

The Impact of Manufactured Imports on Manufacturing Sector Performance in Nigeria: Evidence from FMOLS and DOLS

Innocent Chile Nzeh ¹, Uju Victoria Okoli ² and Ogochukwu Edith Nkamnebe ^{2,*}

¹ Department of Cooperative and Rural Development, University of Agriculture and Environmental Sciences, Umuagwo, Imo State, Nigeria.

² Department of Economics, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria;
uv.okoli@unizik.edu.ng (U.V.O.), oe_nkamnebe@unizik.edu.ng (O.E.N.)

* Correspondence: nzechile@yahoo.com (I.C.N.)

Citations: Nzeh, I.C., Okoli, U.V. & Nkamnebe, O.E. (2025). The Impact of Manufactured Imports on Manufacturing Sector Performance in Nigeria: Evidence from FMOLS and DOLS. *International Journal of Finance, Economics and Business*, 4(1), 1-12.

Received: 10 December 2024

Revised: 22 February 2025

Accepted: 6 March 2025

Published: 31 March 2025

Abstract: The development of the manufacturing sector in Nigeria has the potential to contribute meaningfully to the country's growth, helping to diversify the economy away from the dominant oil sector. However, this sector has been beset by several challenges over the years. This article examines the influence of manufactured imports on the manufacturing sector's performance in Nigeria using an annual dataset spanning the period from 1982 to 2023. The study employs both the Fully Modified Ordinary Least Squares (FMOLS) and the Dynamic Ordinary Least Squares (DOLS) techniques. The focus of past studies has often been on examining the impact of specific variables on the manufacturing sector's performance, mainly the exchange rate and the interest rate. The findings of this study indicate that manufactured imports exerted a negative and significant impact on the performance of the manufacturing sector according to the FMOLS model. Furthermore, while exchange rate appreciation leads to an improvement in the manufacturing sector's performance, the impact of the lending rate is negative. Trade openness is also shown to have a negative impact on the manufacturing sector's performance. Consequently, the study recommends that monetary policy should be used to guide both the exchange rate and interest rate towards desired outcomes to mitigate their adverse effects on the manufacturing sector's performance. In addition, there is a need for the provision of various forms of subsidies to the manufacturing sector to reduce the cost of production, thereby making locally manufactured goods more competitive with imported products.

Keywords: Manufactured Imports; Industrial Performance; Trade Openness; Exchange Rate.



Copyright: © 2025 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

The role of manufacturing in a country's growth path cannot be overemphasized. As observed by Tonye and Gbarawae (2023), the development of the manufacturing sector offers a country numerous advantages such as job provision, the development of other sectors of the economy such as agriculture and the diversification of the economy in general. The manufacturing sector has been the engine of growth of many

countries which hitherto were underdeveloped. For instance, the contribution of the manufacturing sector to the per capita income of the countries comprising the Asian Tigers has been noted by Omolola, Rasaki and Addo (2023). However, in Nigeria the manufacturing sector has not contributed much to the growth of the country's economy. The sector produces light commodities such as detergents, wears, beverages, building materials and other household items. Worthy of note is that these consumer goods are competitive at the international market and as such they need to be of good quality and cheap for them to penetrate the foreign markets. This scenario creates difficulty for the manufacturers in the country who are often faced with numerous challenges. The manufacturing sector has been beset with many obstacles that have hindered its growth over the years. Among the major factors constraining the Nigerian manufacturing sector is high interest rate and recurring inflationary pressures. Others are foreign exchange pressures, high costs of energy, weak infrastructure, institutional constraints as well as weak competition from the manufactured products of advanced economies.

To address the issues that constrain the growth of the manufacturing sector, several policy measures have been embarked upon by successive regimes in the country. Initially, in Nigeria's independence in 1960, the country embraced protectionist policies with the aim of shielding the local industries against stiff competition from foreign competition. The measures adopted include raising the tariff walls, ban on imports and the implementation of Import Substitution Industrialization (ISI) policy. Such measures, instead of stimulating local production ended up making the domestic industries to rely on government protection instead of engaging in innovations. Around the eighties, the country implemented the Structural Adjustment Program (SAP) which entailed trade liberalization measures in the form of tariffs reduction, dismantling of all forms of import ban and the devaluation of the domestic currency. Recently however, the policy stance of the Central Bank of Nigeria (CBN) has been geared towards protectionist measures as exemplified by the ban placed on the importation of 41 items that have local substitutes which took effect from June 2015 until 2023. The policy measure was meant to stimulate the growth of some sectors of the economy such as the food and beverages, cement and textiles.

Despite all the laudable policies put in place to boost the manufacturing sector, the performance of the sector is still sluggish as can be seen from the trend in the manufacturing value added (Figure 1). It is observed from the Figure that apart from 1988 and 1992 when the manufacturing value added rose relatively high, the trend for other years prior to 2010 was very low. After 2014, the trend has been flat despite the protectionist measures put in place around 2015. The import of manufactures is still among the factors that militate against the performance of the manufacturing sector in Nigeria. This is so because the country's manufacturing base is still weak and can hardly compete favourably with the products of advanced economies. To worsen matters, some hitherto burgeoning manufacturing outfits that operated in the country have wound up while others have relocated to neighbouring countries on account of the factors enumerated above. This has reduced the range of locally manufactured goods in the country, suggesting the need to embark on importation to augment the shortfall in local supply.

