EXTERNAL SECTOR AND INDUSTRIAL PERFORMANCE IN NIGERIA

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Abstract
This study determines the effect of external sector on industrial performance in Nigeria. A data period of 1985 to 2023 is considered. The industrial performance in Nigeria is examined using manufacturing sector gross domestic product as the indicator, with exchange rate, net export, foreign direct investment, external debt, and degree of trade openness employed as fundamentals of the external sector. Relevant yearly secondary data were gathered from the Statistical bulletins of the Central Bank of Nigeria (CBN) and reports from the National Bureau of Statistics (NBS). The data analysis process was conducted using the techniques of Augmented Dickey-Fuller (ADF) unit root test, bounds co-integration test, and Autoregressive Distributive Lag (ARDL) approach. The unit root test yielded a mixture of I(0) and I(1) orders of integration, and the bounds co-integration test exhibited long run association among the variables. The ARDL estimates revealed that exchange rate substantially and inversely influenced manufacturing performance. Conversely, the degree of trade openness and foreign direct investment had substantial and driving impact on the manufacturing sector. In the short and long-term, the outcome of external debt and net exports are both positive but not significant. Thus, it is necessarily concluded that industrial performance through the lens of manufacturing sector's domestic output in Nigeria is substantially influenced by the selected external sector variables. The Nigerian government should implement policies to stabilise the exchange rate and reduce volatility which adversely affects industrial production costs, encourage foreign direct investment inflows, and utilise external debt to provide production enablers, among other recommendations.
Keywords*: External Sector Fundamentals, Industrial Performance, Manufacturing GDP, Autoregressive Distributed Lag, Nigeria.*

Introduction

Industrial sector is the lifeblood of every thriving economy. This is because, as Ayeyemi (2020) points out, it is the industrial sector that facilitates the production of services and commodities exported to other

nations. The sector is basically concerned with the making of products by means of manufacturing processes that make utilisation of raw materials in conjunction with other production elements like labour, land, and capital. There are various ways in which the industrial sector excels in developed nations. Import replacement and export growth productivity, foreign exchange earning capacity, employment, and per capita income all rise along this path, leading to distinctive consumption patterns. The industrial sector not only produces capital for investment at a rate no other sector does, but it also promotes more wide and efficient relationships across other economic sectors (Anyanwu, 2010).

Capital formation occurs when the production of services and commodities in the industrial sector upsurges through mass production, better utilisation of materials, and skilled labour. This, in turn, boosts the economic performance of the nation. Because of this, the economy is able to attract international investors and provide job possibilities, which ultimately leads to a decrease in the unemployment rate and rise in the nation's foreign earnings from the sale of commodities overseas. Okuneye (2019) predicts that this would improve manufacturing sector performance and, in the long-term, considerably open the economy for growth. To be sure, inputs are necessary for the production of services and commodities in every industry in Nigeria, and the vast majority of these inputs come from outside the nation. So, input costs, total production, and industrial development are all domestic economic fundamentals that the external sector is likely to influence. Whether a nation is a developed or developing economy, the external sector is an essential component of economic growth and development (Akidi, Tubotamuno, and Obayori, 2018). This is due to the fact that a nation's economic transactions with other nations form a network known as the external sector. It is a reflection of the monetary dealings between a nation's citizens and the rest of the globe.

Stability and equilibrium in an ideal external sector over time would boost industrial sector output and guarantee a nation's long-term economic growth. Therefore, for any open economy to thrive and remain stable, the external sector must operate at peak efficiency. There are two possible states for the external sector: stability and instability, with deficits and surpluses respectively. When the quantity of money coming in from the sector's activity is precisely equal to the amount going out, we say that the economy is in a stable and balanced equilibrium (Gbosi, 2015). Consistent with the foregoing, Obadan and Okojie (2020) noted that, without access to global markets through the external sector, Nigeria's sizable domestic market can only sustain growth at lower rates than what is required to have a discernible sway on the development of all areas of the nation. Key indicators of the external sector comprise the balance of payments (BOP) accounts, exchange rate, foreign debt, external reserve, and export, in line with Nteegah and Oladosu (2022). Among other metrics, we find: FDI, foreign portfolio investment, imports, and foreign legal tender profits. Each of these indicators has some bearing on the state of Nigeria's industrial sector; more especially, the strength and stability of the nation's exchange rate system, which is a key external sector factor, dictates the upshots of international trade and, by extension, the state of the industrial sector.

