

The Impact of Interest Rate and Bank Loan on the Performance of the Manufacturing Sector in Nigerian (1981-2015)

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Abstract

This study examined the impact of interest rate and bank loan on the performance of the manufacturing sector in Nigeria (1981-2015). The government through Central Bank of Nigeria has been regulating interest rate in order to channel funds to this sector. Moderately, low rate of interest is believed to be an incentive to the investors to borrow and invest in order to improve productivity. Interest rate was deregulated in 1986 following the Structural Adjustment Programme launched that year. However as from 1991 government started a programme of guided regulation. This period of interest rate experiment provided the urge to make more studies on impact of this effort on the economy most especially the manufacturing sector. This study employs the ordinary least squares (OLS) multiple regression as the techniques of statistical analysis to determine the impact of interest rates on the performance of the manufacturing sector in Nigeria. However, prior to performing the OLS multiple regression analysis, the stationarity of the variables were examined by performing the unit root test. The result shows a weak and negative relationship between the explanatory variables- interest rate, inflation rate and dependent the average manufacturing capacity utilization. This shows that bank rate of interest and the inflation rate is statistically insignificant factor influencing the manufacturing capacity utilization during the period 1981-2015. Hence, programme to ensure favourable interest rate for the manufacturing sector has to be in place if actually we want to be industrialized. In addition, the result revealed that commercial banks' loan and advances to the manufacturing sector is positively related to the dependent variable, thus, effort must be made by the policy makers that credit facilities allocated to the manufacturing sector must not in any way be diverted to other purpose if actually we want to be among the most industrialized nation in the 2020.

Keywords: *Interest Rate, Bank loan, Performance, Manufacturing sector*

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Background to the Study

Despite great natural wealth, Nigeria, since her independence in 1960, has spent much time and resources, both material and human, trying to convince the world's most industrialized nations that she is capable of developing industrially. Nigeria, like most other developing nations of the world, wants economic independence even after she had gained political independence since the five past decades. Most advanced countries would have preferred that Nigeria should continue to supply them with raw materials and import finished goods, thus trying to perpetuate economic dependence. In view of this, Nigeria launched a programme of industrialization for her economic development especially when the inconsistent nature of the primary export sector is regarded. Towards the end of the 1980s the government introduced a number of economic reforms and programmes like the structural adjustment programme which its major objective was to restructure and diversify product base of the economy so as to reduce the dependency on oil sector and imports (NCEMA, 2003). These reforms involve deregulation of the foreign exchange market, abolition of import licenses and devaluation of the naira. The latest programme of the government is provide jobs for its young people, reducing unemployment to the lowest of single digits and providing safety nets so that no one is left behind and emphasized will be place on the importance of boosting manufacturing sector performance (Ojenike, B., et al. 2016). Efforts have been made by the government to channel investible funds to the manufacturing sector by manipulating interest rate and other monetary policy tools.

Objective of the Study

The **objective** of this study is to show the impact of the various rates of interest on investment and performance of the manufacturing sector in Nigerian during the period under review with particular emphasis *on* the total credit delivery by commercial banks to the manufacturing sector and to analyse the effect of the interest rate deregulation on production, investment and growth of the manufacturing sector.

The study significantly review and appraise the process of interest rate regulation and deregulation on economic performance over the period of consideration. The motivation for this study is to show which interest rate policy to pursue in other to have a vibrant and efficient manufacturing sector. It will also reveal the extent to which problems of inflation and unemployment can be curtailed in the economy. Also, the unique thing about the study is that the study will also enable the companies in the manufacturing sector to develop effective and more efficient policy on loans and investments.

Review of Related Literature

Meaning of Interest Rate

Interest rate is the cost of capital or credit. 'Any borrower normally has to pay the lender more than the principal originally received: the excess is interest' (Black, John 2002). The rate of interested is the interest which has to be paid for a one-period loan, as a percentage of the principal. Interest rate is rental payment for the use of credit by borrowers and return for parting with liquidity by lenders like other prices, interest rates perform a rationing function by allocating limited supply of credit among the many competing demands on it. Some of the common rate of interest in the Nigerian economy includes the following:

- i) **Nominal Interest Rate:** This is the actual rental value paid for the use of money or credit. It includes the effects of inflation and uncertainty.

- ii) **Real Interest Rate:** This is the nominal interest rate adjusted for expected inflation. To encourage savings, real interest rate is expected to be positive.
- iii) **Savings Deposit Rate:** The savings deposit rate is the amount paid by banks for funds withdrawals after seven days, notice. This restriction is however, seldomly applied.
- iv) **Fixed Deposit Rate:** When deposit are for a fixed period of time, say 90 or 180 days, the interest rates paid are called fixed deposit rates. They normally attract higher interest rates, while early withdrawals may attract interest penalties.
- v) **Minimum Rediscount Rate:** This refers to the amount that is charged by the CBN for lending to banks in the performance of its function of lender of last resort and also as a signal of the desired direction of monetary policy.
- vi) **Prime Lending Rate:** This is the interest rate applied to loans made to customers with the highest rating. For each bank, this rate also represents the minimum lending rate.
- vii) **Maximum Lending Rate:** This refers to the rate charged by banks for lending to customers with a low credit rating.
- viii) **Inter-Bank Interest Rate:** This is the rate that applies to transactions among banks, mostly for overnight and other short-term funds.

