IMPACT OF EXCHANGE RATE ON THE PERFORMANCE OF MANUFACTURING SECTOR IN NIGERIA

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ABSTRACT

This study examined the impact of exchange rate on the performance of manufacturing sector in Nigeria within the period of 2000 to 2018. Secondary source and time series data were gathered from the CBN Statistical Bulletin of 2018. The use of Ordinary Least Square was most appropriate for the study in terms of goodness of fit and significance of regression coefficient. Multiple regression of an econometric model was formulated for this study to examine the relationship between the independent variables exchange rate, interest rate and inflation rate and the dependent variable manufacturing output. The result was facilitated using Econometric view version 9. The result of the analysis shows that interest rate and inflation rate are statistically insignificant to explain manufacturing output while exchange rate is statistically significance to determine manufacturing output in Nigeria. The f statistics result reveals a probability value of 0.024 which is less than 5% level of significance, it can be concluded that exchange rate has a significant impact on the performance of manufacturing sector in Nigeria. The study therefore recommends that government should encourage the locally made products in Nigeria by removing the export duties in order to increase exportation of Nigeria products and increase import duties rate to reduce the patronage of external made products.
Keywords: *Exchange Rate, Interest Rate, Inflation Rate, Manufacturing Output.*

INTRODUCTION

Manufacturing sector plays catalytic role in a modern economy and has many dynamic benefits that is crucial for economic transformation. In a typical advanced country, the manufacturing sector is a leading sector in many aspects. It is an avenue for increasing productivity related to import replacement and export expansion, creating foreign exchange earning capacity, raising employment and per capita income which causes unique consumption patterns in a macroeconomic (Tams-Alasia, Olokoyo & Ejemeyovwi, 2018). Furthermore, it creates investment capital at a faster rate than any other sectors of the economy while promoting wider and more effective linkages among different sectors. In terms of contribution to the Gross Domestic Product (GDP), the manufacturing sector is dominant and it has been overtaken to the services sector in a number of organization for Economic Co-operation and Development (OECD) countries (Lawal, 2017; Anyanwu, 2003).

Large and frequent changes in the exchange rate can create a volatile economic structure, particularly if financial markets are underdeveloped and agents have few hedging possibilities. Such a volatile economy could adversely affect prospects for investment and growth. It could also reduce international trade, especially in economies dependent on intra-regional trade because large exchange rate changes have compounding effects on the costs of intermediate inputs, (Tams-Alasia *et al,* 2018). Manufacturing activities have significant impact on the economy of a nation. It developed economies, for instance, it account for a substantial proportion of total economic activities. In Nigeria, the subsector is responsible for about 10% of total GDP annually. In terms of employment

generation, manufacturing activities account for about 12 per cent of the labour force in the formal sector of the nation's economy. This is why manufacturing statistics are relevant indices of the economic performance of any nation (Modebe, Okoye & Ahmed, 2017).

The manufacturing sector has shown strong growth in recent years. Nonetheless, the sector faces ongoing challenges, including an inadequate electricity supply, poor infrastructure facilities, plant maintenance, and heavy dependency on agricultural inputs, which themselves are vulnerable to shocks (Adebanjo, Eseyin, Adegboola, Asamu, Ogunlade, Niyi-Oyebanji & Eluyela, 2019). Its strengths are nonetheless abundant; semi-skilled yet low paid workforce, the availability of domestically sourced inputs and most importantly, a huge domestic demand for consumer products. It therefore displays great potential for future expansion, (NMS 2012). Since a peak of 7.83% in 1982, the contribution of manufacturing sector as a share of total economic output in Nigeria generally declined. Many factors have contributed to the variation in sector share through time, many of which show both the vulnerability of manufacturing to global economic pressures, as well as the impacts that policy changes can have in reshaping the sector (Adebanjo *et al,* 2019).

Adebanjo *et al,* (2019) opined that high dependence on the external sector for import of essential manufacturing inputs as caused low level development of the sector. Inability to get foreign exchange at consumable rates can impair the capacity to import, thereby impacting negatively on manufacturing performance. The structural adjustment programme (SAP) which was adopted in 1986 to restructure the Nigerian economy which led to increase in agricultural output but also had negative effect on the manufacturing sector (International Labour Organization, 1996). SAP entailed the deregulation of prices (including exchange rate) which led to unstable and rising trends in the general price level. This unintended consequence of SAP led to de-industrialization and rising unemployment in the economy. It should be noted that after 28

years of exchange rate deregulation as entrenched in SAP, the industrialization process in Nigeria is still very slow while unemployment is on the increase level. Iyoha (2003) noted that the decline in manufacturing contribution to GNP showed that SAP, indeed, impacted adversely on the operations of the manufacturing sector in Nigeria. The relative share of industrial output in GDP achieved a high level of 45.57 percent in 1980 and a low level of 26 percent in 1986. With the adoption of SAP, the manufacturing sector's relative share of national output declined even further, reaching a low level of 5.2 percent in 1989.Manufacturing capacity utilisation fell from about 73.3 percent in 1981 to 38.3 percent in 1985. This translates to a decline of about 45 percent. It further reduced from 38.1 percent in 1992 to an all-time low of about 29.29 percent in 1995 and has not exceeded an annual average of 57 percent up to 2010 (CBN, 2015; Achugamonu, 2017).

