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Macroeconomic Variables and Performance of Manufacturing Sector in Nigeria (1981-2019)

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Abstract
This study examined effect of macroeconomic variables on performance of manufacturing sector in Nigeria a thirty six year (39) period spanning from 1981-2019. Specifically, this study investigated how macroeconomic variables such as real interest rate, exchange rate and inflation rate relate with performance of manufacturing sector measured by output contribution ratio to real gross domestic product and average capacity utilization. In pursuance of the objectives of this study, four hypotheses were formulated and tested using secondary data obtained from the Central Bank of Nigeria and National Bureau of Statistics Statistical Bulletins. This study is based on time series data. The Augmented Dickey Fuller was used to test the time series data for stationarity. Simple linear regression was employed in the analysis of the data. The findings of this study revealed that macroeconomic variables significantly relate with performance at 5% significant level. On the basis of the findings, it was recommended among others that nominal interest rate should be lowered so as to increase the level of investment. An increase in investment will lead to an increase in overall performance of manufacturing firms in Nigeria and economic growth at large.

Key Word*: Monetary policy, Macroeconomics, Under-utilization*

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I. Introduction

Manufacturing sector is very germane to the development of any nation most especially the under developed ones. The desire of every less developing country like Nigeria is the need to ensure a rapid industrialization. This is in the light that industrialization, the process of manufacturing consumer goods and creating social overhead capital is a prerequisite for economic development and an escape route for unemployment, high poverty level, income inequalities and ensuring self- reliance, confidence and social harmony for the country and its citizens (lawal, 2016).

In most modern economics, industrial sector serves as the vehicle for the production of goods and services, the generation of employment and the enhancement of incomes. Hence, kayode (1989) described industry and in particular the manufacturing sector as the heart of the economy. CBN (2013), revealed that the weighted average prime lending rate fell by 0.33 percentage point to 16.69 percent and a fall in average term deposit rate by 0.50 percentage to 6.66 percent; with the maximum lending rate at 24.51 percent, the spread between the average term deposit and maximum lending rates widened to 17.72 percentage point from 16.74 percentage point in 2012.

The weighted average prime lending rate rose by 0.30 percentage point to 16.85 percent in 2015, while the average term deposit rate fell by 0.55 percentage point to 7.95 percent compared with 8.50 percent recorded in 2014. Standing at a value of 26.71 percent of the maximum lending rate the spread between the average term deposit rate and maximum lending rate widened further to 18. 76 percent in the same year (2015) from 17.25 percentage point in 2014. With the year-on-year inflation rate at 9.6 percent in December, 2015, all the deposit rates were negative in real terms while the lending rates were positive (CBN, 2015).

Following the deregulation of the exchange rate regime from 1986, exchange rate policy was an important consideration in each monetary programme, the aim being to stabilize the naira exchange rate with external sector equilibrium and achievement of domestic price stability. Sequel to the deregulation in 1986, the naira exchange rate depreciated in 1986 and 1987. The official rate however continued to depreciate between 1988 and 1993, recording the largest depreciation of 48 percent in 1992. Again, the naira exchange rate was administratively fixed below market level in 1994 which tended to subdue the downward movement in the value of the naira. In 1995, when the autonomous foreign exchange market was created, the rate in the market immediately depreciated significantly. It was clear that since 1988, the naira exchange rate has been influenced

largely by the excessive growth in aggregate demand in relation to the limited supply of foreign exchange resources.

The manufacturing sector which is a vital catalyst for economic growth in many developing countries has evidently registered dismal performance in Nigeria. Since its peak of 11.78 percent contribution to the real gross domestic product in 1982 and 73.3 percent Average capacity utilization in 1981; it has continued to decline to 6.55 percent contribution to economic output and 36.1 percent average capacity utilization in 2010 and 2000 respectively. However since its rise to 9.22percent contribution to RGDP in 2013 and 55.14 percent capacity utilization in 2009, it has been experiencing a slow and stunted growth. The slow growth in the manufacturing subsector was attributed to low investor confidence occasioned by depreciation in the value of the naira and inadequate electricity supply. (CBN, 2015).

Frank Jacob, the president of Manufacturing Association of Nigeria (MAN) said that the industrial capacity utilization hovered around 20 percent during the year 2016. More than half of the surviving firms are classified as ailing which posed serious threat to the survival of the manufacturing sector. He stated that a major challenge was the acute scarcity of foreign exchange which restricted the ability of manufacturers to import raw materials for production. (Agency report, 2016).

Due to the rising trends in interest rate (particularly the lending rate) since the introduction of SAP, manufactures have continued to cry aloud over the negative impact of lending rate on their operations. Interest rate spread according to Adebiyi and Obasa (2004) negatively affects the growth in the manufacturing sub sector since it led to high cost of borrowing. A close examination of the interest rate showed a widened spread between the average term deposit rate and maximum lending rate to 18.76 percent in 2015 from a previous rate of 17.25 percent in 2014; with year –on-year inflation rate at 9.6 percent in December 2015, all the deposit rate were negative in real terms while lending rates were positive. (CBN, 2015). All things being equal, this situation may discourage savings thereby making loanable funds unavailable for investment in manufacturing sectors.

