

# THE IMPACT OF GLOBALIZATION ON MANUFACTURING OUTPUT: THE CASE OF NIGERIA

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## Abstract

Nigerian government has put in considerable effort at improve bilateral relation in the economy; its net effect is yet unclear. This raises concerns about the tradeoff benefit between trade openness as a proxy to globalization and contributions to the manufacturing output in Nigeria.

This study examines the impact of globalization on manufacturing output in Nigeria. Using structural vector autoregressive (SVAR) approaches, from 2010Q1 to 2018Q4, the findings reveal that manufacturing output and transportation responded significantly to the foreign shocks emanating from globalization. The study established that the manufacturing output reacted negatively to exchange rate fluctuations, implying that exchange rate is very important to manufacturing sector in Nigeria. On the same vein, transportation, financial integration and globalization respectively were affected positively and significantly by exchange rate fluctuations to manufacturing sector.

**Keywords:** Globalization, manufacturing output, exchange rate, transportation, financial integration, Nigeria.

## Introduction

Globalization refers to greater interdependence and interconnectivity among countries. It consists of the increased interaction of product and resources across nations via trade,

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immigration and foreign investment through international flows of goods and services, people, investment in equipment, factories, stocks and bonds. In addition to economic constituents, globalization also includes non-economic elements such as culture and the environment, simply put globalization is political, technological and cultural, as well as economic elements. Considering current economic conditions and relations, no economy can survive, without interdependence on one another, because no country exists in isolation. A country cannot produce all the basic necessities of life, hence the need for high degree of economic interdependence. Against this backdrop, globalization is pivotal to the achievement of any nation, including expansion in manufacturing.

The law of comparative advantage indicates that a nation can gain by spending more of its resources in the production of goods where has relative advantage. Hence, if a good or service can be obtained more economically through trade, it would be rational to trade for it instead of expanding resources producing it domestically at a less competitive cost. The central issue is how the available resources can be used to obtain each good at the lowest possible cost. When trading partners use more of their time and resources producing things they do best, they are able to produce a larger output that provides the source for mutual gain.

International trade also results in gains from the competitive process. Competition is essential to both innovation and efficient production. International competition helps keep domestic producers on their toes and provides them with a strong inducement to improve the quality of their products. Also, international trade usually weakens monopolies.

It is worthy to note that the impact of Globalization in relation to other climes are not industrially competitive, though, in Nigeria, the Manufacturing sector comprises of thirteen activities: Oil Refining; Cement; Food, Beverages and Tobacco; Textile, Apparel, and Footwear; Wood and Wood products; Pulp Paper and Paper products; Chemical and Pharmaceutical products; Non-metallic Products, Plastic and Rubber products; Electrical and Electronic, Basic Metal and Iron and Steel; Motor Vehicles and Assembly; and Other Manufacturing.

In the first quarter of 2019, nominal GDP (Gross Domestic Product) growth in the Manufacturing sector was recorded at 36.45% (year-on-year), or 27.52% points higher than the rate recorded in the corresponding period of 2018 (8.93%), and 2.88% points higher than in the preceding quarter. Quarter on quarter, manufacturing sector recorded a growth rate of 1.09%. The sector's contribution to nominal GDP during the quarter was 11.32%, higher than its contribution in both the first quarter (9.28%) and the fourth quarter (10.11%) of 2018.

Real GDP growth in the manufacturing sector was 0.81% in the first quarter of 2019 (year on year). This was lower than in the same quarter of 2018 by -2.59% points, and the preceding quarter by -1.54% points (Figure 6). On a quarter-on-quarter basis, the growth rate stood at -4.62%. In terms of its contribution, the sector accounted for 9.80% of real GDP in Q1 2019, lower than the 9.91% recorded in the first quarter of 2018 but higher than the 8.86% recorded in the fourth quarter of 2018. (NBS report Q1, 2019)

Manufacturing sector plays an important role in economic development. The sector is considered an engine of growth because of its high potential for increased productivity, higher technological progress, increased capital accumulation and economies of scale. In addition, the Sector has the potential to create employment, produced varied and quality products due to technological advancement. It generates income to households and revenue to government through taxes. It also helps in reducing trade deficits. Furthermore, countries with vibrant manufacturing sectors are less impacted by global economic shocks because of diversified export products.

