

## Does Trade Liberalization Spur Non-Oil Exports? An Empirical Assessment for Nigeria

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### *Abstract*

Nigeria in response to the economic problems brought about by the collapse of oil prices in the international market in the early 1980's adopted measures towards achieving greater liberalization of trade and the pricing system. This was intended at diversifying the export base of the country and particularly, enhancing the country's non-oil exports performance. The performance of Non-oil exports in Nigeria has however not been sturdy. For example, the country recorded negative annual growth rates of Non-oil exports from 2012 to 2016; -0.04 for 2012 and -0.05 for 2013, 2014, 2015 and 2016 respectively. This paper therefore, evaluates the influence of trade liberalization on the performance of non-oil exports in Nigeria. This is achieved by applying the export demand function and the Vector Error Correction Model. The findings indicate a positive long run impact of trade liberalization on non-oil exports in Nigeria as well as a short run relationship among the variables. The study thus, recommends that liberal trade policies be sustained in Nigeria but accompanied with domestic policies that may improve the country's price competitiveness and ensure an efficient non-oil export performance.

**Keywords:** Trade Liberalization, Exports Performance, Export Demand Function, VECM.

**JEL Classification:** F13, F14

#### **CONTRIBUTION/ORIGINALITY:**

This study is one of very few studies which have employed the export demand function methodology to evaluate the effects of trade liberalization on exports in Nigeria. It contributes to the existing literature on trade policy.

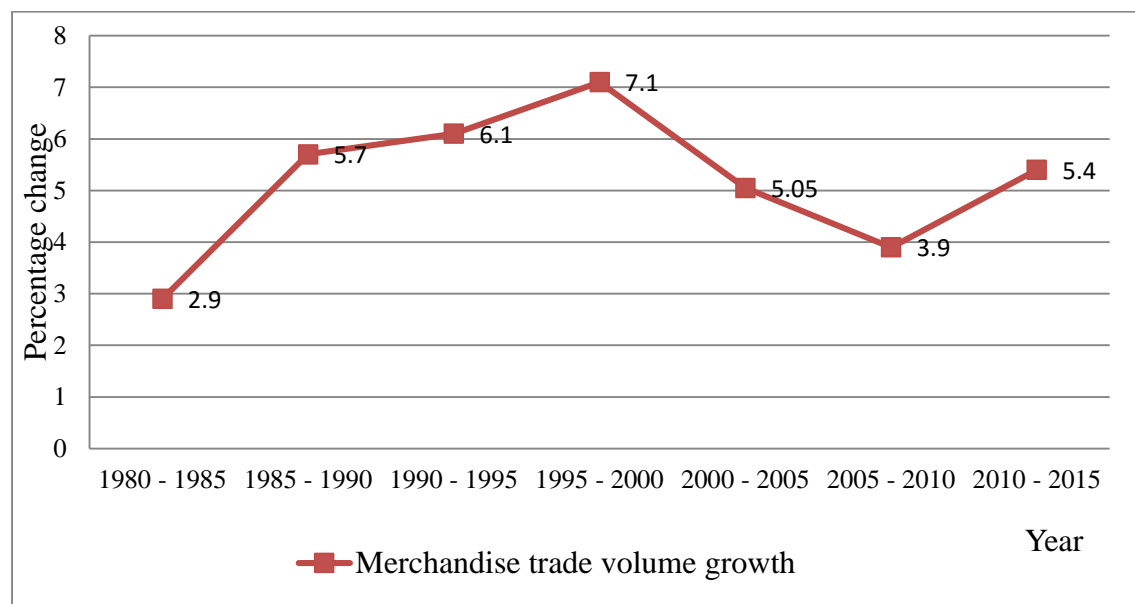
### **1.0 Introduction**

The spread of industrialization from Europe to the Americas, Asia and Africa, and the enormous technological advances in transportation and communications which have steadily led to reduction in the cost of moving goods, technology, capital and people around the world have influenced the development of the world trading system (Cairncross, 1997). Also, the establishment of organizations such as the General Agreement on Tariffs and Trade (GATT) in 1947 and the World Trade Organisation (WTO) in 1995 have influenced the course of international trade, especially with regards to free trade. These organizations have sought mainly reductions of trade barriers across countries and provided a medium for negotiating and monitoring liberalization of trade among countries, determining and implementing rules for international trade, and resolving trade disputes (WTO, 2015). Moreover, the formation of various Regional Trade Agreements (RTAs) have also influenced considerably trade interactions among countries as over 50 per cent of world trade is estimated to be

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covered by these agreements. The RTAs have continued to facilitate international trade by supporting non-tariff barrier-free and duty-free trading environment (UNCTAD, 2012; WTO, 2013).

