

TRADE GLOBALIZATION AND THE PERFORMANCE OF THE MANUFACTURING SECTOR IN NIGERIA

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ABSTRACT

Prior studies on trade globalization and the performance of the manufacturing sector in Nigeria have produced inconclusive results. This study aims to further examine the topic through expanded observations and robust analytical methods, covering the period from 1985 to 2022. The study uses the manufacturing sector gross domestic product (MGDP) as a proxy for the performance of the manufacturing sector, while trade openness, foreign direct investment, official development assistance, and the foreign exchange rate serve as proxies for trade globalization. An ex post facto research design was utilized, with annual time series data sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Development Indicators of the World Bank. Data analysis techniques employed include the Augmented Dickey-Fuller (ADF) unit root test, Bounds Cointegration Test, and Autoregressive Distributed Lag (ARDL) model. The findings indicate that both trade openness and official development assistance have a positive impact on MGDP in the short run, but this effect diminishes in the long run. Foreign direct investment also increases MGDP in the short run; however, it is not significant in the long term. The foreign exchange rate, on the other hand, is found to be insignificant in both time frames. The study recommends that the government and policymakers review current trade policies and address issues that diminish the long-term benefits for the manufacturing sector. Furthermore, it emphasizes the importance of implementing policies that can bolster foreign investors' confidence in Nigeria's manufacturing sector. If these policy revisions are carefully implemented and monitored, they could potentially reverse the negative long-term effects of trade globalization on MGDP.

Keywords: Manufacturing Sector, Trade Openness, Foreign Direct Investment, Official Development Assistance, Foreign Exchange Rate

Introduction

The process of economic growth and development typically begins with the foundation of technology, infrastructure, and production. Manufacturing is often regarded as a cornerstone of economic growth (Dan & Yang, 2016) and has been widely acknowledged as an engine driving growth and development in any nation. The manufacturing sector plays a vital role in the advancement of modern economies globally. As a subset of the industrial sector, it focuses on the production of goods through the effective combination of raw materials, labor, land, and capital. In advanced economies, the manufacturing sector is particularly significant due to its contributions

to productivity, import substitution, export expansion, foreign exchange earnings, job creation, and increases in per capita income, which consequently lead to varied consumption patterns. Additionally, the sector is known for generating investment capital at a pace faster than other sectors of the economy while fostering effective linkages across different industry sectors (Obioma, Kalu, & Anyanwu, 2015).

Globalization is a key enhancer of manufacturing sector performance, sparking considerable debate among scholars and economic experts. Advocates of globalization argue that it fosters the growth of the global economy when supported by appropriate macroeconomic policies and technical frameworks. As a result, trade globalization augments human capital returns, while both globalization and technological advancements contribute to reducing inequality, benefiting both developed and developing nations (Jaumotte, Lall, & Papageorgio, 2008). The competitiveness introduced by globalization has led to significant progress in world economies, particularly after the financial and monetary expansions following 2009 (IMF, 2009). In this context, no nation desires to be excluded from the advantages of trade, foreign investment, and financial integration, especially during this new wave of globalization (Maduka, Madichie & Eze, 2017). Globalization serves as a means of interaction and integration among individuals, businesses, and governments across borders, driven by international trade and investment, while being supported by advancements in information technology. This process has wide-ranging effects on environments, cultures, political systems, and economic development globally (George-Anokwuru, 2018).

Through globalization, societies can gain a competitive advantage from lower operating costs and access to new raw materials and additional markets. Multinationals can manufacture, buy, and sell goods worldwide. A country can manufacture auto parts in several different developing countries, ship the parts to another country for assembly, and then sell the finished cars to any nation. Technology is a major contributor to globalization. Advancements in information technology and the flow of information across borders have increased awareness of economic trends and investment opportunities. Proponents of globalization believe that it allows developing countries to pull alongside the industrialized nations through increased manufacturing, diversification, economic expansion, and improvements in standards of living, which in turn enhances economic growth (George-Anokwuru, 2018). In addition to this, Maduka, Madichie and Eze (2017) noted that globalization has a long-run significant positive impact on economic growth in Nigeria and that it was therefore safe to conclude that Nigeria has benefited from globalization through enhanced trade, investment, and financial flows.

Odebode and Aras (2019) added that trade globalization can have several positive effects on the manufacturing sector, contributing to its growth, competitiveness, and overall development. Specifically, trade globalization provides manufacturers with access to a broader range of international markets. This expanded market access allows companies to diversify their customer

base and reduces dependence on a single domestic market. Increased market opportunities can lead to higher sales volumes and revenue. Also, trade globalization enables manufacturers to achieve economies of scale by producing goods in larger quantities. Larger production runs often lead to lower average production costs, making products more affordable and competitive in the global marketplace.

In addition, Agu, Onah, and Okoroafor (2022) stated that manufacturers can leverage trade globalization to focus on their core competencies and areas of comparative advantage. This allows for specialization in the production of goods and services where a country or company has a competitive edge, leading to increased efficiency and innovation as well as improvement in the performance of the manufacturing sector. Also, trade globalization facilitates the transfer of technology and know-how across borders. Manufacturers can adopt advanced production techniques, machinery, and best practices from other countries, enhancing their technological capabilities and improving overall productivity. Further emphasizing the vital role of trade globalization, Cookey (2023) established that manufacturers can optimize their supply chains by sourcing raw materials, components, and intermediate goods from various countries. Global supply chains contribute to cost efficiency, flexibility, and resilience in the face of disruptions, ensuring a steady flow of inputs for production. Also, exposure to global competition encourages manufacturers to become more efficient and innovative. The need to compete on a global scale drives companies to improve quality, reduce costs, and enhance their overall competitiveness, all of which contribute significantly to the performance of the manufacturing sector.