The Sector transforms raw materials into finished and intermediate products for local consumption and export. The absence of a functional manufacturing sector would lead to overdependence on importation of foreign goods which constitutes a leakage in the economy. The manufacturing sector, therefore, is expected to potentially achieve import substitution of foreign consumer goods and consumer durables (Chete et al., 2016). Manufacturing for export creates employment within the domestic economy as well as enhances value addition to primary products for export. The combined effects of a viable manufacturing sector invariably result in favourable balance of trade (BOT). Globalization, therefore, is a process that transcends national borders, combines national economies, cultures, technologies and governance, and produces the complex relationships of interdependence (Gygli et al., 2018)

In 2017, the contribution to the economic growth was driven by the Agriculture, Industry and Construction sectors which contributed 0.84, 0.38 and 0.04, per cent, respectively, while Services and Trade sectors contributed negatively to the growth by 0.25 and 0.18 per cent respectively. Comparatively, Agriculture contributed 0.95 per cent in 2016, while, Industry, Services and Construction and Trade had negative contributions of 1.73, 0.44, 0.04 and 0.04 per cent, respectively. (CBN Annual Report, 2017)

<b>Table 6.1: Sectoral Contributions to Growth Rates of GDP at 2010 Constant Basic Prices (percentage points)</b>					
<b>Activity Sector</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<b>1. Agriculture</b>	<b>0.7</b>	<b>1.0</b>	<b>0.9</b>	<b>1.0</b>	<b>0.84</b>
Crop Production	0.5	0.9	0.7	0.9	0.80
<b>2. Industry</b>	<b>-0.02</b>	<b>1.23</b>	<b>-0.7</b>	<b>-1.7</b>	<b>0.38</b>
Crude Petroleum	-1.8	-0.2	-0.6	-1.3	0.40
<b>3. Construction</b>	<b>0.5</b>	<b>0.5</b>	<b>0.2</b>	<b>-0.2</b>	<b>0.04</b>
<b>4. Trade</b>	<b>1.1</b>	<b>1.0</b>	<b>0.9</b>	<b>-0.04</b>	<b>-0.18</b>
<b>5. Services</b>	<b>3.2</b>	<b>2.6</b>	<b>1.6</b>	<b>-0.4</b>	<b>-0.25</b>
Information & Communications	0.9	0.8	0.7	0.2	-0.12
<b>TOTAL (GDP)</b>	<b>5.5</b>	<b>6.2</b>	<b>2.8</b>	<b>-1.5</b>	<b>0.83</b>
<b>NON-OIL (GDP)</b>	<b>8.4</b>	<b>7.2</b>	<b>3.8</b>	<b>-0.2</b>	<b>0.47</b>

Source: NBS

Today, in order to flow with the trend of globalization and trade liberalization in global economic system, Nigeria is a member of and signatory to many international and regional trade agreements such as International Monetary Fund (IMF), World Trade Organization (WTO), Organization of the Petroleum Exporting Countries (OPEC), Economic Community of West African States (ECOWAS), and so many others. The policy response of such economic partnership on trade has been to remove trade barriers, reduce tariffs and embark on outward – oriented trade policies. Despite all her efforts to meet up with the demands of those economic partnerships in terms of opening up her border, the economy has struggled vigorously to stimulate growth through openness to trade. In fact, it appears that as the country makes conscious effort to boost her economic growth by opening up to trade with the global economy the more she becomes worse-off relative to her trading partners in terms of country output growth. Based on the above challenges, the study answers the following research questions: What are the effects of degree of openness on financial integration output in Nigeria? Has exchange rate impacted the manufacturing sector output as a result of globalization in Nigeria? What is the impact of trade openness on Transportation sector as a result of Globalization in Nigeria? What is the impact of oil price shocks on exchange rate as a result of Globalization?

The paper seeks to assess the effects of globalization on the manufacturing output and also to determine the relative shock of exchange rate fluctuation on financial integration, transportation, oil price shocks and manufacturing sectors respectively to the output growth in Nigeria.

After the introduction, section two reviewed related theoretical and empirical literature to establish the state of the debate on the subject matter and to highlight the gap to be filled by this paper. Third section focuses on the methodology and assumptions. Fourth section states the techniques of analysis while section five, provide summary, conclusion and policy recommendation.

## **1. Literature Review**

### **1.1. Theoretical Framework**

Adam Smith (1723-90). In his famous book, an inquiry into the nature and causes of the wealth of nations (1776), Smith stressed the importance of trade as a vent for surplus production and as a means of widening the market thereby improving the division of labor and the level of productivity. We may summarize the absolute advantage trade theory of Adam Smith, thus, countries should specialize in and export those commodities in which they had an absolute advantage and should

Import those commodities in which the trading partner had an absolute advantage. That is to say, each country should export those commodities it produced more efficiently because the absolute labour required per unit was less than that of the prospective trading partners. (Appleyard and Field, 1998).