The developments in the direction of free trade between economies have led to a considerable increase in the growth of world trade. Figure 1 shows the trend in the average annual growth rates of world merchandise trade volume (imports and exports) for the period 1980 – 2015.



**Figure 1: Trends in world merchandise trade volume, 1980 – 2015 (annual percentage change).**

*Source of data: World Bank (2017)*

World merchandise trade volume grew in the decades of 1980's and 1990's; from 2.9% between 1980 and 1985 to 7% between 1995 and 2000. This trend may have been influenced by the adoption of trade liberalization measures by a greater number of countries especially developing countries, following the export-led economic growth experienced by the East Asian countries in the 1970s. Prior to 1980 only a few countries embraced free trade policies (Mwaba, 2000; Hammouda, 2004). Moreover, the lessening or removal of barriers to the free exchange of goods among nations that ensues from the liberalization of trade may have widened possible opportunities available to countries for the upgrading of their economic activities and thus increase trade volume. In the 2000's, growth in merchandise trade volume declined; first to 5.05% between 2000 and 2005 then to 3.9% between 2005 and 2010. However, beyond 2010 growth in merchandise trade volume recorded an increase of 1.5%. In general, free trade seems to have driven the growth of world trade.

Since 1986 Nigeria's trade policy shifted significantly towards greater liberalization of trade and the pricing system. This was intended at diversifying the export base of the country as well as adding value to the export of agricultural produce (Adenikinju, 2005). This shift in policy was in response to the economic problems brought about by the collapse of oil prices in the international market in the early 1980's, and the subsequent lowering of the country's Organisation of Petroleum Exporting Countries (OPEC) output quota. Plummeting crude oil export revenues led to a sharp decline of Nigeria's public finances and balance of payments. As a result, the economy went into recession with a GDP growth of – 5.37% in 1983, and – 5.18% in 1984 [National Centre for Economic Management and Administration] (NCEMA, 2004). Moreover, the worsening state of the economy manifested in shortage of foreign exchange, rising unemployment, and balance of payments deficits and debt crises. The new policy direction was therefore aimed at substantially enhancing the non-oil exports in a bid

to restore the steady and balanced growth of the economy [Federal Government of Nigeria] (FGN, 1986; 1990).

Nigeria in recent times has continued to implement trade liberalization measures as a means to diversify the country's export base as relying on crude oil alone portends great risk to the economy. As outlined by FGN (2001), amongst the overall objectives of trade policy were: integrating the Nigerian economy into the global market by establishing a liberal market economy; progressive liberalization of the import regime to increase competitiveness of domestic industries; diversification of exports as well as promoting exports in both traditional and non-traditional markets; and enhancing the attainment of national economic gains from regional bilateral arrangements and multilateral trading systems through effective participation in trade negotiations. Other objectives included: putting in place special incentive packages to attract foreign capital inflow into production focused on exports; and promoting the transfer, acquisition and adoption of suitable and sustainable technologies to assure competitive export oriented industries.

The performance of Non-oil exports in Nigeria have however been an oscillating one. In 1981 and 1984 negative growth rates were recorded for non-oil exports; - 0.41% and - 0.18% respectively. Nonetheless, the average growth rate of non-oil exports in the first half of the 1980's was 0.23%. The average growth rate in non-oil exports increased in the following decade from 0.69% between 1985 and 1990 to 0.78% between 1990 and 1995. This trend was however halted during the period 1995 to 2000 as the growth rate of Nigeria's non-oil exports fell to 0.05%. Non-oil exports then grew to 0.53% in the following 5-year period (i.e. 2001 to 2005). Since then, the average growth rate of the country's non-oil exports has taken a downward trend. Between 2005 and 2010 the growth rate of non-oil exports fell to 0.31% and further declined to 0.01% in the period 2011 to 2015. Noteworthy is the fact that the annual growth rates of non-oil exports in Nigeria from 2012 to 2016 were all negative; - 0.04 for 2012 and - 0.05 for 2013, 2014, 2015 and 2016 (World Bank, 2017).