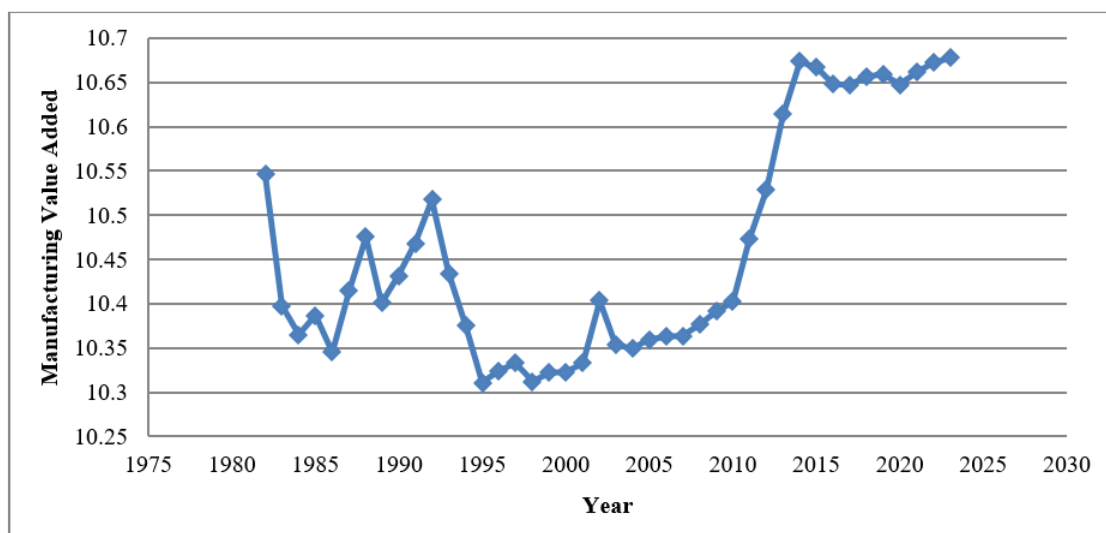


Figure 1. Trend in Manufacturing Value Added

In literature, the adverse effect of opening up the economy of developing countries to the outside world has been noted by some theories such as the dependency theory by Raúl Prebisch and Hans Singer as well the theory of unequal exchange by Aghir Emmanuel. These theories agree that trade between the developed and developing countries end up benefiting the developed countries. On grounds of the, this study aims to examine the impact of import of manufactures on the performance of the manufacturing sector in Nigeria. The study, apart from verifying if the postulations of the two theories explained above hold in Nigeria, is motivated by the dearth of research interest on the link between the manufacturing sector performance and the import of manufactures, especially in Nigeria. The focus of past studies has been on the impact of some macroeconomic variables such as exchange rate, interest rate and inflation rate on the performance of the manufacturing sector. Evaluating the possibility of the import of manufactured goods displacing the domestic manufacturing sector is paramount since the Nigerian economy is an import-dependent economy and is still tied to the economy of other countries through trade liberalization. In achieving the study's objective, the paper used both the Fully Modified Ordinary Least Squares (FMOLS) and the Dynamic Ordinary Least Square (DOLS). The choice of these frameworks is because they handle some of the econometric issues that affect the results obtained from regression analysis such as issues relating to sample size, omitted variable bias, endogeneity, measurement errors and serial correlation.

2. Literature Review

2.1. Theoretical Literature

This work is guided by two complementary theories (the dependency theory and the theory of unequal exchange) which contend that trade between the developed and developing countries adversely affects the developing countries. First, it must be emphasized that these theories arose as a challenge against the dominant Western understandings of development, which assumed that the root of underdevelopment in the countries of the global South was due to the persistence of traditional structures and institutions in these countries. The modernization approach championed by the West suggests that for the developing countries to develop there is need to upgrade the institutions and follow the values adopted by the industrialized countries.

Raúl Prebisch and Hans Singer observed a trade pattern between developing and the developed countries in which the prices of primary goods (usually raw materials) from developing countries experienced a decline in relation to the prices of manufactured goods from developed countries. The dependency theory therefore owed its root from this Prebisch-Singer Thesis which was structuralist in nature (Hout, 2023). Raúl Prebisch in particular contended that developing countries were trapped in a cycle of dependence in their trade relation with the developed nations, thus constraining their ability to be industrialized. It was observed that over time, the terms of trade facing the developing countries were deteriorating, leading them to purchase less manufactured goods from the developed countries in exchange for their raw materials which are usually demand elastic. It was his argument that developing countries, regarded as the "periphery" of the world economy supply cheap labor and raw materials to the "center" (developed nations). In turn, the developed countries would process these materials into finished goods and then sold them back to the periphery at high prices. As a policy measure, Prebisch was of the view that developing countries needed to implement protectionist policies such as import substitution industrialization policy as a way to reduce their dependence on international trade.

