Impact of Trade Liberalization on Oil Manufacturing Sector Output in Nigeria: 1981-2022

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Abstract

The contribution of the oil manufacturing sector output in Nigeria has raised concerns about whether or not the country has benefited from trade liberalization, especially when considering the country's major oil manufacturing sector. Therefore, this paper used the autoregressive distributed lag (ARDL) technique to investigate the short-run and long-run impacts of trade liberalization on the output of Nigeria's oil manufacturing sector. The analysis utilized a unit root test to integrate the data in a distinct sequence, and the ARDL Bounds tests validate the co-integration, indicating a long-term equilibrium among the variables. oil manufacturing output is strongly stimulated by positive changes in trade liberalization. The ARDL result shows that foreign direct investment had a positive but insignificant impact on the oil manufacturing sector while export had a positive and significant impact on the oil manufacturing sector in Nigeria, Similarly, import showed a negative and significant impact on oil manufacturing sector in Nigeria while exchange rate also exhibited a negative with insignificant impact on oil manufacturing sector output in Nigeria. The R^2 showed that 70.4 percent of the independent variables explained oil manufacturing output in Nigeria while 29.6 percent did not capture or explain oil manufacturing sector. The findings suggest that the Federal Ministry of Trade and Investments in collaboration with Federal Ministry of Finance should prioritize initiatives aimed at strengthening and expanding trade liberalization policies. This involves reducing trade barriers, streamlining customs procedures, and actively participating in regional and international trade agreements.

Keywords: *Trade, Liberalization, Oil Manufacturing Sector, Export, Import, FDI*

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Background to the Study

Globally, the liberalized trade paradigm has been that trade liberalization is the major reason for the increase in the growth of the economy and the popular argument is that a competitive economy and an uncertain environment due to trade liberalization lead entrepreneurs to embrace higher capital-intensive productions that affect the growth of the manufacturing sector in two ways: first, for mostly labour-abundant developing countries, moving away from labor-intensive production is a harbinger of unemployment, which people can ill-afford and subsequently seek employment in the informal sector. Secondly, in a bid to reduce costs to sustain competitive pressure, entrepreneurs are keen to sub-contract a few or all the stages of their production process to informal units, whereby they can curtail their costs of training and maintenance of the labour force and vary their production with demand fluctuations (Akpan *et al., 2017;* Nteegah *et al.*, 2017; Ibrahim, 2015). There are also cases where the hitherto protected industries, which get exposed to foreign competition, fail to sustain themselves and are compelled to lay off workers or, in extreme cases, shut down operations (Adekunle & Akinwale, 2020; Edoumiekumo & Opukri, 2013).

Tsaurai (2021) opined that the major problem faced by developing countries in the trade liberalization process is that a country may be able to control how fast to liberalize its imports and thus increase the inflow of products but cannot determine by itself how fast its exports grow. Export performance partly depends on the prices of the existing exported products and developing countries have suffered serious declines in the prices of their commodity exports and their terms of trade and also on having or developing the infrastructure, human and enterprise capacity for new exports. Thus, trade liberalization can cause imports to surge without a corresponding surge in exports.

Another problem of trade liberalization policy is the exchange rate policy, as an important tool derived from the fact that changes in the rate of exchange have significant implications for a country's balance of payments position and even its income distribution and growth. Fluctuation of exchange rate makes international transactions risky such that risk-averse agents tend to reduce export-import activities and reallocate production to domestic markets. Shaikh and Hangbing, (2015) argued that higher exchange rate volatility leads to higher costs for risk-averse traders and less foreign trade. In corroboration, Panda and Mohanty (2015) assert that high volatility in exchange rate usually has a negative effect on price discovery, export performance and sustainability of current account balance.