Moreover, owing partly to the mis- match between short- term nature of deposit money banks (DMB) Funds and the medium to long- term nature of fund needed by industries and also the risky nature of this sector, deposit money banks are discouraged to invest very largely in this sector. Nonetheless, lending to manufacturing sector attracts a high rate of interest which is not profitable for the industry; as manufacturers associations of Nigeria (MAN) have on occasions attributed the low rate of capacity utilization in the sub sector to high lending rates among, other factors.

Inflation has contributed in no small measure to high cost of production. The macroeconomic variable, inflation, erodes the value of money and hence unacceptable levels of inflation can distort economic behavior and impose costs on economic agents and industries resulting in uncertainties and inadequate planning. In addition, persistent high inflation adversely affects the vulnerable groups in the society while it distorts the relationship between borrowers and lenders leading to reduced savings and investment, Other problems include epileptic power supply, bad roads, high cost of energy which contributed to high cost of production and impediment to competitive of the sector and thus snow balled into low capacity utilization. However, the extent to which macroeconomic variables affect the manufacturing sector has a great deal to do with the performance of the industrial sector and hence the economy at large.

In this light, this study sets to examine the relationship of macroeconomic variables (Real Interest rate, exchange rate and inflation rate as proxy) and the performance of manufacturing sector (output ratio to Real Gross Domestic Product and average capacity utilization as proxy).

Objectives of the Study

The major objective of this study is to examine the effect of macroeconomic variables on performance of manufacturing sector in Nigeria.

Other specific objectives are:

i. To determine the relationship between real interest rate and output contribution ratio of manufacturing sector to real gross domestic product in Nigeria.
ii. To ascertain the relationship between the exchange rate and output contribution ratio of manufacturing sector to real gross domestic product in Nigeria.
iii. To evaluate the relationship between the inflation rate and average capacity utilization of the manufacturing sector in Nigeria.

Research Questions

i. What is the extent of relationship that exists between real interest rate and output contribution ratio of manufacturing sector to real gross domestic product in Nigeria?
ii. To what extent does exchange rate relate with output contribution ratio of manufacturing sector to real gross domestic product in Nigeria?

iii. To what extent does inflation rate relate with the manufacturing sector average capacity utilization in Nigeria?

Research Hypotheses

For the purpose of the research work the following null hypothetical statements are considered relevant:

Ho_1: There is no significant relationship between real interest rate and output contribution ratio of manufacturing sector to real gross domestic product in Nigeria.

Ho_2: There is no significant relationship between exchange rate and output contribution ratio of manufacturing sector to real gross domestic product in Nigeria.

Ho_3: There is no significant relationship between inflation rate and manufacturing sector average capacity utilization

II. Material And Methods

Conceptual Review

Macroeconomic variables refer to factors that are pertinent to the broad economy at the regional or national level and affect a large number or population rather than a few individuals. Macroeconomic variables such as output, unemployment, inflation, saving and investment are key indicators of economic performance and are closely monitored by government, business and consumers (Khalid et al, 2012)

Crowley (2007) defines interest rate as the price a borrower pays for the use of money they borrow from a lender or fee paid on borrowed assets. Nguge (2001) describes interest rate as a price of money that reflects market information regarding expected change in the purchasing power of money or future inflation. Monetarist use the interest rate as an important tool to attract more savings as increase in interest rate attracts more savings; decrease in interest rate will encourage investors to look for another investment that will generate more returns accordingly. Interest rate by impacting either on cost of capital or availability of credit, it is known to determine the level of investment. (Acha, 2011)

Inflation is defined as a persistent and appreciable rise in general price level. Jockey (2007) refers inflation as an increase in the general price level of goods and services. While it is easy to identify a rise in general price levels what is considered persistent and appreciable is somewhat subjective and each economy has to decide the time dimension and magnitude of increase that are implied in this general definition(Ojo, 2001). Akers (2014) states that inflation rate measures changes in the average price level based on the price index. The most commonly known index is the consumer price index (CPI). The index measures average retail prices that consumers pay. A high or increasing CPI indicates existence of inflation. Higher prices tend to reduce overall consumer spending which in turns leads to a decrease in GDP; rapidly increasing rate of inflation signal the possibility of poor macroeconomic health.

Harvey (2012) describes exchange rate as the value of two currencies relations to each other. It is the price of one currency expressed in terms of another currency. It is the price at which the currency of one country can be converted to the currency of another.

Exchange rate is also the rate at which one currency exchanges for another. Exchange rate is said to depreciate if the amount of domestic currency required to buy a foreign currency reduces.