In a similar manner, the theory of unequal exchange observed that international trade operates as a mechanism for perpetuating international inequality and widening the gap between the rich and the poor nations. This theory owes its root to the work of Arghiri Emmanuel who was Marxian economist that became popular in the 1960s and 1970s. Emmanuel contended that the wage differentials between the rich and the poor countries can explain the reason that commodities produced in the Third World are so cheap in comparison with those produced in the Western countries. Accordingly, the wide gap in economic development between the developed and the developing countries can be explained by this reason. It is argued that unequal exchange serves as the basis for a process of unequal development on two separate ways. In the first instance, the high incomes accumulated through unequal exchange attract additional investment and then the cumulative process of development commences. The second avenue is that high wages encourage the utilization of capital-intensive production technique which enhance productivity and promote development. As the developed countries get richer the tendency for increased wages is enhanced while at the same time the internal markets of the developing countries get narrowed.

2.2. Empirical Literature

Due to the importance of the manufacturing sector to an economy, empirical studies have been conducted to identify the factors that influence its performance. A thematic review approach is adopted in this paper; first to review the papers that examined the impact of import of manufactures on the performance of the manufacturing sector and then the papers that examined the impact of other factors. Ngene, Nwele and Uduimoh (2016) examined the impact of manufactured goods import on the performance of the manufacturing sector in Nigeria with finding showing that manufactured import impacted positively on the manufacturing sector performance. This finding is a contradiction from the outcome of the study by Eniekezimene and Nathan (2021) which found that while import penetration and trade liberalization impacted negatively and significantly on the index of manufacturing production, trade restriction enhanced it. In a related study, finding by Unegbu *et al.* (2023) revealed that while the import of capital impacted positively to manufacturing sector's performance, the impact of import of manufactures was negative. These results find corroboration in the finding in Nigeria by Unegbu and Ugwunna (2024) which revealed that the import of capital, intermediate and manufactured goods adversely affected the performance of the manufacturing sector.

Some studies have investigated factors other than the import of manufactures that have influenced the performance of the manufacturing sector. For studies that examined the impact of exchange rate and interest rate on the performance of the manufacturing sector, Onwuka, Obi, Ezenekwe and Ukeje (2020) found that exchange rate volatility impacted aggregate manufacturing output negatively and significantly. In another study, Ac-Ogbonna (2021) found that fluctuations in the macroeconomic variables such as the lending rate, exchange rate and inflation rate had adverse effect on the manufacturing output. In support of this, Omolola, Rasaki and Addo (2023) revealed that exchange rate and interest rate impacted negatively on manufacturing output in Nigeria. Lending further support to the outcome of previous studies, Agbonrofo and Ajibola (2023) found that interest rate and exchange rate impacted negatively and significantly on the manufacturing value added both in the short-run and in the long-run.

However, Tonye and Gbarawae (2023) found that high volatility in exchange and interest rates impacted positively on the manufacturing sector's performance which is not in conformity with earlier studies that have established that both exchange rate and interest rate adversely impacted the performance of the manufacturing sector in Nigeria. From another perspective, Effiong, Ukere and Ekpe (2024) found that in the short-run and the long-run, government expenditure had an adverse effect on the manufacturing sector's performance while the effect of value added tax is positive. Ebhotemhen and Njoku (2024) found that lag one of foreign income and gross domestic product (GDP) impacted positively on the manufacturing sector's performance. In another respect, Wang and Zhao (2024) found that in India, the expansion of imports had significant impact on employment in the manufacturing sector.

3. Materials and Methods

In this paper, annual dataset that covers the period from 1982-2022 was used. The dependent variable is manufacturing value added which is in log form, while the independent variables are import of manufactures, lending rate, exchange rate, employment in industry and trade openness. In calculating trade openness, export, import and GDP were all in current US Dollars. The choice of the manufacturing value added is informed by the fact that it reports only net-output of resident manufacturing activity, thereby handles the problem of including intermediate consumption into the calculation. With respect to labour contribution to the manufacturing sector, most studies often use labour force participation rate. However, this study chose employment in industry which is closely related to the labour force in the manufacturing sector. The choice of exchange rate is informed by its sensitive position in manufacturing: in terms of import of inputs and in terms of export of finished export goods. Interest rate represents the cost of capital and as such plays crucial role in business; suggesting the reason the lending rate was included in the study. Another reason for including it is because of the high lending rate in Nigeria which has always pose problem on the part of manufacturers. Since manufacturing entails international trade either with respect to import of inputs or the export of finished goods, there is need to examine how such trade affects the performance of the manufacturing sector. It is against this backdrop that trade openness is included in the study.

Before the estimation of the models, some pre-diagnostic tests such as descriptive statistics, correlation matrix test, unit root test and cointegration test were conducted to identify the behaviour of the variables included in the models. The test for unit root was carried out with the help of augmented Dickey Fuller (ADF) and Phillip-Perron (PP). On the other hand, the autoregressive distributed lag (ARDL) bounds test assisted in conducting the test of cointegration. While the descriptive statistics test was conducted to identify

the behaviour of the variables with respect to their mean, standard deviation, skewness, kurtosis and normality, the correlation matrix test was carried to examine the degree to which the variables relate with each other which serves as a barometer to examine the existence of multicollinearity among them. The test for unit root was conducted to ascertain the order of integration of the variables to ensure that the variables are stationary over time. Stationarity of the variables is essential since most time series are not stationary such that any regression results obtain in such situation are spurious. The cointegration test was conducted to identify if a long-run relationship exists among the variables. The results of the parameters were obtained with the estimation of the Fully Modified Ordinary Least Squares (FMOLS) and the Dynamic Ordinary Least Square (DOLS).