For an open economy that depends on importation to support domestic production, exchange rate plays a critical role in its ability to attain optimal production capacity. Thus, exchange rate fluctuations/uncertainty which attended the introduction of exchange rate deregulation had serious effect on the macroeconomic stability of the country. For example, an over-valued exchange rate hurts the performance of export industries thereby reducing foreign exchange inflow, leading to unsustainable balance-of-payments deficits (Okoye, Okorie & Nwakoby, 2017). On the other hand, excessive devaluation of the domestic currency or depreciation of the exchange rate increases the cost of imported production inputs thereby fueling inflationary pressures. The Nigerian manufacturing sector imports most of its industrial inputs thereby raising the cost of production. This discourages investment in the sector and in the process weakened the manufacturing sector output growth (Adebanjo, 2019).

Prior to the oil boom of the 1970's, manufacturing contributed approximately 10% to Nigeria's economic output. Thereafter,

increased revenues from oil caused the sector's relative Gross Domestic Product (GDP) share to decline; growth persisted albeit at a slower rate. The recession caused by the fall in oil prices in the early 1980's triggered policy attention to turn back to the manufacturing sector, with steel production gaining prime focus. Prior to this, the Nigerian Enterprises Promotion Decrees of 1972 and 1977 had switched the majority firm ownership from foreign to Nigerian, restricting foreign capital inflows. The lack of affordability of imported goods, combined with the absence of foreign capital and technology, encouraged domestic production of basic commodities such as soap and salt. (NMS 2012). The general objective of this research is to examine the impact of exchange rate on the performance of manufacturing sector in Nigeria. This paper is organized into five sections of which the above section is the introduction of the study. Section two emphasized on the review of related literature, section three contains methodology, and section four discussed data analysis and discussion of findings while section five provides for conclusion and policy recommendations.

Literature Review
Concept of Exchange Rate

An exchange rate implies the price of one currency in terms of another. In the Nigerian context, it is the units of Naira needed to purchase one unit of another country's currency e.g. the United States Dollar (Campbell, 2010). Exchange rate policy also determines the mechanism for channeling foreign exchange to end users and therefore reflects the institutional framework, system of exchange rate determination and allocation of foreign exchange as well as the policy options for managing the exchange rate.

Mungule (2004), analysed the fundamental determinants of exchange rate movement in Zambia and found that the terms of trade, openness of the economy, capital flows and excess supply of domestic credit, all significantly explain movements in exchange rate. However, Mordi (2006) justifies movement in exchange to the

following contending factors: exchange rate, inflation rate, balance of payments positions, external reserves, interest rate movements, external debt position, productivity and other macro-economic shocks. In a study of the effects of real exchange rate misalignment and volatility and growth of non-oil exports, Ogun(2004) found out that irrespective of the alternative measures of misalignment and volatility adversely affected growth of Nigeria non-oil exports. In 1985, exchange rate between the Dollar and Naira was $1:N1, by 1986 the market determined rate was $1:₦3.32 the reason for this can be located in the dynamics of market forces following the introduction of Second-Tier- Foreign-Exchange-Market which was a key component of Structural Adjustment Programme introduced in1986 by General Ibrahim Babangida's administration. It depreciated to $1:₦9.76 in 1993, and was $1:₦92.53 in 1999. It reached an all-time high of $1:₦150.66 in 2009, before dropping down to $1:150.3 in 2013 (CBN statistical Bulletin, 2014). The condition has worsened today as the Naira is exchanging for $1: ₦425 in the parallel market. As at the year end 2017, exchange rate of Naira to Dollar stood at N305 to $1 (CBN, 2017).

Concept of Manufacturing Sector

Manufacturing literally means the transformation of raw materials into finished products, usually on a large scale (Wikis 2016). Manufacturing sector is the catalyst for economic growth and its output, developing/less developed and under developed. Thus a country with little or zero capacity for manufacturing will look unto imports even for basics household items. Adanbai (2014) observed that a country cannot be termed as developed if its industrial sector, especially the manufacturing industries are not performing up to the required capacity in the economy. The capacity of a country to manufacture effectively makes it only developed but also less dependent on other countries. Loto (2005) captures the views of Ogwuma (1995) on manufacturing as follows: "it is an avenue for increasing productivity in relation to import substitution and export expansion, creating foreign exchange earning capacity, raising

employments and per capita income it promotes the growth of investments at a faster rates than any other sector of the economy as well as wider and more efficient linkages among different sectors.