This paper therefore, evaluates the impact of trade liberalization on the performance of non-oil exports in Nigeria. This was achieved following the export demand function approach. A similar study for Nigeria that have employed this methodology considered the overall merchandise exports and considered Nigeria within a cross country framework. The current paper thus provides a country specific empirical evidence for Nigeria on the influence of trade liberalization on particularly non-oil exports. Following the introduction, the theoretical framework which the study is based upon and empirical literature is presented in Section 2. The type and sources of data employed in the analysis is presented in Section 3. While Section 4 presents the results and discussion of the findings., Section 5 provides conclusions and policy implications.

## **2.0 Theoretical and Empirical Literature Review**

### **2.1 Theoretical Framework**

The analysis in this paper follows the basic theory of demand and the imperfect substitute model of Goldstein and Khan (1985). The theory of demand states that, the consumer is assumed to maximize utility subject to a budget constraint. In this respect, the export demand function is specified as follows:

$$X_d = f(P_x, Y) \text{-----}(1)$$

Where  $X_d$  is the volume of export demanded,  $P_x$  is the price of exports and  $Y$  represents the rest of the world's real income.

Goldstein and Khan (1985) imperfect substitute model puts forward that exports are imperfect substitutes in world markets for other countries' domestically produced goods, or for third countries' exports. Therefore, the model postulates that the quantity of export demanded is determined by the level of income in the importing region, and not just the export price but, the price of its substitutes (competitors or the rest of the world) as well. Thus, Equation 1 can be expanded as:

$$X_d = f\left(\frac{P_x}{N} \times P^*, Y\right) \text{-----} (2)$$

Where  $P^*$  are the foreign competitor's prices in the country's export markets, and  $N$  is the nominal exchange rate in units of foreign currency per unit of home currency.  $P_x / N \times P^*$  altogether represents relative prices and can be regarded as the terms of trade or the real exchange rate. Equation 2 is the standard specification of the export demand function.

## 2.2 Review of Empirical Studies

Among the studies surveyed on the contribution of trade liberalization to export performance are; Jenkins (1995), for Bolivia, Pacheco-López (2005) for Mexico and Ezike and Ogege (2012) for Nigeria. Others are Kassim (2015) for 28 Sub Saharan African countries including Nigeria, Sofjan (2017) for Indonesia and Yasiru (2017) for Nigeria.

Jenkins (1995) was interested in finding out whether the 1985 trade reforms in Bolivia reflected in better export performance. Using the time series multiple regression technique, the results obtained revealed that neither the elimination of anti-export bias nor elimination of import duties impacted directly on manufacturing exports. In contrast, there was strong evidence that better export performance was associated with a more competitive and stable real exchange rate (REER). Thus, the trade policy reforms of the 1980's in Bolivia had no impact in improving export performance and concluded that trade liberalization is neither a necessary nor sufficient condition for rapid productivity growth. Our study deviated from Jenkins (1995) by examining the impact of trade liberalization on non-oil exports in Nigeria rather than manufacturing exports.

Equally, Pacheco-López (2005) in a study which examined how exports, imports and the balance of payments in Mexico responded to trade liberalization during the mid-1980's and the trade liberalization undertaken in 1994 through NAFTA reached the same conclusion. The export demand function approach which relates the level of exports to world real income and a measure of price competitiveness was used for the estimation. The findings suggested that while the trade reforms during the mid-1980's had a significant impact on exports, the effects of NAFTA were insignificant. Their study therefore, cautioned participation in future free trade agreements by recommending associated domestic policies for effective co-ordination of industrial and trade policies. Since Nigeria's exports are assumed to face competition not only from domestic producers in the importing region, but also from "third world country" exporters to that region, the need to capture the country's price competitiveness is important. Hence, the current study also adopted the export demand function methodology used in Pacheco-López (2005) to estimate the influence of trade liberalization on exports performance.

Similarly, Ezike and Ogege (2012) examined the effect of trade policies on non-oil exports in Nigeria. The study employed annual time series data over the period 1970 to 2010 and regressed the value of non-oil export on trade variables including trade openness, effective nominal exchange rate, oil exports, foreign income and relative price. The results obtained revealed an insignificant effect of trade openness on non-oil exports in Nigeria. A major flaw of the study by Ezike and Ogege (2012) is

the use of the ratio of sum of export and import to real GDP as the measure of trade policy. This is because such will yield inconsistent estimates due to endogeneity between the dependent variable (non-oil export) and trade openness (in which export is again part of). To overcome this, our research employed a dummy of trade liberalization instead.

In contrast to Jenkins (1995) and Pacheco-López (2005), Kassim (2015) found a positive and significant effect of trade liberalization on export growth. The study adopted the export demand equation which relates the level of exports to world real income and a measure of price competitiveness in estimating the impact of trade liberalization on export growth across 28 Sub-Saharan African countries from 1981 to 2010. Export duties and a dummy representing period of significant trade reforms were incorporated as measures of trade liberalization. Based on the findings, the study concluded that trade liberalization is an important factor in improving the growth of exports.