Table 1. Data sources and Measurement

Variable	Abbreviation	Measurement	Sources
Manufacturing Value Added	MVA	Constant 2015 US Dollars	WDI
Manufactures Import	MIMPT	% of merchandise imports	WDI
Employment in Industry	EMPI	% of total employment	WDI
Exchange Rate	EXCHR	Local currency unit per US Dollars	WDI
Lending Rate	LRATE	Annual percentage	WDI
Trade Openness	TPOEN	Export+import/GDP	WDI

3.1. Model Specification

The baseline model that guided the specification of the FMOLS and DOLS models is a modification of the empirical work of Agbonrofo and Olusegun (2023) and it is specified as follows:

$$LMVA = f(MIMPT, EMPI, EXCHR, LRATE, TOPEN) \quad (1)$$

Where,

$LMVA$ = Log of manufacturing value added (a proxy for manufacturing sector's performance)

$MIMPT$ = Manufactures import

$EMPI$ = Employment in industry

$EXCHR$ = Exchange rate

$LRATE$ = Lending rate

$TOPEN$ = Trade openness

3.1.1. FMOLS Specification

The impact of import of manufactures on the manufacturing sector's performance in Nigeria is examined using the FMOLS. The FMOLS was introduced by Phillips and Hansen (1990). As observed by (Adom *et al.*, 2015), by using a semi-parametric approach, the long-run parameters are estimated with the help of the FMOLS. It is also noted that FMOLS can be employed even in a sample size as it provides consistent parameters just as it takes care of problems relating to omitted variable bias, endogeneity, measurement errors and serial correlation. Following Adom *et al.* (2015), the following FMOLS specification is adopted:

$$\hat{\mathfrak{S}}LMVA_t = \left(\sum_{t=1}^T y_t y_t^1 \right)^{-1} \left(\sum_{t=1}^T y_t z_t^+ - T \begin{vmatrix} \lambda_{12}^+ \\ 0 \end{vmatrix} \right) \quad (2)$$

Where,

z_t^+ and λ_{12}^+ terms tackle issues relating to endogeneity and serial correlation.

3.1.2. DOLS Specification

Also, the study employed the framework of DOLS to investigate the impact of the import of manufactures on the performance of the manufacturing sector. The DOLS was introduced by Stock and Watson (1993). It is equally a parametric approach that assists in the estimation of a long-run relationship.

Masih and Masih (1996) observed that DOSL is relevant even in situations when the variables have a mixed order of integration. As contended by Kurozumi and Hayakawa (2009), by including the leads and lags, DOLS tackles issues relating to small sample bias just as it handles endogeneity problem. The following specification of DOLS guided this study:

$$LMVA_t = \delta + \gamma_t + \sum_{i=-k}^{i=k} \pi_i \Delta x_{t+i} + \varepsilon_t \quad (3)$$

Where

γ = long-run elasticity

π 's = coefficients of leads and lags which assist in handling the problems associated with endogeneity and serial correlation (Herzer & Nowak-Lehmann, 2006).

4. Results

4.1. Descriptive Statistics

The essence of the descriptive statistics test is to identify how the variables behave with respect to their mean, skewness and kurtosis, among others. In Table 2, results indicate that while trade openness has the lowest mean value (1.8) with a standard deviation of 0.28. Finding indicates that there is a close proximity between the mean and median of each variable which is an indication that variables are symmetric. Equally, it is revealed that exchange rate has the highest range among the variables which proves that it has the highest volatility within the study period. However, manufacturing value added exhibits the lowest volatility as it has the least range. While manufacturing value added, lending rate and exchange rate positively skewed, others are negatively skewed.

Table 2. Results of Descriptive Statistics

	LMVA	MIMPT	EMPI	EXCHR	LRATE	TOPEN
Mean	10.46	50.85	9.55	115.64	17.44	1.80
Median	10.40	65.19	11.35	114.89	16.92	1.86
Maximum	10.67	86.52	17.87	425.97	31.65	1.8913
Minimum	10.31	0.00	0.00	0.00	9.43	0.00
Std. Dev.	0.13	32.08	5.32	119.1	4.66	0.28
Skewness	0.60	-0.80	-0.98	1.02	0.45	-5.95
Kurtosis	1.77	1.97	2.72	3.22	3.79	37.61
Jarque-Bera	5.13	6.42	6.86	7.44	2.53	2344.8
Probability	0.07	0.04	0.03	0.02	0.28	0.00
Sum	439.41	213	401.35	4856.9	732.7	75.64
Sum Sq. Dev.	0.69	42210.47	1160.42	582528.1	890.8955	3.428126
Observations	42	42	42	42	42	42

4.2. Correlation Matrix

To ascertain the degree of correlation among the variable, the correlation matrix test was carried out. Results in Table 3 reveal that the correlation between manufacturing value added, and other variables is low. To be specific, it is found that while a weak positive correlation exists between manufacturing value added and employment in industry and exchange rate, a weak negative correlation is found to exist between manufacturing value added and import of manufactures, lending rate and trade openness. The weak correlation is an indication that there is an absence of a case of multicollinearity among the variables.