However, the history of industrial development and manufacturing production in Nigeria is a classic illustration of how a nation could neglect a vital sector through policy inconsistencies and distractions attributable to the discovery of oil. For instance, the near-total neglect of agriculture in Nigeria has denied many manufacturers and industries their primary source of raw materials. The absence of locally sourced inputs has resulted in low industrialization and low economic growth. In addition, the manufacturing sector in Nigeria has continued to experience different kinds of challenges. Some of these challenges include inadequacy of capital for production investment, the problem of accessing financial assistance from the banking institutions, undeveloped infrastructural facilities for the development of firms' take-off, asymmetric information regarding business climate, complex bureaucratic procedures in setting up a business, and high cost of doing business. In furtherance, the efforts of many manufacturing firms to grow, modernize, and expand rapidly are still being constrained by their inability to mobilize funds for development. Yet, demand for capital is increasingly on the rise while at the same time, profit margins are being squeezed by rising wages, keener competition, interest rates, high operating costs, and the like. These consequently lead to poor performance of the manufacturing sector in Nigeria.

While trade globalization can open up new market opportunities and lead to efficiency gains, it also presents challenges that negatively affect domestic industries and the manufacturing sector as a whole. For instance, Nigerian manufacturers often face intense competition from low-cost producers in other countries. Imported goods, especially those produced in countries with lower labor and production costs, can flood the Nigerian market, making it challenging for local manufacturers to compete. Also, many Nigerian manufacturers depend on imported raw materials and intermediate goods for their production processes. Global supply chain disruptions or fluctuations in currency exchange rates can lead to increased production costs and supply chain vulnerabilities. Lastly, fluctuations in currency exchange rates can affect the cost of imported inputs and impact the competitiveness of Nigerian manufacturing products in the global market. Sudden changes in exchange rates can lead to increased production costs, reduced profit margins, and consequently, low performance of the manufacturing sector in Nigeria.

Against the backdrop of the identified problems and gaps, this study aims to examine the effect of trade globalization on the performance of the manufacturing sector in Nigeria from 1985 to 2022. The specific objectives of the study include:

1. To ascertain the effect of trade openness on the manufacturing sector's Gross Domestic Product (GDP) in Nigeria.
2. To examine the effect of foreign direct investment (FDI) on the manufacturing sector's GDP.
3. To determine the effect of official development assistance (ODA) on the manufacturing sector's GDP.
4. To evaluate the effect of the foreign exchange rate on the manufacturing sector's GDP.

The study is structured to flow systematically, beginning with a review of related literature, which includes the conceptual framework, empirical review, and identification of literature gaps. The third section details the methodology employed in the research. The fourth section is dedicated to data analysis and discussion of findings, while the fifth section concludes with recommendations for policy and practice.

Literature Review

Conceptual Literature

a. Concept of Trade Globalization

Many authors have defined trade globalization in various ways, reflecting their different professional backgrounds, which has led to a lack of a universally accepted definition. Trade globalization refers to the increasing integration and interdependence of national economies through the expansion of international trade. This process involves the exchange of goods, services, capital, technology, and information across borders, resulting in a more interconnected

global economy. Scholte (2000) describes trade globalization as the processes by which markets and production in different countries become increasingly interdependent due to the dynamics of trade in goods and services. Stiglitz (2002) elaborates on this by describing trade globalization as the integration of economies through trade, investment, capital flow, labor migration, and technology. It encapsulates the growing economic interdependence of countries worldwide through the increasing volume and variety of cross-border transactions in goods and services, international capital flows, and the rapid dissemination of technology. Dicken (2015) defines trade globalization as the increasing connectivity and interdependence of the world's markets and businesses. It refers to the process by which businesses or other organizations gain international influence or begin operating on a global scale, leading to the creation of global markets.

b. Benefits of Trade Globalization

The Milken Institute's report on the Globalization of the World Economy outlines numerous advantages linked to trade globalization while also addressing some potential risks for governments and investors to consider. Overall, there is a consensus among economists that trade globalization yields a net benefit for nations, encouraging both governments and individuals to embrace it. One key advantage is that increased competition stemming from trade globalization stimulates technological innovation, particularly with regard to foreign direct investment. This development results in enhanced economic output by optimizing efficiency in various processes.

Trade globalization allows large companies to achieve economies of scale, which can lead to reduced costs and prices that fuel further economic growth; however, this can pose challenges for smaller businesses struggling to compete domestically. Additionally, rapid capital and financial integration facilitated by trade globalization has been pivotal for mobilizing foreign savings towards domestic investment, which in turn promotes economic growth. Efficient deployment of capital has become increasingly feasible through these global networks. Trade globalization also opens the door for businesses to tap into larger, more diverse markets. A broader market size can substantially increase sales volumes and revenue, ultimately contributing to economic expansion. Moreover, trade globalization encourages countries to specialize in the production of goods and services where they hold a comparative advantage. This specialization enhances efficiency and productivity and leads to a more optimal allocation of resources. Lastly, as industries grow and new opportunities arise, trade globalization plays a significant role in diversifying economic activities, facilitating job creation, reducing unemployment rates, and improving overall livelihoods.