In a similar manner, Sofjan (2017) used the import and export demand functions to analyse the impact of trade liberalization on Indonesia's imports and exports. The study's findings revealed that in the long-run, trade liberalization policies which were measured by export taxes and import duties have negative impact on exports and imports respectively. However, in the short-run, trade liberalization policies have a negative impact on exports and positive impact on imports. Although our study also employed the export demand function as done by Kassim (2015) and Sofjan (2017) but considered only non-oil exports and not the whole merchandise exports. Moreover, our study provides country specific evidence for Nigeria.

While Yasiru (2017) employed a similar measure of trade policy as Ezike and Ogege (2012) to examine the impact of globalization on non-oil export performance in Nigeria. The study which cover the period 1975 to 2014 used the Autoregressive Distributed Lag approach to time series analysis. The finding of the study was that globalization as measured by the ratio of trade to GDP only had along-run positive relationship with non-oil export growth in Nigeria. As noted for Ezike and Ogege (2012), the undoing of Yasiru (2017) is that the endogeneity concerns related to the choice of the trade policy variable casts doubt on the reliability of the results obtained.

### 3.0 Methodology

#### 3.1 Empirical Model

From Equation 2, quantity of export demanded in a period is explained by the real exchange rate and world income. This relationship can be specified in a log-linear form with a random error term as follows:

$$EXP_t = \alpha + \beta_1 REER_t + \beta_2 INCOME_t + \mu_t \text{------(3)}$$

Where;  $EXP$  is the growth of real exports,  $\alpha$  is the constant,  $REER$  represents the growth in real exchange rate,  $INCOME$  is the growth of world real income,  $u$  is the error term while subscript  $t$  stands for the time period. Also,  $\beta_1$  and  $\beta_2$  denotes the price and income elasticity of demand for exports, respectively. The log-linear functional form has the advantage of allowing the dependent variable to respond proportionally to changes in the explanatory variables, and avoids the secular fall in elasticities implicit in the linear formulation (O'Connell, 1978).

Equation 3 is then modified to include a measure of trade liberalization:

$$EXP_t = \alpha + \beta_1 REER_t + \beta_2 INCOME_t + \beta_3 DTRDLIB + \mu_t \text{------(4)}$$

Where; DTRDLIB is the trade liberalization dummy which takes the value of 1 from the year significant trade reforms began in Nigeria and zero beforehand.

The model estimation was based on annual data for the period 1971 – 2016. The data set consists of observation on variables including the deflated non-oil exports value for exports quantity ( $EXP_t$ ); real exchange rate ( $REER_t$ ); and the Gross National Income of Economic Community of West African States as proxy for world real income ( $INCOME_t$ ). The dummy for trade liberalization is also employed. All the data, except the dummy, are obtained from the World Development Indicators.

## 4.0 Empirical Results and Discussion

### 4.1 Descriptive Statistics

Table 1 presents the summary statistics of the variables used in the estimations that follow.

**Table 1: Summary Statistics**

	Variables			
	<i>exp</i>	<i>reer</i>	<i>income</i>	<i>Dtrdlib</i>
Mean	9.2454	4.9911	24.4952	0.6383
Maximum	13.1175	6.3032	25.6709	1.0000
Minimum	5.3142	3.9067	23.7833	0.0000
St. Dev.	2.5552	0.6551	0.5742	0.4857
Skewness	0.1756	0.1966	0.9561	-0.5757
Kurtosis	1.6090	1.7216	2.5527	1.3314
Jarque-Bera	4.0306	3.5032	7.5526	8.0484
Probability	0.1333	0.1735	0.0229	0.0179
No. of Obs.	47	47	47	47

Source: Authors' computation (2018).

Table 1 shows that the log of non-oil exports had a mean of 9.25, a maximum value of 13.12 and a minimum value of 5.31. The deviation from the mean of the log of non-oil exports was 2.56. The log of real effective exchange rate had an average of 4.99 and the deviation around the average of 0.65. The log of world income recorded 24.50, 25.67, and 23.78 as mean, maximum and minimum values respectively. Trade liberalization dummy had an average of 0.64 suggesting that a larger portion of the data were for periods of liberal trade policy. The probability values of the Jarque-Bera test show that the logs of non-oil exports and real effective exchange rate were normally distributed even at 10% level of significance. On the other hand, the log of world income and trade liberalization dummy can be said to be normally distributed at 1% level of significance.