Briefs on the Manufacturing Sector in Nigeria

The history of manufacturing sector can be traced to the pre-colonial times. In village based societies of the Igbo, Hausa, Bini and the Yoruba among other, small scale manufacturers of goods and services for trade, social and other purposes prevailed. West African manufacturing was based on activities such as metal working, food processing and clothing among a variety of others.

The manufacturing sector in Nigeria is still small and dominated by a wide range of light consumer goods. According to Jide (2010), upon attainment of independence, the post-independence governments embraced the policy of transformation of the country into a modern industrial economy with emphasis on rapid industrialization as Nigeria's development objectives in the first National plan (1962-1968); while importation of finished goods was discouraged to encourage locally manufactured goods through import substitution strategy. Unfortunately our local industries were still heavily importing dependent in sourcing raw materials and capital goods.

However, the emergence of the oil boom in the 1970's made huge foreign exchange available for further massive importation of industrial inputs. The recession caused by fall in oil prices in the early 1980's triggered policy attention to turn back to the manufacturing sector with the steel production gaining prime focus. Prior to this, the Nigerian Enterprise promotion Decrees of 1972 and 1977 had switched the majority firm ownership from foreign to Nigeria, restricting foreign capital inflows. The lacking affordability of imported goods combined with the absence of foreign capital and technology encouraged domestic production of basic

commodities such as soap and salt. Many industries were closed down leading to massive retrenchments with the resultant social security.

Between 1982 and 1986, all macroeconomic indicators such as oil revenue, naira exchange rate and foreign reserves posted negative trends in their movements.

The adverse macroeconomic trends during the period 1980-1985 prompted the adoption of the Structural Adjustment Program (SAP) introduced formally in July 1986. It's in underlying philosophy was to ultimately institute a more efficient market system for the allocation of resources.

Capacity Utilization

Capacity utilization is the extent to which an enterprise or a nation uses its installed productive capacity. It is the relationship between output that is produced with the installed equipment and the potential output which could be produced with it, if capacity was fully used. Excess Capacity means that insufficient demand exists to warrant expansion of output. Implicitly, the capacity utilization rate is also an indicator of how efficiently the factors of production are being used (Wikipedia)

Krugman and Taylor(1978), using a Keynesian framework have also identified certain conditions under which exchange rate depreciation or devaluation is found to be contractionary; these are (1) If initially imports exceeds exports, (2) Consumption propensity out of profit and wages are different (3) If government revenues are increased as a result of currency depreciation or devaluation.

Theoretical Framework

International Fisher Effect (IFE) Theory

The International Fisher Effect (IFE) theory states that currencies with higher interest rate will depreciate because the higher nominal interest rate reflects higher expected inflation. Exchange rate depreciation of a particular country affects investments; as it leads to increased cost of imported inputs which discourages production and in turn leads to low manufacturing sector output and consequently low capacity utilization of the subsector.

Ehinomen and Oladipo (2012) posit that in Nigeria, exchange rate appreciation has a significance relationship with domestic output and will promote manufacturing sector growth. The rate of interest in the Keynesian system determines the level of investment. Investment can be increased by a fall in interest rate or rise in marginal efficiency of capital and vice versa. Okoye (2006) revealed that a negative relationship exist between interest rate and manufacturing output.

Implication from the IFE theory shows that currency depreciation occurs as a result of high interest rate through its effect on inflation. Generally, Inflation erodes the value of money, hence the purchasing power of money. Higher Inflation rate tends to decrease savings as consumers spend more to meet rising prices. Depressed savings as a result of inflation reduces the level of investment which in turn leads to reduced output, employment and production capacity.

It is also pertinent to note that high inflation rate in domestic economy scares foreign customers due to the high prices of goods and services. This situation which will invariably leads to reduced export will depreciate the domestic country's currency. This work was anchored on the Real Interest Rate Differential Theory which states that countries with higher real interest rates will see their currencies appreciate against countries with lower real interest rate; and International Fisher Effect Theory because it explains the interplay between interest rate, exchange rate and inflation rate; as it implies that a higher interest rate in a particular economy depreciates the country's currency because higher nominal interest rate reflects higher expected inflation.

Empirical Review

Odior(2013) studied the macroeconomic variables and productivity of manufacturing sector in Nigeria: A static analysis approach. A period from 1975-2011, the method used is the Augmented Dickey Fuller test and Estimate Error Correction Model; And revealed that credit to manufacturing sector in the form of loan and advances and foreign direct investment have the capacity to sharply increase the level of manufacturing productivity in Nigeria, while broad money supply has less impact.

Mojekwu (2012) examined factors affecting capacity utilization decision in Nigeria: A series Analysis using expo facto research design; The study showed that inflation rate and interest rate had negative impact on capacity utilization while power supply have positive significant impact on capacity utilization.