The foreign market value of Nigerian commodities goes up when the naira goes up and down. Trade is inherently risky due to

the unpredictable nature of currency rates, which drives up or drives down the cost of exportations and importations and impacts industry performance (Olufayo & Fagite, 2024). Exchange rates impact not just the production of services and commodities but also pricing incentives, international confidence, fiscal viability, balance of payments equilibrium, export competitiveness, and industrial sector performance. Because of these and other considerations, the exchange rate is crucial to the success of any nation's economy and its ability to compete in global commerce (Amassoma & Odeniyi, 2016). Imoughele and Ismaila (2015), when looking at net export as a measure of the external sector, one way for oil producing nations like Nigeria—ranking 6th in oil export—to foster industrial development is to diversify their exportations away from oil. In assent with Vincent and Oluchukwu (2020), successive Nigerian administrations on their side have showed attempts over years to promote the non-oil export sector by adopting beneficial policies.

Problem Statement

Industrial sector is indispensable, and the functions it performs are critical to overall economic health. In particular, the industrial sector opens the door to augment productivity by facilitating the substitution of imported goods and the growth of exports. As an upshot, industrial development leads to more jobs, higher per capita income, and the ability to earn foreign legal tender, all of which fuel distinctive spending habits and overall economic expansion. Nevertheless, the performance of Nigerian industry has not improved near its potential despite the implementation of several industrialisation policies by different administrations in the nation. In addition, the industrial sector's contribution to Nigeria's GDP has been pitiful and unremarkable. Additionally, despite the fact that there are foreign investors looking to improve Nigeria's industrial sector's growth prospects, the nation's current industrial outlet is not even close to operating at full capacity, and neither the foreign nor domestic investors' presence nor their beneficial upshot on industrial development have been significant.

Also, most industrial inputs are imported at high cost, which can lead to suboptimal performance in the Nigerian industrial sector (as an consequent of the exchange rate instability), in assent with Aidi, Saidu, and Suleiman (2018). A decline in industrial output is inevitable when manufacturing costs are high since few investors will be willing to invest in the industry. As production declines, more workers would be fired off to minimise cost hence worsening the unsolved enormous unemployment rate issue in Nigeria. Weak raw material base, insufficient technical manpower, political instability, inadequate funding for small industries expansion, and inadequate funds for maintenance of existing industries are some of the factors that contribute to the poor performance of industries in Nigeria. Due to a lack of capital and unfriendly business climate, the nation has been unable to develop its industrial sector to its full potential.

Against this backdrop (identified problem), that this study investigated the outcome of external sector’s effect on industrial performance in Nigeria. This study specifically evaluated the effects of exchange rate, net export, foreign direct investment, external debt and degree of trade openness on industrial performance in Nigeria.

Literature Review

The two-gap theory is adopted in this study. The post-Keynesian two-gap model,

put out by academics Harrod (1939) and Domar (1946), is a framework for economies to flourish. They were the two thinkers who first put forth the model. The main part of the model states that most nations are thought to be underdeveloped because they do not have enough money to save up for investments or because they cannot afford the international commodities and capital that are needed because of currency restrictions. Therefore, the concept presupposes that one must import a non-local commodity in order to manufacture investment items. In this way the model is displayed:

$$Y = C + I + (X - M) \quad (1)$$

where: (X-M) equals to net export.

By rearranging Equation (1), we get:

$$Y + M = C + I + X \quad (2)$$

Consequently, sources of revenue in the economy are equivalent to the utilisation of resources inside the economy.

Equation (2) may be further decomposed into:

$$S + C + M = C + I + X \quad (3)$$

Subtracting C from both sides and defining savings (S= Y-C),

$$S + M = I + X \quad (4)$$

The two-gap model is then represented by:

$$M - X = I - S \quad (5)$$

(Foreign exchange gap) = (Savings gap).