c. Manufacturing Sector

Arthur Lewis, a Nobel laureate, articulated his Structural-change theory, which describes how underdeveloped economies transition from an agriculture-based foundation to a focus on

industrial manufacturing and a service economy. This theory highlights a significant transformation in the industrial composition of any economy (Todaro & Smith, 2011). At its core, manufacturing involves the conversion of raw materials into finished consumer goods or producer goods. Obioma, Kalu, and Anyanwu (2015) further explored the relationship between manufacturing and economic growth, underscoring that manufacturing not only creates jobs but also supports agricultural development. They defined manufacturing as “the application of modern technology, equipment, and machinery for the production of goods and services, alleviating human suffering and ensuring continuous improvement in welfare.” In essence, manufacturing involves the production of merchandise for use or sale, utilizing labor, machines, tools, and various processing techniques. The manufacturing sector encompasses those segments of the economy where investors produce goods aimed at either satisfying domestic market consumption or serving as inputs for other manufacturing and agricultural activities.

d. Performance of the Manufacturing Sector in Nigeria

The performance of the manufacturing sector in Nigeria has drawn considerable attention due to its crucial role in promoting economic development and diversification. Over the years, Nigeria's manufacturing sector has experienced various phases, starting from the post-independence industrialization push in the 1960s and 1970s, to a notable decline in the 1980s and 1990s, largely attributed to economic mismanagement and political instability. The introduction of the Structural Adjustment Program (SAP) in 1986 aimed to revitalize the sector by liberalizing the economy. However, the program also contributed to deindustrialization as a result of its stringent economic measures.

Currently, the manufacturing sector accounts for roughly 10% of Nigeria's Gross Domestic Product (GDP), according to the Nigeria National Bureau of Statistics (NBS). This contribution is relatively modest when compared to other emerging economies where the manufacturing sector plays a more substantial role. Although manufacturing output in Nigeria has witnessed some growth in recent years, this growth has not been proportional to the nation's potential and population size. The growth rate in the sector has been inconsistent, often swayed by broader economic factors such as oil price fluctuations and changes in exchange rates. Moreover, the manufacturing sector remains a vital source of employment, providing jobs for millions of Nigerians. However, employment levels are still below potential due to underperformance and systemic challenges, including insufficient infrastructure and inconsistent policies. The Central Bank of Nigeria (CBN) has also reported that capacity utilization in the Nigerian manufacturing sector has historically been low, typically ranging between 50-60%. This suggests that many manufacturing enterprises are not operating at their optimum capacity, a situation that can be linked to a variety of operational and external constraints.

Empirical Literature

Cookey (2023) investigated the relationship between globalization and the development of the manufacturing sector in Nigeria. The study utilized an ex-post experimental research design, focusing on annual time series data from 1986 to 2019. The research defined several globalization variables, including the overall globalization index, economic globalization index, trade openness, and foreign direct investment (FDI), while using the manufacturing sector's output contribution to GDP as a proxy for manufacturing sector development. The findings from the unit root test indicated that all variables, except for FDI, were integrated of order 1 ($I(1)$), with FDI classified as $I(0)$. The bounds cointegration test confirmed a stable long-run relationship among the variables. However, the Autoregressive Distributed Lag (ARDL) model estimates demonstrated that overall globalization, economic globalization, trade openness, and variations in the exchange rate negatively and significantly impacted manufacturing output growth in the long run. FDI, although positive, had an insignificant effect on manufacturing sector development during the analysis period. In a related study, Agu, Onah, and Okoroafor (2022) examined the impact of globalization on the Nigerian manufacturing sector using the ARDL and Error Correction Model (ECM) to analyze long- and short-run effects on manufacturing value added. Their data, sourced from the KOF Swiss Economic Institute and World Bank Development Indicators (WDI), spanned from 1981 to 2020. The results indicated a positive relationship between globalization and manufacturing value added in Nigeria, both in the short and long run, although the findings were not statistically significant. Despite the positive impact of globalization on the Nigerian economy, they noted that improvements were necessary, especially concerning infrastructural development, which is negatively related to manufacturing value added. Additionally, Imandojemu, Akinlosotu, and Aina (2021) explored the broader impact of globalization on the Nigerian economy, specifically assessing the effects of FDI, exchange rate, external debt, and balance of payment on economic growth measured by gross domestic product per capita (GDPPC). The study employed the Ordinary Least Squares (OLS) technique to evaluate the relationships between variables using secondary annual time series data collected from the Central Bank of Nigeria's Statistical Bulletin for 2019. Their results revealed that the exchange rate and balance of trade positively correlated with GDP per capita, while external debt exhibited an inverse relationship. The coefficient of determination (R^2) indicated that FDI, exchange rate, external debt, balance of trade, and net official development assistance accounted for 88.5% of the changes in GDP per capita in Nigeria.

Omoke and Opuala–Charles (2021) examined the relationship between trade openness and economic growth in Nigeria, focusing on the role of institutional quality. Their study covered the period from 1984 to 2017 and utilized three indicators of trade openness: total trade, import trade, and export trade. They employed the ARDL bounds testing approach to examine cointegration among the variables. The findings revealed a long-run relationship, indicating that while export trade positively impacts economic growth, import trade has a significant negative effect.

Moreover, the adverse long-run effects of import trade on economic growth diminish as institutional quality improves.

Idoko and Silas (2020) explored the connection between globalization and economic development in Nigeria, utilizing data sourced from the Central Bank of Nigeria (CBN) statistical bulletin and the World Bank database (2018). Their analysis combined cointegration and OLS techniques, revealing that foreign direct investment (FDI) plays a critical role in globalization and significantly impacts Nigeria's economic development. However, both trade openness and financial openness showed an inverse relationship with economic development. Although the cointegration analysis indicated a long-run relationship between globalization and economic development, the overall results suggested that Nigeria has yet to fully benefit from the globalization process.