### 4.2 Results of the Unit Root Test

In processing time series data, it is important to ascertain the properties of all the variables. Hence, we employed the Augmented Dickey-Fuller (ADF) and Philips-Peron (PP) tests for stationarity. The results obtained from the tests are as provided in Table 2.

**Table 2: Unit Root Tests Results**

Series	Level		First Difference	
	ADF	PP	ADF	PP
<i>exp</i>	-2.7436	-2.4187	-6.3472	-6.3472
<i>reer</i>	-2.7313	-2.1955	-5.0080	-4.9068
<i>income</i>	-1.7011	-1.7011	-5.5462	-5.5480

Source: Authors' computation (2018).



The null hypothesis of non-stationarity of the unit root test was tested against its alternative hypothesis that the series is stationary. The results as revealed in Table 2 indicate that all the series were not stationary in their levels. However, at first difference, we reject the null hypothesis of non-stationarity at 5% level of significance for all the variables. This is because the absolute values of all the tests statistics are greater than the absolute critical value. Therefore, all variables can be said to be integrated of order one,  $I(1)$ .

### 4.3 The influence of Trade liberalization on Non-oil exports

Having determined that non-oil exports, real effective exchange rate and world income become stationary only after taking their first difference the next step involved the application of the Johansen procedure to ascertain whether these variables are cointegrated. The results of the procedure are presented in table 3.

**Table 3: Results of the Johansen Cointegration Test**

Hypothesized Number of Cointegration Equation(s)	Trace Test		Maximum Eigenvalue Test	
	Trace Statistic	5% Critical Value	Maximum Eigenvalue Statistic	5% Critical Value
None*	40.3128	29.7971	25.3897	21.1316
At most 1	14.9230	15.4947	12.2746	14.2646
At most 2	2.6484	3.8415	2.6484	3.8415

Note: \*significant at 5% level of significance. Lag length was selected using the sequential modified Likelihood Ratio (LR) test statistic criterion, Final Prediction Error (FPE) criterion, and Akaike Information criterion (AIC) - (see table A2 in appendix), maximum lag was set to 5.

Source: Authors' computation (2018)

Based on the results of both the trace statistic and maximum eigen value statistic test the null hypothesis that there is no cointegration equation is rejected. This is because in both cases the test statistic exceeds the 5% critical value. However, we failed to reject the null hypothesis that there is at most 1 cointegration equation; the trace test statistic of 14.92 is less than the 5% critical value of 15.49. Similarly, the 5% critical value of the maximum eigen value test of 14.26 is greater than the test's statistic of 12.27. The results point to the case that there is 1 cointegrating equation. This suggests that there exists a long run relationship among the variables.

In order to establish the direction of causality from real exchange rate, world income and trade liberalization to non-oil exports, we estimated the Vector Error Correction Model (VECM). The VECM distinguishes between long run causality and short run causality. The results for the long run relationship between non-oil exports, real exchange rate, world real income and trade liberalization for one cointegrating vector are as shown in Table 4.

**Table 4: Results of the VECM for Long run Causality**

Variable	Coefficient	Standard Error	t-statistic
ECT1	-0.1672***	0.0431	-3.8812
$\Delta exp_{t-1}$	-0.2791	0.1916	-1.4569
$\Delta exp_{t-2}$	-0.3685	0.2198	-1.6761
$\Delta exp_{t-3}$	-0.2228	0.2056	-1.0834
$\Delta exp_{t-4}$	-0.3156	0.2075	-1.5209
$\Delta exp_{t-5}$	-0.4832**	0.2019	-2.3932
$\Delta reer_{t-1}$	0.1567	0.2358	0.6642
$\Delta reer_{t-2}$	0.2286	0.2322	0.9844

$\Delta reer_{t-3}$	-0.6840**	0.2498	-2.7381
$\Delta reer_{t-4}$	0.2519	0.2333	1.0799
$\Delta reer_{t-5}$	0.0893	0.2044	0.4369
$\Delta income_{t-1}$	1.0254	0.8849	1.1587
$\Delta income_{t-2}$	0.8737	0.8420	1.0376
$\Delta income_{t-3}$	-0.2842	0.9049	-0.3141
$\Delta income_{t-4}$	-0.3887	0.8127	-0.4783
$\Delta income_{t-5}$	2.1886**	0.7992	2.7384
$\Delta Dtrdlib$	1.7430***	0.3676	4.7414
Constant	-1.0022***	0.2407	-4.1644
R-squared	0.6509		
F-statistic	2.5230		
Prob. (F-statistic)	0.0200		
<b>Diagnostic Tests</b>			
<b>Test</b>	<b>F-statistic</b>	<b>Probability</b>	
Breusch-Godfrey Serial Correlation LM Test	0.2303	0.7963	
Breusch-Pagan-Godfrey Heteroskedasticity Test	0.5418	0.9078	

Note: \*\*\* means statistical significance at 1% level and \*\* means statistical significance at 5% level.