Ezeaku and Modebe (2016) in their study Dynamics of inflation and manufacturing sector performance in Nigeria: Analysis of effect and causality, a period from 1982-2014; using progression analysis/vector error correction model revealed that inflation and interest rate have negative and non-significant effect on manufacturing sector growth while exchange rate appear to positively and significantly influence on the growth of manufacturing sector value-added.

Nwandu (2016) studied the impact of rising interest rate on the performance of the Nigerian manufacturing sector, a period of 34 years from 1981-2015, using an ordinary least square method; the study shows a negative effect of rising interest rate on contribution of the manufacturing sector to GDP as well as on the average capacity utilization of the Nigerian manufacturing sector. Aloto (2012) researched on determinants of output expansion in the manufacturing industries, using the ordinary least square method from a period of 1980-2010. The study revealed that inflation rate plays the highest significant role in explaining manufacturing output expansion. Any policy that can curb inflation will surely increase output.Secondly; Real GDP and per capita real GDP have positive and significant roles to play in the manufacturing output expansion.

Adebiyi and Obasa (2004) examined the impact of interest rate policy on the financing of Nigerian manufacturing sub-sector using annual data for the period 1970-2002. They find that interest rate exerts a negative impact on the growth of the sub-sector in Nigeria. Adrian, Lam, Lim, Loh and Nicholas (2015) examined the impact of macroeconomic variables on manufacturing sector growth in Malaysia using Vector Error Correction Model for the period of 32 years, from 1979-2010. They find that consumer price index and net inflows of foreign direct investment have significant positive relationship with manufacturing sector growth. Secondly, that Real Effective Exchange Rate has a significant negative relationship with manufacturing sector growth. Thirdly, Broad money supply is found to be statistically insignificant.

Opaluwa, Umeh and Abu (2010) studied the effect of exchange rate fluctuation on the Nigerian manufacturing sector using Regression Analysis: E-view software package for the period of 20 years, 1986-2005. They posit that fluctuations in the rate of exchange are not favorable to economic activities in the manufacturing sector. Ukoha (2000) examined the determinant of manufacturing capacity utilization in Nigeria, from 1970-1998 and revealed that exchange rate had a positive effect on manufacturing capacity utilization.

Lawal (2016) examined the effect of Exchange Rate fluctuations on manufacturing sector output in Nigeria, from 1986-2014 using Autogressive Distribution Lag Approach; The study shows that exchange rate has a positive relationship on manufacturing sector output. Inflation and loans & advances had negative effect. Abdul-mumuni (2016) studied the exchange rate volatility and manufacturing sector performance in Ghana. Using the Autogressive Distributed Lag Approach, for the period of 1986-2013; the study reveals that both short and long run relationship exist between exchange rate and manufacturing sector performance. Thus, in Ghana, as exchange rate appreciates the manufacturing sector performance improves and as it depreciates the sector is adversely affected.

Igbinedion and Ogbeide(2016) researched on monetary policy and manufacturing capacity utilization: A further evidence from Nigeria. Using error correction modelling approach , for a period of 35years from 1980-2014; their study revealed that both current and past values of lending rate adversely affect manufacturing performance but responds positively to the current period banking credit,confirming that policy to enhance access to funds can stimulate investment in manufacturing sub sector in Nigeria.

Enekwe, Ordu, and Nwoha(2013)studied the effect of exchange rate fluctuation on manufacturing sector in Nigeria,from 1985-2010 using descriptive statistics and multiple regression. Using the manufacturing foreign private investment, manufacturing employment rate and exchange rate as independent variables; the manufacturing gross domestic product as dependent variables, the studied revealed that all the independent variables have significant and negative relationship with the dependent variable.

Adebiyi and Olufemi(2016)research on the determinants of capacity utilization in the Nigerian manufacturing sector for a period of 34years from 1975-2008, using the co-integration and error correction model; the studied revealed that there is positive relationship between consumer price index , fixed capital formation in manufacturing sector and capacity utilization, it also shows a negative relationship between electricity generation , real manufacturing output growth rate and capacity utilization which resulted in low manufacturing productivity growth rate in Nigeria.

Sources of Data

This study basically made use of secondary data. The data for interest rate, exchange rate, inflation rate, output contribution ratio and average capacity utilization were obtained from Central Bank of Nigeria (CBN) Statistical Bulletin and National Bureau of Statistics (NBS) for a thirty nine (39) year period spanning from 1981-2016.

Population of the Study

The population of this study is the number of observation of the time series data which covered a period of 36 years from the 1981-2019.

Sample Size and Sampling Method

The population of this study is the number of observation of the time series data which covered a period of 39 years from the 1981-2019.

Method of Data Analysis

i) Augmented Dickey-Fuller (ADF) test: was used to check for stationarity and to find out if the time series data contain a unit root toavoid a spurious result.

ii) Regression analysis: predicts the value of a variable based on the value of the other variable and explains the effect of changes in the values of variable on the values of the other variables.

Simple Linear Regression (SLR) analysis was used for this study.

Model Specification

This study specifies a functional linear relationship between performance of manufacturing sector and macroeconomic variables.

