural deficits and high production costs.

Globally, the manufacturing sector has been a cornerstone of industrial development and economic modernization. Economies that have achieved sustained growth have typically done so through robust manufacturing sectors that absorb labour, increase productivity, and catalyze technological innovation. Countries like Germany, South Korea, and China have demonstrated that strategic integration into global trade can facilitate rapid industrial growth (IMF, 2025). In contrast, the manufacturing sectors in many developing countries, including Nigeria, have struggled to compete in global markets, often due to structural weaknesses such as unreliable electricity supply, poor infrastructure, limited access to credit, and inconsistent policy environments (Unegbu & Ugwunna, 2024).

Nigeria's manufacturing sector has experienced series of declining significance within the national economy, representing a clear case of premature deindustrialization despite the country's large domestic market, abundant natural resources, and historical industrial base established during the oil boom years of the 1970s. The manufacturing sector's contribution to Nigeria's GDP has exhibited a persistent downward trend over the past four decades, declining from 21.22% in 1986 to a low of 6.55% in 2010, with a modest recovery to 12.60% by 2024, as evidenced in the available statistics from Central Bank of Nigeria (2023) and the National Bureau of Statistics Nigeria (2024). This declining path reflects multiple interconnected challenges that have undermined manufacturing competitiveness and constrained sectoral growth, despite efforts to stimulate domestic production through initiatives like the National Industrial Revolution Plan and local content policies.

Given that foreign trade plays a pivotal role in shaping industrial performance through market expansion, resource allocation, and competitive pressures, it becomes essential to examine how key dimensions of trade openness, represented by Export Intensity, Import Penetration, and Tariff Rates, have influenced the growth of the manufacturing sector in Nigeria over the period 1986 to 2024.

II. Literature Review

Conceptual Review

Foreign Trade

Foreign trade has been widely conceptualized in the literature as the exchange of goods and services across national borders, serving as a vital mechanism for economic integration, specialization, and industrial development. According to the World Bank (2024), foreign trade enabled countries to access new markets, acquire technologies, and enhance competitiveness by leveraging comparative advantage. Researchers such as Onuoha and Aluko (2023) viewed foreign trade as a catalyst for structural transformation, particularly in developing economies where domestic markets are often limited in scale. In this context, foreign trade has often been examined through various dimensions that capture both its openness and protective tendencies.

Export intensity, one of the key proxies of foreign trade, has been defined by Adebayo and Yusuf (2022) as the ratio of a country's total exports to its gross domestic product (GDP), indicating the

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degree to which an economy relies on external markets for its output. Higher export intensity typically reflected increased competitiveness and productive capacity, often linked to growth in sectors such as manufacturing. Import penetration, on the other hand, measured the ratio of imports to GDP and has been interpreted by Okonkwo and Bello (2023) as a representation of foreign goods' dominance in domestic consumption. While moderate import penetration could support local production through access to critical inputs, excessive dependence might threaten domestic industries and widen trade deficits. Tariff rates, the third component, have been defined by the World Trade Organization (2024) as taxes imposed on imported goods, serving as instruments of trade policy that regulate market access and protect infant industries. Scholars like Eze and Ibrahim (2023) considered tariffs a double-edged sword, capable of fostering domestic production but also potentially increasing costs for local manufacturers if applied to intermediate goods.

For this paper, foreign trade shall be conceptually defined as the interaction of an economy with global markets, measured through export intensity, import penetration, and tariff rates, to assess its influence on manufacturing sector growth in Nigeria.

Manufacturing sector growth

Manufacturing sector growth has been conceptually discussed as a critical indicator of industrialization, economic diversification, and structural transformation, particularly in developing economies. It typically captures the increase in output, productivity, and contribution of manufacturing activities to a country's gross domestic product (GDP). According to the African Development Bank (2024), manufacturing sector growth reflected the extent to which value-added production processes contribute to economic development, job creation, and technological advancement. Scholars such as Adedeji and Olanrewaju (2022) described it as the sustained expansion in the scale, scope, and efficiency of manufacturing activities, often driven by factors such as infrastructure investment, innovation, and access to capital and markets.

In empirical literature, manufacturing sector growth has often been assessed using the percentage contribution of the manufacturing sector to GDP over time. This measure allows for the evaluation of the sector's relative importance in the overall economy. Okonkwo and Musa (2023) emphasized that steady growth in this measure indicated progress toward industrial development, while stagnation or decline often signalled structural imbalances and overreliance on primary commodities. Moreover, Nwachukwu and Ahmed (2022) argued that manufacturing growth in Africa, including Nigeria, remained constrained by poor infrastructure, weak institutional capacity, and inconsistent policy implementation, despite its recognized role in economic transformation. International organizations such as the World Bank (2024) also associated robust manufacturing growth with increased competitiveness, export diversification, and reduced vulnerability to external shocks.

For the purpose of this study, manufacturing sector growth shall be defined as the progressive increase in the manufacturing sector's contribution to Nigeria's GDP, reflecting the sector's performance, productivity, and structural significance within the national economy.