Also, trade policy in many African countries has been dominated by significant restrictions. In African countries like Nigeria, protectionist trade policies were initially influenced by the perceived need to stimulate local industrial development, under the banner of import substitution and infant industry protection. In Nigeria, tariffs and quantitative restrictions have constituted the most important form of trade restriction. A large proportion of imports into Nigeria were either subjected to outright prohibition, high tariffs, or some sort of import ban or licensing mechanism. Usually, an industry can be protected from imports by applying a quantitative restriction or imposing a tariff. Trade barriers in Nigeria were however, excessive in that the country applied quantitative restrictions, tariffs, inappropriate use of import and

export licenses, undue government interventions, indiscriminate use of import bans and foreign exchange regulations to control the flow of imports and exports (Kromtit *et al.,* 2017; Shin *et al.,* 2014). Protectionist policies were instituted to block imports into the country, except those deemed as priorities by the government and obtainable through elaborate licensing arrangements.

Thus, the multiplier effect from the acquisition of manufacturing equipment and productivity improvements, which are generated to permit us to produce more with less labour and in this way, we can then grow rich; seeing as labour is finally the source of every value-added. In line with the above view, trade liberalisation and manufacturing have been used as a trade strategy for faster growth in developing countries that aim to increase output (Pradhan *et al*, 2019; Tatyana, 2015; Uzma & Mohammad, 2023). Before trade liberalization in Nigeria, government strategy simply involved attracting and encouraging foreign capital to engage in manufacturing activities through the provision of social overheads and the role of government was also limited to providing infrastructure and other public incentives (Adeniyi & Olasunkanmi, 2019).

The manufacturing sector in Nigeria has been assigned the crucial role of driving the needed growth and development of the economy. Additionally, the sector has been assigned the major task of transforming the economy away from overdependence on crude oil, and an import-dependent economy to a diversified and export-oriented economy (Abubakar 2019). Despite the introduction of these trade liberalization policies have not contributed significantly to the oil manufacturing sector and other sectors, especially when compared with their performance in the late 80s. The crude oil and gas sector accounted for over 95 per cent of the earnings from exports in 2011 and 68.88 percent in 2015. The sector contributed 14.8 percent to GDP in 2011, its contribution was 14.4 percent in 2015, while in 2022 was estimated for 6.63 percent which implies a decline in the contribution. This study therefore seeks to examine the impact of trade liberalization on oil manufacturing sector output in Nigeria.

Materials and Methods
Conceptual Review
Trade liberalization involves a country lowering import tariffs and relaxing import quotas and other forms of protectionism. One of the aims of liberalization is to make an economy more open to trade and investment so that it can then engage more directly in the regional and global economy (Narjoko, 2023). Trade liberalization generally refers to reductions in trade barriers, liberalized external capital flows, diffusion of technology and international migration of labour. It covers decontrol the elimination of non-tariff measures as well as policies that shift the trade regime towards neutrality a reduction in the bias toward a particular activity, especially the production of import substitutes (Mohammed, 2018).

On the other hand, Keji (2023) stated that the manufacturing sector comprises both the real and oil sector of the economy, which are charged with the economic responsibility of transforming raw materials into finished goods or intermediate goods, as the case may be. Also, Keji (2023) stressed that the manufacturing sector of any economy remains a source of

FDI attraction. Furthermore, Fonseca and Llamosas-rosas (2018) opined that the manufacturing output is the products produced as a demonstration of total countrywide output. While oil manufacturing sector refers to the total production of oil-related products in an economy and this sector encompasses a wide range of activities related to the extraction, refinement, and processing of crude oil and other petroleum products (Uddin & Khanam, 2017). An important metric is the value of oil production. This includes the market value of the oil produced, taking into consideration factors such as crude oil prices and the value added through refining processes. It is often measured in monetary terms, such as dollars or the local currency.

