

## **Liberalization of Foreign Trade and Manufacturing Output in Nigeria**

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### **Abstract**

The study examined the effects of trade liberalization on the Nigerian manufacturing sector output between 1980 and 2015. Johansen test was used to determine the existence or otherwise of a long run relationship among the variables. The Impulse Response test was also applied to ascertain the direction of causality and the ripple effects of the shock of one variable on the other respectively. The findings concluded that all the moderating variables had long-run relationship with manufacturing output. There was no significant relationship between trade liberalization and the output of the Nigerian manufacturing sector in both the short and long run.

**Key words:** Industrialization, Liberalization, Trade Openness, Gross Domestic Product, Inflation Rate, Real exchange rate, Foreign Direct Investment.

### **Introduction**

Trade policies are intertwined with the industrial growth of a country. The neoclassical theory of growth and international trade by Lucas (1988), Romer, (1990) and Grossman and Helpman (1991) supports the beneficial impact of trade liberalization due to efficiency of large scale, and technological progress accruing to domestic industrial sector. This strand of economic theory found consonance with the neo-liberalism theory, which prescribes the free markets system including the liberalization of economic policies in terms of free trade, as the most-efficient allocator of resources. Nigeria, like other developing countries have deployed restricted trade policies towards the protection of domestic industries. However, the African Union (2018) identified trade openness as one of the key reasons for

conceptualization of the African Continental free Trade Area (AfCFTA). This is a precursor to deeper integration of African economies and the enhancement of competitiveness at the enterprise level for better reallocation of resources. The advent of globalization, in the findings of Razak (2012) has forced several countries to reconsider their economic policy stance in terms of trade openness.

The contribution of manufacturing sector to the Nigerian GDP has over the years, been uneven. At independence in 1960, the manufacturing sector accounted for 4.8% of the GDP. It rose to about 7.4% a decade later largely due largely to foreign direct investments. The peak record of 10.7% was recorded in 1980 which crashed to 6.3% in 1985 and further down to 4.3% in 1997, and 4.21% in 2009. Manufacturing contribution went back up to 6.46% in 2011 and 6.83% in 2013, and 9.33% in 2016. Indeed, the manufacturing production in Nigeria averaged 5.84% between 2007 and 2018 (Tradingeconomics, 2018a). The prima facie deduction from the performance of the manufacturing sector is its inverse relationship with the trade liberalization policy in terms of bilateral and multilateral trade agreements of Nigeria. There are conflicting findings by works on the country. Positive relationship was reported by Asongo (2013), Umoro (2013) among others. Ogu, Aniebo and Elekwa (2016) reported damaging impact while Ojo and Olalade (2014) recorded an insignificant influence. These apparent contradictions in the literature necessitate the conduct of this research. Indeed, as Nigeria prepares to implement the African Continental Free Trade Area agreement this research seeks to re-examine the relationship between trade liberalization and manufacturing output in Nigeria by identifying relevant underlining theories, utilising robust econometric and model validity techniques and providing policy options. The on-going non-tariff measure of closure of the land borders in Nigeria which restricts international also requires empirical analysis. The research is laid out as follows: The next section conducts a review of theoretical and empirical literature. In the third section and fourth sections, the methodology and findings are presented. Section five provides the conclusion and recommendations.

## **2.0 Literature Review**

The review is in two parts: theoretical and empirical.

### **2.1 Theoretical Underpinning**

The Neo-Liberalism theory, a resurgence of the laissez-faire economic liberalism prescribes the free markets system as the most-efficient allocator of resources. The idea is the liberalization of economic policies in terms of free trade, economic deregulation, execution of austerity measures, privatization and, reductions in government expenditure (Moini, 2016). The postulation of the neo-liberals as reviewed by Aalbers (2013), asserts that a country should embark on domestic markets liberalization in concert with external trade openness. This will allow the prices; interest rates and wages find their natural equilibrium through market discipline as a result of the reduction in government interference in domestic markets for labour, capital and goods. This will consequently propel the market and the economy towards an equilibrium growth path where investment, production, and indeed the absorptive capacity creation follow a dynamic comparative advantage. The concomitant impact is a more efficient utilization of resources through increased competition in domestic markets and international competitiveness. With respect to the foreign markets, there are additional costs: trade costs (tariffs) and sunk and/or variable costs (Dalgic, Fazhoglu and Gasiorek, 2015).