Theoretical Underpinning

The theoretical underpinning for this study is the Heckscher-Ohlin Theory of international trade, which originates from the neoclassical school of economic thought. The Heckscher-Ohlin (H-O) theory posited that countries engage in trade based on their relative factor endowments, exporting goods that intensively use their abundant resources while importing goods that require resources in which they are relatively scarce. According to this theory, international trade leads to a more efficient global allocation of resources, promotes specialization, and enhances productivity and sectoral development. Scholars such as Bowen, Hollander, and Viaene (2023) argued that trade liberalization, guided by the H-O framework, allows developing countries like Nigeria to leverage their comparative advantage, particularly in labour-intensive manufacturing, by integrating more actively into global value chains.

The relevance of this theory to the present study lies in its explanation of how foreign trade mechanisms, such as export intensity, import penetration, and tariff structures, influence the growth path of the manufacturing sector. As per the H-O framework, when a country liberalizes its trade regime, it potentially expands output in sectors that align with its factor strengths. In Nigeria's context, this could translate into increased manufacturing output driven by the availability of labour and growing demand in both domestic and international markets. However, critiques of the theory, particularly from contemporary trade theorists, highlighted its limited consideration of real-world complexities such as market imperfections, institutional weaknesses, and infrastructural gaps (World Bank, 2024). These limitations have prompted further theoretical refinements, including

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the new trade theories, which incorporate scale economies, technology, and imperfect competition. Nevertheless, the Heckscher-Ohlin Theory provides a foundational channel through which the relationship between foreign trade variables and manufacturing sector performance can be examined, offering insights into how trade openness might stimulate or constrain industrial growth in an emerging economy like Nigeria.

Empirical Review

Understanding the empirical relationship between foreign trade and manufacturing sector growth has attracted considerable scholarly attention, especially as nations strive to harness trade for industrial development. Researchers have examined this relationship using various proxies such as export intensity, import penetration, and tariff rates to determine how trade dynamics shape industrial performance. The following studies offer insights into this evolving body of literature.

Olubiyi (2025) examined the influence of external conditions on Nigeria's industrial output between 1985 and 2022, with emphasis on the manufacturing sector. The study employed an ARDL framework, incorporating real exchange rate, external reserves, and trade openness as proxies for external shocks. Findings indicated that trade openness and exchange rate dynamics affected industrial output with varying signs depending on the time horizon, while reserves acted as stabilizing buffers. The study offered important insight into the trade-growth nexus but was constrained by limited structural adjustments, unaccounted regime shifts, and quality inconsistencies in legacy data. The analysis could have benefited from using disaggregated manufacturing sub-sector data and alternative identification techniques like SVAR, which would provide stronger policy relevance and help isolate causal effects related to foreign trade mechanisms such as tariff changes or import reliance.

Okeke (2024) analysed the dynamics between foreign trade and manufacturing sector performance in Nigeria using annual time series data from 1999 to 2022. Anchored in the foreign trade domain, the study employed an ex-post facto design and applied the Ordinary Least Squares (OLS) method to evaluate the effects of export trade, import trade, and balance of payments on real manufacturing GDP. The findings indicated that exports had a positive and statistically significant effect on manufacturing output, while imports and the balance of payments had significant negative effects, an outcome attributed to Nigeria's import-dependent production structure. While the study offered clarity on variable-specific impacts, its methodology raised concerns due to potential endogeneity, ignored structural breaks, and autocorrelation in the residuals. The exclusive reliance on OLS with macro time series data constrained the robustness of causal inference. Employing more dynamic models like VECM or bounds testing would have improved the analysis, and disaggregating exports based on product categories would have enhanced precision in interpreting export intensity.

Unegbu and Ugwunna (2024) explored the relationship between imports and manufacturing performance in Nigeria, covering the period from 1970 to 2019. Situated within the manufacturing domain, the authors innovatively disaggregated imports into capital goods, intermediate goods, and manufactured consumer goods, analysing their impacts on manufacturing value added, capacity utilization, and employment. Using ARDL and bounds cointegration methods, the results showed that capital goods imports promoted manufacturing performance, intermediate goods had mixed outcomes, while consumer imports were consistently detrimental. This diverse approach advanced the understanding of import penetration by highlighting the varied implications of import types. However, inconsistencies in measuring performance across models introduced comparability issues. Moreover, the study did not fully account for potential multicollinearity among import categories and lacked broader trade openness indicators such as tariff protection levels or non-tariff barriers that could contextualize the effects more holistically.

Bakla et al. (2024) assessed the impact of exchange rate volatility on Nigeria's manufacturing exports from 1981 to 2021, integrating the foreign trade and manufacturing domains. The study utilized the EGARCH model to generate volatility indices and estimated long- and short-run effects using ARDL. Key findings showed that in the long run, exchange rate volatility and government financing positively influenced manufacturing exports, while interest rates reduced them. Short-run dynamics revealed adverse responses to both volatility and financing. The model was comprehensive in diagnostics, incorporating Bayer-Hanck cointegration and an error correction mechanism. However, the study's focus on exports alone excluded broader manufacturing performance indicators like value added or employment, thereby limiting insight into internal manufacturing dynamics. The narrow treatment of trade policy variables also omitted important dimensions such as trade facilitation, tariff structures, and logistics, which are vital to

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understanding export intensity within a developing economy context.