Challenges of Manufacturing Output

Oyati (2016) noted that the growth rate of manufacturing sector in a country reflects its economic potentials. Currently, in Nigeria, the sector is growing at a good pace but has not made appreciable impact as regards its percentage share in the total GDP of Nigeria all because of the challenges it faces. These include:

Funding: Limited access to credit was not reported as a major problem the firms are facing. Not having enough access to credit results in low investment drive such as investing in manpower, technology, which are vital in reducing cost of production and improving competitiveness. When credits are readily available, the high lending rates scare these firms away, because it is unattractive and risky since returns on investments on manufacturing are mostly lower than rates of borrowing, (Nasir, 2011)

High Cost of Production Inputs: Costs of production inputs are usually prohibitive. This is true for both domestic and imported ones as a result of inflation in the domestic economy and turbulence in the foreign exchange market. According to the CBN, Nigeria's industrial utilisation was about 55% in the year 2002.

Availability of Ready Markets: According to Sloan (2011), exchange rate has been fingered as one of the product marketing challenges. Even the most successful organisations are facing new and unexpected challenges. The only way that manufacturing companies can prosper in these new trending market is to cut cost and accept profit margins close to zero (Matthew, Mark and Hari, 2011). Unfortunately Nigerian's in the key leadership positions as the greatest patrons of foreign goods and services which do not even meet standards of those here in Nigeria. Insufficient demand for products of the firm's products also imposes constrained on their growth. It is appreciated

that these industries' products are some inputs for large corporations and enterprises, non-standardisation and lack of quality assurance as well as dwindling low purchasing power arising from low income earned by customers. This is further compounded by the absence of knowledge about the existence of fringe markets by the SMEs (Iromaka, 2006).

Infrastructure Facilities Deficiency: Today, if an entrepreneur must do any kind of business here in Nigeria, which has to do with power, there is need to serve with the means of power such as generating sets or inverters. The effect of this is that goods locally manufactured are now out of markets giving way to imported foreign goods. Absence of power has contributed to the manufacturing sector's low contribution the country's GDP. The decay in infrastructure in a country like Nigeria hinders the SMEs sector from being competitive at both local and international markets (Aruwa, 2004).

Multiple tax Regimes: Multiple tax regimes in Nigeria imposed on the manufacturing firms in Nigeria's is a disincentive to investments and impression of systematic unfairness. Nigerian firms view these levies as rip offs. The taxes hardly get to the government coffers as it is being diverted into private pockets and their cronies who do not know how to establish or manage manufacturing companies.

Trade policies: Government policy has not been helpful to the firms under the manufacturing sector due to instability of these policies. These policies have sent most large scale and small scale manufacturing industries to either bankruptcy or liquidation, (Iromaka, 2006). The country trade policy stifles the industries and negates economic development. The ban on some certain listed goods and products about forty one of them, are what the local industries can produce, yet once a ban is imposed, the ban is rather uplifted in rather fast fashion with little regard on domestic goods and products. Most manufacturing companies here lack the strength to persevere in face of the challenges.

Corruption: Corruption is a major challenge facing manufacturing sector in the county. Most Nigerians uphold the highest value in relation to truth and transparency. Money stolen and not invested is loss to the entire nation. These loots end up in other countries' treasure accounts or retrieved at the demise of looter, e.g. Abacha loots. The said loots, if it had been invested would help shape up the manufacturing sector. Private sector is also not immune to corruption as employees can act as saboteurs by diverting cash payments of customers and also theft of stock in trade by the said employees. Many enterprises have folded up because of these acts.

Poor Accounting and Record Keeping: Most manufacturing firms do not imbibe standard accounting practices and policies and do not make room for assessment of their performances. Opportunity for mismanagement occurs here as manufacturing firms fail in their bid to stay alive.

Non continuity: Once the owner or the major stake holder dies, the successors-in-title withdraw their interest. (Stakeholders) Most of these firms lose focus and do not function anymore. This increases the risk in manufacturing sector. (Iromaka, 2006).

Weak Cooperate Governance System: This situation is common here in Nigeria which often results in opportunistic behaviour and this is a major problem for the manufacturing sector. Research studies have proposed the separation of the position of the Chief Executive Officer and the Board Chairperson, (Odeyemi, 2006). This is predominant among the manufacturers (Yermack, 1996). CEO dualities have a way of interfering the performance and growth of such firms. The rationale for the separation of CEO and chairperson positions was suggested by Fama and Jensen, (1983). Yermack, (1996) reported that firms are valuable and perform well when the position of CEO and Chairman are held separately

Possible Remedies for Dwindling Manufacturing Sector in Nigeria

Analysts said that for the sector to sustain its growth, the government needed to address the challenges still facing it.