$Y = f(X) + \mu$

$OCR = \beta_0 + \beta_1 RINTR + \mu$ - - - Ho_1

$OCR = \beta_0 + \beta_1 EXR + \mu$ - - - - Ho_2

$ACU = \beta_0 + \beta_1 INFR + \mu$ - - - - Ho_3

Where:

OCR = Output Contribution Ratio (to RGDP)

ACU = Average Capacity Utilization

RINTR = Real Interest Rate

EXR = Exchange Rate

INFR = Inflation Rate

β_0 = Constant term (intercept)

β_1 = Coefficient of Macroeconomic Variables

μ = Error term (Stochastic Term)

Decision Rule

Accept the alternative hypothesis, if the P-value of the test is less than 0.05. Otherwise accept Ho.

Data Presentation And Analysis

The time series data obtained from the publications of Central Bank of Nigeria and National Bureau of Statistics from 1981 to 2016 were presented in table 4.1below:

Table 4.1: Operational Data of variables

YEAR	RINTR	EXR	INFR	OCR	ACU
1981	-13.15	0.61	20.90	10.22	73.30
1982	2.55	0.67	7.70	11.78	63.60
1983	-13.20	0.72	23.20	8.43	49.70
1984	-27.10	0.76	39.60	7.39	43.00
1985	3.75	0.89	5.50	9.47	38.30
1986	5.10	2.02	5.40	9.01	38.80
1987	7.30	4.02	10.20	9.16	40.40
1988	-21.80	4.54	38.30	9.98	42.40
1989	-14.10	7.39	40.90	9.63	43.80
1990	18.00	8.04	7.50	8.65	40.30
1991	7.01	9.91	13.00	9.53	42.00
1992	-14.70	17.30	44.50	8.96	38.10
1993	-38.88	22.05	57.20	8.56	37.20
1994	-36.00	21.89	57.00	8.36	30.40
1995	-56.62	21.89	72.80	7.82	29.29
1996	-9.56	21.89	29.30	7.55	32.46
1997	5.04	21.89	8.50	7.39	30.40
1998	8.29	21.89	10.00	6.32	32.40
1999	14.72	92.69	6.60	6.50	34.60
2000	11.08	102.11	6.90	6.36	36.10

2001	-0.61	111.94	18.90	6.60	42.70
2002	11.95	120.97	12.90	6.26	54.90
2003	6.71	129.36	14.00	6.05	56.50
2004	4.18	133.50	15.00	6.12	55.70
2005	0.05	132.15	17.90	6.27	54.80
2006	9.06	128.65	8.20	6.44	53.30
2007	11.54	125.83	5.40	6.58	53.38
2008	3.62	118.57	11.52	6.69	53.84
2009	6.59	148.88	12.40	6.67	55.14
2010	4.39	150.30	13.20	6.55	56.22
2011	5.18	153.86	10.84	7.33	56.30
2012	4.27	157.50	12.52	7.98	56.80
2013	8.17	157.31	8.52	9.22	57.90
2014	8.55	158.55	8.00	9.95	59.60
2015	7.85	169.68	9.00	9.54	59.90
2016	8.17	169.91	17.50	9.66	59.94
2017	8.55	157.50	19.52	9.69	60.76
2018	8.60	156.56	19.67	7.01	61.56
2019	8.67	169.91	20.12	8.45	62.46

Source: Publications from CBN and NBS Statistical Bulletin (various issues)

III. Result

Table 4.2 Differenced Result

Variables	Test Statistic	Test Critical Values			Status	Prob.
	ADF	1% level	5% level	10% level	Stationary	
ACU	-7.760730	-3.646342	-2.954021	-2.615817	1(1)	0.0000
EXR	-9.701251	-3.646342	-2.954021	-2.615817	1(1)	0.0000
RINTR	-8.950262	-3.646342	-2.954021	-2.615817	1(1)	0.0000
OCR	-10.62541	-3.646342	-2.954021	-2.615817	1(1)	0.0000
INFR	-4.573769	-3.679322	-2.967767	-2.622989	1(1)	0.0011

Source: Researcher's computation using E-view 9.0, 2019

Correlation Matrix

	RINTR	EXR	INFR	OCR	ACU
RINTR	1.0000	0.4765	0.9570	0.1890	0.3588
EXR	0.4765	1.0000	0.4082	0.4185	0.5614
INFR	0.9570	0.4082	1.0000	0.1293	0.4090
OCR	0.1890	0.4185	0.1293	1.0000	0.1605
ACU	0.3588	0.5614	0.4090	0.1605	1.0000

Source: Researcher's computation using E-view 9.0, 2019

Interpretation of Correlation Matrix

The correlation matrix result in table 4.3 shows that macroeconomic indicators positively correlate with OCR and ACU respectively.

Test of Hypotheses

Test of Hypothesis I

Ho_1: There is no significant relationship between interest rate and output contribution ratio of manufacturing sector to RGDP in Nigeria.