Empirical Review

Puepet *et al.*, (2023) examined the effects of non-oil exports on economic growth in Nigeria and the ARDL technique of estimation and the findings of the study showed that agricultural and services exports have a positive and statistically significant impact on economic growth in the short and long run. The study, therefore, concluded that agricultural and services exports are important for the economic growth of Nigeria in the short and long run while manufacturing export is necessary for economic growth only in the short run. The study recommended that agricultural, manufacturing, and services exports should be greatly promoted in Nigeria by granting tax concessions to companies, organizations, or individuals that export services, agricultural and manufacturing outputs to other countries. While Chude and Chude (2023) investigated the effect of exchange rate policy on non-oil export in the Nigerian economy 1981-2021 and Ordinary least square (OLS) method of data analysis was adopted. The variables were on non-oil export as the dependent variable, while trade openness, exchange rate and money supply as the independent variables. From the model it was discovered that trade openness has a significant impact on non-oil export in Nigeria and the exchange rate sector has a significant impact on non-oil export in Nigeria while money supply has a significant impact on non-oil export in Nigeria. The study recommends that foreign exchange control should be adopted to determine the appropriate exchange rate value. The government should adopt selective credit control to channel funds to the productive sectors of the economy and a restrictive policy is also recommended to reduce pressure on foreign currency.

In another study, Ajala and Adekunle (2023) investigated the relationship that exists between trade openness and agricultural output in Nigeria. The methodology adopted was the Autoregressive Distributed Lag (ARDL) model. The findings revealed that the degree of openness had a positive relationship with agricultural output (T= 0.72). It further revealed that government expenditure on agriculture had a negative correlation with the agricultural output or VAO (T= 1.28) which negate the a-priori expectation. Labour participation in agriculture was positively related and was significant to the value of agricultural output (T=11.48). The study recommends among others that government should regulate trade activities, most especially at the land borders of the country as it will help improve the outcomes of trade openness. While, Al Amin (2022) examined the impact of FDI in manufacturing sector, using data from 1995-2020. The Time Series analysis has shown that there is statistically significant relationship between FDI and manufacturing sector. From the result, it can be seen that the

dependent variable explained 96% of the variations in manufacturing value added, while the other independent variables are foreign direct investment (FDI), service value added (SVA), inflation (INF), exchange rate (ER). This study also shows a scenario of contribution of manufacturing sector into the GDP of the country. One of the alarming recommendations of the study is foreign investors should be guaranteed by resolving the armed opposition concerns in the nation, as disturbance everywhere will turn off foreign investment.

Similarly, Chen *et al.,* (2022) examined the link between FDI and industry and the service sector's industrial progress from 1980 to 2005. The empirical evidence points to an independent connection between FDI and company growth. Given that FDI can only result in expansion if the host nation has a well-established and adequately skilled labour force, the government must pay close attention to the specific ways in which FDI can engage with human capital in order to significantly affect the ongoing expansion of Malaysia's industrial sector. While, Ikpe, *et al* (2020) empirically provided answer to the question of whether trade liberalization policy enhances non-oil export trade in Nigeria. The study adopted an Autoregressive Distributed Lag model approach to the analysis of the impact of trade liberalization policy on non-oil export trade. Evidence provided support for trade liberalization policy as the growth driver for non-oil export, a sector that exports more but earns little in terms of revenue. As a result, the study recommends a well-thought-out public–private partnership arrangement for the efficiency of the private sector (a major player in non-oil export trade), to optimally harness the benefits of liberalization in Nigeria's non-oil trade sub-sector.