Recapitalization of Development Banks: Government must recapitalize development finance institutions in the country such as the Bank of Industry and Bank of Agriculture to tackle the issue of access to funding by manufacturers.

Enabling Policy: policy marker needs to implement all the policies that were created to ease business operations in the country.

Collaboration: Federal Ministry of Finance, the CBN and the Federal Ministry of Budget and National Planning must work together to strengthen the synergy between monetary and fiscal policies.

Improve Incentives: Increased incentives and support for the sector and an upscale of the various intervention funds with other windows created to make funds available to the SME sector.

Reduce Dumping: There is a need to stem smuggling and dumping of foreign products in the country. The strengthening of the institutions manning the nation's borders, noting, "The borders are porous, and the institutions of government charged with managing these borders and ports are very weak."

Government needs to do something about the high cost of logistics for the sector occasioned by bad roads, weak rail transportation system and absence of inland waterways, which "increase the haulage cost as well as other distribution costs for manufacturers.

Other analysts have suggested effective raw materials development and distribution to meet the needs of the manufacturing sector as a way of reducing overdependence on imports and enhancing growth of local industries.

Theoretical Framework

Cob-Douglas Production Theory

The Cobb-Douglas production function is widely used to represent the relationship of an output to inputs (Wikipedia, 2016). In economics, total-factor productivity (TFP) is a variable which accounts for effects in total output not caused by inputs. For example, a year with unusually good weather will tend to have higher output, because bad weather hinders agricultural output. A variable like weather does not directly relate to unit inputs, so weather is considered a total-factor productivity variable (Wikipedia, 2017)

The equation below (in Cobb-Douglas form) represents total output (Y) as a function of total-factor productivity (A), capital input (K), labor input (L), and the two inputs' respective shares of output (a is the capital input share of contribution). An increase in either A, K and L will lead to an increase in output. While capital and labor input are tangible, total-factor productivity appears to be more intangible as it can ranch from technology to knowledge of worker (human capital). The reason why Cobb-Douglas equation is used in this function is because it exhibits constant return to scale. That is, if we double input, we get a double output.

Purchasing Power Parity Theory

This theory according to Dodds (1982) recognizes inflation levels and trends as important determinants of exchange rate of a currency both in emerging and developed economies. The theory states that typically a currency will lose value if there is a high level of inflation in the country or if inflation levels are perceived to be rising. This is because inflation erodes purchasing power, thus demand, for that particular currency. However, a currency may sometimes strengthen when inflation rises because of expectations that the central bank of the country concerned will raise short-term interest rates to combat rising inflation. The theory concludes that the equilibrium exchange rate between two inconvertible paper currencies is determined by the equality of their purchasing power. In other words, the exchange rate between two countries is determined by their relative price levels. As

a matter of fact, faults this notion by stating that unless the real exchange rates were constant, then "purchasing power parity" would hold otherwise the exchange rate would not be proportionate to relative price levels.

Empirical Framework

Ugwu (2017) This paper studies the impact of exchange rate fluctuation on the performance of manufacturing firms in Nigeria using firms' profitability as a proxy for performance within the periods 1986 to 2016. The estimation technique adopted for the study was multiple regression method based on Ordinary Least Squares technique. However, in order to avoid the incidence of spurious estimates, evidence from the ADF test conducted revealed that the variables are integrated of order two, 1(1). The Johansen test conducted showed evidence of long run equilibrium relationship between Exchange rate fluctuation and the profitability of manufacturing firms in Nigeria Findings shows that there is a statistical significance between Exchange rate fluctuations on the profitability of manufacturing firms in Nigeria as shown by the joint variation of the T and F test and their respective P-values. It therefore recommends that Government should stimulate export diversification in the area of agriculture; agro-investment, and agro-allied industries, oil allied industries such that will improve Exchange rate fluctuations on improving basic amenities like electricity, transportation, water supply, telecommunication, human resource development, instead of implementing policies in an unhealthy economic and social structure.

Oyati (2016) in her research paper titled Relevance, prospects and challenges of manufacturing sector in Nigeria asserted the fact that manufacturing is the hub of a vibrant and stable national economy. It also stated that for the sector to remain relevant, various available raw materials should be harnessed, processed and transformed to either finished goods or semi-finished goods. The challenges the researcher noticed in the sector was poor availability of power, poor

infrastructures, irregular taxes, poor business development strategies e.t.c. The paper articulates various strategies that stakeholders in the manufacturing sector can consider in order to re-position the industry for national economic growth for robust performance with consequent national economic growth.