The Smithian trade theory generated a lot of arguments. This led David Ricardo (1772-1823) to develop the theory of comparative advantage and showed rigorously in his principles of political economy and taxation (1817) that on the assumptions of perfect competition and the full employment of resources, countries can reap welfare gains by specializing in the production of those goods with the lowest opportunity cost over domestic demand, provided that the international rate of exchange between commodities lies between the domestic opportunity cost ratios. These are essentially static gains that arise from the reallocation of resources from one sector to another as increased specialization, based on comparative advantage, takes place. The static gains from trade stem from the basic fact that countries are differently endowed with resources and because of this the opportunity cost of producing products varies from country to country. The law of comparative advantage states that countries will benefit if they specialize in the production of those goods for which the opportunity cost is low and exchange those goods for other goods, the opportunity cost of which is higher. Heckscher-Ohlin theory seeks to explain the pattern of international trade as determined by the relative factor of production existing in countries. This theory postulates that, trade arises from differences in comparative costs which in turn arise from inter-country differences in relative factor endowments means that countries should make use of locally abundant factors to produce export goods and import goods that are locally scarce. By

implication the emphasis of this theory is that countries should rely on factor endowment. This links international trade to the international movement of labour and capital. The theory is based on the following assumptions: (i) There are no transport costs and impediment to trade. (ii) There is also perfect competition in commodity and factor market. (iii) All production functions are homogeneous of the first degree. (iv) The production functions differ between commodities but are the same in both countries. It is the belief of many economists that Heckscher-Ohlin model is an improvement on the Ricardian theory of comparative advantage (Jhingnn, 2006).

The Ricardian and Heckscher-Ohlin theories are based on the assumption that technology is the same in all trading countries, as such, they do not analyse the effect of technological change on trade. According to (Posner, 1961) the effect of technology on trade is manifested in the continuous process by which technological changes influences the pattern of international trade. A technological innovation in the form of production of a new good in one country leads to the imitation gap and the demand gap in the other country. The extent to which trade will take place between the two countries depends on the net effect of the demand lag and the imitation gap. The imitation gap theory explains the sequence of innovation and imitation but as it affects the pattern of trade when a firm innovates in the form of a new product which becomes profitable in the domestic market, it enjoys a temporary monopoly. As it exports the product to foreign market and has an absolute advantage in this product. After some time, the profit of the innovating firm encourages imitation in the other country. But it will continue to export the product and have a comparative advantage in its production till the importing country learns the new process, change plant, equipment, etc. in order to produce it, this is the imitation gap.

According to (Posner, 1961) the imitation gap has three components. The first is the “foreign reactions lag” which is the time taken by the innovating firm to start the production of the new product. The second is the “domestic reaction lag” which is the time taken by other domestic producers to follow suit and establish a hold on the domestic market. The third is the “learning period” which is the time taken by domestic producers to master the technique of producing the new product and selling it in the domestic market. These three components together form the imitation lag. Therefore, in this study we adopted as our theoretical framework the Smithian theory of Absolute advantage, the Ricardian theory of Comparative advantage and the Hecksher-Ohlin trade theory. These provided explanations as to the patterns of international trade and how countries benefit from trade.

## **1.2. Empirical literature**

The impact of globalization and other macro-economic variables has been examined by various researchers from different countries using various econometric techniques. The results are, however, mixed.

Egberi and Samuel (2017) examined the relationship between major globalization indicators and economic growth in Nigeria. The study covered the period of 1980-2015 by using Error Correction Model (ECM). The result showed that current FDI (Foreign Direct Investment) openness of the economy to the outside world has a positive and significant impact on the level of economic growth in Nigeria.

Maduka et al. (2017) uses Autoregressive Distributed Lag (ARDL) Model to examine the impact of globalization on economic growth in Nigeria. Using annualized secondary time series data from 1970 to 2015, the study reveals that trade openness; financial integration and foreign direct investment have significant positive impact on economic growth in Nigeria.

Asuamah et al. (2016), examined the stable long run hypothesis between globalization and manufacturing sector productivity for Ghana for the period 1961-2013 using Ordinary Least Squares (OLS) Model. The findings of the study indicate that the manufacturing sector has not benefited from globalization.

Zerrin and Yasemin (2018) the study showed the impact of globalization on economic growth in Turkey covering the period from 1980 to 2015 using the globalization index and its components (economic, social and political globalization indices). The findings showed that economic growth increase “economic” and “social” globalization in Turkey.

Usenobong and Atan (2015) examined the impact of globalization on three key sectors of the Nigerian economy: agriculture, manufacturing and international trade over the period (1970-2011), using Error Correction Model (ECM). The evidence shows that globalization offers Nigeria brighter opportunities to improve on its economic performance in the selected sectors.

Olaniyi, et al. (2016), the study examined influenced on globalization on the Nigeria capital market, using OLS method, the period covered from 1980-2014, the findings showed that globalization has a positive impact on the performance of the Nigerian capital market.

Nyeche and Ekine (2018), the study examined the effectiveness of trade openness on the performance of the transportation sub-sector in Nigeria, using OLS method. The result showed that trade openness and exchange rates are negatively related to transportation GDP while FDI and export-import ratio exert insignificant influence on transportation GDP.

Giray et al. (2019) revisited the impact of economic globalization on public employment in Turkey using a panel dataset of 92 developing economies over the period 2000-2016. Findings showed a negative impact of economic globalization on public.