The self-selection theory propounded by Bernard and Jensen (1995) states that companies involved in export markets demonstrate higher productivity level in comparison with non-entrants into the international arena. This is because a higher level of efficiency is required by the exporting firm to deal with the complexities of selling in the foreign markets including the sunk costs, and foreign trade specific variable costs. Only the higher productive firms are able to incur and yet make profits Melitz (2003). However, the Metzler Paradox (1949) conceptualized within the Heckscher-Ohlin model, posits the theoretical likelihood that the imposition of an import tariff may in fact lead to a reduction in the relative internal price of the commodity. This could have a deleterious effect on the recipient country leading to immiserizing growth (Casas & Choi, 1985) if the offer curve of the exporting nation is very inelastic. Krugman and

Obstfeld (2003) therefore recommend the lowering of import tariffs on goods and services only where the offer curve exporting nation is elastic which would cause the tariff to beneficially impact international trade. This situation is particularly germane for countries with agrarian monoculture.

## **2.2 Empirical Review**

The findings on the nexus between trade openness and the output of the manufacturing sector are mixed in the literature. Dixit and Norman (1980) utilizing the Cournot – Nash model reported that the imposition of tariff protection in Canada led to inefficient industrial performances. The application of the Ordinary Least Squares (OLS) method by Asongo (2013) evaluated the impact of trade liberalization on the Nigeria manufacturing sector in between 1989 and 2006. The results showed that the manufacturing is favourably impacted by the openness of international trade. Similar results were recorded in the investigation of the level of export by manufacturing companies in Nigeria by Umoro (2013). This study emphasized that in the long run, trade openness significantly influenced with the potential ability to boost the manufacturing output in Nigeria. However, the use of the same OLS method revealed the insignificant impact of globalization on the Nigerian manufacturing sector in the study by Ojo and Olalade (2014). The combined use of the Simple Annual Growth Rate (AAGR) and Co-integration, error correction techniques by Umoru and Eborieme (2013) on the influence of open trade on the growth of the Nigerian industrial sector found a negative connection between manufacturing sector and the advent of globalization. This contrasted from the earlier research in China by Mairerse, Mohnen, Zhao and Zhen (2012) on the impact of globalization, innovation and productivity in manufacturing firms. The use of the Marginal impact estimation technique by Edeme and Karimo (2014) incorporated the standard errors to within a Structural-break model, correct for serial correlation.

The finding showed that trade liberalization when combine with financial deepening, weakened the Nigerian manufacturing sector performance. In the same vein, Ogu, (2016), using the VECM

mechanism techniques reported that the liberalization of international trade was harmful to the output of the manufacturing sector in Nigeria in the short run but with the potential for enhancement in the long term. These lapses were fully exploited by multinationals. This result is contrary to the findings of Onakoya, Fasanya and Babalola (2012) who using the same method, discovered a positive consequence of open trade on the Nigerian manufacturing sector output with the use of time series data spanning from 1975 to 2010. The mixed results in the literature findings on the nexus between trade openness and the output of the manufacturing sector makes the need for this study manifest as the African Continental Free Trade Agreement is readied for implementation.

### **3.0 Methodology**

#### **3.1 Data Source and Descriptions**

The contribution of manufacturing output to Gross Domestic Product (GDP) was used to represent manufacturing output. Trade liberalization is measured by imports (constant local currency) plus export (local currency) divided by GDP (constant local currency). The data on these variables and those of inflation and real exchange rates were obtained from the World Bank Development Indicators (2017). The statistics on government expenditure on economic activity was retrieved from the Central Bank of Nigeria Statistical Bulletin (2017).

#### **3.2 Model Specification**

The model is based on the Solow (1956) theory of production function framework, which, was adapted from the work of Enu and Attah-Obeng (2013) using the Cobb - Douglas production function. A multiple regression equation model is deployed in the investigation using the Vector Error Correction Model. This estimates the speed at which the dependent variable (manufacturing contribution) returns to equilibrium after a change in the independent variables (regressors). The Vector Error Correction Model is specified in equation (i) as:

$$\begin{aligned}
 &LnManugdp_t = \\
 &\beta_0 + \sum_{i=1}^p \beta_{1i} \Delta infr_{t-1} + \sum_{i=1}^p \beta_{2i} \Delta Lnreer_{t-1} + \sum_{i=1}^p \beta_{3i} \Delta Lngexea_{t-1} + \\
 &\sum_{i=1}^p \beta_{4i} \Delta tradeop_{t-1} + \Omega_1 ECT_{t-1} + \varepsilon_t
 \end{aligned}
 \tag{1}$$