Table 3. Results of Correlation Matrix

	LMVA	MIMPT	EMPI	EXCHR	LRATE	TOPEN
LMVA	1	-0.03	0.37	0.64	-0.27	-0.21

	LMVA	MIMPT	EMPI	EXCHR	LRATE	TOPEN
MIMPT	-0.03	1	0.11	0.24	-0.35	-0.01
EMPI	0.37	0.11	1	0.62	0.25	-0.22
EXCHR	0.64	0.24	0.62	1	-0.17	0.20
LRATE	-0.27	-0.35	0.25	-0.17	1	0.12
TOPEN	-0.21	-0.01	-0.22	0.20	0.12	1

4.3. Unit Root Test

The test conducted to ascertain the unit root helps to establish the order of integration of the variables. In Table 4, both the ADF and PP results show that at level the variables have unit root; implying that they are not stationary. However, after first differencing, the variables did no longer have unit root (they became stationary). The conclusion is that the variables are integrated of order one or $I(1)$.

Table 4. Result of Unit Root Test (Stationery) using ADF and PP

Variable	ADF		PP		Order of Integration
	Level	First Diff.	-Level	First Diff.	
LMVA	-0.66	-6.09	-0.82	-6.09	$I(0)$
MIMPT	-3.28	-6.99	-3.41	-8.09	$I(0)$
EMPI	-1.29	-6.28	-1.29	-6.28	$I(1)$
EXCHR	-1.35	-2.03	-1.95	-2.93	$I(1)$
LRATE	-0.36	-5.53	-0.30	-7.05	$I(1)$
TOPEN	-0.98	-1.12	-0.62	-1.10	$I(1)$

4.4. Cointegration

The ARDL bounds test was conducted to ascertain the cointegration (long-run relationship) among the variables. The existence of cointegration is conducted by comparing the F-statistic with both the lower critical bound $I(0)$ and the upper critical bound $I(1)$ which are evaluated at a the 5% level of significance. Finding in Table 5 reveals that the value of the F-statistic is 4.65 which is higher than the upper critical bound (4.25). The study thus concludes that a long-run relationship exists among the variables

Table 5. Results of ARDL Bounds Test for Cointegration

Test Statistic	Value	K
F-statistic	4.65	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.75	3.79
5%	3.12	4.25
2.5%	3.49	4.67
1%	3.93	5.23

4.5. Estimated FMOLS and DOLS

The estimated results of FMOLS and DOLS in Table 6 reveal that under the FMOLS, the import of manufactures exerted a negative and significant impact on the manufacturing sector's performance. Finding indicates that if the import of manufactures increased by one unit, manufacturing sector's performance reduced in average by 0.01 percent. However, under the DOLS the result is not significant notwithstanding that the import of manufactures impacted the manufacturing sector's performance negatively. It is equally found that employment in industry impacted positively and significantly on the performance of the manufacturing sector under the DOLS but the result under the FMOLS is not significant. Finding indicates that if employment in industry increased by one unit, the manufacturing sector improved in average by 0.3 percent.

Table 6. Results of Estimated FMOLS and DOLS Results

Variable	FMOLS			DOLS		
	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
MIMPT	-0.001	-1.86	0.07	-0.002	-1.26	0.23
EMPI	-0.008	-1.34	0.18	0.03	1.95	0.07
EXCHR	0.001	4.26	0.00	-0.0004	-0.68	0.50
LRATE	-0.003	-0.45	0.65	-0.03	-2.64	0.02
TOPEN	-0.23	-2.70	0.02	0.52	1.16	0.26
C	10.92	68.88	0.00	9.98	12.84	0.00
R-squared	0.62			0.94		
Adjusted R-squared	0.56			0.84		

With respect to exchange rate, finding indicates that its impact was positive and significant under the FMOLS, but the impact was negative under the DOLS even though it was not significant. FMOLS result reveals that if exchange rate appreciated by one Dollar, the manufacturing sector improved by 0.1 percent. The results of lending rate in both models indicate that it impacted negatively and significantly on the manufacturing sector's performance. Finding indicates that under the FMOL, one percent rise in the lending rate resulted in a fall in the manufacturing sector's performance by 0.3 percent. However, under the DOLS one percent rise led to a fall in the manufacturing sector's performance by 3 percent. Lastly, the study found that trade openness impacted negatively and significantly on the performance of the manufacturing sector under the FMOLS. It was found that one unit increase in trade openness led to a reduction in the manufacturing sector's performance by 23 percent.

4.6. Normality Test

For post-diagnostic analysis, the normality results in Figures X and Y indicate that the errors are normally distributed. This is because the p-value in each of the Appendixes is greater than 5% level of significance.