There are positive impacts in the empirical literature under review, the effect of globalization on the exchange rate at aggregate level, the impact of the shocks on the manufacturing output, Transportation and appropriate data for financial integration however, has received very little attention in the literature on Nigerian. It is, therefore, vital to ascertain the impact of exchange rate shocks on the performance of disaggregated macro-economic variables as it affects globalization in Nigeria.

## **2. Methodology, data and variables choices**

### **2.1. Methodology**

In this research, the authors choose to estimate a baseline structural vector autoregressive (SVAR) model with contemporaneous restrictions to analyze the effectiveness of globalization to manufacturing output in Nigeria. For significance at risk (VAR) analysis, first of all, structural equation (1) is assumed thus:

$$A_0 Y_t = A_t X_t + \vartheta \omega_t \quad (1)$$

Where  $Y_t$  is  $(n \times 1)$  vector of endogenous variables,  $A_0$  is a  $(n \times n)$  matrix of coefficients of simultaneous relations on the endogenous variables;  $X_t$  includes lag of endogenous variables,  $A$  is the matrix of coefficients on the lagged variables in the model;  $\mu_t$  as  $(k \times 1)$  vector of the structural innovation is orthogonal and  $\Sigma_{\omega t} = E(\omega_t \omega_t')$  presents variance covariance matrix of the structural innovation.

Furthermore,  $\omega_t$  is orthogonal and has a normal distribution, it means that shocks are uncorrelated and variance covariance matrix has normal distribution with zero means. The main difficulty in the evaluation of the structural model is that the authors cannot directly estimate the real values of  $A_0$  and  $A$ . The sampling information of data is not adequate for additionally identifying restriction. Gottschalk and Hoppner (2001), believed there were too many sets of unlike value of  $A_0$  and  $A$  that all of them indicated similar probability distribution of data. This must estimates the real value, of which  $A_0$  and  $A$  are impossible. To solve this difficulty, the authors should obtain reduced form of equation (1). The reduced form solves this problem by explaining each endogenous variable exclusively as a function of predetermined variables.

$$Y_t = A^* X_t + \theta_t \quad (2)$$



With  $A^* = A_0^{-1}A$  and  $\theta = A_0^{-1}\vartheta\omega_t$

In order to recover the structural parameters from the reduced form model or exactly identify the model as Hamilton (1994), mentioned the order condition should be satisfied. It means that the number of parameters in the covariance matrix of the reduced form should be the same. The variance covariance matrix of the reduced form is given in equation (3).

$$\sum_{\theta} = E(\theta_t\theta') \text{ or } \sum_{\theta} = (A_0^{-1}) \sum_{\mu t} (A_0^{-1})' \quad (3)$$

To achieve identification, it is expected that the parameters in  $\vartheta$  and  $A_0$  are recoverable from the reduced form. In equation (3)  $\Sigma$  contains  $K(K + 1)/2$  parameters, and there are  $K(K + 1)$  free parameters in equation (3) of the right-hand side, so we imposed  $2K^2 - K - K(K + 1)/2$  restrictions on  $\vartheta$  and  $A_0$ . As normally impose  $K(K - 1)$  restriction to restrict  $\vartheta$  to be diagonal, so identification is achieved if at least  $K(K - 1)/2$  restrictions are imposed on  $A_0$ . In the VAR modeling with Cholesky decomposition,  $A_0$  is considered as triangular. However, in a structural VAR,  $A_0$  can be of any structure until it has enough restriction.

## 2.2. The structural vector autoregression (SVAR) estimates

We adopted the augmented Kim and Roubini's (2000) and Vinayagathan (2013) to investigate the shocks of globalization and other macroeconomic variables of manufacturing output in Nigeria. Structural shocks in a SVAR can be identified by inserting some restrictions in the baseline model. The SVAR basic model variables represented by the following vector  $X_t$ :

$$X_t = (TOP_t, EXCHR_t, FININ_t, OREV_t, MOUT_t, RTRANS_t) \quad (4)$$

Where  $MOUT_t$  represent manufacturing output in terms of the naira,  $EXCHR_t$  refers to the naira-US dollar exchange rate,  $FININ_t$  is financial integration,  $OREV_t$  means oil revenue in naira terms,  $TOP_t$  connotes trade openness and  $RTRANS_t$  represent real transport in terms of naira.