Also, Adekunle and Akinwale (2020) analyzed the link between trade liberalization and the manufacturing sector of Nigeria from 1986 to 2018. Autoregressive Distributed Lag (ARDL) and Pairwise Granger Causality econometric techniques were used for analysis. The existence of a dynamic relationship was established between the output of the manufacturing sector and trade liberalization. Also, it was found that trade liberalization exerted indirect and significant impact on productivity of manufacturing sector while the causality findings indicated independent causality linking trade liberalization to the output of the manufacturing sector in Nigeria. This implies that trade policy impedes the development and enhancement of the manufacturing sector resulting from the country's over-reliance on foreign products. It was however concluded that policy on international trade has undesirable impact on output of manufacturing sector. Thus policies on trade barrier should be totally removed in order to make the economy more open to foreign trade and putting in place structures to enhance the survival and performance of local manufacturing firms. In another study, Daasi *et al.,* (2020) examined the impact of trade liberalization on manufacturing sector output in Nigeria. In order to achieve this objective, the study employed the econometrics technique of ordinary least squares (OLS) in analyzing time series data from 1981-2016. Data on Manufacturing Sector Output, trade openness, foreign direct investment and exchange rates were collected from the Central Bank of Nigeria Statistical Bulletin. The results showed that trade liberalization has an impact on Manufacturing Sector Output in Nigeria for the period under study, with trade openness and foreign direct investment conforming to apriori expectation thus having a positive relationship with manufacturing sector output while exchange rate

showed a negative relationship with manufacturing sector output and also conform to apriori expectation. There should be effective regulation of trade inflows so as to avoid Nigeria from being a dumping ground for substandard goods.

In another study, Sidi and Osunaiye (2019) examined the impact of trade liberalization on the export of non-oil sector of the Nigeria economy within the period 1986-2018 and the Autoregressive Distributed Lag model (ARDL) was used for the analysis. The ARDL results affirmed that EXT, INF, EXR had a positive and significance relationship with non-oil sector. In view of this, the study recommends that there is need for the diversification of the economy from oil to non-oil sector, in order to encourage the export of the non-oil sector during trade liberalization. And Awoke *et al.* (2019) investigated the impact of non-oil export on economic growth in Nigeria using the autoregressive distributive lag method (ARDL). The results demonstrate that exchange rate, real gross domestic product, non-oil export, trade openness, and inflation trend together in the long run. Yet, the effect of non-oil exports on economic growth is not substantial enough to take Nigeria to a fortunate economic level within the period studied. This is similar to this study even though there is a slight difference in terms of some variables; which are trade openness and inflation in Nigeria.

Eze *et al*. (2019) examined the effect of funding from foreign countries (FDI) on the progression of economic expansion production in Nigeria from 1970 to 2016. The business sector's valuable contribution hasn't been all that inspiring because of issues including a lack of cash. Thus, the research presents a nonlinear model of the influence of FDI influx on factory growth. Although quantitatively negligible, this reveals a long-term link between both FDI and industrial output. The Granger causality finding reveals that FDI and MSOG are both causal. According to the study, in order to modify the economy by means of the industrial region, government policymakers should pay attention to the following factors: energy generation, currency fare, private sector lending, and civil security, all of which have strong correlations with MSOG. In another study, Mohammed (2018) investigated the relationship between non-oil trade openness (NTOP) and the financial development effect on economic expansion in Saudi Arabia, focusing on the 1990-2016-time period and applying the fully modified ordinary least squares approach. In the long run, the findings suggest that the NTOP, the private sector's domestic bank credit and the stock market are significant in their expected positive signs. In the short run, the results indicate that NTOP and the stock market have an expected positive and significant coefficient but the domestic bank credit offered to the private industry has a noteworthy but negative unexpected sign. Consequentially, if the real GDP is out of equilibrium by 1 percent, a 26.8 percent adjustment will occur towards equilibrium by the end of the 1st year. While, Onuarah (2018) investigated the effect of non-oil exports on the economic development of Nigeria. The study analyzed data from 1985- 2017. The research employed the ARDL technique, and the variables used were technology as a proxy of non-oil exports, FDI, and government expenditure. The study revealed that a significant long-run relationship exists between non-oil exports and the growth of the economy in Nigeria. This is similar to this study in terms of the variable of non-oil exports but differs in capturing the variables of FDI, technology, and government expenditure.