H_1: There is significant relationship between interest rate and output contribution ratio of manufacturing sector to RGDP in Nigeria.

Decision Rule
Accept the alternative hypothesis, if the P-value of the test is less than 0.05. Otherwise accept Ho.

Table 4.4: Simple Regression Analysis testing the relationship between DRINTR and DOCR

Dependent Variable: DOCR
Method: Least Squares
Date: 08/30/19 Time: 11:53
Sample (adjusted): 1982 2019
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.023704	0.150784	-0.157205	0.8760
DRINTR	0.012671	0.009844	4.287217	0.0070

R-squared	0.470809	Mean dependent var	-0.016000
Adjusted R-squared	0.218955	S.D. dependent var	0.899916
S.E. of regression	0.891346	Akaike info criterion	-9.663277
Sum squared resid	26.21841	Schwarz criterion	-9.752154
Log likelihood	44.60734	Hannan-Quinn criter.	-9.693957
F-statistic	10.65928	Durbin-Watson stat	1.145182
Prob(F-statistic)	0.006974		

Source: Researcher's computation using E- View 9.0, 2019

Interpretation of Regression Result

The regressed coefficient correlation result in table 4.4 shows the existence of a positive and statistically significant relationship between RINTR (β_1=0.012671) and OCR at 5% significant level. The probability value for the slope coefficient shows that P(x_1=0.0070<0.05). This implies that RINTR has a statistically significant relationship with OCR at 5% significance level. The coefficient of determination obtained is 0.47 (47%), which is commonly referred to as the value of R^2. The cumulative test of hypothesis using R^2 to draw statistical inference about the explanatory variables employed in this regression equation, shows that the R-Squared value tells that 47% of the systematic variations in the dependant variable can be jointly predicted by the independent variable (RINTR) while 53% was explained by unknown variables that were not included in the model. The Durbin-Watson statistic of 1.145182 indicates that there is no auto-correlation problem. The overall significance of the model Prob F-statistic (0.006974) is statistically significant at 5%.

Consequently, since the P-value of RINTR at 0.0070 is less than the critical value of 0.05, thus, this study submits that there is a statistically significant relationship between RINTR and OCR of manufacturing sector in Nigeria at 5% level of significance.

Test of Hypothesis II
Ho_2: There is no significant relationship between exchange rate and output contribution ratio of manufacturing sector to real gross domestic productin Nigeria.
H_2: There is significant relationship between exchange rate and output contribution ratio of manufacturing sector to real gross domestic product in Nigeria.

Decision Rule
Accept the alternative hypothesis, if the P-value of the test is less than 0.05. Otherwise accept Ho
Simple Regression Analysis testing the relationship between DEXR and DOCR

Dependent Variable: DOCR
Method: Least Squares
Date: 08/30/17 Time: 11:54
Sample (adjusted): 1982 2016
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.019970	0.164948	-0.121071	0.9044
DEXR	0.000821	0.012004	4.068380	0.0059

R-squared	0.500142	Mean dependent var	-0.016000
Adjusted R-squared	0.430157	S.D. dependent var	0.899916
S.E. of regression	0.913384	Akaike info criterion	-9.712125
Sum squared resid	27.53094	Schwarz criterion	-9.801002
Log likelihood	45.46219	Hannan-Quinn criter.	-9.742805
F-statistic	10.04676	Durbin-Watson stat	1.181260
Prob(F-statistic)	0.005896		

Source: Researcher's computation using E- View 9.0, 2017

Interpretation of Regression Result

The regressed coefficient correlation result in table 4.5 shows the existence of a positive and statistically significant relationship between EXR (β_1=0.000821) and OCR at 5% significant level. The probability value for the slope coefficient shows that P(x_1=0.0059<0.05). This implies that EXR has a statistically significant relationship with OCR at 5% significance level. The coefficient of determination obtained is 0.50 (50%), which is commonly referred to as the value of R^2. The cumulative test of hypothesis using R^2 to draw statistical inference about the explanatory variables employed in this regression equation, shows that the R-Squared value tells that 50% of the systematic variations in the dependant variable can be jointly predicted by the independent variable (EXR) while the remaining 50% was explained by unknown variables that were not included in the model. The Durbin-Watson statistic of 1.181260 indicates that there is no auto-correlation problem. The overall significance of the model Prob F-statistic (0.005896) is statistically significant at 5%.

Consequently, since the P-value of EXR at 0.0059 is less than the critical value of 0.05, thus, this study submits that there is a statistically significant relationship between EXR and OCR of manufacturing sector in Nigeria at 5% level of significance.

Test of Hypothesis III

Ho_3: There is no significant relationship between inflation rate and manufacturing sector average capacity utilization

H_3: There is significant relationship between inflation rate and manufacturing sector average capacity utilization

Decision Rule

Accept the alternative hypothesis, if the P-value of the test is less than 0.05. Otherwise accept Ho.