Busse et al. (2024) explored the effects of trade liberalization on manufacturing employment across 131 developing countries between 1991 and 2020. Utilizing fixed effects and instrumental variable regressions, the study found that trade liberalization, measured through tariff changes and openness indicators, generally reduced manufacturing employment, with stronger negative outcomes observed in sub-Saharan Africa and Latin America. While the use of instrumental variables enhanced identification, the focus on employment outcomes excluded direct assessment of manufacturing value added, which is more relevant to sectoral productivity. Furthermore, the absence of product-level trade data and global value chain integration indices reduced the clarity of causal channels. The findings also pointed to the importance of complementary factors such as infrastructure and skills development that were not captured in the models.

Akorsu and Okyere (2023) analysed the relationship between trade and manufacturing sector output in Ghana from 1981 to 2020 using a nonlinear ARDL approach. The study examined the effects of trade openness, exports, and imports on manufacturing output, finding that greater trade openness and rising exports significantly supported long-run manufacturing growth. Conversely, increased imports negatively impacted the sector, largely due to competitive pressures and cost dependencies on foreign intermediate goods. Short-run analysis revealed asymmetric effects, where positive shocks to openness had stronger implications than negative ones. Despite effectively capturing asymmetry, the study applied a composite measure of openness and did not disaggregate imports into capital versus consumer goods, which reduced its explanatory depth. Furthermore, important structural shifts linked to trade policy reforms or energy shocks were not explicitly modelled.

Ko et al. (2023) examined the impact of trade-induced structural change on sub-Saharan African economies. Using a multi-country panel design, the study combined employment and value-added shares with trade indicators to explore shifts in the manufacturing sector. The findings indicated that increasing imports were associated with reduced manufacturing employment, while exports did not significantly affect manufacturing value added. These outcomes pointed toward trade-induced labour reallocations without accompanying industrial upgrading, aligning with theories of premature deindustrialization. Although the model was quantitatively rich, the use of aggregate export and import measures overlooked critical distinctions in technological content or participation in value chains. The annual frequency of the data also limited the ability to observe short-run trade competitiveness effects or sector-specific dynamics.

Wolde (2022) conducted a dynamic panel analysis on the determinants of manufacturing value added across developing countries using annual data. The model integrated trade openness and macroeconomic controls to evaluate sectoral performance. Results showed that trade openness significantly supported manufacturing growth, particularly in countries with strong capital formation and large domestic markets. The dynamic specification addressed persistence in the dependent variable, offering robustness against short-term volatility. However, the openness measure used was too broad, failing to differentiate between export intensity and import penetration, and the study did not distinguish between technologically advanced exports and low-value or raw material exports. Moreover, issues such as cross-sectional dependence and country-specific commodity cycles may have affected the reliability of the estimates without adequate controls.

Kpagih et al. (2022) investigated how Nigeria's external sector influenced manufacturing output over the 1981–2019 period. The study adopted ARDL estimation with manufacturing output as the dependent variable, and trade openness, foreign direct investment (FDI), and exchange rate as key independent variables. Long-run estimates suggested that exchange rate and FDI positively influenced manufacturing growth, while trade openness had a negative and statistically significant effect, aligning with the view that liberal trade policies can undercut nascent domestic industries. In the short run, effects were weaker and more volatile. The study highlighted the tension between openness and capital inflows but relied heavily on aggregated indices. This approach obscured the role of trade composition and specific barriers to manufacturing competitiveness. Further refinement using product-level data, inclusion of non-tariff costs, and asymmetric models such as NARDL would have allowed a more detailed exploration of trade policy effects on different dimensions of manufacturing performance.

Osakede and Adenikinju (2022) evaluated the impact of foreign trade on manufacturing performance across ECOWAS countries, covering the period 1990 to 2020. Situated in the foreign trade and manufacturing domain, the authors employed the system Generalized Method of Moments (GMM) panel estimator to analyse manufacturing value

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added as the dependent variable. The independent variables included trade openness, export share, and import share. Their findings revealed that trade openness and exports significantly improved manufacturing value added across the region, while imports showed mixed effects, turning adverse in economies with high exchange rate pass-through. Though the study offered policy-relevant insights across multiple countries, its use of aggregate trade proxies limited the understanding of product sophistication, and the absence of institutional variables likely obscured cross-country differences. Additionally, quarterly data or global value chain participation indicators would have offered richer inferences regarding trade–industry linkages.

III. Methodology

This paper adopted an *ex-post* facto research design, which is appropriate for the paper. The design enabled the researcher to analyse past trends and patterns without manipulating any of the variables. By relying on secondary data from reputable sources, the study explored cause-and-effect relationships in a non-experimental setting. This design was suitable for assessing long-term impacts of trade variables on manufacturing growth, offering insight into how policy shifts and trade dynamics have historically influenced the industrial performance in Nigeria.