From equation (4), the first identification arrangement is the standard approach which imposes a recursive structure of the VAR that shows the relationship between the reduced-form errors and the structural disturbance is presented in equation (5).

$$\begin{bmatrix} \varepsilon_t^{MOUT} \\ \varepsilon_t^{EXCHR} \\ \varepsilon_t^{FININ} \\ \varepsilon_t^{OREV} \\ \varepsilon_t^{TOP} \\ \varepsilon_t^{RTRANS} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ \alpha_{21} & 1 & 0 & 0 & 0 & 0 \\ \alpha_{31} & \alpha_{32} & 1 & 0 & 0 & 0 \\ \alpha_{41} & \alpha_{42} & \alpha_{43} & 1 & 0 & 0 \\ \alpha_{51} & \alpha_{52} & \alpha_{53} & \alpha_{54} & 1 & 0 \\ \alpha_{61} & \alpha_{62} & \alpha_{63} & \alpha_{64} & \alpha_{65} & 1 \end{bmatrix} \begin{bmatrix} \mu_t^{MOUT} \\ \mu_t^{EXCHR} \\ \mu_t^{FININ} \\ \mu_t^{OREV} \\ \mu_t^{TOP} \\ \mu_t^{RTRANS} \end{bmatrix} \quad (5)$$

Unlike the recursive identification, in identifying the structural VAR, the authors employed Amisano and Gianini (1997) strategy. In Amisano, et al. method, enough restrictions are imposed on both matrices  $A_0$  and  $\vartheta$ . For the system to be justly identified, it requires  $k(3k - 1) / 2$  or  $2k^2 - k(k + 1) / 2$  or  $51 = 2(6^2) - 6(6 + 1) / 2$  restrictions on both  $A_0$  and  $\vartheta$ . Since 12 restrictions are imposed on  $\vartheta$  (assumed to be a diagonal matrix in the model), another 39 restrictions on  $A_0$  are required for the system to be justly identified.

The restrictions placed on the non-recursive contemporaneous relationships among the variables are shown in Equation (6). In the left side of the baseline SVAR model, coefficients  $b_{ij}$  point out that variable  $j$  immediately affects variable  $i$ . Equation (5) shows the identified system  $A_0\theta_t = \vartheta\mu_t$ .

$$\begin{bmatrix} 1 & \alpha_{11} & \alpha_{12} & \alpha_{13} & \alpha_{14} & \alpha_{15} \\ 0 & 1 & \alpha_{22} & \alpha_{23} & \alpha_{24} & 0 \\ 0 & \alpha_{32} & 1 & \alpha_{34} & \alpha_{34} & 0 \\ 0 & 0 & 0 & 1 & \alpha_{45} & 0 \\ 0 & \alpha_{52} & \alpha_{53} & \alpha_{54} & 1 & 0 \\ 0 & 0 & \alpha_{63} & 0 & \alpha_{65} & 1 \end{bmatrix} \begin{bmatrix} \mu_t^{MOUT} \\ \mu_t^{EXCHR} \\ \mu_t^{FININ} \\ \mu_t^{OREV} \\ \mu_t^{TOP} \\ \mu_t^{RTRANS} \end{bmatrix} = \begin{bmatrix} \varepsilon_t^{MOUT} \\ \varepsilon_t^{EXCHR} \\ \varepsilon_t^{FININ} \\ \varepsilon_t^{OREV} \\ \varepsilon_t^{TOP} \\ \varepsilon_t^{RTRANS} \end{bmatrix} \quad (6)$$

The trade openness, financial integration, transportation, oil revenue and exchange rate represent the exogenous external shocks. Domestic variable shocks have no effect on this variable contemporaneously. However, it is expected that financial integration reacts positively and immediately oil revenue increase, because the Nigerian monetary authority uses a tightening policy when they encounter oil revenue shock. The exchange rate and trade openness are assumed to

affect the level of manufacturing output with a one period lag. The real transport responds instantaneously to the manufacturing sector and nominal exchange rate.

The reason for this is that exchange rate is one of the main indicators of adjustment of price stability in Nigeria. Furthermore, as oil revenue is determined by the government below the international crude oil price level. As Nigeria is the seventh largest exporter of the crude oil, dollars play a crucial role in the economy of the country. It is expected that manufacturing sector output positively responds to crude oil price.

### 2.3. Sources of data and variables used

The study used secondary data to analyse the impact of globalization on manufacturing output in Nigeria. The data were sourced from the CBN and National Bureau of Statistics (NBS) statistical data bases. The data are quarterly spanning the period 2010Q1 to 2018Q4.

The variables for the study consists of trade openness as a proxy for globalization (TOP), financial integration (FNIN), oil revenue (OREV), Manufacturing output (MOUT), Exchange Rate (EXCHR), and Real Transportation (TRANS). All series are transformed into natural logarithm form with the exception of financial integration and trade openness since it's already in ratios.

The descriptive statistics of the variables used in the study showed that the standard deviation for the variables were not below one apart from TOP of the mean values. Based on the Jarque-Bera test for normality, we reject the null hypothesis of normal distribution for all the variables except for EXR at 5 per cent significant levels. (See table 1).