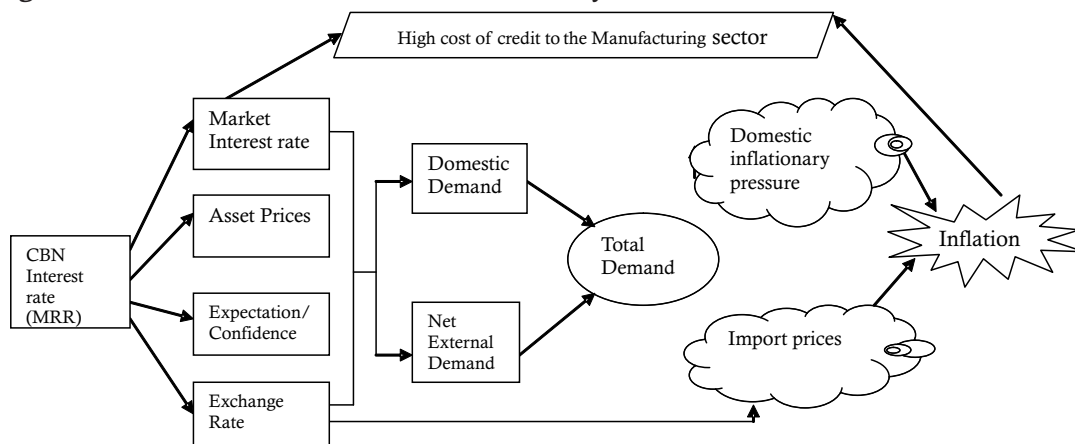
Usually, interest rates tend to follow the rule laid down by the government minimum lending rate like the CBN's minimum rediscount rate (MRR). This MRR reflects the supply and demand for short rate securities (like treasury bills) and more or less fit the low rate of interest situation. Long term government bonds represent the trend of long-term loan rates.

How Interest Rate Affect the Economy

The Central Bank of Nigeria (CBN) may decide to make a adjust the Minimum Rediscount Rate (MRR). The MRR is the official interest rate of the CBN, which anchors all other interest rates in the money market and the economy. CBN's decision on the MRR affects the level of economic activities and prices in the country through a number of channels. The purpose of this brief is to examine how a change in interest rate by the CBN affects people and the economy.

A decision by the CBN to change the MRR affects the market interest rate in different ways. When the Bank makes an announcement on the MRR, it affects the expectations of people and economic agents about the future direction of the economy. Such decisions also affect the prices of financial assets (like shares) and the exchange rate of the naira to other currencies as well as the ability of people and economic agents to save and spend money. For instance, when the interest rate is increased, people are encouraged to save instead of spend their money. An increase in interest rate would also lead to foreigners paying more to buy our local currency, thereby making foreign goods to be cheaper than goods produced in the country, and vice versa. This could encourage imports and discourages exports of goods and services. This has a limiting effect on our level of external reserves. Thus, when the CBN makes a change in interest rate, it affects the exchange rate. Although the change in exchange rate may directly affect domestic prices of imported goods and services, this effect may not be immediate. Also, the change in interest rate could generate an indirect effect on the prices of goods and services which compete with goods that are domestically produced or those goods and services that use imported raw materials. Consequently, a change in interest rate has effect on the component of the general price level of those goods that are imported and this affect all economic agents in the country which include the manufacturing sector.

Figure 1: How Interest Rate Affects the Economy



Interest Rate and the Manufacturing Sector

In the survey of manufacturing activities by the central bank of Nigeria the following facts about the development in the sector were gathered. An important development in the manufacturing subsector decline by 4.4% in total investment expenditure due to what respondents referred to as “the high cost of credit” from the banking system. As regard to interest rate policy review, it was the subject of much heated controversy in 1987, while everyone appeared with the regulation in principle, there were various views about what should be the appropriate level of interest rates. The CBN rediscount rate which is the reference rate has subsequently been lowered by 0.25% points to 12.75% and banks have followed by lowering their own rates. This various issues involved could be considered from two points. One of such is the short term aspect which has to do with how the prevailing rates affect business costs, businessmen's expectations about the likely course of aggregate output and how such expectations affect investment decisions.

Okigbo (1981) argued that the change in the level of interest rates for loans is most likely to affect decisions to invest on long term equipment, and other assets rather than total spending in the economy. But how far a rise will determine further investment is dependent on the expected returns from investment. He gave example of the period 1970-74 when the returns being declared by the commercial and industrial houses in Nigeria were of the order of over 100% return on capital invested, while first class promise advances rate remained unchanged at 7%, other advances rose by 2% from 8% to 10%. This increase, Okigbo argued that it is hardly likely to be decisive in the investors' plan and decisions to invest if the expected return will be reduced not so significantly, or may increase regardless of the resultant increase in costs. It follows that what is important for the Nigerian investor seeking fund, in the boom condition of 1970-76, is not much the interest rate but whether or not credit would be available at all.