Source: Authors' computation (2018)

The probability value of the 0.02 of the F-test for the overall fit of the model shows that the model is well fitted at 5% level of significance. Also, the R-square value of 0.65 indicates that real exchange rate, world income and trade liberalization jointly influence non-oil exports in Nigeria equal to 65%. Furthermore, it was necessary to check that the residuals of the model were normally distributed, homoskedastic as well as not serially correlated. Since the probability of the Jarque-Bera test for normality was 0.91 (see figure A1 in appendix) the null hypothesis that the residuals are normally distributed was not rejected. More so, the probability values of the Breusch-Godfrey Serial Correlation LM Test and the Breusch-Pagan-Godfrey Heteroskedasticity Test were greater than 10%. Thus, we concluded that the residuals of the model are neither serially correlated nor heteroskedastic. Moreover, the result of the Cumulative Sum of Recursive Residuals presented in figure A2 in the appendix reveals that the model is stable.

Given that the error correction term on table 4 is negative in sign and significant, there is therefore long run causality from real exchange rate, world income and trade liberalization to non-oil exports in Nigeria. Its value of -0.17 implies that 17% of the deviation from the long run equilibrium level can be corrected annually. In addition, the reported results are consistent with expectations. Where significant, the coefficients of real exchange rate and world income are negative and positive respectively. Suggesting that, in the long run, while real exchange rate appreciation would have a negative impact on non-oil exports rise in world income would impact positively on non-oil exports in Nigeria. In the case where the value of the naira appreciates, non-oil exports from Nigeria would become expensive hence; non-oil exports growth will be impeded. On the other hand, a rise in the income of buyers of the non-oil exports of Nigeria would entail more resources to finance additional purchases and thus, higher quantities would be exported from Nigeria. This finding agrees with that obtained by Jenkins (1995), Kassim (2015) and Sofjan (2017). Also, as expected, the coefficient of the index of trade liberalization is positive and significant in the long run. This evidence implies that trade policy reforms would induce a positive impact on Nigeria's non-oil exports in the long run. This finding is in line with the results obtained by Kassim (2015) but varies with that obtained by Sofjan (2017).



To check whether or not short run causality exists among the variables the Wald Test was employed. A summary of the results from the Wald Test is presented in Table 5.

**Table 5: Summary of Results of the Wald Test for Short run Causality**

<b>Null Hypothesis (<math>H_0</math>)</b>	<b>Chi-square Value</b>	<b>Probability</b>
No causality from real exchange rate to Non-oil exports	8.2508	0.1429
No causality from world income to Non-oil exports	8.7576	0.1191
No causality from trade liberalization to Non-oil exports	22.4805	0.0000

*Source: Authors' computation (2018)*

From Table 5 it can be observed that the probability of the Chi-square values of Wald test corresponding to the first two null hypotheses that there is no causality from exchange rate to non-oil exports and from world income to non-oil exports are greater than 5%. Hence, we do not reject the null hypothesis. Neither the coefficients of the lagged values of real exchange rate nor the coefficients of the lagged values of world income do jointly influence non-oil exports; the coefficients of real exchange rate are jointly zero and so are the coefficients of world income jointly. This means that there is no short run causality from real exchange rate to non-oil exports as well as there is no short run causality from world income to non-oil exports in Nigeria. In the case of short run causality from trade liberalization to non-oil exports, the corresponding Chi-square value of 22.48 has a probability of 0 which is less than 5%. Therefore, the null hypothesis that there is no causality from trade liberalization to non-oil exports is rejected. This implies that trade liberalization causes non-oil exports in Nigeria in the short run.

## **5.0 Conclusion and Policy Implication**

The main objective of this paper was to examine the influence of trade liberalization on non-oil exports growth in Nigeria. Data for the period 1970 to 2016 was analysed following the Johansen cointegration and error correction model procedure to ascertain the long – and short – run relationship between trade liberalization and non-oil exports growth. The findings indicate both long – and short – run relationship between trade liberalization and non-oil exports growth; trade liberalization was found to have positive impact on non-oil exports in Nigeria. Thus, it can be concluded that the liberal trade policies adopted in Nigeria have spurred non-oil exports.