Oladapo and Oloyede (2014) examine foreign exchange management and the Nigerian economic growth during the years 1960-2012. The data for this research paper was sourced from the Central Bank of Nigeria. The researchers employed Ordinary Least Square estimation techniques within the error correction model for the work. The result of the research shows that exchange rate import and inflation are found to be statistically non-significant. With this finding, it was recommended that efforts should be intensified to increase consumption of Nigerian made goods which include raw materials that can be sourced locally to increase inflow of foreign currency.

Onatanyohuwo and Oladipupo (2013) carried out a research work on impact of exchange rate on balance of payments in Nigeria. It investigated the impact of exchange rate on the external sector of Nigeria using the Ordinary Least Square Method (OLS) for estimation of data covering the year 1970-1980. It was noted that there was a significant impact on the balance of payment by exchange rate. The paper also discovered that improper allocation, abuse of domestic credit, fiscal indiscipline, and lack of appropriate expenditure owing to centralization of power in government are part of the major causes in the balance of payment deficits in Nigeria. The paper recommended that efficient and direct monitoring machineries should be set up to ensure good use of credit and available foreign exchange. Furthermore, this implies that the balance of payments problems can be addressed concurrently from two distinct angles namely boosting supply and managing demand. Export diversification and promotion, import substitution and import restriction cannot be overemphasized.

Methodology

The study investigated exchange rate volatility on the performance of the manufacturing sector in Nigeria (2000 to 2018).Secondary sources of data were used as materials were sourced from journals, textbooks, website related to the study as well as Central Bank of Nigeria (CBN) Statistical Bulletin. The data used for this study are annual times series from 2000 to 2018. They are sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin of 2018.

Model Specification and Formulation

The model for the study is formulated as follows;

$$Y = f(X_n)$$

$$Y = f(X_1, X_2, X_3, \ldots \ldots X_n)$$

$$MGDP = f(EXR, INF, INT) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \text{Equ (1)}$$

$$MGDP = \beta_0 + \beta_1 EXCH + \beta_2 INFL + \beta_3 INTRST + \mu \ldots \ldots \ldots \text{Equ (2)}$$

Where: MOUT = Manufacturing Sector Output to Gross Domestic Product

   EXCH = Exchange Rate
   INFL = Inflation Rate
   INTR = Interest Rate
   β_0 =Constant term
   β_1– β_3 =Coefficients of explanatory variables .
   μ =Error term

Data Presentation and Interpretation

Unit Root Test

Unit root test was conducted in the research in order to avoid spurious regression, it is a test to know whether variables are stationary or non stationary.However,the results indicate the absence of unit root having made the data stationary at first order difference.

Table 1: Regression Result

Dependent Variable: MGDP
Method: Least Squares
Date: 11/02/19   Time: 14:53
Sample: 2000 2018
Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1129.848	2842.040	0.397548	0.6966
EXCR	34.52183	9.950559	3.469335	0.0034
INFL	-146.9485	181.5210	-0.809540	0.4309
INTR	-67.54135	194.8685	-0.346600	0.7337

R-squared	0.6546647...	Mean dependent var	4137.174
Adjusted R-squared	0.6455976...	S.D. dependent var	3121.165
S.E. of regression	2524.871	Akaike info criterion	18.69043
Sum squared resid	95624577	Schwarz criterion	18.88926
Log likelihood	-173.5591	Hannan-Quinn criter.	18.72408
F-statistic	4.168671	Durbin-Watson stat	0.790007
Prob(F-statistic)	0.024697		

Source: E View 9

Results Interpretation

Table 1 above shows the econometric model of the the impact of exchange rate on the performance of manufacturing sector in Nigeria . Thus, the fitted classical linear regression model is given as:

MGDP = 1129.848 + 34.52183EXCR-146.949INFR- 67.54135INTR

The implication of this model is that holding all the predictor variables constant, the manufacturing sector will experience an increase of ₦1,129,848,000. However, only exchange rate posed a positive impact on manufacturing output while inflation rate and interest rate shows a negative impact on manufacturing output. The exchange rate value of 34.5218 implies that a unit increase in the appreciable value of the country's exchange rate will brings a decrease of same value in manufacturing sector. The values of inflation is -146.949, this means that for every unit increase in inflation rate will bring the same unit decrease in manufacturing output. Interest rate value is -67.541; this means for every unit decrease in interest rate will bring the same unit decrease in manufacturing output.