A savings-investment gap exists, in assent with the concept, if the sum of domestic savings is insufficient to attain the desired rate of investment. Furthermore, FDI is necessary to fill this gap; hence, a deficit in foreign legal tender will result from excessive importation if the growth target's maximum import demand is above the maximum export level. This causes a trade deficit, which may be filled by assistance from other nations. Despite making a valid argument, Abdullahi, Aliero, and Addullahi (2013) highlighted the model's limitations, namely that it depends too much on the savings-investment gap to provide growth. It gets around the requirement to fix this transformation problem as it is a model for local economic growth that does not take the borrower's performance in the external sector into account. This theory is relevant to the study since the model incorporates domestic savings to steer the economy towards a target growth rate. It further confirmed that the external sector is crucial to an economy's industrial development, growth, and development trajectory because it can maintain external stability through FDI, foreign exchange, and aid, and it can help close the domestic savings-investment gap.

Empirically**,** Wosu (2024) applied OLS analysis, the co-integration test, and an error correcting method to look at the connection between the rate of exchange, production industry output performance, and external industry factors in Nigeria from 1980 to 2023. This study appraised the outcome of several factors on Nigeria's production industry output performance and found that FDI and FIPI had a beneficial relationship, whereas the rate of exchange and industrial capacity utilisation had an unbeneficial one.

In their 2022 study, Nteegah and Oladosu appraised how the Nigerian manufacturing industry fared compared to the foreign industry. We applied the World Bank's database to get data on trade openness, FDI, foreign debt, and the naira-to-dollar rate of exchange. The Parsimonious Vector ECM method over the studied period (1985–2020), indicated that trade openness and external debt had beneficial effects on Nigeria’s manufacturing industry performance, whereas FDI and rate of exchange had unbeneficial effects.

Fetene (2017) applied an ARDL model to look at four different kinds of industrial

exports. Immediate consequences of a real rate of exchange depreciation on exportations from labour-intensive, low-skill, medium-skill, and technology-intensive sectors are similar to those of the long-term effects. True effective rate of exchange decline hurt exportations that were highly dependent on technology and specialist knowledge, as the numbers show. Consistent with the data, a depreciation of the legal tender also improves export performance in East Africa.

Ugwu (2017) applied multiple regression analysis of the OLS technique to study the outcome of rate of exchange fluctuation on the performance of Nigerian manufacturing firms. The research applied the ADF test to check for stationarity, and the upshots showed that the factors were integrated to an order of one. There is a long-term link between rate of exchange fluctuations and the profitability of Nigerian manufacturing enterprises, in assent with the upshots of the Johansen co-integration test. Onodugo, Marius, and Oluchukwu, (2022) used time series model, applying the Johansen cointegration, they combed through data sets spanning 1981–2019. Upshots demonstrated that non-oil exportations substantially affect production industry development in Nigeria, but to a negligible degree.

Adenugba and Dipo (2021) focused on non-oil exports. The research showed that non-oil exportations have not done likewise hoped, casting doubt on the effectiveness of previous and current export development initiatives. The report accurately pointed out that crude oil exportations are still a major contributor to the Nigerian economy, and the crude oil sub-sector remains the nation's most substantial economic driver.

Adeleke (2019) appraised the nexus between FDI and GDP growth in Nigeria from 1999 to 2013. Primary data for this research came from secondary sources, comprising the Statistical Bulletin, Annual Reports, and Statement of Accounts published by the CBN. The study applied OLS regression analysis as its estimation approach. The upshots showed a clear link between GDP growth and FDI inflows; this link is mathematically substantial at the 5 percent level, suggesting that strong economic performance serves as an attractive signal to FDI providers. This proves that FDI is a growth driver for economies.

Sule (2017) studied the outcome of foreign funding on industrialisation in Nigeria. This research relies on the Dual Gap Model and uses the Johansen Co-integration Test and ECM to analyse its data. The data for external loans, FDI, FIPI, remittances, ODA, and rate of exchange came from the World Development Indicators and the Statistical Bulletin of the CBN. The upshots showed that FDI had a beneficial outcome on industrial production in Nigeria, but that external loans, remittances, foreign portfolio investment, and government development aid had unbeneficial effects on industrialisation.