Danmola *et al.,* (2017) examined FDI in the automotive industry as a highly relevant and favorable effect on industrial output. Time series investigations were carried out. Through the implementation of permissive industrial and trade regulations, the outcome supports the efficacy of the national government of Nigeria's economic strategy. According to the concept, boosting the flow of FDI into the industrial sector requires favourable domestic economic conditions to preserve economic growth and development. While, Nwodo and Asogwa (2017) examined non-oil export, global integration, and economic growth in Nigeria from 1986-2014, employed the ADRL technique also to analyze the research objective with Real Gross Domestic Product (RGDP) as the dependent variable while the degree of trade openness, government final expenditure, credit to the private sector, non-oil exports, size of the labor force as independent variables. The study indicated that non-oil exports significantly impacted the economic growth of Nigeria in the short run and consequently in the long run. Given the signs of their coefficients, it was discovered that trade and financial openness had an insignificant effect on economic growth. The study is similar to this study by capturing the non-oil sector in the topic but differs from 1986-2019 employed in this research.

Theoretical Review
The theoretical framework for this study is the neoclassical trade theory which was first developed by Marshall (1879). Unlike in the Ricardo's comparative advantage theory where countries could benefit from trade due to technological differences in production, the neoclassical trade theory explains why trade could still be beneficial even if the technology between countries was identical. The theory posited that patterns of trade are determined simultaneously by the differences in: factor endowments, technologies, and the tastes of different countries (Pradhan, *et al.,* 2019). In contrast to the classical theory that only considered the supply side (cost) factors relating to trade, the neoclassical theory held that the utility of a product is also important and therefore, preference accounts for the existence of trade among nations even if their factor endowments and technologies are entirely similar. Thus, under the neoclassical trade theory, productivity will be improved upon with increased trade liberalization measures provided that any one factor such as taste, technologies, or factor endowments differs among trading partners. Thus, according to the Heckscher-Ohlin model productivity increases with greater trade liberalization (lower tariff and export tax rates) when trading partners have different factor endowments. Therefore, the study established that there is a functional relationship between trade liberalization and oil manufacturing sector output in Nigeria.

Methodology
This paper adopted the ex-post-facto research design and time series data were used. The data on oil manufacturing output (OMO) (measured as oil components of total manufacturing output), foreign direct investment (FDI) (measured as Foreign direct investment, net inflows % of GDP), Export (EXP), Import (IMP), exchange rates (EXP) in Nigeria were sourced from World Development Indicators (WDIs) of the World Bank and Central Bank of Nigeria Annual Statistical Bulletin, December 2022.

Method of Data Analysis

Autoregressive Distributed Lagged (ARDL) was the best method for estimating variables integrated into 1(1) and 1(0), according to Pesaran and Shin (1999), which was expanded by Pesaran *et al.,* (2013). Therefore, Autoregressive Distributed Lagged (ARDL) was used to estimate and analyze the long and short-term impact of trade liberalization on the oil manufacturing sector in Nigeria. The co-integrations of trade liberalization and oil manufacturing sector in Nigeria were examined using the autoregressive distributed lag (ARDL) bound test. The analytical program for model estimation is E-Views 12.0. (Shin *et al.,* 2014). Following Abdullah & El-Rasheed (2021), the paper derived an ARDL framework from the conventional ARDL. The function is expressed below;

$$OMO = f(FDI, EXP, IMP, EXR) \qquad (1)$$

Where OMO is oil manufacturing sector output, FDI stands for foreign direct investment, EXP stands for export in Nigeria, IMP is import in Nigeria and EXR means exchange rate in Nigeria.

The model is represented in econometric format; and also shows the explicit function of the model:

$$OMO_t = \alpha + \beta_1 FDI_t + \beta_2 EXP_t + \beta_3 IMP_t + \beta_4 EXR_t + \mu_t \qquad (2)$$

OMO is the oil manufacturing sector output, FDI stands for foreign direct investment, EXP is for export in Nigeria, IMP is import in Nigeria and EXR means exchange rate in Nigeria. Subscript t is the period and μ is a stochastic error term.