This table equally shows the validity statistic for the fitted model. The results reveal that the multiple correlation coefficient between the manufacturing output (dependent variable) and all the explanatory variables exhibit a strong positive correlation. Also the coefficient of multiple determinations (R^2) is 0.64559 which indicates that exactly 65% of the variations in the growth of Nigerian economy as measured by manufacturing output share of gross domestic product is explained by the joint effect of our independent variables while the remaining 35% is due to other factors equally responsible for advancement manufacturing output but not considered in this research. The Durbin Watson statistic measures the exigencies of serial correlation among the variables. The result of the Durbin Watson test gives a value of 0.79007 and since this value lies between -1 and 1, it is confirmed that there is autocorrelation among the successive values of the variables in the model; hence the model has been correctly specified. F-statistic with a probability value of 0.024697 shows that the overall model is significant. Since the probability value of our model is less than the critical values of 0.05, it implies that the model is significant at5% level of significance and we can reasonably inferred that there is significance relationship between exchange rate and manufacturing output in Nigeria, thus given a basis of opinion exchange rate has a significant impact on manufacturing sector within the period under review.

Table 2: Granger Causality Test

Pairwise Granger Causality Tests
Date: 11/02/19   Time: 18:31
Sample: 2000 2018
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
EXCH does not Granger Cause MOUT	17	1.9232 4	0.1722
MOUT does not Granger Cause EXCH		6.7648	0.005

		9	7
INFL does not Granger Cause MOUT	17	0.23133	0.7956
		0.3784	
MOUT does not Granger Cause INFL		3	0.6897
INTR does not Granger Cause MOUT	17	2.3067 9	0.1255
		0.0934	
MOUT does not Granger Cause INTR		4	0.9112
INFL does not Granger Cause EXCH	17	1.13738	0.3405
EXCH does not Granger Cause INFL		1.74649	0.1999
INTR does not Granger Cause EXCH	17	0.047 02	0.9542
EXCH does not Granger Cause INTR		0.71153	0.5029
INTR does not Granger Cause INFL	17	0.010 5.81895 2	0.9832
INFL does not Granger Cause INTR		6	0.3915

Source: E View 9

Granger Causality

Correlation does not necessarily imply causation in any meaningful sense of that word. The econometric graveyard is full of magnificent correlations, which are simply spurious or meaningless. Thus a pair wise ganger causality test results presented in table 2 shows there exist one way granger causality effect between MOUT and EXCH, this means that manufacturing output is capable of influencing exchange rate in the country, also there exist a one way granger cause effect between INTR and INFL (i.e. INTR ganger cause INFL) This implies

that any other relationships that exist among the variables outside the ones presented by the ganger causality test are spurious.

Table 3: Cointegration Test

Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.803957	61.83758	47.85613	0.0014
At most 1	0.359998	21.10207	29.79707	0.3513
At most 2	0.285645	9.944983	15.49471	0.2850
At most 3	0.059575	1.535587	3.841466	0.2153

Trace test indicates 1 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigen value)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.803957	40.73551	27.58434	0.0006
At most 1	0.359998	11.15708	21.13162	0.6316
At most 2	0.285645	8.409396	14.26460	0.3386
At most 3	0.059575	1.535587	3.841466	0.2153

Max-eigen value test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The findings that many macro-economic time series variables may contain a unit root has spurred the development of the theory of non-stationary time series. Since a linear combination of two or
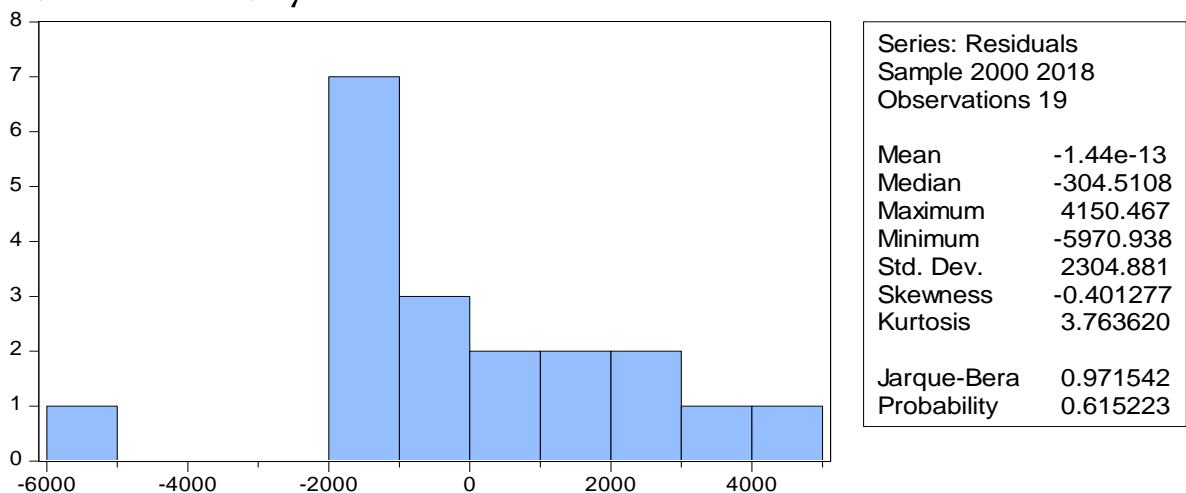
more non-stationary series may be stationary and if such a stationary linear combination exists, the non-stationary time series are said to be co integrated and this implies that there exist a long-run equilibrium relationship among the variables. Thus, the result in table 4 shows that a long-run equilibrium relationship exists among all the three explanatory variables. This was indicated by the Trace test showing 1 cointegrating at 0.05 level of significance. Also Max-eigen value test indicates 1 contegrating equ(s) at 0.05 level of significance.