Where: *manugdp* = manufacturing contribution to Gross Domestic Product;

*gexea* = government contribution to economic activity;

*reer* = Real exchange rate;

*infr* = the inflation rate;

*tradeop* = trade openness (liberalization)

$\varepsilon_t$  is error term covering unspecified variables in the model.  $\beta_0$  is the intercept.  $ECT_{t-1}$ , the error term is derived from the long term co-integration relationship.  $\beta_1, \beta_2, \beta_3, \beta_4$   $e_t$  is the slope of the linear equation where  $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0$ , and  $e_t < 0$ . *Ln* is the natural logarithm. *t* is time; *p* is the optimal lagged time.

### 3.3 Model Estimation Procedure

A three-stage methodology was deployed. First, pre estimation tests: Descriptive statistics, Augmented Dickey Fuller (1979) and Phillip-Perron (1988) unit root tests. In the estimation stage, the employed parametric techniques included the Johansen co-integration. This technique is based on an unrestricted Vector Autoregressive (VAR) model. The Johansen test was applied to determine the existence of a long run relationship among the variables (Johansen, 1988). Two types of tests within the Johansen cointegration method were applied: the Eigenvalue and Trace statistic assessments. The roots are the eigenvalues of the system which evaluates the number of cointegrating vectors *r* against the alternative of *r*+1 cointegrating vectors. The trace statistics test the null hypothesis that the number of distinct cointegrating vectors (*r*) is less than or equal to *r*.

$$\lambda_{trace} = -T \sum_{i=r+1}^n \ln (1 - \lambda_i^2)$$

(2)

$$\lambda_{max} = -T \ln (1 - \lambda_{r+1})$$

(3)

Where  $\lambda_i$  = the obtained ordered eigenvalues from the estimated matrix and

T = the number of the observations after the lag adjustment.

The statistics verify the stability or otherwise of a dynamic system. In a cointegration test as this, the process considered stationary if all the roots of the system are within the unit circle. The consequential implication is that the variables are cointegrated and the existence of long-term inter-correlation is confirmed. Thereafter, the VECM technique is then deployed to determine the rate of correction adjustment to short-term shocks. The cointegration test may not however, expose the full interfaces amongst the system variables, which, makes the examination of the Impulse Response function necessary. This function explains the variations in the regressor, over time, as a result of exogenous shocks to the independent variables especially in the context of a Vector Autoregression model (Hamilton, 1994 & Lütkepohl, 2008). The study conducted a number of post-estimation tests to confirm model robustness and validity. These tests conducted within the VECM framework examined the normality of the distribution of the residuals and the ability of the estimates to provide reliable statistical inferences. The diagnostic tests are the Breusch-Godfrey (1978) LM test to analyse the serial relationship between the variables.

The Durbin Watson statistic (1951) test is also deployed. This is the auto-correlation test between the variables, the statistic of which lies between 0 and 4. The values between 0 and less than 2 indicate positive autocorrelation and values from more than 2 to 4 indicate negative autocorrelation. A rule of thumb is that test statistic values in the range of 1.5 to 2.5 are relatively normal. It also included the Vector Error Correction (VEC) residual normality test, which examined whether the residuals are normally distributed and the Vector Error Correction (VEC) residual heteroscedasticity tests to validate whether the variance of the errors in a regression model is constant White (1980). Others post-estimation diagnostic tests are the Inverse Roots of AR Characteristic Polynomial to test the dynamic stability of the estimates. As postulated by Lütkepohl (1991) the estimated VAR is

considered stationary where all the roots with less than one modulus, are situated inside the unit circle. The study further deployed the Q-Statistics tests recommended by Dean and Dixon (1951) to further check the existence of a serial relationship amongst the variables by identifying and eliminating residual outliers.

#### **4.0 Empirical Findings and Discussions**

##### **4.1 Preliminary Analyses**

This analysis is divided into two parts: Descriptive Statistics and Stationarity test.

##### **4.1.1 Descriptive Statistics**

The descriptive statistics of the variables are presented in Table 1.