The paper relied on secondary, time-series data spanning from 1986 to 2024, drawn from credible national and international sources. Data on export intensity, import penetration, and tariff rates were obtained from the World Bank, International Monetary Fund, World Trade Organization, and Central Bank of Nigeria. Manufacturing sector growth, measured by its percentage contribution to GDP, was sourced from the Central Bank of Nigeria Statistical Bulletin and the National Bureau of Statistics. The data were annual, macroeconomic, and quantitative in nature, making them suitable for econometric analysis aimed at examining the long-term relationship between foreign trade and manufacturing sector growth in Nigeria.

In alignment with the objectives of this research, the study was anchored on the Heckscher-Ohlin theoretical framework and adapted the empirical model developed by Akorsu and Okyere (2023), who investigated the relationship between trade and manufacturing sector output in Ghana over the period 1981 to 2020. The present study modified this framework to reflect the Nigerian context and its specific focus on assessing how export intensity, import penetration, and tariff rates influence manufacturing sector growth between 1986 and 2024. The mathematical representation of the model employed in this study is presented as follows:

$$MSG_t = \alpha_0 + \alpha_1 IMP_t + \alpha_2 EXI_t + \alpha_3 TAR_t + u_t$$

-----(1)

Where:
MSG is Manufacturing Sector growth
IMP is Import penetration (import/gdp)
EXI is Export intensity (export/gdp)
TAR is tariffs

u_t = error term.

The initial stage of analysis in this paper involved testing the stationarity properties of each variable using the Augmented Dickey-Fuller (ADF) test. Establishing stationarity was essential to prevent spurious regression results and ensure the validity of subsequent econometric estimations.
The mathematical specification for the ADF test is as follows:

$$\Delta y_t = \theta + \vartheta t + \lambda y_{t-1} + \sum_{i=1}^{p} \partial_i \Delta y_{t-i} + u_t$$

----------(2)

Where:

y_t represents the variable being tested; Δy_t is the first difference of the variable; θ is a constant (drift term); ϑt represents the trend component; λy_{t-1} captures the lagged level of the variable, where the coefficient λ determines whether a unit root is present; $\partial_i \Delta y_{t-i}$ accounts for lagged differences to correct for serial correlation; u_t is the error term.

After confirming the stationarity conditions of the time series data, the next critical step was to examine potential long-term relationships among the variables.
Mathematically, the Bounds ARDL model can be specified as follows:

$$y_{t(p,q)} = \alpha_0 + \sum_{i=1}^{p} \alpha_i \Delta y_{t-i} + \sum_{j=0}^{q} \beta_j \Delta x_{t-j} + \alpha_1 y_{t-1} + \beta_1 x_{t-1} + \varepsilon_t$$

------(3)

Δ denotes the first difference operator; y_t represents the dependent variable; x_{t-j} represents the independent variables; Δy_t represents the first difference of the dependent variable; Δx_{t-j} represents the first difference of the independent variables; α_0 is the constant term; α_i and β_j are the coefficients for the lagged values of the dependent

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and independent variables, respectively; ε_t is the error term.

The Bounds test involves computing an F-statistic to test the joint significance of the lagged level variables. The null hypothesis (H_0) is that there is no cointegration: $\alpha_1 = \beta_1 = 0$, while the alternative hypothesis (H_1) is that cointegration exists: at least one $\alpha_1 = \beta_1 \neq 0$.

After establishing the presence of a long-run cointegrating relationship among the study variables, this research proceeded to estimate both the short-run and long-run dynamics using the Auto-Regressive Distributed Lag (ARDL) modeling technique. This method was chosen for its suitability in analysing time series data with a limited sample size and its ability to accommodate variables integrated at levels I(0) and I(1). The ARDL approach effectively addressed potential issues of endogeneity and serial correlation, which are common challenges in macroeconomic data. By including appropriate lag structures for both the dependent and independent variables, the model enabled a comprehensive analysis of the short-term and long-term effects of export intensity, import penetration, and tariff rates on Nigeria's manufacturing sector growth. The unrestricted ARDL model thus provided a consistent framework for exploring the dynamic interplay between foreign trade and industrial performance across the study period, and is formally represented as follows:

$$\Delta MSG_{t(p,q)} = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta MSG_{t-i} + \sum_{j=0}^{q} \alpha_2 \Delta IMP_{t-j} + \sum_{m=0}^{r} \alpha_3 \Delta EXI_{t-m} + \sum_{n=0}^{s} \alpha_4 \Delta TAR_{t-n} +$$

$$+\alpha_5 MSG_{t-1} + \alpha_6 IMP_{t-1} + \alpha_7 EXI_{t-1} + \alpha_8 TAR_{t-1} + u_t \quad (4)$$

Specifying the restricted ARDL-ECM after achieving cointegrations we have:

$$\Delta MSG_{t(p,q)} = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta MSG_{t-i} + \sum_{j=0}^{q} \alpha_2 \Delta IMP_{t-j} + \sum_{m=0}^{r} \alpha_3 \Delta EXI_{t-m} + \sum_{n=0}^{s} \alpha_4 \Delta TAR_{t-n} + \theta ect_{t-1} + u_t \quad (5)$$

IV. Results and Discussions

Descriptive Statistics Results

Descriptive statistics serve as a preliminary tool in empirical research, providing a summary of the central tendency, dispersion, and distributional characteristics of each variable. In the context of this paper, the descriptive statistics help to contextualize the behavior and variability of the key variables, manufacturing sector growth (MSG), import penetration (IMP), export intensity (EXI), and tariff rates (TAR), over the study period from 1986 to 2024. These insights are important for understanding the underlying structure of the data before advancing to more rigorous econometric analyses.