In this light, government should be encouraged to sustain those measures that have enhanced the free posture of trade policy in Nigeria. These may include leveraging on regional integration such as the ECOWAS trade liberalization scheme and the African Continental Free Trade Area. By so doing, the country will stand the chance of diversifying her economy away from over-reliance on crude oil. However, domestic policies that would improve the country's price competitiveness is necessary if the country's non-oil export performance is to be efficient. This is because the finding points to the fact that Nigeria's non-oil export performance is negatively associated with real effective exchange rate in the long run. A large portion of Nigeria's non-oil exports have little/no value added components and thus enjoy almost no price setting power. Therefore, small changes in the relative price of closely related goods produced by competing third countries can have significant implications for exports demand of Nigeria's goods. Therefore, there is the need for such measures as lessening the cost of doing business/ production through improvement in infrastructure and tax related issues and enhancing access to finance. These policies would increase competitiveness and assist in export production to optimize the gains derivable from international trade in the long run.

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## Appendix

**Table A1: Data on variables Used in the Study's Analysis**

Year	Non-oil Exports	Real Effective Exchange Rate	GNI of ECOWAS	Trade Liberalization Dummy
1970	28503.36	224.50	41350000000	0
1971	26034.08	233.60	39870000000	0
1972	23270.74	242.70	38390000000	0
1973	20161.35	251.81	36910000000	0
1974	12666.57	260.91	35430000000	0
1975	9171.59	270.01	33960000000	0
1976	7071.87	279.12	32480000000	0
1977	5530.78	288.22	31000000000	0
1978	4103.10	297.33	29520000000	0
1979	3005.69	306.43	28040000000	0
1980	2073.57	315.53	26570000000	0
1981	1243.90	324.64	25088998367	0
1982	703.37	333.74	23611154138	0
1983	916.73	393.99	21347718509	0
1984	664.57	546.31	21327267492	0
1985	1265.19	490.41	21584823373	0
1986	1258.78	266.89	27533482819	0
1987	2931.04	85.16	30029992855	1
1988	3055.28	85.57	31090254723	1
1989	2257.00	76.18	27733358695	1
1990	2278.47	70.80	33052139514	1
1991	2780.02	59.95	34016159997	1
1992	1495.19	49.73	34195487438	1
1993	1399.48	54.51	32728895958	1
1994	1144.79	100.81	26005291530	1
1995	2319.83	160.13	32901502921	1
1996	1765.33	207.65	35874978893	1
1997	2184.82	235.93	34883084352	1
1998	2705.73	272.37	37698018956	1
1999	1322.56	70.15	37868052084	1
2000	1245.43	69.87	31772937378	1
2001	1409.81	77.84	33339055627	1
2002	3408.46	78.09	37286506468	1
2003	3068.24	73.20	46037872731	1
2004	3674.01	74.91	52618546719	1
2005	2815.48	85.55	59103120959	1
2006	3025.38	91.50	72355933062	1
2007	4306.90	89.65	85544082085	1
2008	4932.04	99.13	1.01832E+11	1
2009	6047.34	92.14	98792298405	1
2010	4058.56	100.00	1.07051E+11	1
2011	4543.95	100.31	1.20857E+11	1
2012	3978.76	111.38	1.24876E+11	1
2013	3588.35	118.82	1.40842E+11	1
2014	3266.37	127.14	1.37962E+11	1
2015	3017.82	135.46	1.351E+11	1
2016	2611.02	143.79	1.322E+11	1

Source: World Bank (2017)