Table 4.6: Simple Regression Analysis testing the relationship between DINFR and DACU

Dependent Variable: DACU
Method: Least Squares
Date: 08/30/17 Time: 11:56
Sample (adjusted): 1982 2016
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.382622	0.760199	-0.503319	0.6181
DINFR	-0.009349	0.050336	-4.185725	0.0053

R-squared	0.481044	Mean dependent var	-0.381714
Adjusted R-squared	0.329227	S.D. dependent var	4.432989
S.E. of regression	4.497304	Akaike info criterion	5.900279
Sum squared resid	667.4496	Schwarz criterion	5.989156
Log likelihood	21.02549	Hannan-Quinn criter.	5.930959
F-statistic	10.04494	Durbin-Watson stat	0.759823
Prob(F-statistic)	0.005309		

Source: Researcher's computation using E- View 9.0, 2017

Interpretation of Regression Result

The regressed coefficient correlation result in table 4.6 shows the existence of a negative but statistically significant relationship between INFR ($\beta_{1=}$-0.009349) and ACU at 5% significant level. The probability value for the slope coefficient shows that P(x_1=0.0053<0.05). This implies that INFR has a negative but however, statistically significant relationship with ACU at 5% significance level. The coefficient of determination obtained is 0.48 (48%), which is commonly referred to as the value of R^2. The cumulative test of hypothesis using R^2 to draw statistical inference about the explanatory variables employed in this regression equation, shows that the R-Squared value tells that 48% of the systematic variations in the dependant variable can be jointly predicted by the independent variable (INFR) while the remaining 52% was explained by unknown variables that were not included in the model. The Durbin-Watson statistic of 0.759823 indicates that there is no auto-correlation problem. The overall significance of the model Prob F-statistic (0.005309) is statistically significant at 5%.

Consequently, since the P-value of INFR at 0.0053 is less than the critical value of 0.05, thus, this study submits that there is a statistically significant relationship between INFR and ACU of manufacturing sector in Nigeria at 5% level of significance.

IV. Discussion

Having tested the hypotheses the **first finding** reveals that real interest rate has a significant positive relationship with output contribution ratio of manufacturing sector to RGDP, which in turn conforms to the a priori expectation that the real interest rate will relate positively to output contribution ratio to RGDP. The expectation stems from the fact that the real interest rate differential theory confirms that countries with higher real interest rate attract investors around the World; this invariably will increase manufacturing output. Moreover Adrian et al (2015) confirmed also that net inflow from foreign direct investment has significant positive relationship with manufacturing sector growth. Note that higher real interest rate of a country is what attract foreign direct investment.

The **second finding** reveals that exchange rate has a positive significant relationship with output contribution ratio of manufacturing sector to RGDP in Nigeria, and hence agrees with the a priori expectation. Moreover Lawal (2016) posit that exchange rate has a positive relationship with manufacturing sector output .Ehimonem and Oladipo (2012) posit that in Nigeria, exchange rate appreciation has significance relationship with domestic output and will promote manufacturing sector growth.

The **third finding** shows a negative and significant relationship between inflation rate and average capacity utilization deviating from the apriori expectation of the researcher that states a positive relationship between the variables based on the fact that an optimal increase in prices of commodities which of course are most often than not basic needs of consumers will lead to increase profit and investment and thus capacity utilization but a persistent high inflation will thus have adverse effect. Considering the literature of Nwandu (2016) that reveals a negative effect of rising interest rate on average capacity utilization in line with the International Fishers Effect Theory that says that high nominal interest rate reflects higher inflation; the researcher observed from the time series data that since 2014 -2015 the inflation rate which was held at single digit rates increased sharply to double digit rates of 17.50 percent, a rate which for the past decade was not recorded.

V. Conclusion

This study has examined the effect of macroeconomic variables on the performance of manufacturing sector in Nigeria for the 1981 - 2016 periods. Existing literature shows that researchers are yet to reach a consensus about the effect of macroeconomic variables on the performance of manufacturing sector in Nigeria. Therefore, the effect is yet to be well established. This study has contributed to the research effort at empirical measure of the effect of macroeconomic variables on the performance of manufacturing sector in Nigeria. Data analysis revealed that a relationship exists between macroeconomic variables and the performance of manufacturing sector in Nigeria, and that while some components of macroeconomic exerted negative effect on performance, others exerted positive effect. As disaggregated components, INFR on ACU exerts negative but significant effect, while RINTR on OCR (to RGDP)exerts significant positive effect, EXR on OCR (to RGDP) exerts significant positive effect and RINTR had significant positive effect on ACU. However, the aggregated effect of macroeconomic variables on the performance of manufacturing sector in Nigeria is statistically significant.