Umar, Hawwa, Nazeef, and Yahaya (2021) appraised how trade liberalisation affected GDP growth in Nigeria. Over the course of the 1980s–2020s, the following factors were considered: real rate of exchange, degree of trade openness added with import and export serving as independent factors, and GDP as the dependent factor. The research applied the PP unit root test and the ADP. When making estimates, the ARDL bound test was also use. In the long-term, exportations and rate of exchanges had a beneficial and mathematically substantial outcome on economic expansion in Nigeria, but importations had an unbeneficial effect.

Muhammad and Benedict (2018) empirically evaluated the impact of trade openness on economic growth in Nigeria for the period 1981-2017. The ordinary least squares technique was used to examine trade openness on Gross Domestic Product (GDP). The series data were extracted from World Bank data 2017. The result showed that all the variables; Real Gross Domestic Product (RGDP), Degree of Openness (DOP), FX and Per Capita Income (PCI) were positive and statistically significant at first difference, the study found that the variables are cointegrated and unidirectional causality was found from RGDP to DOP.

Methodology

Research Design

In Ihenetu (2008), research design is the blueprint for data collection and analysis. An ex-post facto research strategy was used for the investigation. Systematic empirical inquiry applying factors over which the researcher has no control throughout the investigation is known as an ex-post-facto research strategy (Onwumere, 2009). The researcher may collect, analyse, and evaluate data applying this study methodology to determine how external sector affect industrial performance in Nigeria. Since the events under investigation have already transpired, the researcher applying an ex-post facto research design likewise lacks control over some aspects of the study. Events were already in the past, and the researcher is only attempting to analyse them, therefore the research design is ideal for this study since it considers secondary data time span of 1985 to 2023.

Data Collection Method and Sources

This analysis relied on secondary data, namely temporal data, culled from publications by the National Bureau of Statistics (NBS) and the Central Bank of Nigeria (CBN) in 2023. Additionally, there are thirty-nine (39) years of sample observations in the temporal data, which extends from 1985 to 2023. One of the reasons for picking this time is because comprehensive data is available.

Model Specification

The model for the study is expressed in its functional, mathematical and econometric forms. Expressing the model in its functional form, we have:

$$MGDP = f(EXR, NEX, FDI, EXD, DTO) \quad (6)$$

Transforming equation (6) into a mathematical model, we have:

$$MGDP = \beta_0 + \beta_1 EXR + \beta_2 NEX + \beta_3 FDI + \beta_4 EXD + \beta_5 DTO \quad (7)$$

Transforming equation (7) into an econometric model gives:

$$MGDP = \beta_0 + \beta_1 EXR + \beta_2 NEX + \beta_3 FDI + \beta_4 EXD + \beta_5 DTO + \mu_t \quad (8)$$

Where: MGDP = Manufacturing sector gross domestic product, EXR = Exchange rate, NEX = Net export, FDI = Foreign direct investment, EXD = External debt, DTO = Degree of trade openness, f = Function of, β_0 = Constant term, β_1 = Parameter of exchange rate, β_2 = Parameter of net export, β_3 = Parameter of foreign direct investment, β_4 = Parameter of external debt, β_5 = Parameter of degree of trade openness, μ_t = Disturbance or error term

Data Analysis Technique

The ARDL analytical process by Pesaran and Shin (1999) is employed. The justification for this method is predicated on existence of zero and one mixed orders of integrated in unit root estimates. This estimation approach is considered ideal for short data sample period as well as addresses the issue of endogeneity by allowing for including lags of endogenous and that of the exogenous variables while providing the basis for estimating the long and short run

dynamic relationship between the dependent and independent variables. In other words, the Autoregressive Distributed Lag (ARDL) model is a widely used econometric technique for analyzing the short-run and long-run relationships between variables, particularly in time series data. Unlike traditional cointegration methods (e.g., Johansen or Engle-Granger), ARDL does not require all variables to be integrated of the same order. They can be a mix of I(0) (stationary) and I(1) (non-stationary but first-difference stationary). This flexibility makes the technique particularly useful in empirical economic research. However, if all the variables are stationary at first difference, Error Correction Model technique is usually adopted. The EViews 12 statistical package is utilised to aid the data analysis.