Table 1: Descriptive Statistics

Statistics	Infr	Lnreer	Lngexea	Lnmanugdp	Tradeop
Mean	19.60	3.29	24.84	28.40	0.35
Median	12.55	3.81	25.94	28.18	0.34
Maximum	72.84	5.54	27.61	29.53	0.54
Minimum	5.38	-0.48	20.58	27.65	0.06
Std. Dev.	17.69	1.95	2.39	0.52	0.08
Skewness	1.67	-0.73	-0.46	0.99	-0.86
Kurtosis	4.53	2.19	1.59	2.84	7.32
Jarque-Bera	20.12	4.22	4.26	5.96	32.51
Probability	0.00	0.12	0.12	0.05	0.00
Sum	705.71	118.42	894.34	1,022.52	12.50
Sum Sq. Dev.	10,953.29	133.30	200.40	9.32	0.20

**Source: Author’s computation using E-views 8.0 (2018)**

The test above portrays minor disparities between the maximum and minimum values for each variable in the period of study - 1981 till 2016. This depicts a minor disparity in the variable trends over the period in consideration as a result of the difference between the maximum and minimum values of each variable. Additionally, inflation rate and manufacturing contribution to the GDP variables were positively skewed. The real exchange rate, government expenditure



on economic activity and manufacturing contribution to GDP were platykurtic in nature because their values for kurtosis are all less than 3. The combined impact of the skewness and kurtosis is manifested in the Jacque-Bera statistics which revealed the non-normality in all the variables because their values were greater than the standard threshold of 2.

**4.1.2 Stationarity Test Results**

The Augmented Dickey Fuller (ADF) and the Phillip Perron test results are presented in Table 2. The decision upon which difference should be selected is based upon the decision criteria which states that if the absolute test statistic is greater than the absolute critical value then reject the null hypothesis and accept the alternative hypothesis. However, if the absolute test statistic is less than the absolute critical value, then accept the null hypothesis and reject the alternative hypothesis.

Table 2: Unit Root Test Results: Augmented Dickey Fuller and Phillip Perron Test

Series	5% Critical Value	ADF Test at first difference (Prob.)	Phillip Perron Test at First Difference (Prob.)	Equation Specification	Order of integration
<i>tradeop</i>	-2.95	-4.97 (0.00)	-5.75 (0.00)	Intercept	I(1)
<i>infr</i>	-2.95	-5.42 (0.00)	-9.06 (0.00)	Intercept	I(1)
<i>Inreer</i>	-2.95	-5.03 (0.00)	-5.03 (0.00)	Intercept	I(1)
<i>Ingexea</i>	-2.95	-6.02 (0.00)	-6.01 (0.00)	Intercept	I(1)
<i>Inmanu gdp</i>	-2.95	-5.09 (0.00)	-5.09 (0.00)	Intercept	I(1)

Source: Author’s computation using E-Views 8.0 (2018)

The result as reported in Table 2 revealed a first order of integration at 5% significance level which suggests the use of Johansen cointegration test as the appropriate estimation method based on an unrestricted vector autoregressive (VAR) model.

**4.2 Estimation Results**

**4.2.1 Optimal Lag Length Selection**

The result of the optimal lag length required to determine the impact of previous on the current period is presented in Table 3.

**Table 3: Result of Optimal Lag Length Selection Criteria Test**

Lag length	LogL	LR	FPE	AIC	SC	HQ
0	216.40	NA	0.31	13.02	13.25	13.10
1	-75.12	232.69*	0.00*	6.18*	7.53*	6.64*
2	-63.87	15.22	0.00	6.99	9.46	7.84

**Source: Author’s computation using E-views 8.0(2018)**

\* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan- Quinn information criterion

The result showed that all the selection criteria suggest the lag of one period. The co-integration tests are conducted next.

**4.2.2 Cointegration Test Result**

The result of the Johansen Co-integration for both the Trace Statistic and Maximum Eigen Value is reported in Table 4.