**Table 1:** Summary or Descriptive Statistics

Statistics	MOUT	EXCHR	FININ	OREV	TOP	RTRANS
Mean	1410.12	201.82	90.30	1426.74	0.06	387660.75
Median	1522.49	157.39	88.73	1448.63	0.07	385156.55
Maximum	1731.15	313.29	107.46	2642.79	0.17	506651.03
Minimum	875.41	149.94	76.87	537.19	-0.05	289697.21
Std. Dev.	285.90	65.51	8.52	533.13	0.06	50600.31
Skewness	-0.69	0.94	0.32	0.28	-0.28	0.07
Kurtosis	1.99	2.07	2.01	2.35	2.32	2.81
Jarque-Bera	4.25	6.45	2.05	1.07	1.15	0.08
Probability	0.12	0.04	0.36	0.59	0.56	0.96
Observations	35	35	35	35	35	35

### 3. Empirical Analysis

The result of this empirical analysis is presented in two folds; the preliminary results, which cover the unit root tests, stability test and lag length selection criteria, and the results of the structural VAR model as well as the impulse response function result. These are presented below.

**Table 2:** Unit Root Test

Variable	ADF		PP		Decision
	Level	1 <sup>st</sup> Diff	Level	1 <sup>st</sup> Diff	
MOU	-1.93	-6.70	-3.77	-6.69	I(0)
EXCHR	-0.05	-4.92	-0.0001	-4.85	I(1)
FININ	-1.11	-8.11	-2.67	-13.09	I(1)
OREV	-1.37	-6.52	-1.31	-6.51	I(1)
TOP	-1.97	-2.37	-1.28	-7.91	I(1)
RTRANS	-1.65	-17.43	-3.77	-14.25	I(0)
<i>Critical Value</i>	-2.96	-2.95	-2.94	-2.95	

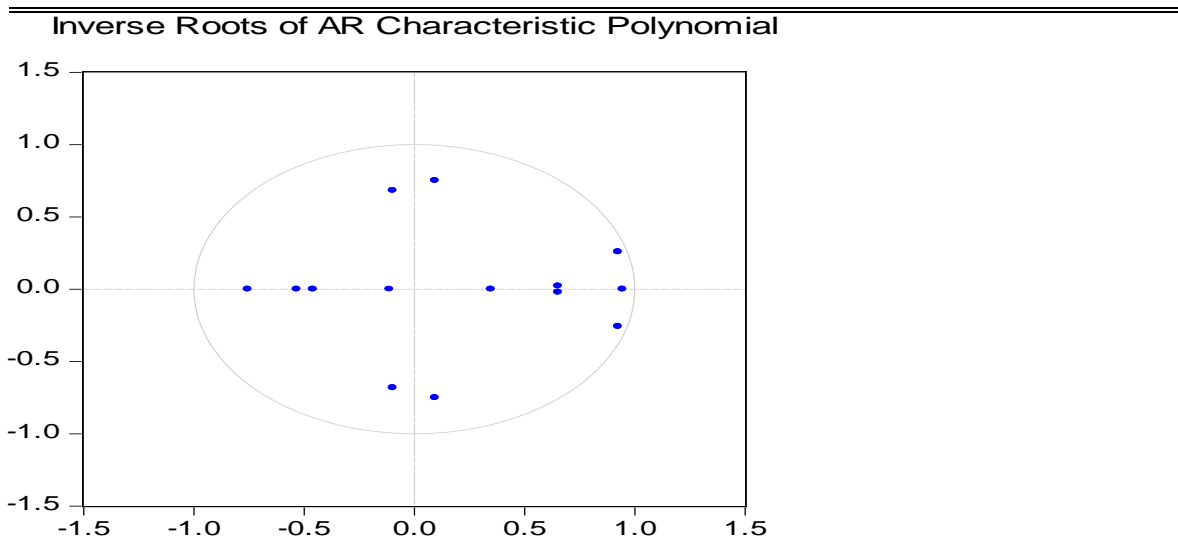
The unit root tests suggest that most of the variables were combination of integration of order zero and one. However, the ADF tests for log MOU and log RTRANS showed that the two variables became stationary in the order I (0), the PP test justify further inclusion of these variables in the study. However, since the point of interest lies in the dynamic interrelationships among the macroeconomic variables, the SVARs were estimated in levels to avoid losing economic information embedded in the variables as used in other literature such as CBN, 2014 and Berkelmans L., 2005.

#### 3.1. Stability tests

A structural vector autoregression of the aggregate manufacturing output was estimated in its level form in line with literature on globalization, especially policy variables. (CBN, 2014, Lawson and Rees, 2008, Vinayagathan 2013 and Claudes 2007 E.TC.). To achieve this, the unrestricted VAR is expected to be stable, meaning-the inverse root of AR characteristic polynomial must lie within a circle. However, where the model is not stable, the VAR is estimated on first difference. In this study, the stability condition was established at lag length 1 and 2 based on lag selection criterion, but the stability test indicated that lag 2 was more appropriate, which is selected by SC and HQ criteria. The outcome of the lag lengths stability test is presented in Table 3 and Figure 1.