Ozigbu (2019) investigated the short-term and long-term empirical relationship between net exports and exchange rate variation in Nigeria, utilizing an error correction model (ECM) and Fully-Modified Least Squares (FM-OLS) for the period from 1986 to 2017. The study also analyzed the impacts of trade openness and tariffs on net exports. Before model estimation, unit root tests using the Phillips-Perron method indicated that the series were stationary at first difference. The cointegration test results showed long-run relationships among the non-stationary series. The ECM analysis indicated significant short-run impacts on net exports, with an error correction coefficient suggesting that short-run disequilibrium could be corrected at 53.47% to achieve long-run equilibrium. The estimated model further revealed a significantly positive impact of the nominal effective exchange rate on net exports in the long run.

Odebode and Aras (2019) assessed the impact of globalization on manufacturing output in Nigeria using structural vector autoregressive (SVAR) methods from 2010Q1 to 2018Q4. Their findings demonstrated that manufacturing output and transportation significantly responded to foreign shocks resulting from globalization, with manufacturing output negatively impacted by exchange rate fluctuations, underscoring the exchange rate's importance to the sector.

George-Anokwuru (2018) analyzed the effect of trade globalization on the performance of Nigeria's manufacturing sector from 1981 to 2016. This study examined the relationship between imports, exports, foreign direct investment, and gross domestic product (GDP). The bounds cointegration tests and ARDL model revealed that imports negatively affect GDP but significantly impact growth, while exports positively and significantly contribute to GDP growth by 10.98%. Conversely, foreign direct investment was found to negatively influence GDP, suggesting its ineffectiveness in driving actual growth in Nigeria.

Maduka, Madichie, and Eze (2017) employed contemporary econometric techniques of cointegration and error correction mechanisms within an ARDL framework to evaluate the impact of globalization on economic growth in Nigeria using data from 1970 to 2015. Their results

indicated that trade openness, financial integration, and foreign direct investment have significant positive effects on economic growth. The study calls for mechanisms to ensure globalization contributes to achieving the desired economic growth rate.

Agu, Nnaemeka, and Nneka (2016) studied the impact of globalization on Nigeria's manufacturing sector, employing a sample size of 246 derived from a population of 640, using the Taro Yamane Formula at 5% error tolerance and 95% level of confidence. Data was collected through questionnaires and interviews. They adopted a descriptive research design and tested three hypotheses using linear regression. The findings revealed that trade liberalization significantly negatively affects the consumption of domestically made products, while technology positively impacts product quality in the Nigerian manufacturing sector. Furthermore, globalization significantly enhances employee job relations in the industry. The study concluded that globalization acts as a double-edged sword, both promoting and undermining economic activities in developing nations.

Literature Gap

After conducting a thorough conceptual and empirical review of relevant literature regarding trade globalization and its impact on the manufacturing sector in Nigeria, it became evident that the relationship between globalization and economic growth is a well-established topic. However, the specifics of how this relationship manifests are still hotly debated in academic circles, particularly in empirical studies. Notably, there is a dearth of empirical research specifically focusing on the effects of trade globalization on the performance of Nigeria's manufacturing sector. Moreover, the few existing studies have produced conflicting results, highlighting a lack of consensus in this area. In light of these gaps and challenges, this study sets out to examine the impact of trade globalization on the performance of the manufacturing sector in Nigeria over a thirty-eight-year period, from 1985 to 2022. By addressing these issues, the study aims to contribute valuable insights to the ongoing discourse on the subject.

Methodology

Research Design

This study employed an ex-post facto research design, which is grounded in facts or events that have already occurred. This approach utilizes investigation and basic principles of inquiry similar to those seen in experimental methods.

Data Collection and Sources

This study utilized annual time series data obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin as well as the World Development Indicators (WDI) of the World Bank. The data encompasses a span of thirty-eight years, from 1985 to 2022.

Model Specification

This study employed a multiple regression model to show the relationship that exists between the independent variables (trade globalization) and the dependent variable (performance of the manufacturing sector), using StataNow 19.5 statistical package.

To show the functional relationship, the model can be written as;

$$MGDP = f(\text{TON}, \text{FDI}, \text{ODA}, \text{FER}) \quad (1)$$

To show the linear mathematical relationship, the model can be written as;

$$MGDP = \alpha_0 + \alpha_1\text{TON} + \alpha_2\text{FDI} + \alpha_3\text{ODA} + \alpha_4\text{FER} \quad (2)$$

Including the stochastic or error term (ε_t) in our econometric model, our model becomes;

$$MGDP = \alpha_0 + \alpha_1\text{TON} + \alpha_2\text{FDI} + \alpha_3\text{ODA} + \alpha_4\text{FER} + \varepsilon_t \quad (3)$$

Transforming the econometric model into log-linear form gives:

$$\ln MGDP = \alpha_0 + \alpha_1 \ln \text{TON} + \alpha_2 \ln \text{FDI} + \alpha_3 \ln \text{ODA} + \alpha_4 \ln \text{FER} + \varepsilon_t \quad (4)$$

Where:

MGDP = Manufacturing Sector Gross Domestic Product as a percentage of Gross Domestic Product (GDP), TON = Trade openness, FDI = Foreign direct investment as a percentage of GDP, ODA = Official development assistance as a percentage of GDP, FER = Foreign exchange rate, α_0 = Constant variable in the model, α_1 = Coefficient of trade openness, α_2 = Coefficient of foreign direct investment, α_3 = Coefficient of official development assistance, α_4 = Coefficient of foreign exchange rate, ε_t = Disturbance or error term