Table 1: Descriptive Statistics

	MSG	IMP	EXI	TAR
Mean	13.59860	14.83615	25.69462	20.00385
Maximum	21.22906	22.93000	37.89000	91.27000
Minimum	6.552817	8.240000	8.830000	8.220000
Std. Dev.	4.693484	4.126916	9.130042	17.74132
Skewness	0.232288	0.155205	-0.3861	2.703510
Kurtosis	1.625108	1.840970	1.689188	10.14012
Jarque-Bera	3.422508	2.339518	3.761079	130.3530
Probability	0.180639	0.310442	0.152508	0.000000
Observations	39	39	39	39

Source: Researcher's Computation Using EViews-12 (2025)

From Table 1, the mean value for manufacturing sector growth (MSG) was 13.60%, indicating that, on average, the sector contributed moderately to Nigeria's GDP across the sample period. However, this average show notable variability, with a maximum of 21.23% and a minimum of 6.55%. The relatively high standard deviation of 4.69% suggests considerable fluctuations in manufacturing performance, which aligns with observed historical volatility due to factors such as economic reforms, policy inconsistencies, and global shocks. The positive skewness (0.23) shows that the distribution was slightly right-skewed, meaning a few years

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experienced relatively higher-than-average manufacturing growth. The kurtosis value of 1.63, being below the normal distribution benchmark of 3, suggests a flatter distribution with lighter tails, and the Jarque-Bera probability of 0.18 indicates that the variable is normally distributed.

Import penetration (IMP) had a mean of 14.84%, reflecting moderate exposure to foreign goods relative to GDP. With values ranging from 8.24% to 22.93%, and a standard deviation of 4.13%, the data show notable dispersion. A skewness of 0.16 and kurtosis of 1.84 imply a mild right-skew and a relatively flat distribution. The Jarque-Bera probability of 0.31 suggests that the series does not significantly deviate from normality. This implies that import flows were relatively stable but occasionally spiked, particularly during periods of trade liberalization or currency depreciation.

Export intensity (EXI), with a mean of 25.69%, reflects Nigeria's historically strong reliance on exports, largely driven by crude oil. The range of values is wide, from 8.83% to 37.89%, and the standard deviation of 9.13% confirms considerable volatility. The negative skewness (−0.39) indicates that more years recorded above-average export intensity, although some years had notably low export performance, especially during periods of oil price shocks or export restrictions. The kurtosis of 1.69 points to a flatter-than-normal distribution, and the Jarque-Bera test result (p = 0.15) supports the assumption of normality.

Tariff rates (TAR) displayed the most variability among the variables, with a mean of 20.00% and a standard deviation of 17.74%. The maximum rate of 91.27% and minimum of 8.22% reflect dramatic shifts in trade policy, especially during the 1990s liberalization efforts and subsequent reforms. The distribution is highly skewed to the right (2.70), indicating the presence of a few years with very high tariffs, likely during protectionist phases. The kurtosis value of 10.14 confirms a leptokurtic distribution with heavy tails. The Jarque-Bera test strongly rejects normality (p = 0.0000), suggesting that the tariff data are not normally distributed, which is expected given the historical policy volatility.

Unit Root Test

Unit root tests are essential in time series analysis to determine the stationarity of variables, which affects the choice of appropriate econometric techniques. Stationarity implies that a variable's statistical properties, such as mean and variance, are constant over time. The presence of a unit root suggests non-stationarity, which can lead to spurious regression results if not properly addressed. In this study, the Augmented Dickey-Fuller (ADF) test was used to assess the stationarity of the variables, and both level and first-difference forms were examined.

Table 2: Summary of Unit Root Test Results

Variable	Levels: ADF Test Statistics (Critical Values)	1st Difference: ADF Test Statistics (Critical Values)	Order of Integration
MSG	-0.848124 (-3.533083)	-6.461327 (-4.226815)*	I(1)
EXI	-2.509664 (-3.533083)	-6.507420 (-4.226815)*	I(1)
IMP	-1.754048 (-3.552973)	-3.289510 (-3.209642)***	I(1)
TAR	-3.329344 (-3.218382)***	-	I(0)

Note: The tests include intercept with trend; ** and *** significant at 1 percent and 10 percent.*
Source: Researcher's Computation Using EViews-12 (2025)

The results in Table 2 revealed that manufacturing sector growth (MSG) was non-stationary at level, with an ADF statistic of -0.848124, which was greater than the 1 percent critical value of -3.533083 in absolute terms. However, at first difference, MSG became stationary with an ADF statistic of -6.461327, which exceeded the 1 percent critical value of -4.226815 in absolute terms, indicating that MSG is integrated of order one, I(1). This confirms that while manufacturing performance varied significantly over time, its changes followed a stable path.