Now, the empirical model for the ARDL is driven from equation 3:

$$OMO_t = \alpha_0 + \alpha_1 FDI_t + \alpha_2 EXP_t + \alpha_3 IMP_t + \alpha_4 EXR_t + \sum_{i-1}^{q} \alpha_5 \Delta OMO_{t-1}$$
$$+ \sum_{i-1}^{p} \alpha_6 \Delta FDI_{t-1} + \sum_{i-1}^{p} \alpha_7 \Delta EXP_{t-1} + \sum_{i-1}^{p} \alpha_8 \Delta IMP_{t-1} + \sum_{i-1}^{p} \alpha_9 \Delta EXR_{t-1} + \mu_t \qquad (3)$$

Equation 4 clearly expresses the log run coefficients. Δ is a first difference operator. α_0 is constant. $\sigma_1, \sigma_2, \sigma_3, \sigma_4$ and σ_5 are short run estimates coefficients while $\vartheta_1, \vartheta_2, \vartheta_3, \vartheta_4$ and ϑ_5 represent the long run estimates. μ is the stochastic error term.

Empirical Results and Discussions

This section starts with some pre-estimation tests as indicated below:

Table 2: Descriptive Statistics

	OMO	FDI	EXP	IMP	EXR
Mean	0.045442	1.238031	6227897.	5194325.	115.7410
Median	25.43834	1.078745	1906839.	1435438.	115.2551
Maximum	412.3001	4.282088	27251572	27115109	425.9811
Minimum	0.045442	-0.039522	7502.500	5983.600	0.610025
Std. Dev.	119.1179	0.950780	7243131.	7108949.	119.1411
Skewness	1.042634	0.911567	0.992946	1.528542	1.021358
Kurtosis	2.952647	3.700421	3.052886	4.523062	3.221266
Jarque-Bera	7.613525	6.675211	6.906487	20.41458	7.387882
Probability	0.022220	0.035522	0.031643	0.000037	0.024874
Sum	4024.940	51.99729	2.620000	2.180000	4861.124
Sum Sq. Dev.	581752.3	37.06330	2.150000	2.070000	581978.7
Observations	42	42	42	42	42

Source: Output from E-view 12 (2024)

Table 1 shows the summary of statistics or the descriptive statistics of the variables used in the study. From the table, the highest value for the oil manufacturing sector output in Nigeria during the period of study was 412.3001 billion, as shown in the maximum values in Table 1. while the peak values for Foreign direct investment, export, import and exchange rates in Nigeria were 4.282088, 27251572, 27115109, 425.9811 respectively. However, the lowest value for oil manufacturing sector output in Nigeria during the period of study was 0.045442. While the lowest values for Foreign direct investment, export, import and exchange rates in Nigeria were -0.039522, 7502.500, 5983.600 and 0.610025 respectively, on average, oil manufacturing sector output in Nigeria was 0.045442, while the values for Foreign direct investment, export, import and exchange rates in Nigeria were 1.238031, 6227897, 5194325 and 115.7410 respectively, as indicated by their mean values.

Stationary Tests (Unit Root Tests)
This section shows the unit root of the variables using the Augmented Dickey-Fuller (ADF) Test to check the stationary at a 5 percent level of significance.

Table 2: Unit Root Test Result

Variable	Augmented Dickey-Fuller (ADF) Test		
	ADF	Critical Value	Status
OMO	-3.755333**	-3.574244	1(1)
FDI	-4.770939**	-2.957110	1(0)
EXP	-5.851615**	-2.957110	1(1)
IMP	-2.006012**	-1.951687	1(1)
EXR	-4.935806**	-3.526609	1(1)

* implies significant at 1% level, **implies significant at 5% level and *** implies significant at 10%

Source: Researcher's Compilation Using EViews-12 (2024)

Table 2 shows the stationary tests of OMO, EXP, IMP and EXR in Nigeria Thus, Table 2 of the ADF test results revealed that the variables were not stationary at the level until they were differenced once, and they were said to be integrated of order 1(1) at a 5 percent level of significance. On the other hand, FDI in Nigeria was stationary at level and it was said to be integrated at order zero 1(0). Given the mix result, as shown by ADF tests, as well as the order of integration of the variables, the long-run relationship among the variables will be tested using the ARDL model, which can capture the characteristics of a mixture of 1(0) and 1(1) of the variables as postulated by Pesaran *et al.,* (2001).