Assumption 1: Residual should be normally distributed
Null Hypothesis: Residuals are normally distributed
Alternative Hypothesis: Residuals are not normally distributed.
Table 4: Normality Test

Series: Residuals	
Sample 2000 2018	
Observations 19	
Mean	-1.44e-13
Median	-304.5108
Maximum	4150.467
Minimum	-5970.938
Std. Dev.	2304.881
Skewness	-0.401277
Kurtosis	3.763620
Jarque-Bera	0.971542
Probability	0.615223

Source: E View 9
Conclusion: since the p value of Jarque –Bera is (0.615223) is more than 5percent, we cannot reject null hypothesis, means that residuals are normally distributed. So, we fail to reject null hypothesis that residuals are normally distributed which is desirable
Assumption 2: No serial or auto-correlation in the residual (u).
If residuals are correlated, we call this situation serial correlation which is not desirable.

Table 5: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	12.30116	Prob. F(2,25)	0.0002

		Prob.	Chi-	
Obs*R-squared	15.37573	Square(2)		0.0005

Source: E View 9

Findings, Conclusion and Recommendations

This research was carried out to investigate the effect of exchange rate on the performance of manufacturing sector in Nigeria. It was found out that interest rate and inflation rate are statistically insignificant to explain manufacturing output while exchange rate is statistically significance to determine manufacturing output in Nigeria. Based on this findings, the study concludes that exchange rate have a significant impact on the performance of manufacturing sector in Nigeria. Based on the findings the study concludes that exchange rate volatility has a significant impact on the performance of manufacturing sector in Nigeria. Therefore, the study recommends the following:

i. Exchange rate determination must not be left entirely to market forces as Nigeria is majorly a mono-product economy. The Apex Bank must put the operations of the forex market under its watchful scrutiny

ii. Granting more incentives for development of import substitution industries to reduce the excruciating pressure on the foreign exchange reserves of the country.

iii. Government should stimulate export diversification in the area of agriculture; agro-investment, and agro-allied industries, oil allied industries such will improve Exchange rate fluctuations on manufacturing sector in Nigeria Economy.

iv. The government should therefore, embark on improving basic amenities like electricity, transportation, water supply, telecommunication, human resource development, instead of implementing policies in an unhealthy economic and social structure.

v. The government should encourage the made in Nigeria products by removing the exportation duties in order to increase exportation of Nigeria products.

References

Abdallah, A. (2016). Exchange rate variability and manufacturing sector performance in Ghana: Evidence from cointegration analysis. *International Economics and Business, 2(1), 1-14.*

Achugamonu, U. O. (2017). Monetary Policy and Manufacturing Sector Performance: A Structural VAR Approach. Unpublished M.Sc dissertation submitted to the Department of Banking and Finance, Covenant University, Ota, Ogun state, Nigeria.

Adebanjo, J. F., Eseyin, O, Adegbola, O., Asamu, F., Ogunlade, P., Egbide, B., Bamisele, R., Niyi-Oyebanji, M., and Eluyele, D. (2019) Impact of exchange rate on the manufacturing sector in Nigeria. *International Journal of Mechanical Engineering and Technology, 10(2), 1568-1583*

Adediran, O. & Obasan, K. (2010).The role of industrial sector in the economic development of Nigeria. *Journal of Management and Society, 1(2), 9-16.*

Adeoye, B. & Atanda, A. (2015). Exchange rate volatility in Nigeria: Consistency, persistency & severity analysis. *CBN Journal of Applied Statistics 2 (2), 2-49*

Ajao, M. G & Igbekoyi, O. E. (2013). The determinants of real exchange rate volatility in Nigeria. *Academic Journal of Interdisciplinary Studies, 2(1), 459-469*

Ajie, H .A (2000). *Fundamentals of Monetary Economics.* Port Harcourt: Peerafi Publications

Anynawu, J. C. (1993). *Monetray Economics, Theory, Policy and Institutions.* Onitsha: Hybrid Publishers Ltd.