**Table 4: Result of Johansen Co-integration Test based on Trace Statistic and Max Eigenvalue**

No. of CE(s)	Eigen value	Trace Statistic			Max. Eigen Value		
		Trace Statistic	0.05 Critical Value	Prob .	Max - Eigen Value	Critical Value	Prob .**
None *	0.75	97.27	69.82	0.00	45.58	33.88	0.00

At most 1 *	0.55	51.69	47.8 7	0.02	26.3 9	27.58	0.07
At most 2	0.39	25.30	29.8 0	0.15	16.2 1	21.13	0.21
At most 3	0.24	9.09	15.5 0	0.36	8.93	14.27	0.29
At most 4	0.01	0.16	3.84	0.69	0.16	3.84	0.69

Source: Author's computation using E-views 8.0 (2018)

Notes:

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

Max-eigenvalue test indicates 1 cointegration at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

The result suggests the existence of a long-run nexus between manufacturing contribution to GDP on the one hand, and trade openness, inflation rate, real exchange rate, government expenditure, on the other. The result of the long-run Johansen co-integration estimated model is shown in Table 6 and equation (iv). The regression model had been normalized after the co-integration test by multiplying the values with the minus (-) sign.

**Table 6: Result of the Vector Error Correction Model Result**

Variable	Co-Efficient (After Normalization)	Standard Error	T-Statistic (df31 = 2.04)
Inmanugdp	1.00		
tradeop	-9.38	5.54	-1.69
infr	0.11	0.02	6.67
Inreer	-1.54	0.38	-4.04
Ingexea	1.44	0.29	4.81

Source: Author's Computation using E-VIEWS 8.0 (2018)

**Liberalization of Foreign Trade and Manufacturing Output.....**

The estimated long run model is shown in equation (iv):

$$Lnmanugdp = -9.38tradeop + 0.11infr - 1.54Lnreer + 1.44Lngexea \quad (4)$$

This long run estimation result shows that an inverse but non-statistically significant relationship exists between trade openness and manufacturing contribution to GDP. This is because the *t*-statistic (1.69) is less than the tabulated *t*-statistics (2.04 at *df*<sub>31</sub>). The rate of inflation and government expenditure on economic activity are both positively and statistically related to the dependent variable—manufacturing contribution to GDP. Both variables recorded calculated *t*-statistics values of (6.67) and (4.81) respectively, which are greater than the tabulated *t*-statistics (2.04). Indeed, one hundred percentage rise in the inflation rate and government expenditure would cause a surge in manufacturing output by 11% and 144% respectively. However, with respect to the real exchange rate, the relationship is statistically significant as 0.05 level given that the calculated *t*-statistic (4.04) was greater than the tabulated *t*-statistics (2.04 at *df*<sub>31</sub>). Indeed, one hundred percentage increases in the rate would lower manufacturing contribution to GDP by 154%.

**4.2.3 Result of the Short-Run Vector Error Correction Model**

This test ascertains the presence of a short run relationship amongst the variables over the period under consideration after the integration of the multi-variate time series by the Vector Auto-regression model test. The result is presented in the Table below;

**Table 5: Vector Error Correction Model (VECM) Short-Run Result.**

Error Correction	D( <i>Inmanugdp</i> )	D( <i>tradeop</i> )	D( <i>infr</i> )	D( <i>Inreer</i> )	D( <i>Ingexea</i> )
CointEq1	0.03	-0.00	8.21	-0.01	-0.08
	(0.01)	(0.01)	(1.38)	(0.05)	(0.08)
T-stat (Cal)	[ 2.08]	[-0.16]	[5.97]	[-0.22]	[-1.03]

**Source: Author’s computation using E-views 8.0 (2018)**

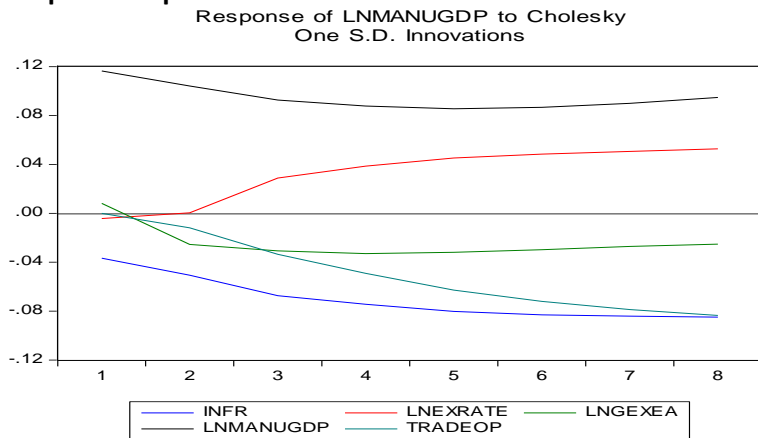
The analysis from the Table 5 reveals a positive short-run association subsists between the inflation rate and manufacturing contribution to GDP since the calculated T-value of the variable was greater than the

tabulated value (T-stats 2.04). There is the absence of a short-run relationship amongst trade openness, real exchange rate and government expenditure on the one hand and manufacturing output on the other.