The Autoregressive Distributed Lag (ARDL) model specifications of the above models are given as;

$$\begin{aligned}
\Delta \ln(MGDP_t) = & \delta_1 + \alpha_{1i} \Delta \ln(MGDP_{t-1}) + \alpha_{2i} \Delta \ln(TON_{t-1}) + \alpha_{3i} \Delta \ln(FDI_{t-1}) \\
& + \alpha_{4i} \Delta \ln(ODA_{t-1}) + \alpha_{5i} \Delta \ln(FER_{t-1}) + \sum_{t=1}^p \beta_{1i} \Delta 1n(MGDP_{t-1}) \\
& + \sum_{t=1}^q \beta_{2i} \Delta 1n(TON_{t-1}) + \sum_{t=1}^q \beta_{3i} \Delta 1n(FDI_{t-1}) \\
& + \sum_{t=1}^q \beta_{4i} \Delta 1n(ODA_{t-1}) + \sum_{t=1}^q \beta_{5i} \Delta 1n(FER_{t-1}) + \varepsilon_{1i}
\end{aligned}$$

Furthermore, the short run dynamic parameters are arrived at by the estimation of an error correction model linked with the long-run estimates. The model is stated below:

$$\begin{aligned}
\Delta \ln(MGDP_t) = & \beta_0 + \sum_{t=1}^p \alpha_{1i} \Delta 1n(MGDP_{t-1}) + \sum_{t=1}^q \beta_{2i} \Delta 1n(TON_{t-1}) \\
& + \sum_{t=1}^q \beta_{3i} \Delta 1n(FDI_{t-1}) + \sum_{t=1}^q \beta_{4i} \Delta 1n(ODA_{t-1}) \\
& + \sum_{t=1}^q \beta_{5i} \Delta 1n(FER_{t-1}) + \delta ECMT_{t-1} + \varepsilon_{1i} \quad (6)
\end{aligned}$$

Where:

In = natural log; Δ = the difference operator and p = the optimum lag of the dependent variable; q = the optimum lags of the independent variables; t = time lag; δ_1 = constant variable; $\alpha_1 - \alpha_5$ = long-run dynamic coefficients of the model; $\beta_1 - \beta_5$ = short-run dynamic coefficients of the model; ε_{1i} = serially uncorrelated stochastic term with zero mean and constant variance.

Variables Explanation and A Priori Expectation

Operationally, the variables of this study are classified into dependent and independent variables. The performance of the manufacturing sector is identified as the dependent variable, measured by the manufacturing sector's GDP as a percentage of overall GDP. On the other hand, trade globalization serves as the independent variable in this study. For this research, globalization is proxied by several indicators: trade openness as a percentage of GDP, foreign direct investment as a percentage of GDP, official development assistance as a percentage of GDP, and the foreign exchange rate:

Manufacturing Sector GDP (MGDP) (Dependent Variable)

MGDP refers to the monetary value of the final output of goods and services generated by the manufacturing sector in an economy. It is expressed as a percentage of the total Gross Domestic Product (GDP) for a specified period, typically measured annually. This metric provides insight into the significance of the manufacturing sector's contribution to the overall economy.

Trade Openness (Independent Variable)

Trade openness refers to the degree to which a country engages in international trade and permits the exchange of goods and services across its borders. It serves as a measure of how integrated a nation is within the global economy, reflecting the flow of goods, services, labor, and capital with other countries. Typically, the level of trade openness is evaluated through the ratio of a country's total trade (the sum of exports and imports) to its Gross Domestic Product (GDP). It is generally anticipated that a higher degree of trade openness will have a positive impact on the GDP of the manufacturing sector, which can be expressed mathematically as: $\beta_1 > 0$.

Foreign Direct Investment (FDI) (Independent Variable)

FDI is defined as the value of investments made by individuals, businesses, or governments from one country into business interests located in another country, expressed as a percentage of GDP. In the context of FDI, the investor typically acquires a significant ownership stake in a foreign enterprise, aiming to gain substantial influence and control over the operations of that business. This aspect of FDI sets it apart from other forms of investment, such as portfolio investment, where investors purchase stocks or bonds without seeking to influence the management of the company. It is generally believed that foreign direct investment has a positive impact on the GDP of the manufacturing sector, which can be expressed mathematically as $\beta_2 > 0$.

Official Development Assistance (ODA) (Independent Variable)

ODA is crucial for fostering growth in developing countries. It refers to financial aid provided by governments, typically through their official development agencies or international organizations, aimed at enhancing the economic and social conditions in these nations. However, official development assistance is expected to have a positive effect on the manufacturing sector GDP. This is mathematically stated as: $\beta_3 > 0$.

Foreign Exchange Rate (FER) (Independent Variable)

The exchange rate represents the value at which one currency can be exchanged for another. It's commonly understood that fluctuations in the exchange rate can significantly influence economic sectors, including manufacturing. When the exchange rate increases, meaning the currency strengthens, it can lead to more expensive exports, which may hurt the manufacturing sector by reducing demand for domestically produced goods abroad. This relationship can be mathematically expressed as $\beta_4 < 0$, indicating that changes in the exchange rate have a negative impact on the GDP of the manufacturing sector.

Data Analysis Technique

For this study, the ARDL bounds cointegration test was employed to determine the existence of cointegration among the proxies of the dependent variable and the proxies of the independent variables. According to Pesaran, Shin, and Smith (2001), the bounds cointegration test can be used to test for cointegration in a mixture of variables of order $I(0)$ and $I(1)$. Furthermore, long-run and short-run estimations were conducted using the Autoregressive Distributed Lag (ARDL) technique. The ARDL approach is a popular econometric method used to model the relationship between a dependent variable and one or more independent variables, both in the short and long run. This technique is particularly useful in this study since all the variables in the model are integrated at different orders, with some variables stationary at level $I(0)$ and others stationary at first difference $I(1)$.

Data Analysis and Discussion of Findings

Descriptive Analysis

The descriptive statistics for the study variables are summarized in Table 1.