**Table 3:** VAR lag Selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	6.145177	NA	2.48e-09	0.051807	0.369248	0.158617
1	189.3900	277.6437*	7.79e-13	-8.084242	-5.544714*	-7.229768*
2	246.9342	62.77546	7.16e-13*	-8.602070*	-3.840455	-6.999932



Source: Author's Computation

### 3.2. Impulse response function

#### 3.2.1. Response of manufacturing output to trade openness

The IRF analysis in Figure 2a shows the response of the globalization to the shocks in exchange rate. Output increases continually from the first to second quarter in response to one standard deviation innovation in exchange rate. This positive response of MOUT to TOP continued to increase throughout the forecast horizon as shown in Figure 1. This implies that it will take manufacturing output a short time to adjust to trade openness, because the manufacturing is highly dependent on imported input particularly capital equipment and machineries and there was a trade openness for Nigeria to open up the balance of trade relationship and this in line with a priori expectation.

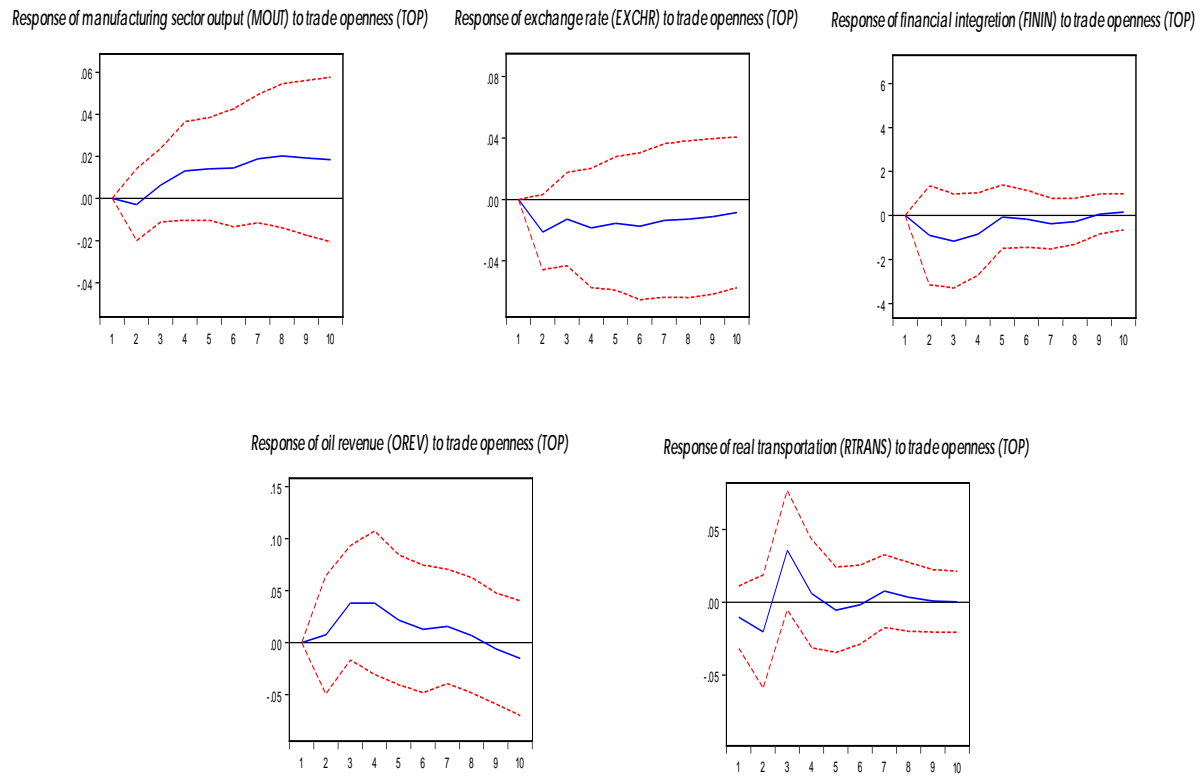


Figure 2: Response to Cholesky One Standard Deviation Innovations  $\pm 2$ S.E.

### 3.2.2. Response of exchange rate to trade openness

The IRF analysis in Figure 2b shows the response of the trade openness to the shocks in exchange rate. Output declined continually from the first to tenth quarter in response to a one standard deviation innovation in exchange rate. This negative response of EXR to TOP continued throughout the forecast horizon as shown in Figure 2. This implies that it will take the globalization a long time to adjust to exchange rate shock, because the manufacturing sub-sector is highly dependent on imported input particularly capital equipment and machineries.