VI. Recommendations

The following policy recommendations were proffered from the findings and conclusion of this study:

i. There is need for the government through the central bank to implement policy that will increase the level and size of market capitalization in the capital market. Such increase in capital market will provide the needed funds for investors for further investments and hence increased productivity in Nigeria.

ii. There is also need to institute policies that will further increase the value of market transaction in the market due to the significant positive effect that EXR has on OCR. An increase in the value of transaction will in turn lead to improved performance and economic growth in Nigeria.

iii. The negative effect of INFR and ACU calls for proper policies to be implemented so as to attract more investors to invest in the market. There is also need to relax some stringent registration and operating procedures to enable more people and organizations to participate in the market.

References

[1]. Adebiyi,M.A&Babatope-Obasa,B.(2004).Institutional framework, interest rate policy and the financing of Nigerian manufacturing sub-sector. *African Development and Poverty Reduction Forum Paper*.

[2]. Adebiyi,P.A., &Olufemi,O.B.(2016).The determinants of capacity utilization in the Nigerian manufacturing sector. *Journal of Economics and Sustainable Development*,7(5),20-31.

[3]. Agency report(2016,January 10).Nigerian manufacturers lament: 272 firms shut, 20% capacity utilization, other challenges in 2016. *Word Press.*Retrieved from http://www.premiumtimesng.com.

[4]. Akers,H.(2014).Key macroeconomics variables. *EHOW Contributor*.

[5]. Crowley,J.(2007).Interest rate spreads in English-speaking Africa. *IMF Working Paper.April*,2007.

[6]. Dhasmana,A.(2013).Transmission of real exchange rate changes to the manufacturing sector performance. *IIM Bangalore Research Paper* 435.

[7]. Enekwe,CI., Ordu,MM.,&Nwoha,C.Ph.D.(2013).Effect of exchange rate fluctuations on manufacturing sector in Nigeria. *European Journal of Business and Management*,5(22),67-73.

[8]. Gbadamosi,R.(1989).Deregulating the Nigerian Banking Economy: The effects of high interest rate on economic growth in Nigeria. *Paper delivered at a World Bank organized seminar,Lagos.*

[9]. Harvey,H.(2012).Exchange rate volatility and money demand in selected South-East Asian countries. *Economics and Finance Review*,2(10),1-7.

[10]. Igbinedion,S.O. &Ogbeide,F.I.(2016).Monetary policy and manufacturing capacity utilization: A further evidence from Nigeria. *South-Eastern Europe Journal of Economics*,2,159-174.

[11]. Kayode,M.O.(1989).*Nigeria since independence: The first 25years*. Ibadan, Nigeria: Heinemann Books Ltd.

[12]. Khalid,Z., Iqtidar,A.S.,Muhammed,M.K., &Mehboob,A.(2012).Macroeconomics factors determining foreign direct investment impact on Pakistan's growth. *South Asian Journal of Global Business Research*,1(1),79-95.

[13]. Krugman, P.R & Taylor, L.(1978). Contractionary effects of devaluation. *Journal of International Economics*,8(3),445-456.

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

[15]. Modebe,N.J. & Ezeaku,H.C. (2016).Dynamics of inflation and manufacturing sector performance in Nigeria: Analysis of effect and causality. *International Journal of Economics and Financial Issues*,6(4),1400-1406.

[16]. Mojekwu,J.N.(2012).Factors affecting capacity utilization decision in Nigeria: A time series analysis. *International Business Research Journal*,5(1),157-163

[17]. Ngugi,R.W.(2001).An empirical analysis of interest rate spread in Kenya. *African Economics Research Consortium, Research Paper* 106.

[18]. Nwandu,E.(2016).Impact of rising interest rate on the performance of the Nigerian manufacturing sector. *European Journal of Business and Management*,8(4),2222-2228

[19]. Odior,E.S.(2013).Macroeconomic variables and the productivity of the manufacturing sector in Nigeria: A static analysis approach. *Journal of Emerging Issues in Economics,Finance and Banking*,1(5),362-380

[20]. Ojo,M.O.(2001).*Principles and practice of monetary management in Nigeria*. Nigeria: Central Bank of Nigeria.

[21]. Okoye,L.U.(2006).The impact of interest rate on productive activities in Nigeria: A study of selected manufacturing industries in Nigeria. *Unpublished Master of Business Administration Dissertation, Department of Banking and Finance, University of Nigeria, Nsukka.*

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

[23]. Torlagh,S.T.(2013).Effect of high lending rate on the manufacturing sector of the Nigerian economy. *Unpublished B.Sc Thesis, Department of Banking and Finance, Caritas University,Amorji-Nike,Enugu*.

[24]. Ukoha,O.O.(2000).Determinants of manufacturing capacity utilization in Nigeria. *The Nigeria Journal of Economics and Social Studies*,42(2),121-131.

Ezu, Gideon Kasie, et. al. "Macroeconomic Variables and Performance of Manufacturing Sector in Nigeria (1981-2019)."*IOSR Journal of Business and Management (IOSR-JBM)*, 22(11), 2020, pp. 52-62.