Table 1: Descriptive Statistics

	MGDP	TON	FDI	ODA	FER
Mean	13.71288	31.38562	2.524635	11.43018	128.6550
Maximum	21.05627	55.02100	5.504199	58.29916	456.7600
Minimum	6.451563	7.521000	0.228930	1.237887	0.890000
Std. Dev.	4.862545	10.29577	1.477666	14.43018	121.0976
Observations	38	38	38	38	38

The descriptive statistics presented in Table 1 indicate that the Manufacturing Mean Gross Domestic Product (MGDP) over the thirty-eight years of this study has an average rate of 13.71288 percent, with a maximum value of 21.05627 percent and a minimum of 6.451563 percent. The standard deviation is reported at 4.862563 percent per annum, suggesting that MGDP exhibits a high to moderate deviation from its mean. For trade openness (TON), the data show a mean of 31.3 percent, a maximum of 55.0 percent, and a minimum of 7.5 percent, accompanied by a standard deviation of 10.29 percent per annum. This indicates a high level of dispersion in the TON figures.

In terms of Foreign Direct Investment (FDI), the mean over the analysis period stands at 2.524635 percent, with a maximum of 5.504199 percent and a minimum of 0.2289304 percent, leading to a standard deviation of 1.477666 percent per annum. This reflects a low dispersion from the mean for FDI. Official Development Assistance (ODA) shows a mean of 11.43018 percent, a maximum of 58.29916 percent, and a minimum of 1.237887 percent, along with a standard deviation of 14.43018 percent, indicating a low deviation from the mean. Finally, the Foreign Exchange Reserves (FER) recorded a mean of 128.655, with a maximum of 456.76 and a minimum of 0.89 percent. The standard deviation is 121.0976, revealing a low deviation from the mean for FER.

Unit Root Test

To avoid the problem of spurious regression, the series were subjected to a stationarity test using the Augmented Dickey Fuller (ADF) statistic. The results of the unit root test are presented in Table 2 below.

Table 2: Augmented Dickey-Fuller (ADF) Test Results

Variables	Levels		First Difference		Stationarity	Order of Integration
	ADF Test Statistics	5% Critical Value	ADF Test Statistics	5% Critical Value		
InMGDP	-1.356	-2.966	-4.950*	-2.969	1 st Difference	I(1)
TON	-3.264*	-2.966	-	-	Level	I(0)
InFDI	-3.384*	-2.966	-	-	Level	I(0)
InODA	-1.763	-2.966	-3.450*	-2.966	1 st Difference	I(1)
InFER	-4.923*	-2.969	-	-	Level	I(1)

*Note: (a) * implies stationarity at 5% level of significance; (b) Decisions are based on absolute values.*

The results of the Augmented Dickey-Fuller (ADF) unit root test are displayed in Table 2. The findings indicate that all variables, except for TON, underwent a first log transformation, resulting in TON, FDI, and FER achieving stationarity at levels, meaning these time series are

integrated of order zero, denoted as $I(0)$. On the other hand, MGD_P and ODA were found to be stationary only after taking the first difference, indicating that they are integrated of order one, or $I(1)$. This mixed order of integration among the time series highlighted the appropriate choice for conducting a cointegration test, specifically the Bounds cointegration test, as well as the use of the Autoregressive Distributed Lag model estimation technique.

Table 3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	HQIC	SBIC
0	-177.836	NA	0.044676	11.081	11.1573	11.3077
1	-94.1943	167.28	0.001304	7.52693	7.98468	8.88739*
2	-73.841	40.707	0.001933	7.80855	8.64776	10.3027
3	-37.3513	72.98	0.001317	7.1122	8.33287	10.7401
4	32.185	139.07*	0.000181*	4.41303*	6.01517*	9.17464

The lag selection criteria presented in Table 3 suggest that the majority of the criteria indicate a lag of 4 as the optimal choice. This selection serves as the foundation for the further analyses conducted in this research.

ARDL Bound Cointegration Test

Table 4: ARDL Bounds Cointegration Test

Significance	Lower Bound I [0]	Upper Bound I[1]	F-statistics K = 4
10%	2.45	3.52	
5%	2.86	4.01	7.832*
2.5%	3.25	4.49	
1%	3.74	5.06	

*Note: * implies that the F-statistic is greater than the upper bound 5% critical value and long run exists between the variables in the model.*

The ARDL bounds test results in Table 4 indicate a long-run relationship among the variables in the manufacturing sector Gross Domestic Product model. The computed F-statistic of 7.832 exceeds the upper bound critical value of 4.01 at the 5% significance level. This finding allows us to reject the null hypothesis of no co-integration for the manufacturing sector Gross Domestic Product model at a 5% significance level. Consequently, it can be concluded that there is indeed a long-run relationship among the variables in this model, which include the manufacturing sector Gross Domestic Product, trade openness, foreign direct investment, official development assistance, and foreign exchange rate. After establishing long-run co-integration among these

variables, the ARDL long-run and short-run models for the manufacturing sector Gross Domestic Product were derived.

Autoregressive Distributive Lag (ARDL) Long-Run and Short-Run Dynamics

The long-run and short-run dynamic relationship between trade globalization and the performance of the manufacturing sector in Nigeria was estimated using the ARDL method. The results are presented in Table 5.