The long-run Autoregressive Distributed Lag (ARDL) model is specified from the earlier models and expressed together with the error correction linked short run dynamic parameters. The model is stated below:

$$\begin{aligned}&\Delta\ln(MGDP_t)\\&= \beta_0 + \beta_{1i}\Delta\ln(MGDP_{t-1}) + \beta_{2i}\Delta\ln(EXR_{t-1})\\&+ \beta_{3i}\Delta\ln(NEX_{t-1}) + \beta_{4i}\Delta\ln(FDI_{t-1})\\&+ \beta_{5i}\Delta\ln(EXD_{t-1}) + \beta_{6i}\Delta\ln(DTO_{t-1})\\&+ \sum_{t=1}^{p}\delta_{1i}\Delta 1n(RGDP_{t-1}) + \sum_{t=1}^{q}\delta_{2i}\Delta 1n(EXR_{t-1})\\&+ \sum_{t=1}^{p}\delta_{3i}\Delta 1n(NEX_{t-1})\\&+ \sum_{t=1}^{q}\delta_{4i}\Delta 1n(FDI_{t-1}) \sum_{t=1}^{q}\delta_{5i}\Delta 1n(EXD_{t-1})\\&+ \sum_{t=1}^{P}\delta_{6i}\Delta 1n(DTO_{t-1}) + \Omega ECMT_{t-1}\\&+ \varepsilon_{1i} \qquad (9)\end{aligned}$$

Where; ln = natural log; Δ = the difference operator and indicates the optimum lag; t = time lag; $\beta_1 - \beta_6$ = long-run dynamic coefficients of the variables; $\delta_1 - \delta_6$ = short-run dynamic coefficients; Ω = coefficient of the error correction term; $ECMT$ = the error correction term; ε_{1i} = serially uncorrelated stochastic term with zero mean and constant variance.

Results and Discussion of Findings

Characteristics Analysis

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

Table 1: Descriptive Statistics

	MGDP	EXR	NEX	FDI	EXD	DTO
Mean	4327.767	141.1169	1205615.	1674.439	3889.151	30.96156
Median	3591.400	125.8300	326454.1	258.3900	896.8500	32.28800
Maximum	6754.960	645.1900	5822589.	6591.530	38219.85	55.02100
Minimum	2898.470	0.890000	-7905599.	0.430000	17.30000	7.521000
Std. Dev.	1414.040	143.6582	2702067.	2045.216	7125.094	10.19039
Skewness	0.724682	1.475941	-0.670713	0.939388	3.348367	-0.127664
Kurtosis	1.827184	5.335976	4.748511	2.630591	15.38082	2.877124
Jarque-Bera	5.648750	23.02689	7.892157	5.957682	321.9628	0.130472
Probability	0.059346	0.000010	0.019330	0.050852	0.000000	0.936846
Sum	168782.9	5503.560	47019000	65303.14	151676.9	1207.501
Sum Sq. Dev.	75981332	784231.5	2.77E+14	1.59E+08	1.93E+09	3946.073
Observations	39	39	39	39	39	39

Source: Author's Computation, 2025 (EViews 12.0).

Table 1 above presents the descriptive statistics of research variables (manufacturing sector gross domestic product, exchange rate, net export, foreign direct investment, external debt and degree of trade openness) over a period of thirty-nine years from 1985 to 2023. Relying on the Jarque-Bera test values of the variables, the result indicated that except manufacturing sector gross domestic product and degree of trade openness which are normally distributed as their respective Jarque-Bera probability values of 0.059346 and 0.936846 are greater than the conventional 0.05 significance benchmark, other variables are not normally distributed as their probability values fall short of the 5 percent significance benchmark.

Unit Root Test

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

Variables	Level	Critical Value @ 5%	1st Difference	Critical Value @ 5%	I(d)	Stationary @
LOG(MGDP)	-0.734143	-2.943427	-5.104650***	-2.943427	I(1)	1st Difference
LOG(EXR)	-3.171743**	-2.941145	-	-	I(0)	Level
NEX	-2.847981	-2.963972	-9.794832***	-2.954021	I(1)	1st Difference
LOG(FDI)	-2.831543	-2.941145	-6.172176***	-2.943427	I(1)	1st Difference
LOG(EXD)	-1.071431	-2.943427	-4.165823***	-2.943427	I(1)	1st Difference
LOG(DTO)	-3.417477**	-2.941145	-	-	I(0)	Level

Note: *, **, and * denote significance at 10%, 5% and 1%, respectively**

Source: Author's Computation, 2025 (EViews 12.0).