### 3.2.3. Response of financial integration to trade openness

The Financial integration (FNIN) reacted negatively to a structural one standard deviation shock in exchange rate from quarters 1 to 5 with the highest impact in quarter 5. Thereafter, from quarter 6, it maintained a steady rise and tended towards equilibrium in quarter 10. It implies that injecting money to investors in the economy will pave will bring about positive impact on globalization at the long run.

### 3.2.4. Response of oil revenue to trade openness

The oil revenue (OREV) reacted positively to a structural one standard deviation shock in exchange rate from quarters 1 to 10 with the highest impact in quarter 4. Thereafter, from quarter 6, it maintained a steady decline and tended below equilibrium in quarter 10. It implies that oil revenue has a short time impact on globalization

### 3.2.5. Response of real transportation to trade openness

The real transportation (RTRANS) reacted positively to a structural one standard deviation shock in exchange rate from quarters 1 to 10 with the highest impact in quarter 3. Thereafter, from quarter 4, it maintained a steady volatility and tended towards equilibrium in quarter 10. This shows that with trade openness it will have significant impact on transportation system in the economy.

## 3.3. Variance decomposition (VC)

The proportion of variation of the dependent variables due to shocks used in the study indicated that manufacturing output, transportation and financial integration reacted positively on globalization from the first year up to the fourth year. From the fifth year, up till the end of the analysis horizon.

**Table 4:** Variance Decomposition

Variance Decomposition of LMOUT:							
Period	S.E.	LMOUT	LEXCHR	FININ	LOREV	TOP	LRTRANS
1	0.043535	100.0000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)
2	0.054023	85.75243 (11.0455)	2.665539 (6.41744)	4.531416 (6.18714)	0.575249 (3.07575)	0.299111 (3.25568)	6.176257 (5.50965)
3	0.068402	72.64869 (11.5539)	1.770197 (6.43610)	15.34305 (9.43309)	4.329995 (5.32712)	1.058409 (4.19024)	4.849653 (4.70973)
4	0.076121	67.19557 (13.7588)	3.173479 (8.20425)	16.30078 (10.2273)	5.002259 (6.33550)	3.783160 (6.25061)	4.544748 (4.62383)
5	0.084780	63.79716 (15.6208)	3.418410 (9.07388)	14.89451 (10.3531)	6.543722 (8.12117)	5.779491 (8.47295)	5.566711 (4.57569)

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6	0.092927	60.41167 (16.7522)	4.936057 (10.5340)	14.36934 (11.0228)	7.112059 (9.13625)	7.233469 (9.54865)	5.937412 (5.06125)
7	0.101591	55.90781 (17.7839)	6.657548 (11.6240)	14.35489 (11.7036)	7.881772 (10.3028)	9.494278 (10.9873)	5.703702 (5.03694)
8	0.110052	50.65913 (18.0665)	9.219379 (13.1453)	14.32686 (12.5029)	8.599338 (11.0750)	11.46624 (12.0569)	5.729054 (5.19953)
9	0.118167	45.94815 (18.5047)	12.21935 (14.2390)	13.74403 (12.8794)	9.584771 (11.9515)	12.59382 (12.7184)	5.909874 (5.16834)
10	0.126122	41.58830 (18.4215)	16.09081 (15.7965)	12.87590 (13.0088)	10.36629 (12.6465)	13.19947 (13.2586)	5.879225 (5.19517)

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Cholesky Ordering: LMOUT LEXCHR FININ LOREV TOP LRTRANS

Standard Errors: Monte Carlo (100 repetitions)

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In summary, it is evident that foreign shocks in terms of trade openness transmit largely shocks dependent variables in Nigeria. Thus, findings support the evidence that other domestic shock especially fall in output exerts serious pressure in the Nigerian manufacturing output and vice versa.

### **Conclusions and Policy Recommendations**

This study examines the impact of globalization on manufacturing output in Nigeria. The paper covers five sections, introduction in section one, section two reviews some relevant literature, while section three presents the methodology used for the study, section four is on interpretation and analysis of the results, while the last section infers policy implication and conclusion. Attempt to determine the nature of the response of the variables and time lag of the impact of the exogenous variable on the selected endogenous variables, the structural VAR model was estimated using quarterly data ranging from 2010Q1 to 2018Q4. Specifically, the result revealed that manufacturing output, financial integration and transportation responded significantly to the exchange rate shocks emanating from globalization.

The study established that the manufacturing output reacted negatively to exchange rate fluctuations, implying that exchange rate is very important to manufacturing sector in Nigeria in line with Asuamah, et al. (2016). On the same vein, Transportation and Financial Integration



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respectively were affected positively and significantly to globalization inline to findings of Nyeche and Ekine (2018) and Maduka et al. (2017). This implies trade openness and good infrastructural facilities and financial integration would boost manufacturing output positively in Nigeria. Therefore, policy focus should not only be on external demand but requires clearer strategies to shore-up foreign exchange supply as well as make the economy less dependent on external developments to enable favorable trade openness to manufacturing output in Nigeria.

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