Bilson, J. F. O. (1976). The monetary approach to the exchange rate: Some empirical evidence." Unpublished manuscript, Northwestern University, October.

Caselli, F. G & Roitman, A. (2016) *Non-linear Exchange Rate Pass-Through in Emerging Markets,* IMF Working Papers.

CBN (2016). MPC Communique No 107 of the meeting held on May 23 and 24, 2016', Central Bank of Nigeria.

David, U. & Ameh, J. N. (2010). The effect of exchange Rate fluctuation Nigeria manufacturing sector. *African Journal of Business Management 4(14): 2994-2998*

Fakiyesi, O. A. (2005). *Issues Money, Finance and Economic Management.* Lagos: University press.

Jhingan, M. L. (1997), *Macro-economic theory10th revised and enlarged edition.* India: Vrinda Publishers Ltd.

Jongbo, O. (2014). The impact of real exchange rate fluctuation on Industrial output in Nigeria. *Journal of policy and development studies 9, (1),268-278*

King-George, O. J. (2013). The effect of exchange rate fluctuation on the Nigeria manufacturing sector. *Journal of policy and development studies 9, (10), 20- 29.*

Lawal, E. O. (2016). Effect of exchange rate fluctuations on manufacturing sector output in Nigeria. *Journal of Research in Business and Management.4 (10)32-39*

Lewin, J. (2016). Nigerian currency slump sharpens focus on Central Bank', 25 July, Financial Times.

Modebe,N. J., Okoye, L.U. & Ahmed, A. (2017). Exchange Rate Movements and Manufacturing Capacity Utilization in Nigeria, *ESUT Journal of Accountancy, 8(1), 30-44*

Mordi, M. C. (2006). Challenges of exchange rate volatility in economic management of Nigeria, in the dynamics of exchange rate in Nigeria, *CBN Bullion*, 30 (3), 17-25

Nwokoro, A. N. (2017). Foreign exchange and interest rates and manufacturing output in Nigeria. *International Journal of Business & Law Research 5(1), 30-38.*

Obstfeld, M. & Rogoff, K. (1996). *Foundations of international macroeconomics*, USA: MIT Press.

Okolo, C. V, Ugwuanyi, O. S & Okpala, K. A. (2016). Exchange rate volatility, its determinants and effects on the manufacturing sector in Nigeria. *International Journal of Economics and Management Engineering, 10(12), 4001-4009*

Okoye, L.U. and Nwakoby, C.I.N. (2015), The influence of finance and macroeconomic variables on manufacturing capacity utilization in Nigeria, *Accounting Frontier, 6(1),176-190*

Okoye, L.U., Nwakoby, C.I.N., Modebe, N.J. & Okorie, U.E. (2016), Impact of economic liberalization on the growth of the Nigerian economy (1986-2015), *African Banking and Finance Review, 2(2): 87-101*

Okweshine W. J. & Mohammed N. (2015). Analysis of the impact of exchange rate deregulation on industrial output in Nigeria. *International Journal of Business & Law Research 4(2), 25-29.*

Olowe, R. A. (2009). Modelling Naira/Dollar exchange rate volatility: Application of GARCH and asymmetric models. *International Review of Business Research Papers*, 5(3), 377-398.

Olufayo, M. B. & Fagite, B. A. (2014). Exchange rate volatility and sectoral export of Nigeria: case of oil and non-oil sectors. *Journal of Economics and Sustainable Development, 5(10), 66-69.*

Onu, E. & Wallace, P. (2016) Naira forwards, volatility surge as Nigeria removes spread limit', 18 July, Bloomberg.

Opaluwa, D., Umeh, J. C. & Abu ,A. A. (2010). The effect of exchange rate fluctuation on the Nigerian manufacturing sector. *African Journal of Business Management.4 (14), 2994 2998.*

Rodrik, D. (2008). The real exchange rate and economic growth. *Brookings Papers on Economic Activity, Fall, 9(8), 365-412.*

Tams-Alasia, O., Olokoyo, F. O., Okoye, L. U. and Ejemeyovwi Jeremiah, O. (2018). Impact of exchange rate deregulation on manufacturing sector performance in Nigeria. *International Journal of Environment, Agriculture and Biotechnololgy, 3(3), 994-1001.*

Tyson, J. (2016). Shockwatch Report: sub-Saharan Africa's economic downturn and its impact on financial development, July, London: ODI.

Ugwu O.J. (2017). Foreign exchange rate dynamics and manufacturing firms' performance in Nigeria. *International Journal of Humanities and Social Science Invention, 6(9),9-14.*