**4.2.4 Impulse Response Function**

The impulse response functions are utilized to explain the variation in the manufacturing output level over time, as a result of exogenous shocks especially in the context of a Vector Auto regression model (Lutkepohl, 2008).

**Figure 3 Impulse Response of LNMANUGDP**



**Source: Author’s computation using E-views 8.0 (2018)**

As depicted in Figure 4, one standard negative deviation shock of trade openness led to a gradual reduction in manufacturing output until the third year and a gradual increase until the eighth year. A similar standard negative deviation shock of real exchange rate had no impact in the first year but led to a sharp rise in the manufacturing output in the second up to the third year and continues to rise at a reducing rate until the eighth year. However, the inflation rate caused the manufacturing output reduced sharply up to the second year and thereafter continued its decent until the eighth year. In consonance, the government expenditure led to the sharp fall of manufacturing output up to the second year and it thereafter maintained a gentle rise until the eighth year.

**4.3 Post-Estimation Tests**

The validity and the robustness of the model is revealed by the diagnostic tests applied on the residuals. The residuals of the variables should be normally distributed without serial correlation and homoscedasticity. The post estimation diagnostic tests are presented in this section.

**4.3.1 Breusch-Godfrey Serial Correlation Lm Test**

The result of the Breusch-Godfrey serial correlation LM test in Table 7 confirmed the presence of a serial correlation among the variables. The probability value, 0.00 is less than the 0.05 level of significance as propounded by Breusch-Godfrey (1978). This is not desirable.

Table 7: Result of Breusch-Godfrey Serial Correlation LM Test

F-statistic	105.49	Prob. F(2,29)	0.00
Obs*R-squared	31.65	Prob. Chi-Square(2)	0.00

Source: Authors computation using E-views 8.0 (2018)

**4.3.2 Durbin Watson statistics Tests**

This result of the test performed to determine the level of auto-correlation between the variables is presented in Table 8. The result shows the evidence of the absence of positive auto-correlation since  $0 < d < d_L$ .

Table 8: Durbin Watson Autocorrelation Test Results

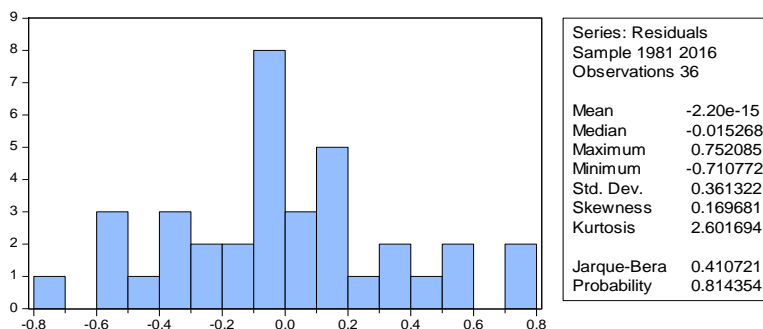
DW Value (d)	D-Upper ( $d_{U,\alpha}$ )	D-Lower ( $d_{L,\alpha}$ )	Decision Criteria
0.15	1.59	0.99	No positive auto-correlation

Source: Authors computation using E-views 8.0 (2018)

The result shows the evidence that a no positive auto-correlation exists

**4.3.3 Vector Error Correction Residual Normality Test**

The results of the normality test depicted in Figure 4 confirm the normality of the residuals with a skewness, which is less than 2 and the kurtosis of the residuals, which, is less than 3.



**Figure 4: Normality Test**

Source: Authors' computation using E-views 8.0 (2018)

The combined normality measurement of the residual - the Jarque-Bera statistics and the probability of 0.81 which is greater than 5% level of significance means that the Null hypothesis which states the residual is normally distributed be acceptable.

#### **4.3.4 Vector Error Correction (VEC) Residual Heteroscedasticity Tests**

The result of the Vector Error Correction (VEC) Residual Heteroscedasticity tests is presented in Table 9 shows the absence of heteroscedasticity as advised by White (1980). This is desirable.