Table 5: Results of the Estimated Long-Run and Short-Run ARDL MGDP Model

Dependent Variable = D_InMGDP				
Long-Run Results				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
TON	-0.0110396	0.0017721	-6.23	0.0001
InFDI	0.05489610	0.0340178	1.61	0.1380
D_InODA	-0.2475231	0.0682829	-3.62	0.0050
InFER	-0.0027700	0.0125884	-0.22	0.8300
Short-Run Results				
D_(TON)	0.0047331	0.0021333	2.22	0.0510
D_In(FDI(-2))	0.2192295	0.0683703	3.21	0.0090
D_In(ODA)	0.2674289	0.0582609	4.59	0.0010
D_In(FER(-3))	-0.0996831	0.0594526	-1.68	0.1250
CointEq(-1)*	1.3624810	0.267018	-5.10	0.0001
No. of Obs. = 33				
R-squared = 0.9261				
Adjusted R ² = 0.7636				
Durbin-Watson stat (<i>d</i> -statistic) = 1.963676				

Interpretation of Long-Run and Short-Run ARDL Coefficient

1. Trade Openness (TON) and Manufacturing Sector Gross Domestic Product (MGDP)

The long-run estimates from the ARDL model presented in Table 5 indicate a negative and significant relationship between trade openness and the manufacturing sector Gross Domestic Product (MGDP) in Nigeria. This finding contradicts the initial assumption of this study regarding the relationship between these variables. Specifically, the negative coefficient of -0.0110396, coupled with a p-value of 0.0001 (which is less than the 0.05 threshold), signifies that an increase in trade openness is associated with a decrease of 0.0110396 in MGDP over the long term. In contrast, the short-run estimates show a positive and significant relationship between trade

openness and MGDP, aligning with the study's initial assumption. The coefficient for trade openness in the short run is recorded at 0.0047331, with a p-value of 0.0510, which indicates that an increase in trade openness results in a 0.0047331 increase in MGDP in the short term.

2. Foreign Direct Investment (FDI) and Manufacturing Sector Gross Domestic Product (MGDP)

The results of the long-run estimates of the model indicate a positive but insignificant relationship between foreign direct investment (FDI) and the manufacturing sector Gross Domestic Product (MGDP) in Nigeria. This is highlighted by a positive coefficient value of 0.05489610, accompanied by a p-value of 0.1380. Conversely, the short-run analysis reveals a positive and significant relationship between FDI and MGDP. This aligns with the assumptions of this study, suggesting that an increase in foreign direct investment correlates with a 0.2192295 increase in MGDP, supported by a p-value of 0.0090. Consequently, a percentage increase in foreign direct investment is expected to lead to a 0.2192295 increase in MGDP in the short run.

3. Official Development Assistance (ODA) and Manufacturing Sector Gross Domestic Product (MGDP)

The analysis of the long-run estimates from the model indicates a significant and negative relationship between official development assistance (ODA) and manufacturing gross domestic product (MGDP). The coefficient for ODA is -0.2475231, accompanied by a p-value of 0.0050, suggesting that this finding contradicts the initial assumption of the study. Specifically, it implies that a one percent increase in official development assistance correlates with a 0.2475231 decrease in MGDP. On the contrary, the short-run results show a positive and significant relationship between ODA and MGDP. With a coefficient of 0.2674289 and a p-value of 0.0010, these findings align with the study's assumptions. In the short run, official development assistance appears to contribute positively to the growth of Nigeria's manufacturing sector.

4. Foreign Exchange Rate (FER) and Manufacturing Sector Gross Domestic Product (MGDP)

The model estimates indicated that there are negative and statistically insignificant relationships between the foreign exchange rate and MGDP, both in the long and short terms. This analysis suggests that the foreign exchange rate does not have an impact on MGDP during the analysis period, assuming all other factors remain constant.

Interpretation of CointEq(-1) Result

The results of the short-run dynamic coefficients associated with the long-run relationships obtained from the error correction model are detailed in Table 5. The signs of the short-run

dynamic interactions align with those of the long-run relationship. Notably, the estimated error correction coefficient is -1.362481, accompanied by a p-value of 0.0001, indicating the correct sign and a very high speed of adjustment to equilibrium following a shock. This suggests that any disequilibria caused by the previous year's shock were converged back to the long-run equilibrium at an impressive rate of 136 percent in the current year.

Interpretation of Adjusted R-Squared (Adj. R²) and Durbin-Watson (d-statistic) Values

The Adjusted R-squared value of 0.7636 from the short-run estimates of the ARDL model presented in Table 5 suggests that the model is well-fitted. This means that approximately 76 percent of the variation in the MGDGP can be explained by the systematic changes in the explanatory variables, which include trade openness, foreign direct investment, official development assistance, and foreign exchange rate. The remaining 24 percent of the variation is attributed to other factors not included in the model. Additionally, the Durbin-Watson Statistic value of 1.963676 is close to the recommended value of 2 (Gujarati, 2004). This indicates that there is no significant autocorrelation present in the residuals of the model. It is common practice to report the Durbin-Watson Statistic alongside the Adjusted R-squared, F statistics, or t statistics to provide a more comprehensive view of the model's performance.

Post-Estimation Tests

The results of the post-estimation tests are presented and discussed below in Table 6.

Table 6: Post-Estimation Test Results

Test	Null Hypothesis	Test Type	Chi-Square	Prob.
Normality Test	Normal distribution exists	Jarque-Bera Test	1.294000	0.5237
Serial Correlation Test	Serial correlation does not exist	Breusch-Godfrey Test	LM 0.002100	0.9651
Heteroscedasticity Test	Homoscedasticity exists	Breusch-Pagan-Godfrey	2.040000	0.1528
Functional Form Test	Estimated model is stable	Ramsey RESET	0.960000	0.4231

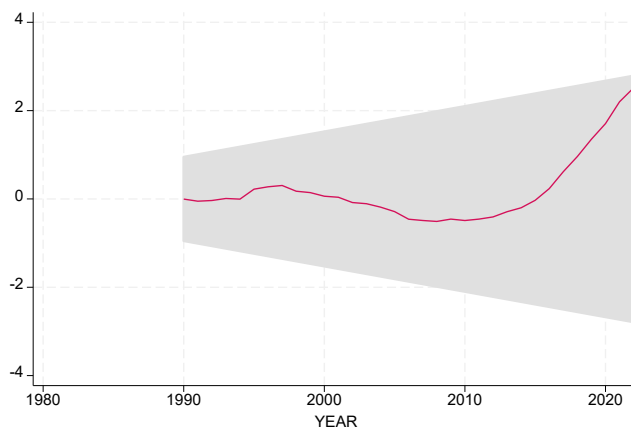
Source: Authors' Computation, 2026.