Export intensity (EXI) also became stationary after first differencing. At level, the ADF statistic of -2.509664 did not surpass the 1 percent critical threshold. After first differencing, the test statistic improved substantially to -6.507420, which was more negative than the 1 percent critical value of -4.226815. This result implies that EXI is also I(1), reinforcing the idea that export trends in Nigeria were subject to structural shifts and external shocks but became stable when analysed in terms of changes over time.

Import penetration (IMP) followed a similar pattern. At level, the ADF statistic of -1.754048 was

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insufficient to reject the null hypothesis of a unit root. However, at first difference, the variable became stationary with an ADF statistic of -3.289510, which exceeded the 10 percent critical value of -3.209642, confirming stationarity at I(1). This suggests that import behaviour, though volatile over time, achieved stability when analysed in terms of its first differences.

However, tariff rate (TAR) was found to be stationary at level, with an ADF statistic of -3.329344, which surpassed the 10 percent critical value of -3.218382. This implies that tariff rates in Nigeria, despite exhibiting high variability as shown in the descriptive statistics, followed a mean-reverting process and did not require differencing to achieve stationarity. This result aligns with the policy-driven nature of tariffs, which are often adjusted through deliberate regulatory actions rather than random fluctuations.

Co-integration Test

In this paper, the ARDL bounds testing approach to cointegration was employed due to its robustness in handling variables of mixed integration orders (I(0) and I(1)), which aligns with the unit root test results obtained earlier.

Table 3: Bound Test-Co-integration Results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	14.3129	10%	2.37	3.20
k	3	5%	2.79	3.67
		1%	3.65	4.66

Source: Researcher's Computation Using EViews-12 (2025)

The results from the bounds test in Table 3 indicated a computed F-statistic of 14.3129, which was assessed against the critical values at different levels of significance. Focusing on the 5 percent level, the lower and upper bounds for I(0) and I(1) are 2.79 and 3.67, respectively. Since the F-statistic far exceeds the upper bound value of 3.67, the null hypothesis of no level relationship is strongly rejected at the 5 percent significance level.

ARDL Regression Estimates

Having confirmed the existence of a long-run cointegrating relationship between foreign trade and manufacturing sector growth in Nigeria, the study proceeds to estimate both the error correction and long-run components of the ARDL model. The ARDL Error Correction Model (ECM) captures how short-run deviations adjust back to long-run equilibrium over time. A general-to-specific modelling strategy was employed to arrive at a parsimonious and statistically reliable short-run dynamic equation, with the results of this estimation presented in Table 4. This approach allows for a clearer interpretation of the immediate and sustained effects of export intensity, import penetration, and tariff rates on manufacturing sector performance.

Table 4: ARDL-ECM Result

Dependent Variable: D(MSG)

Short-run Estimates				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IMP)	-0.2651	0.0743	-3.5694	0.0024
D(IMP(-1))	0.3495	0.0826	4.2330	0.0006
D(IMP(-2))	0.3539	0.0888	3.9848	0.0010
D(IMP(-3))	0.2669	0.0865	3.0857	0.0067
D(IMP(-4))	0.1863	0.0763	2.4413	0.0259
D(EXI)	0.0507	0.0420	1.2057	0.2444
D(EXI(-1))	0.0325	0.0376	0.8642	0.3995
D(EXI(-2))	0.0736	0.0428	1.7178	0.1040
D(EXI(-3))	0.1512	0.0410	3.6907	0.0018
D(EXI(-4))	0.1682	0.0391	4.3076	0.0005
D(TAR)	0.0047	0.0090	0.5185	0.6108

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D(TAR(-1))	-0.0288	0.0097	-2.9733	0.0085
CointEq(-1)*	-0.5069	0.0539	-9.4023	0.0000
Long-Run Estimates				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IMP	-1.6139	0.2610	-6.1838	0.0000
EXI	0.3929	0.1193	3.2938	0.0043
TAR	0.0847	0.0284	2.9844	0.0083
C	25.5259	1.8675	13.6686	0.0000
Goodness of Fit				
R-squared	0.8537			
Adjusted R-squared	0.7701			
Durbin-Watson stat	1.6300			

Source: Researcher's Computation Using EViews-12 (2025)

From Table 4, the coefficient of the error correction term, CointEq(-1), from the ARDL Error Correction Model (ECM) provides crucial information about the speed at which short-run deviations adjust back to the long-run equilibrium. In this study, the coefficient is -0.5069, with a t-statistic of -9.4023 and a probability value of 0.0000, indicating statistical significance at the 1 percent level. The negative and significant sign of the coefficient is consistent with theoretical expectations and confirms the presence of a valid long-run relationship among the variables. Specifically, the value of -0.5069 suggests that approximately 50.7 percent of any deviation from the long-run equilibrium in the manufacturing sector is corrected in the following period (assumed to be annually, given the data frequency). This means the system returns to equilibrium at a moderate pace, neither too sluggish nor overly abrupt, which is appropriate for a real sector like manufacturing that responds gradually to changes in trade dynamics and policy interventions.