Co-integration of ARDL-Bounds Test
This section shows the ARDL co-integration bounds test of the variables used in this paper.

Table 3: ARDL-Bound Testing

Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	9.053520	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.49	3.38
5%	2.81	3.76
2.5%	3.11	4.13
1%	3.5	4.63

Source: Researcher's Compilation Using EViews-12 (2024)

Table 3 shows the ARDL bounds test for co-integration that was carried out for all five models based on the research objectives. The model result shows that the F-statistic derived from the ARDL bounds test was 9.053520, and when compared with the critical values obtained from the Pesaran Table at a 4 percent level of significance, its value exceeded both 2.81 and 4.25 for 1(0) and 1(1), respectively. FDI, EXP, IMP and EXR variables in Nigeria were co-integrated at a 5 percent level of significance.

Estimation Results
This section presents the long-run and short-run results of the ARDL regression analysis, where the OMO in Nigeria is the dependent variable and the FDI, EXP, IMP and EXR in Nigeria were the independent variables.

Table 4: ARDL Error Correction Regression

Dependent Variable: D(OMO)
Co-integrating Estimates (ECM Estimates)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.933439	4.104688	-0.714656	0.4805
D(OMO(-1))	-0.188679	0.101121	-1.865877	0.0722
D(EXP01)	1.5100000	2.020000	7.459881	0.0000
D(EXP01(-1))	-9.250000	2.100000	-4.398309	0.0001
CointEq(-1)*	-0.444998	0.050882	-8.745664	0.0000
R-squared	0.703512	Mean dependent var		0.486919
Adjusted R-squared	0.669627	S.D. dependent var		42.98882
S.E. of regression	24.70913	Akaike info criterion		9.368692
Sum squared resid	21368.94	Schwarz criterion		9.579801
Log likelihood	-182.3738	Hannan-Quinn criter.		9.445022
F-statistic	20.76214	Durbin-Watson stat		2.597055
Prob(F-statistic)	0.000000			

Long Run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	1.209198	12.05732	0.100287	0.9208
EXP	5.820000	1.440000	4.051117	0.0003
IMP	-4.61000	1.190000	-3.87137	0.0006
EXR	-0.30978	0.552225	-0.56098	0.5791

Source: Researcher's Compilation Using EViews-12 (2024)

From Table 4, the value of F-statistics of 20.76214 and the probability value of 0.0000 indicated that there was a long-run relationship between trade liberalization on oil manufacturing sector output in Nigeria. The R-square value of 0.703512 revealed that FDI, EXP, IMP and EXR jointly accounted for about 70.3512 percent of the variation in the oil manufacturing sector output in Nigeria during the period under review, while the remaining 29.6488 % percent was accounted for by other factors outside the model.

The short-run result and the ECT show the 1-period lag error correction term. Its value of -0.444998 indicated that it is negative and statistically significant, with a probability value of 0.05 at a 5 percent significant level. This means that the average speed of adjustment from the short run to the long run, should there be any disequilibrium, is 29 percent. The long run coefficient and probability values of each variable revealed that all the independent variables, which reveals that FDI had a positive but insignificant impact with value of 1.209198 and probability of 0.9208 on OMO while EXP had positive and significant impact on OMO in Nigeria with value of 5.82E-05 and probability value of 0.0003 that rejected the null hypothesis at 5 percent level. Similarly, the value -4.61E-05 and probability of 0.0006 indicated that IMP had a negative and significant impact on OMO in Nigeria while -0.309787 and probability of 0.5791 for the EXR also exhibited a negative with insignificant impact on OMO in Nigeria at a 5 percent level.