The results of various statistical tests provide insights into the quality and reliability of the model. The Jarque-Bera test indicates a probability value of 0.5237, which exceeds the 0.05 significance level. This suggests that we cannot reject the null hypothesis of normal distribution, leading us to accept that the model is normally distributed. Next, the Breusch-Godfrey Serial Correlation LM test yields a probability value of 0.9651, also greater than the 0.05 significance

level. This result implies that the null hypothesis of no serial correlation cannot be rejected, allowing us to conclude that there is no serial correlation problem present in the model.

Furthermore, the Breusch-Pagan-Godfrey heteroskedasticity test reveals a probability value of 0.1528, again above the 0.05 threshold. This finding indicates that we cannot reject the null hypothesis of homoscedasticity, suggesting that the model maintains homoscedasticity and that relevant variables were likely included. Lastly, the Ramsey RESET test shows a probability value of 0.4231, which also exceeds the significance level of 0.05. This suggests that we cannot reject the null hypothesis regarding correct specification, supporting the conclusion that the model is correctly specified, and confirming that its functional form is appropriate.

Figure 1: Stability [Cusum Test](#)



Source: Authors' Composition 2026

The cumulative sum (CUSUM) analysis reveals that the CUSUM line remained within the 5 percent critical bound, indicating it did not cross the critical bound lines. This suggests that the coefficients of the variables demonstrate stability both in the long run and the short run.

Discussion of Findings

From the data analysis, it is clear that as trade openness increases between Nigeria and its trading partners, the manufacturing sector's Gross Domestic Product (MGDP) in Nigeria experiences a rise in the short run, but a decline in the long run. This suggests that initially, trade openness boosts production capacities for the Nigerian manufacturing sector, allowing for potentially greater exports, all else being equal. This outcome aligns with previous studies on trade openness and manufacturing performance in both Malaysia and Nigeria (Sun and Tian, 2021; Agu, Nnaemeka, and Nneka, 2016).

However, the positive impacts observed in the short run are not sustained over time. Eventually, the MGDG begins to experience negative growth due to trade openness. Yan et al. (2021) similarly found that trade openness and innovation negatively affected the equipment manufacturing industry in China. The significant impact of trade openness on Nigeria's manufacturing sector can be attributed to various theories, including the notion that the sector lacks the absorptive capacity to effectively compete with the influx of foreign goods; that anticipated technical spillovers from trade are not realized; that trade agreements with partner countries are not adequately enforced; or that a dominant and aggressive foreign presence in the market hampers the Nigerian firms' ability to penetrate international markets.

In addition, Foreign Direct Investment (FDI) has a positive and significant influence on MGDG in Nigeria within the short run, but this effect is negligible in the long run. This finding aligns with research by Ding, Aliyu, and Umar (2025), which indicates that FDI has a slight promoting effect on industrialization in Africa. Similarly, while Official Development Assistance (ODA) positively impacts MGDG in the short run, its beneficial effects diminish significantly in the long run. This indicates that the initial positive effects of ODA on the manufacturing sector are fleeting.

Finally, the analysis revealed that foreign exchange rates do not significantly affect MGDG in either time frame. This leads to the conclusion that foreign exchange rates were not a primary factor influencing the performance of the manufacturing sector during the period of this study.

Conclusion and Recommendations

Conclusion

This study has determined the effect of trade globalization on the performance of the manufacturing sector in Nigeria from 1985 to 2022. The results showed that, except for foreign direct investment (FDI), which only positively impacted the Manufacturing Gross Domestic Product (MGDP) in the short run, both trade openness and official development assistance (ODA) have mixed influences on the MGDG in Nigeria. Therefore, we conclude that trade globalization has a mixed impact on the performance of the manufacturing sector in Nigeria.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. Government and policymakers in Nigeria should review current trade policies and address negative influences affecting the growth of the manufacturing sector. This includes formulating trade policies and agreements that enhance the local manufacturing sector's ability to compete against foreign products.
2. The government should aim to equalize the inflows and outflows of manufacturing goods between Nigeria and its trading partners by promoting the manufacturing goods in which

the Nigerian sector specializes. This strategy can help increase supplies in both local and international markets.

3. The government should assess and rectify the weaknesses in policies related to foreign direct investments in Nigeria. While FDI can be beneficial, its impacts may be temporary. Therefore, it is important to address negative perceptions about Nigeria that discourage long-term investments. Ensuring reliable returns on investments, improving security for life and properties, maintaining political stability, establishing an independent judiciary, prioritizing infrastructural development, and clarifying tax regulations will help build investor confidence.
4. The government should develop a long-term strategy for directing ODA intended for the manufacturing sector towards more productive uses. This process should involve manufacturing experts during policy formulation, decision-making, and implementation to ensure favorable outcomes.

In conclusion, implementing these recommendations, coupled with ongoing reviews by policymakers and experts, will yield positive changes and potentially reverse the long-term negative impacts of trade globalization on the MGDP in Nigeria.

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