Table 2 presents the summary results of the ADF Unit root tests carried out on all the variables in our model. The results indicated that exchange rate and degree of trade openness did not exhibit unit root problems at the significance level of 5 percent while manufacturing sector gross domestic product, net export, foreign direct investment and external debt exhibited unit root problems, hence become integrated after first differencing.

ARDL Bound Cointegration Test

Table 3: ARDL Bounds Cointegration Test

	Critical Value Bound		F-Statistics
F_{MGDP}(EXR, NEX, FDI, EXD, DTO) K = 5			6.268507***
Significance	I(0) Bound	I(1) Bound	
10%	2.08	3	
5%	2.39	3.38	
2.5%	2.7	3.73	
1%	3.06	4.15	

Note: Null hypothesis: No level relationship; K = number of regressors; *, ** and *** denote significance at 10%, 5% and 1% level, respectively.

Source: Author's Computation, 2025 (EViews 12.0).

To determine if there is cointegration among manufacturing sector gross domestic product (MGDP), exchange rate (EXR), net export (NEX), foreign direct investment (FDI), external debt (EXD) and degree of trade openness (DTO), the bounds cointegration test was conducted. The result of ARDL bounds cointegration test in Table 3 indicates the presence of cointegration or long-run relationship among the employed variables.

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

The short-run and long run effects of the proxies of external sector activities on industrial performance indicator (manufacturing sector gross domestic product) was estimated using the ARDL method. The results are presented in Table 4:

Table 4: Estimated Long-Run and Short-Run Coefficients of ARDL

Dependent Variable = MGDP				
Short-Run Results				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
DLOG(EXR)	-0.127912	0.049357	-2.591549	0.0213
D(NEX)	0.028027	0.026812	1.045316	0.3051
DLOG(FDI)	0.088750	0.037293	2.379780	0.0321
DLOG(EXD)	0.047355	0.028810	1.643708	0.1118
DLOG(DTO)	0.131629	0.047435	2.774953	0.0099
DLOG(DTO(-1))	0.065236	0.052897	1.233254	0.2281
CointEq(-1)*	-0.141859	0.043061	-3.294356	0.0028
R^2 = 0.724437	Adjusted R^2 = 0.531543	Durbin-Watson stat = 1.670369		
Long-Run Results				
LOG(EXR)	-0.294989	0.070097	-4.208270	0.0009
NEX	0.780330	0.441509	1.767418	0.0885
LOG(FDI)	0.104808	0.046027	2.277087	0.0390
LOG(EXD)	0.060072	0.259959	0.231083	0.8190
LOG(DTO)	0.197077	0.073407	2.684703	0.0178
C	10.67153	1.755916	6.077470	0.0000
EC = LOG(MGDP) - (-0.2950*LOG(EXR) + 0.7803*NEX + 0.1048*LOG(FDI) + 0.0601*LOG(EXD) + 0.1971*LOG(DTO) + 10.6715*)*				

Source: Author's Computation, 2025 (EViews 12.0).

Interpretation of Short -Run and Long-Run ARDL Model Results

Exchange Rate (EXR) and Manufacturing Sector Gross Domestic Product (MGDP)

The short-run estimates of the ARDL model are shown in Table 4. The results revealed that exchange rate has a negative (-0.127912) and significant (0.0213 < 0.05) effect on manufacturing sector gross domestic product in Nigeria. This implies that a unit appreciation in exchange rate caused 12.8% decrease in manufacturing sector gross domestic product. Also, the long-run estimates of the ARDL model results revealed that exchange rate has a negative (-0.294989) and significant (0.0009 < 0.05) effect on manufacturing sector gross domestic product in Nigeria. This implies that unit appreciation in the exchange rate caused 29.5% significant decrease in manufacturing sector gross domestic.