From the long-run results, import penetration (IMP) has a negative and highly significant coefficient of -1.6139 with a t-statistic of -6.1838 and a p-value of 0.0000, suggesting a strong inverse relationship between import levels and manufacturing sector performance in the long run. This implies that increased import penetration consistently undermines domestic manufacturing growth, likely due to Nigeria's reliance on imported finished goods, which crowds out local producers and reduces capacity utilization in the domestic sector. This result reinforces previous empirical findings that excessive imports, especially of consumer goods, can stifle local industry by reducing demand for domestically produced alternatives.

Export intensity (EXI), on the other hand, shows a positive long-run coefficient of 0.3929, with a t-statistic of 3.2938 and a p-value of 0.0043, indicating that higher levels of export engagement significantly boost manufacturing sector output. This result supports the Heckscher-Ohlin theoretical perspective, where economies benefit from engaging in international trade in sectors where they have comparative advantage. It suggests that an outward-oriented trade strategy, particularly through value-added exports, plays a pivotal role in sustaining industrial growth in Nigeria.

Tariff rates (TAR) also exhibit a positive and statistically significant effect on manufacturing growth, with a coefficient of 0.0847, a t-statistic of 2.9844, and a p-value of 0.0083. This result implies that moderate tariff protection can support manufacturing by shielding domestic industries from unfair foreign competition, allowing local firms to grow, innovate, and compete over time. However, while the effect is positive, its smaller magnitude compared to exports and imports suggests that tariffs alone are not sufficient to drive industrial growth, and must be complemented by broader structural and policy reforms.

The R-squared value of 0.8537 indicates that approximately 85.4 percent of the variation in manufacturing sector growth is explained by the combined effects of export intensity, import penetration, and tariff rates. This is a strong indication that the model fits the data well, and that foreign trade variables are highly relevant in explaining the performance of the manufacturing sector in the long run.

The adjusted R-squared value of 0.7701 further supports the robustness of the model. Unlike

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the regular R-squared, the adjusted R-squared accounts for the number of predictors in the model relative to the number of observations. The relatively high adjusted value suggests that the inclusion of the trade proxies does not result in overfitting and that the model maintains strong explanatory power even after adjusting for degrees of freedom.

The Durbin-Watson statistic of 1.6300 assesses the presence of autocorrelation in the residuals of the regression model. Although the ideal value for no autocorrelation is 2.0, a statistic between 1.5 and 2.5 is generally considered acceptable. Therefore, the value of 1.63 falls within an acceptable range, suggesting that the model is not significantly affected by serial correlation, which strengthens the credibility of the results.

V. Discussion of findings

Findings from the paper showed that import penetration (IMP) had a negative and statistically significant impact on manufacturing sector growth in Nigeria. This negative relationship suggests that high levels of imports, particularly of finished and consumer goods, continue to displace domestic manufacturing output by intensifying external competition and undermining local production capacities. The implication is that Nigeria's manufacturing sector remains highly vulnerable to global market dynamics due to its import-dependency structure, especially for critical inputs and consumer alternatives. This outcome supports the findings of Ko et al. (2023), who reported that rising imports across Sub-Saharan Africa reduced manufacturing employment and output by reallocating economic activity away from industrial production. Similarly, Osakede and Adenikinju (2022) found that import surges in ECOWAS countries, particularly those with high exchange rate pass-through like Nigeria, had adverse effects on manufacturing performance due to the inability of local firms to compete with cheaper imports. However, this result contrasts with Unegbu and Ugwunna (2024), who noted that importation of capital goods had a positive effect on Nigeria's manufacturing indicators, suggesting that the type of imports matters significantly. In this study, the aggregate treatment of imports likely reflects the dominance of consumer goods in Nigeria's import basket, explaining the net negative outcome.

The paper also found that export intensity (EXI) had a positive and statistically significant impact on manufacturing sector growth. This relationship implies that increased engagement in international trade through exports supports industrial expansion by exposing local firms to broader markets, encouraging scale economies, and facilitating learning-by-exporting. It aligns with the Heckscher-Ohlin theory, which argues that countries can achieve growth by specializing in sectors where they hold a comparative advantage. This finding corroborates the work of Akorsu and Okyere (2023), who established that greater trade openness and export growth significantly improved manufacturing output in Ghana. Likewise, Li and Zhang (2022) reported that rising export intensity in China had long-run positive effects on industrial expansion, especially when supported by trade infrastructure and policy stability. The outcome of this study confirms that while Nigeria's export structure is still dominated by crude oil, an outward-oriented manufacturing strategy can stimulate sectoral growth when value-added exports are promoted. However, the result differs from Ko et al. (2023) who found exports had limited impact on manufacturing value added in African economies, indicating that the benefits of exports depend on the sophistication of goods and integration into global value chains.