**Table A2: Lag Selection Criteria**

Sample: 1970 2016

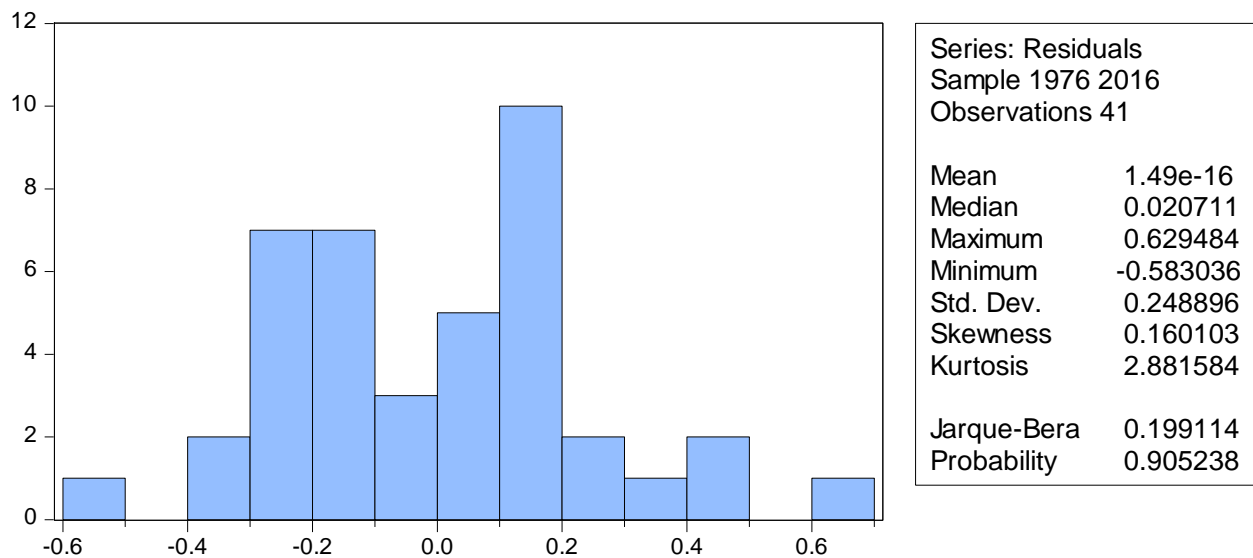
Included observations: 42

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-134.7849	NA	0.141931	6.561187	6.685306	6.606682
1	12.86648	267.1787	0.000193	-0.041261	0.455216*	0.140717
2	25.57199	21.17585	0.000163	-0.217714	0.651121	0.100748*
3	33.99597	12.83654	0.000171	-0.190284	1.050908	0.264662
4	38.96434	6.861079	0.000214	0.001698	1.615248	0.593128
5	55.37039	20.31225*	0.000160*	-0.350971*	1.634937	0.376943

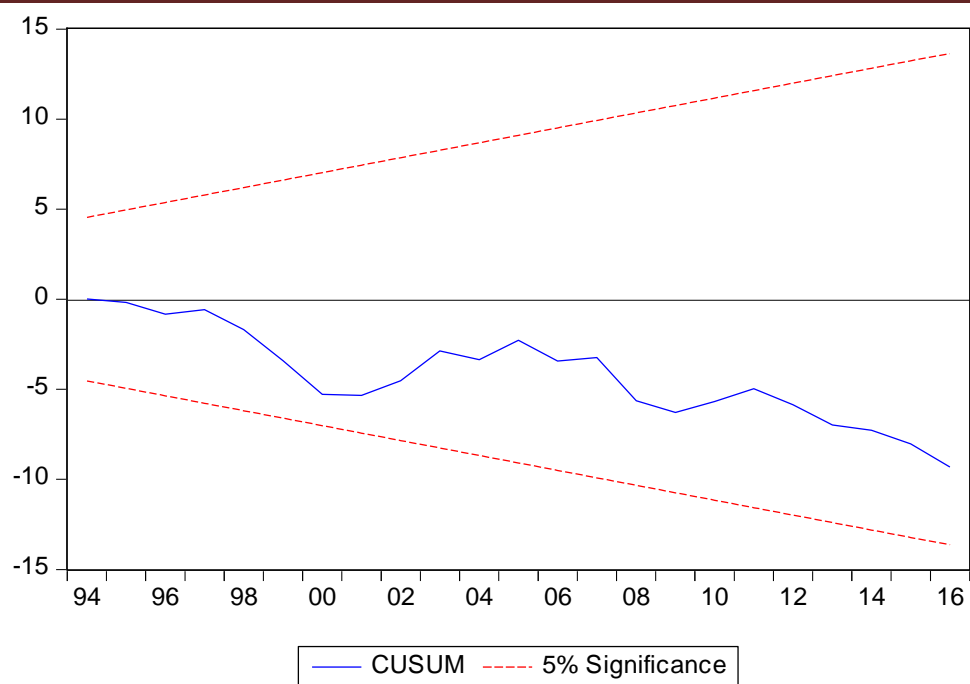
\* indicates lag order selected by the criterion

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



**Figure A1: Result of the Jarque-Bera Test for Normality**



**Figure A2: Cumulative Sum of Recursive Residuals for Non-oil Exports equation**