Post-Diagnostic Checks
Table 5: Results of Post-Diagnostic Checks

Test		Outcomes	
		Coefficient	Probability
Breusch-Godfrey Serial Correlation LM Test	F-stat.	3. 056643	0.0067
Heteroskedasticity: Breusch-Pagan-Godfrey	F-stat.	3.648530	0.0031
Normality Test	Jarque-Bera	3.481620	0.1753

Source: Researcher's Compilation Using EViews-12 (2024)

Table 5 revealed that the variables were free from the problem of Serial Correlation since the F-statistics is 3. 056643 and the P-value of 0.0067 is less than the 5% significance level. This outcome suggests the presence of Serial Correlation in the model of the impact of selected revenue indicators on oil manufacturing sector output in Nigeria. Similarly, the Heteroskedasticity results show that variables are not free from the problem of Heteroskedasticity since the F-statistics of 3.648530 and P-value of 0.0031 are less than the 5% significance level. This outcome suggests the presence of heteroskedasticity in the model of the impact of selected revenue indicators on economic growth in Nigeria. Also, the Jarque-Bera test of normality shows that the error term in our specified equation was normally distributed. Finally, this was evidenced by the respective insignificant Jarque-Bera statistics of 3.481620 and the probability value of 0.1753.

Discussion of Findings
The study revealed that FDI had a positive but insignificant impact on oil manufacturing sector output in Nigeria and this suggests that while FDI may contribute to the sector's growth, its impact was not statistically significant. This implies that other factors beyond FDI were more influential in driving output in the oil manufacturing sector, and this finding agreed to the study of Danmola *et al.,* (2017). Also, the positive and significant impact of EXP on oil manufacturing sector output indicated that increasing EXP activities will lead to notable improvements in the sector's performance. Policies aimed at promoting exports from the oil manufacturing sector will therefore be beneficial for enhancing its output and economic contribution and this finding agreed with the study of Ojeyinka and Adegboye (2017).

The negative and significant impact of IMP on oil manufacturing sector output implies that higher levels of IMP were associated with decreased output in the sector. This suggests that measures to reduce import dependency or enhance domestic production capacities will potentially improve the performance of the oil manufacturing sector and this finding agreed to the work of Abubakar, (2019). Finally, the negative and insignificant impact of EXR on oil manufacturing sector output suggested that fluctuations in EXR may not significantly influence the sector's output and this finding agreed with the study of Akanbia *et al.*, (2017). However, maintaining exchange rate stability could still be important for overall economic stability and investors' confidence.

Conclusion and Recommendations

The analysis reveals a long-run relationship between trade liberalization and the output of Nigeria's oil manufacturing sector. Approximately 70.4 percent of the variation in the sector's output during the study period was explained by foreign direct investment, export, import, and exchange rates, while the remaining 29.6 percent was attributed to other factors outside the model. The short-run dynamics indicated a significant negative error correction term, suggesting a moderate speed of adjustment towards long-run equilibrium. Therefore, the paper recommended the following:

1. The Federal Ministry of Trade and Investment and the Federal Ministry of Finance should redesign foreign direct investment in Nigeria to increase its significant impact on oil manufacturing sector output in Nigeria;
2. The Export Promotion Council of Nigeria and the Federal Ministry of Trade and Investment should implement policies aimed at promoting exports from the sector. This could involve providing incentives for exporters, investing in export infrastructure, and facilitating access to international markets;
3. The Federal Ministry of Trade and Investment and the Federal Ministry of Finance should consider measures to reduce import dependency and enhance domestic production capacities. This could include supporting local industries, implementing import substitution policies, and improving trade balance; and
4. The Federal Ministry of Finance and the Central Bank of Nigeria should continue to implement measures to ensure exchange rate stability through effective monetary and fiscal policies.

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