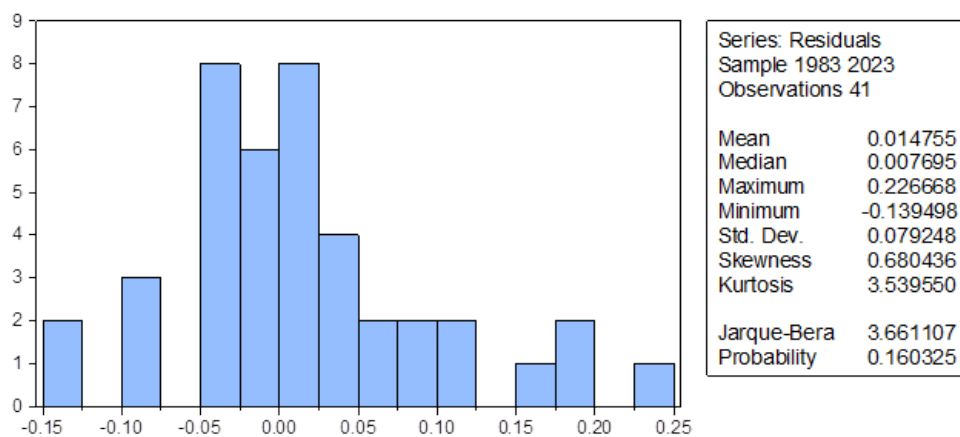


Figure 2. Result of Normality for FMOLS

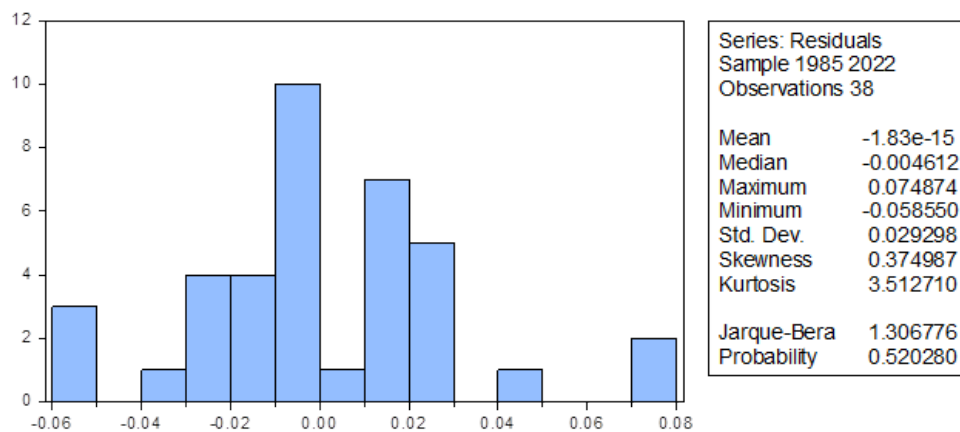


Figure 3. Result of Normality for DOLS

5. Discussion

The paper revealed that the import of manufactures exerted a negative and significant impact on the manufacturing sector's performance within the study period. This finding is not in conformity with earlier finding in Nigeria by Ngene et al. (2016) which revealed that the import of manufactures impacted the manufacturing sector performance positively. However, it finds corroboration in the results of other studies in Nigeria (Eniekezimene & Nathan, 2021; Unegbu et al., 2023; Unegbu & Ugwunna, 2024). The negative impact of the import of manufactures on the manufacturing sector's performance is in line with apriori expectation since it has been observed by some theories that importation into developing countries usually hurts the domestic economy. One of the sectors that suffer from importation in Nigeria is the manufacturing sector because of the weak manufacturing base in the country which cannot adequately compete with that of advanced economies. All manner of manufactured products finds their way into the economy with adverse effect on the locally manufactured products. It is partly on account of this development that in recent time, a ban was placed on the importation of 41 items that could be produced at comparatively least cost locally. The recent policy on exchange rate liberalization is equally another move to discourage importation as the resulting depreciating domestic exchange rate is expected to boost the export of manufactures.

Finding equally shows that the result under the FMOLS indicates that employment in industry impacted the manufacturing sector's performance negatively even though the impact is not significant. This result is not in line with apriori expectation since employment is expected to contribute positively to the manufacturing sector. The result under the DOLS is however in line with apriori expectation. The disparity in the results of the two models could be due to the way the models are specified. For instance, the specification of the DOLS entails the inclusion of the leads and lags which is not accommodated under the FMOLS. The negative impact of employment in industry finds corroboration in the finding by Agbonrofo and Ajibola (2023) which found labour force to impact negatively on the performance of the manufacturing sector in 24 sub-Saharan African (SSA) countries. Also, Effiong et. al (2024) found that with a one period lag, the impact of employment in industry is negative and significant. However, the current period of the variable impacted significantly and positively on the manufacturing sector performance which is in line with the finding of the present study. As observed by Agbonrofo and Ajibola (2023), SSA countries are bedeviled by unskilled and semi-skilled worke force instead of skilled manpower that could have meaningful contribution to the manufacturing sector, accounting for the negative impact of labour force. Even if the result under the DOLS is significant, evidence shows that at 0.3 percent, the contribution is minimal which aligns with the notion of unskilled labour. Most manufacturing outfits in Nigeria still hire foreign expatriates to handle some technical aspect of the jobs, leaving the non-technical aspects to be handled by the indigenous workers. The indigenous workforce in the country therefore handles the peripheral aspect of the works in the manufacturing outfit, contributing less significantly.