Net Export (NEX) and Manufacturing Sector Gross Domestic Product (MGDP)

Furthermore, the short-run estimates of the ARDL model as shown in Table 4 revealed that net export is positive (0.028027) but non-significant (0.0001 > 0.05) on the manufacturing sector in Nigeria, implying that a Naira increase in net export earning led to 0.028027 billion naira increase in manufacturing sector gross domestic product. Similarly, the long-run estimates revealed that net export had a positive (0.780330) and non-significant (0.0885 > 0.05) effect on the regressand in Nigeria. This implies that a Naira increase in net export will lead to 0.780330 billion Naira increase in Nigeria.

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

The short-run estimates revealed that foreign direct investment is positive (0.088750) and significant (0.0321 < 0.05) on manufacturing sector gross domestic product in Nigeria. This implies that a Naira increase in foreign direct investment inflow led to 0.088750 billion Naira increase in manufacturing sector gross domestic product. the result is similar in the long-run estimates as foreign direct investment had positive (0.104808) and significant (0.0390 < 0.05) effects on the sector in Nigeria, suggesting that a Naira increase in foreign direct investment enhanced the sector's gross domestic product by 0.104808 billion Naira increase.

External Debt (EXD) and Manufacturing Sector Gross Domestic Product (MGDP)

In addition, the short-run analysis indicated that external debt as expected is positive (0.047355) but non-significant (0.1118 > 0.05) on the manufacturing sector gross domestic product in Nigeria. This suggests that a Naira increase in external debt led to 0.047355 billion Naira increase in gross domestic product from the manufacturing sector. More so, the long-run outputs exhibited external debt had a positive (0.060072) and non-significant (0.8190 < 0.05) effect on the gross domestic product of the sector, implying that a Naira increase in external debt led to 0.060072 billion Naira increase in the sector gross output in Nigeria.

Degree of Trade Openness (DTO) and Manufacturing Sector Gross Domestic Product (MGDP)

Degree of trade openness exhibited a positive (0.131629) and significant (0.0099 < 0.05) effect on manufacturing sector gross domestic product in Nigeria in the short-run. This depicts that a percentage increase in degree of trade openness improved the manufacturing sector gross domestic product by13.2%. The long-run estimates similarly agreed as degree of trade openness had a positive (0.197077) and significant (0.0178 < 0.05) effect on the sector in Nigeria. This implies that a percentage increase in degree of trade openness improved the sector's gross domestic product by 19.7% billion Naira.

Interpretation of CointEq(-1) Result

The results of the short run dynamic coefficients associated with the long run obtained from the error correction model are given showed that the signs of the short run dynamic interactions are consistent with that of the long run results. The estimated error correction coefficient of -0.141859 (with p-value of 0.0028) is highly significant, has the correct sign, and imply a low speed of adjustment to equilibrium after shock. This implies that approximately 14.2% of disequilibria from the previous year's shock reconverge to the long run equilibrium.

Interpretation of Adjusted R-Squared (Adj. R^2)

The Adjusted R-squared value of 0.531543 from the short-run results in table 4 indicated that the estimated model is well fitted as the systematic changes in explanatory variables (exchange rate, net export, foreign direct investment, external debt and degree of trade openness) explained approximately 53 percent (R-squared) variation in manufacturing sector gross domestic product while the remaining 47% is explained by other variables outside the model.

Interpretation of Durbin-Watson Statistic Value

Lastly, Durbin-Watson stat of 1.670369 which is closer to 2 indicates that the estimated model has no problem of serial correlation.

The results of the post-estimation tests are presented and discussed below:

Table 5: Post-Estimation Test Results

Test	Null Hypothesis	X^2 Value	X^2 Prob	Remark
Jarque-Bera	Normal distribution exists	1.020697	0.600286	Normal residuals
Breusch-Godfrey LM	Serial correlation does not exist	1.457737	0.2519	Serial independence
Breusch-Pagan-Godfrey	Homoscedasticity exists	2.027579	0.0753	Constant Variance
Ramsey RESET	Model is stable	0.033114	0.8570	correctly specified model

Source: Author's Computation, 2025 (EViews 12.0).