Finally, the paper revealed that tariff rates (TAR) exerted a positive and significant impact on manufacturing sector growth. This suggests that moderate tariff protection has historically helped shield Nigerian manufacturers from excessive foreign competition, giving room for local capacity building and market consolidation. The implication is that when appropriately implemented, tariff policy can be a useful tool for industrial policy by providing temporary protection for emerging sectors. This result resonates with Bello and Danjuma (2023) who showed that tariff reductions in the early 2000s had a weakening effect on Nigeria's manufacturing sector due to premature exposure to international competition. Similarly, Busse et al. (2024) found that trade liberalisation, especially in developing countries with underdeveloped manufacturing bases, often resulted in deindustrialisation unless supported by complementary policies. However, this study's finding diverges from Wolde (2022), who argued that broad trade openness (including low tariffs) was associated with manufacturing growth in developing countries where institutions and industrial policies were already well-developed. In Nigeria's context, the positive effect of tariffs reflects the ongoing need for strategic protection, especially in light of weak infrastructure, high production costs, and limited access to finance.

VI. Conclusion and Recommendations

This paper set out to examine the impact of foreign trade on manufacturing sector growth in

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Nigeria, focusing on three key dimensions: export intensity, import penetration, and tariff rates. The findings established a statistically significant relationship among these variables, confirming that foreign trade dynamics play a crucial role in shaping the performance of the manufacturing sector. The negative impact of import penetration suggests that excessive reliance on imports has continued to undermine local production capacity, highlighting structural weaknesses within the domestic manufacturing base. Conversely, the positive influence of export intensity points to the potential gains of an outward-oriented industrial strategy, where access to global markets can drive production and innovation. Lastly, the significant and positive impact of tariff rates indicates that strategic protection through moderate trade barriers can support domestic industrial development when used to complement other policy tools. These findings highlight the diverse link between trade and industrial performance.

In light of the paper's findings, several targeted policy actions are necessary to strengthen Nigeria's manufacturing sector through a more strategic approach to foreign trade.

i. Given the significant negative impact of import penetration on manufacturing growth, the Federal Ministry of Industry, Trade and Investment (FMITI), in collaboration with the Nigerian Customs Service and the Central Bank of Nigeria (CBN), should implement measures that discourage the excessive importation of finished consumer goods, particularly those that compete directly with locally produced alternatives. This may include stricter import licensing regulations for non-essential goods and enhanced support for backward integration in key manufacturing industries.

ii. Considering the positive influence of export intensity, the Nigerian Export Promotion Council (NEPC) should lead efforts to expand non-oil export capacity by incentivizing value-added manufacturing exports, simplifying export procedures, and enhancing market access through trade agreements. The Bank of Industry (BOI) and Nigerian Export-Import Bank (NEXIM) must also provide export financing schemes and capacity-building programs that enable manufacturers to meet international quality standards and scale their operations for global markets.

iii. Furthermore, the positive impact of tariff rates suggests that moderate and well-targeted protection can foster local industry. The Tariff Technical Committee (TTC) under the Federal Ministry of Finance, alongside the Nigerian Customs Service, should periodically review the tariff structure to ensure it balances protection for emerging industries with affordability of inputs. Special attention should be given to input-output linkage industries where moderate tariffs on competing final goods are necessary, while ensuring low tariffs on essential raw materials and machinery. These institutions should coordinate to create a tariff regime that aligns with Nigeria's industrial policy goals, promoting competitiveness without isolating the economy from global trade opportunities.

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Data Presentation

Table: Data Summary

Year	Import Penetration (Percentage of Import/GDP)	Tarriff rate (%)	Export Intensity (Percentage of Export/GDP)	Manufacturing sector growth (% contributions to GDP)
1986	8.52	33.16	17.1	21.22
1987	10.41	28.5	26.61	18.97
1988	14.71	26.23	23.12	21.23
1989	12.46	25.11	16.32	18.54
1990	10.81	24.83	25.43	17.96
1991	15.25	25.08	29.87	19.69
1992	14.56	25.32	30.12	17.83
1993	13.44	58.3	28.45	18.56
1994	11.76	74.79	26.78	21.14
1995	19.62	91.27	35.64	20.19
1996	17.77	16.06	36.21	19.29
1997	18.34	16.21	37.89	19.39
1998	18.27	16.21	32.18	17.63
1999	18.79	19.77	33.92	16.42
2000	14.01	19.99	36.02	14.08
2001	18.57	21.47	34.56	14.07
2002	17.17	18.45	30.21	11.93
2003	18.74	20.62	32.87	12.19
2004	19.12	14.98	34.12	10.97
2005	22.93	9.34	35.98	10.17
2006	19.51	9.4	33.45	8.94
2007	21.2	9.6	35.67	8.49
2008	22.2	9.79	37.24	8.25
2009	17.69	9.83	28.56	7.92
2010	17.83	10.7	30.42	6.55
2011	19.18	10.15	32.18	7.19
2012	15.14	10.43	28.93	7.79
2013	11.69	10.07	20.45	9.03
2014	11.47	11.34	18.76	9.75
2015	8.56	8.22	12.56	9.53
2016	8.24	8.52	10.89	8.77
2017	9.13	10.44	12.34	8.83
2018	11.01	11.36	16.78	9.75
2019	11.22	11.9	15.23	11.64

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2020	13.01	12.37	8.83	12.83
2021	11.68	12.2	10.9	14.83
2022	12.2	9.34	13.6	13.80
2023	11.4	9.3	15.4	12.37
2024	11	9.5	16.5	12.60

Sources: Central Bank of Nigeria. (2023). *Statistical bulletin*.
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