Table 9: Result of White Heteroscedasticity Test

F-statistic	0.65	Prob. F (14,14)	0.72
Obs*R-squared	14.15	Prob. Chi-Square (14)	0.69
Scaled explained SS	22.94	Prob. Chi Square (14)	0.69

Source: Authors' computation using E-views 8.0 (2018)

#### **4.3.5 Inverse Roots of AR Characteristic Polynomial**

The result of the Inverse Roots of AR Characteristic Polynomial to test is presented in Figure 5 which showed that all the roots are less than one modulus, and are situated inside the unit circle. This according to Lütkepohl (1991) proves the dynamic stability of the estimates.

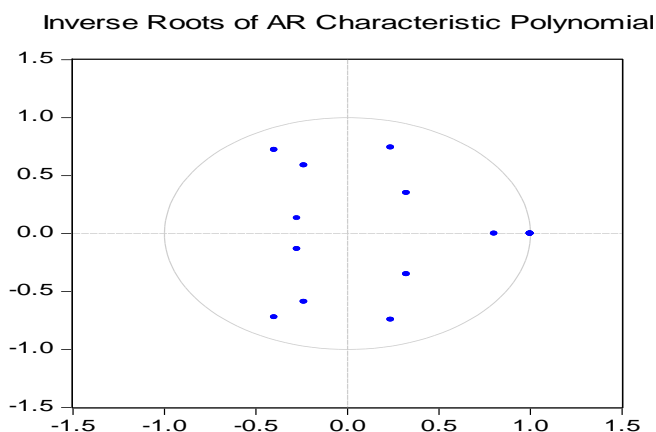


Figure 5 AR Roots Graph

Source: Authors' computation using E-views 8.0 (2018)

#### 4.3.6 Q - Statistics Tests

The result of the Q-Statistics test provided in Table 10 indicates that the Null hypothesis of the absence of serial correlation amongst the residuals be rejected.

Table 10: Result of Q- Statistics Test

No.	Auto Correlation (AC)	Partial Auto Correlation (PAC)	Q-Stat	Probability
1	0.879	0.879	30.180	0.000
2	0.717	-0.241	50.882	0.000
3	0.596	0.117	65.594	0.000
4	0.425	-0.380	73.302	0.000
5	0.248	0.013	76.025	0.012
6	0.136	0.053	76.868	0.014
7	0.022	-0.151	76.890	0.011
8	-0.103	-0.064	77.409	0.013
9	-0.198	-0.111	79.388	0.023
10	-0.281	-0.092	83.545	0.017
11	-0.364	-0.058	90.787	0.015
12	-0.413	-0.028	100.50	0.024
13	-0.449	-0.130	112.47	0.022



14	-0.477	-0.036	126.62	0.031
15	-0.466	0.008	140.76	0.005
16	-0.428	-0.018	153.29	0.028

Source: Authors' computation using E-views 8.0 (2018)

The consequential acceptance of the alternative hypothesis according to Dean and Dixon (1951) confirmed the presence of serial correlation since all the corresponding probability values were lower than the 5% level of significance.

#### **4.3.7 Model Validity**

In summary, the results of the post-estimation diagnostic tests deployed to confirm the validity and robustness of the model are mixed. The vector error correction residual result confirms the normality of the residuals while the vector error correction residual heteroscedasticity tests reveal the absence heteroscedasticity in the residual. The inverse roots of AR Characteristic polynomial dynamic estimates the stability of the residuals. In addition, the Durbin Watson statistics test result reveals the evidence of the absence of positive auto-correlation. However, the result of the both the Breusch-Godfrey serial correlation LM tests and Q statistics confirmed the presence of a serial correlation among the residuals respectively. Serial correlation affects the efficiency but not the consistency or unbiasedness of OLS estimators. Given the nature of data and its collection in a developing country like Nigeria, the estimated model can be reasonably relied upon to provide reliable statistical inferences. The estimated model therefore possesses enough integrity for policy formulation.

#### **4.4 Discussion of Findings**

The result of the study reveals the absence of a short-run relationship amongst trade openness, real exchange rate and government expenditure on the one hand and manufacturing output on the other. The long run estimation result however shows a negative but insignificant relationship between trade openness and manufacturing output. In effect, the liberalization of international trade has had no impact on the output of the manufacturing sector in Nigeria in the short and the long terms. This study confirms the findings of Ojo and

### ***Liberalization of Foreign Trade and Manufacturing Output.....***

Olalade (2014) which revealed the insignificant impact of globalization on the Nigerian manufacturing sector. It however contradicts the findings of Asongo (2013), Umoro (2013), which reported positive impact. Ogu, Aniebo and Elekwa (2016) reported harmful impact of open trade on manufacturing outputs in Nigeria.