The result in table 5 showed that the Jarque Bera (Normality) test with probability value (0.600286) is greater than 0.05 level of significance, the Breusch-Godfrey Serial Correlation LM test result showed that the probability values (0.2519) is greater than 0.05, the Breusch-Pagan-Godfrey heteroskedasticity test shows that the probability values (0.0753) is greater than 0.05 and the Ramsey RESET test shows that the probability values (0.8570) is greater than 0.05. These post-test results suggest that the model's variables collectively showed normal distribution, no problem of serial correlation, the results is homoscedastic and the model is specified correctly suggesting that the estimated result is robust and suitable for policy recommendation.

Discussion of Findings

First, estimates for both the short-run and long-run indicated a negative and statistically considerable correlation between the currency rate and GDP in Nigeria's industrial sector. This implies that there would see a precipitous decline in the event of appreciation in the EXR, both in the near and far future. That the currency rate has a negative effect on industrial output in Nigeria is something that Odebode and Aras (2019) had previously found. Consistent with Sule's (2019) finding, this outcome confirms that the exchange rate is negatively associated with economic growth in Nigeria.

The second point is that net export has a beneficial effect on GDP in Nigeria's manufacturing sector GDP, according to both the short-term and long-term estimations. However, this effect is not statistically considerable. Because of this, it seems that an increase in Nigeria's net export had little effect on the GDPs of the manufacturing sector, either immediately or in future. That exportations help propel Nigeria's economy

forward is consistent with the findings of Ajayi and Araoye (2019).

Thirdly, according to both the short- and long-term predictions, FDI had a beneficial and statistically considerable impact on the GDP of Nigeria's manufacturing sector. If FDI were to increase in Nigeria, the nation's manufacturing sector GDP would grow sharply, both immediately and over the long-term. The findings are in line with those of Okoli and Agu (2015), who similarly found that FDI considerably boosted GDP growth in Nigeria. This and the findings of Agu, Onah, and Okoroafor (2022) corroborate the idea that FDI considerably boosted GDP growth.

Furthermore, both the short-term and long-term estimates demonstrated that foreign debt had a beneficial impact on manufacturing sector GDP in Nigeria, although it is not statistically considerable. If Nigeria's foreign debt were to increase, the impact on the nation's GDP from the manufacturing sector is minimal, both in the short and long-term. Sule (2019) also discovered a beneficial correlation between foreign loans and industrial output in Nigeria, supporting our findings.

Finally, the extent of trade openness had a considerable impact on GDP of manufacturing sectors of Nigeria, according to both the short-term and long-term estimates. A more flexible trade policy would lead to considerable short- and long-term growth in the GDP of Nigeria's manufacturing sector. These upshots support those of Agu, Nnaemeka, and Nneka (2016), who discovered that trade openness is a crucial sign of economic globalisation that influences the growth of Nigeria's manufacturing sector favourably and considerably.

Conclusion and Recommendations

Conclusion

This study determined the effects of external sector on industrial performance in Nigeria. Based on the findings, the study concluded that external sector resources significantly critical for driving industrial sector performance in Nigeria.

Recommendations

The following recommendations are proffered based on the findings of this study:

i. The Nigerian government should implement policies to stabilize the exchange rate and reduce volatility, which negatively impacts industrial production costs. A managed floating exchange rate system, supported by foreign reserve buffers, can help moderate sharp fluctuations. Additionally, the Central Bank of Nigeria (CBN) should prioritize forex allocation to critical industrial sectors to ease access to imported raw materials and machinery, thereby enhancing local manufacturing capacity.

ii. To improve net exports, Nigeria should reduce its dependence on oil and promote value-added industrial exports. Policies should incentivize agro-processing, textiles, and light manufacturing through tax holidays, export subsidies, and improved access to international markets via trade agreements. Strengthening export promotion agencies (e.g., Nigerian Export Promotion Council) and enhancing quality standards will help Nigerian industrial goods compete globally.

iii. The government should create a more attractive foreign direct investment environment by improving infrastructure (power, transport, and logistics), reducing bureaucratic bottlenecks, and offering tax incentives for foreign investors in key industrial sectors. Special Economic Zones (SEZs) with investor-friendly policies should be

expanded to boost foreign direct investment inflows into manufacturing and agro-processing. Additionally, Nigeria should strengthen bilateral investment treaties to protect foreign investors and reduce capital flight risks.

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