It was found that under the FMOLS, exchange rate exerted a positive and significant influence on the manufacturing sector's performance. It should be noted that exchange rate fluctuations should have either positive or negative impact on the performance of the manufacturing sector. For instance, appreciation of exchange rate will result in higher revenue for the manufacturers if they export their commodities because of the exchange rate differentials. Such could encourage the export of manufactures to improve. However, domestic currency appreciation can also adversely affect locally produced goods since it makes importation cheaper. On the basis of the arguments raised, the positive impact of exchange rate appreciation under the

FMOLS is in line with the apriori expectation. The result implies that due to exchange rate appreciation, manufacturers are encouraged to export more to gain from the exchange differentials. On account of this finding, it should be commented here that the current exchange rate depreciation of the domestic currency (naira) arising from the exchange rate liberalization policy could have an adverse effect on the performance of the manufacturing sector; especially as it affects the cost of importation of inputs. The positive impact of exchange rate appreciation on the performance of the manufacturing therefore contradicts the widely held view that allowing the domestic currency to depreciate will boost the export sector. This finds corroboration in some past studies Tonye and Gbarawae (2023)

The paper finds that the lending rate exerted a negative influence on the manufacturing sector's performance. This result follows apriori expectation as it is expected that high lending rate adds to the cost of capital which could have an adverse effect on the productivity of the manufacturing sector. One major phenomenon in Nigeria is high lending rate which has been among the factors that have an adverse effect on the manufacturing sector's performance. Borrowing cost is very expensive, especially long-term borrowing which manufacturers need most. The negative impact of lending rate on the manufacturing sector's performance finds empirical support in a study in Nigeria by Unegbu and Ugwunna (2024). Also, the result finds corroboration in the studies conducted by Agbonrofo and Olusegun (2023) as well as the finding by Omolola, Rasaki and Addo (2023).

Trade openness was found to impact the manufacturing sector's performance negatively and significantly under the FMOLS. The finding follows the predictions of some theories (notably the dependency theory and the theory of unequal exchange) which contend that trade relationship between developing and developed countries often turn against the developing countries. Nigeria is a country with weak manufacturing sector base caused by many factors. Consequently, manufacturers in the country usually find it difficult to produce at cheap cost, suggesting that their products may not be competitive internationally. Opening up trade with other countries will therefore work against the manufacturing sector's performance. This view has found empirical supports in some previous studies. For instance, Eniekezimene and Nathan (2021) found that while trade restriction impacted positively on the manufacturing sector's performance, the impact of trade liberalization was negative. Furthermore, in a study in sub-Saharan African countries, Agbonrofo and Olusegun (2023) found that trade openness depressed the performance of the manufacturing sector which aligns with the present study.

6. Conclusions

In this study, two econometric frameworks were used to examine the impact of import of manufactures on the manufacturing sector's performance in Nigeria over the period from 1982 to 2023. Past related studies have often examined the impact of some macroeconomic variables such as interest rate and exchange rate on the manufacturing sector's performance. However, the focus of the present study was to investigate the impact of import of manufactures on the performance of the manufacturing sector, considering that it is the import of manufactures that directly displaces locally manufactured goods. Findings reveal that import of manufactures impacted negatively on the performance of the manufacturing sector with the result significant under the FMOLS. It is equally found that while exchange rate appreciation led to an improvement in the manufacturing sector's performance, the impact of lending rate was negative. In another vein, trade openness was revealed to have impacted negatively on the manufacturing sector's performance. These findings are supported by past empirical works done within Nigeria and outside the country.

The findings present some issues that require commenting on. First, the negative impact of the import of manufactures on the performance of the manufacturing sector indeed shows that domestic manufactured products cannot compete favourably with imported products. The result is amplified by the negative impact of trade openness on the manufacturing sector's performance. As has been observed earlier, production cost is very high in Nigeria, giving rise to high cost of domestically produced products. Fixing the factors that constrain the growth of the manufacturing sector has been a topical issue in Nigeria. Apart from the capacity of the manufacturing sector been underutilized, some manufacturing outfits have gone moribund owing to the difficulty in doing business in the country. With the adverse impact of import of manufactures, the dilemma facing policymakers is that using some protectionist measures to regulate the importation of manufactured products has become outdated as countries have embraced liberalization policy. Yet, trade liberalization has been found to hurt the manufacturing sector. On the face of these situations, the manufacturing sector in Nigeria is confronted with many obstacles.

Consequent upon the, this present study recommends that several factors that impede the manufacturing sector should be fixed. Two factors identified in the study which fall directly within the purview of the monetary authorities should be highlighted. One is high lending rate which has been among

the major factors that add to the cost of production. The monetary authorities should come up with interest rate policy that allows manufacturers borrow at reduced rate. Though selective credit control measure has always been on ground, the authorities should fine-tune this aspect of policy by introducing some innovations that will propel banks to channel certain percent of their credit to the manufacturing sector. In another vein, there has always been the notion that the devaluation of the domestic currency should raise exports as imports are made to be expensive. However, finding in this study has proved the opposite. Thus, raising the fear that continuous depreciation of the exchange rate can have an adverse impact on the performance of the manufacturing sector. It is therefore recommended that the current exchange rate liberalization which has been among the factors responsible for exchange rate depreciation has to be revisited. This is more so considering that if the manufacturing sector is weak, its export potential will be retarded, and this exacerbates the already weak domestic currency. Lastly, this study is of the view that notwithstanding the trend in the world economy which supports liberalization policy, because of the peculiar nature of the Nigerian economy, there is need to protect the manufacturing sector using any measure that may not offend the country's trading partners. One of the measures recommended here is the provision of all kinds of subsidies to the manufacturing sector as a way to reduce the cost of production.