The result could not uphold the theoretical postulation of the neo-liberal theorists that the free markets system when combined with the rise in the role of the private sector as a paradigm shift from the Keynesian economic policy is beneficial to the growth. The expected greater efficiency in the allocation of resources and reduction in the associated distortions of government markets regulations could not materialize because of the rigidities in the trade liberalization and policy implementation. Indeed, as observed by Aalbers (2013), Nigeria embarked on domestic markets and trade policies liberalization, in concert with external trade openness, foreign exchange system, privatization of public enterprises as part of the 1986 Structural Adjustment Programmes (SAP). The reason could be due to policy summersaults in the areas of fiscal, monetary and trade.

The adoption of such outward orientation in terms of exchange and trade rate policies expected to allow the prices, interest rates and wages find their natural equilibrium through price and market mechanism has met with limited success because of lack of policy fidelity. Although the deregulation and privatization of State-Owned Enterprises (SOE) has led to reduction in government interference in domestic markets for labour, capital and goods, the expected greater efficient utilization of resources has not translated to international competitiveness. This is due to infrastructural, production and cost rigidities. Indeed, the capacity utilization of manufacturing firms in Nigeria between 2009 and 2018 averaged 55 percent (Tradingeconomics, 2018b). The research result however, confirms the postulation of the self-selection theory propounded by Bernard and Jensen (1995) which, requires that companies involved in export markets should demonstrate higher productivity level in order to compete with the foreign goods. As suggested by Melitz (2003), companies need to increase their efficiency before entering the

foreign market. The Nigerian manufacturers who are beset with debilitating constraints of poor infrastructure and paucity of stable electricity have not been able to take advantage of the liberalized markets.

The inability of Nigerian manufacturing firms to take full advantage of open trade borders can be also be ascribed to the fact that foreign countries provide subsidies in terms of low cost of funds and guarantees for their export-oriented companies. In the findings of Klaver and Trebilcock (2011), one of the trade policies of the Chinese government is the provision of financial subsidies. This unfair practice may deindustrialize Africa given the inability of the African manufacturing sector to withstand the onslaught of cheap Chinese imports. With respect to the inflation rate, and government expenditure this research found positive and statistical significant relationship with manufacturing output. The upward trended foreign exchange had an inverse relationship with manufacturing output. This deleterious effect is due in part to the dependence of import for most of the raw materials used in the manufacturing process.

### **5.0 Conclusions**

Although the result in the literature is mixed the objective of this paper was to reexamine the relationship between trade liberalization and manufacturing output in Nigeria using robust econometric and model validity techniques. The study reveals found the absence of relationship between trade openness and manufacturing output in both the short-run and the long term. The Nigerian manufacturing firms have not been able to take full advantage of the benefits of liberalized international trade coupled with globalization. These firms need to increase their efficiency before entering the foreign market and indeed compete with foreign imported good. The collapse of the Nigerian textile industry which has been stifled with cheap foreign imports is a case in point. Such incentives as the Anchor Borrowers' Programme of the Central Bank of Nigeria should be extended to the manufacturing sector to create economic linkages between small producers and reputable large-scale manufacturers with a view to increasing output and export, and significantly improve capacity

utilization of processors. The Central Bank of Nigeria is enjoined to provide a special foreign exchange window for the importation of industrial raw materials and machinery at concessional rates.

Given the findings of this study, the on-going non-tariff measure of closure of the land borders in Nigeria which restricts international trade should be discontinued. This is because of the absence of nexus between trade openness and manufacturing output in both the short-run and long run. Nigeria should follow the example of many countries that provide subsidies for their export-oriented companies. The government should enhance the export promotion programmes especially in non-tariff areas including specific import bans such as that on rice and products dumping, and product-specific quotas without infringing on World Trade Organization agreements. It should take full advantage of the African Continental Free Trade Area Agreement (*AfCFTA*) but provide subsidies for export-oriented companies and enhancing export promotion programmes.

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***Liberalization of Foreign Trade and Manufacturing Output.....***

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