Author Contributions: Conceptualization, I.C.N.; methodology, I.C.N.; software, I.C.N.; validation, U.V.O. and O.E.N.; formal analysis, I.C.N.; investigation, U.V.O. and O.E.N.; resources, I.C.N. And U.V.O.; data curation, I.C.N., U.V.O. and O.E.N.; writing—original draft preparation, I.C.N. and U.V.O.; writing—review and editing, I.C.N., U.V.O. and O.E.N.; visualization, U.V.O.; supervision, I.C.N. and O.E.N.; project administration, I.C.N.; funding acquisition, I.C.N. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data used in this study are freely downloaded or accessed and available at <https://databank.worldbank.org/source/world-development-indicators>.

Acknowledgments: The author would like to thank the University of Agriculture and Environmental Sciences and Nnamdi Azikiwe University, Nigeria, for supporting this research and publication. The author would also like to thank the reviewers for all their constructive comments.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Ac-Ogbonna, C. (2021). Fluctuations of macroeconomic variables and manufacturing output: Issues, challenges and prospects of the growth of manufacturing output in Nigeria. *Bullion*, 45 (3), 30 -43.
- Adom, P. K., Amakye, K., Barnor, C., & Quartey, G. (2015). The long-run impact of idiosyncratic and common shocks on industry output in Ghana. *OPEC Energy Review*, 39(1), 17-52.
- Arghiri, E. (1972). *Unequal Exchange: A Study of the Imperialism of Trade*. New York: Monthly Review Press.
- Agbonrofo, H. E. & Ajibola, O. (2023). Manufacturing sector development in sub-Saharan Africa: Does monetary policy matter? *International Journal of Management, Economics and Social Sciences*, 12(2), 133-161. <https://doi.org/10.32327/IJMESS/12.2.2023.6>.
- Ebhotemhen, W. & Njoku, K. C. (2024). Effect of globalization on manufacturing sector performance in Nigerian economy. *KASU Journal of Economics and Development Studies*, 10 (2), 68-81.
- Effiong, U., Idongesit, J. U. & Ekpe, P. J. (2024). Fiscal policy, interest rate and the manufacturing sector performance in Nigeria. *World Journal of Advanced Research and Reviews*, 21(03), 2514–2533. <https://doi.org/10.30574/wjarr.2024.21.3.0962>
- Eniekezimene, A. F. & Nathan, E. (2021). Trade restriction and manufacturing sector performance in Nigeria. *International Journal of Arts and Social Science*, 4(2), 106-115
- Herzer, D., & Nowak-LehmannD, F. (2006). Is there a long-run relationship between exports and imports in Chile? *Applied Economics Letters*, 13(15), 981-986.
- Hout, W. (2023). Dependency theory. In M. Clarke, & X. Zhao (Eds.), *Elgar Encyclopedia of Development* (pp. 162-166). Edward Elgar Publishing.

- Kurozumi, E., & Hayakawa, K. (2009). Asymptotic properties of the efficient estimators for cointegrating regression models with serially dependent errors. *Journal of Econometrics*, 149(2), 118-135.
- Masih, R., & Masih, A. M. M. (1996). Stock-Watson dynamic OLS (DOLS) and error-correction modelling approaches to estimating long- and short- run elasticities in a demand function: New evidence and methodological implications from an application to the demand for coal in mainland China. *Energy Economics*, 18, 315-334.
- Ngene, A. N., Nwele, J. O. & Uduimoh, A. A. (2016). Evaluation of manufactured goods import and the manufacturing sector productivity in Nigeria. *Saudi Journal of Business and Management Studies*, 1(4), 186-195. DOI: 10.21276/sjbms.2016.1.4.5.
- Omolola, O. E., Rasaki, G. M. & Addo, G. O. (2023). The effect of exchange rate fluctuation on the performance of the manufacturing sector in Nigeria (1990-2020). *Journal of Stock and Forex Trading*. 10 (2), 1-9. <https://doi.org/10.35248/2168-9458.23.10.235>
- Phillips, P. C. B., & Hansen, B. E. (1990). Statistical inference in instrumental variables regression with I(1) processes. *The Review of Economic Studies*, 57(1), 99-125.
- Tonye, T. & Gbarawae, N. C. (2023). Effects of exchange and interest rates on manufacturing sector performance in Nigeria: Arch and Garch approach. *Gusau Journal of Economics and Development Studies*, 4 (1). <https://doi.org/10.57233/gujeds.v4i1.12>.
- Onwuka, I. N., Obi, K. O., Ezenekwe, U. R. & Ukeje, C. D. (2020). Effect of exchange rate volatility on manufacturing sector performance in Nigeria *International Journal of Economics, Commerce and Management*, 8(3), 345-359. Retrieved from: <http://ijecm.co.uk/>.
- Stock, J. H., & Watson, M. W. (1993). A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica*, 61(4), 783-820.
- Unegbu, P. I., Nwogwugwu, U. C., Nwokoye, E. S., Metu, A. G. & Ezindu, O. N. (2023). Import dependence, value added and employment in the Nigerian manufacturing sector. *International Journal of Management Studies and Social Science Research*, 4(6). <https://doi.org/10.56293/IJMSSSR.2022.4539>
- Unegbu, P. I. & Ugwunna, O.T. (2024); Importation and manufacturing sector performance in Nigeria: An empirical analysis, *ANSU Journal of Arts and Social Sciences*, 11 (2), 43-60.
- Wang, S. & Zhao, C. (2024). Effects of expanding imports on urban manufacturing employment: Evidence from China. *PLoS ONE*, 19(1), e0296961. <https://doi.org/10.1371/journal.pone.0296961>.