Thus, the CBN policy objectives were to curtail inflationary measures and to ensure that the bulk of bank funds went to the production sectors of the economy. The policy instruments excluded interest rate which showed that the use of interest rate as an instrument to encourage investment was not considered important enough. All recent studies have shown an interest elasticity of demand for money in Nigeria to be low and insignificant as to be close to zero. All the above point to the fact that interest rate is not a significant determinant of demand for credit for investment purposes.

Duncan K. Foley and Mignel Sidrausici (1971) observed that other things being equal an increase in the rate of interest covers the demand for capital on the part of wealth owners, thereby decreasing the equilibrium prices of capital and thus, lowering the level of investment goods. But other things are not usually equal. The rate of interest itself is an endogenous variable of the system. Thus, for the rate of interest to change, some other variables must have changed and the change in this demand for capital, this increase may even outweigh the depressing effect in the demand for capital that resulted from the rise in the rate of interest. They argued that tighter fiscal policy rather than interest rate leads to higher price of capital. Consequently, the level of interest had no significant impact. They concluded that given the level of technology and the stock of capital, the only variable that is unequivocally related to the level of investment is the price of capital goods which has a positive relationship with investment not the rate of interest.

A study by Trygve Haavelmo (1960) showed that there is clearly no room for any relation between the rate of interest and the demand for investment. When the rate of interest and other explanatory variables are constant, the demand for additional capital is zero (or somewhat indefinite) regardless of what the level of interest. If there is any relationship between investment and the rate of interest, it must be the rate of change in the rate of interest that matters. In conclusion, Haavelmo says that he does not mean to reject the possibility that an empirical relation may be found between the rate of interest and the rate of investment, but that he would like to reject the naive reasoning that there is a demand schedule for investment which could be derived from a classical scheme of producers behavior in maximizing profit.

According to Uchendu (1993), interest rate policy is among the emerging issues in current economic policy in Nigeria in view of the role it is expected to play in the deregulated economy in inducing savings which can be channel to investment and thereby increasing employment, output and efficient financial resource utilization. Also, interest rates can have a substantial influence on the rate and pattern of economic growth by influencing the volume and disposition of saving as the volume and productivity of investment (Leahy, 1993).

Akintoye and Olowolaju (2008) examined optimizing macroeconomic investment decision in Nigeria. The study employed both the ordinary least square and vector autoregression frameworks to stimulate and project intertemporally private investment response to its principal shocks namely public investment, domestic credit and output. The study found low interest rate to have constrained investment growth. The study then resolved that only government policies produce sustainable output public investment and encourage domestic credit to the private sector will promote private investment.

Albu (2006) studies trends in the interest rate, investment, GDP growth relationship. The study used two partial models to examine the impact of investment on GDP growth and the relationship between interest rate and investment in the case of the Romanian economy. The study found that the behavior of the national economy system and interest rate-investment relationship tend to converge to those demonstrated in the normal market economy.

The major source of funds for most manufacturing companies is the internally generated funds of the companies. The percentage of internally generated funds is higher than that of loans although, internally generated funds declined by 25.7% as against an increase of 8.5% in 1979, they continued to be the main source of financing additional investment. This trend has not

changed over the years. Study on the relationship between investment and interest rate is inexhaustible. The review could go on and on and what will emerge would not be different from what has been given above. It is believed, that this review is enough to make severe the possible relationship between investment and the rate of interest.

Furthermore, in Nigeria the role of institutions in the development of the Nigerian manufacturing sub-sector has not been fully addressed and the impact has not been fully felt. Manufacturing sub-sector contribution to gross domestic product has remained low in Nigeria. For instance, the manufacturing sub-sector as a whole remains small, accounting for only 6.6 percent of GDP in 2000 and 12 percent of employment (World Bank, 2002). The product indices [using 1990 as a base year (100)] also indicated that while agriculture and services experienced modest growth from 103.5 and 101.5 to 133.6 and 297.0 between 1991 and 1999 respectively, manufacturing sub-sector record a decline from 109.4 to 92.3 in the same period. It is also sad to mention that capacity utilization in the manufacturing sub sector declined from about 70.1% in 1980 to just 54.9 percent in 2002 (CBN, 2002). In addition to the above, high interest rate in the Nigerian financial system is a reflection of the extremely poor performance of the manufacturing sector. To respond to this deteriorating economic situation, the Nigerian policy makers need to introduce several forms of corrective measures in reform policies that will help to reduce obnoxious charges of interest by the financial sector.

Overview of the Nigerian Manufacturing Sub-sector

The structure of manufacturing production has been a derivative of the various development plans (Alao, 2006). The first national development plan (1962 - 1968) emphasized light industry and assembling activities. The second plan (1970 - 1975) had a somewhat similar thrust and focus, but the emphasis shifted in the third plan (1975-1980) towards heavy industries. Major projects were initiated in the steel and petroleum refinery sector. For the fourth plan (1980 - 1985), the broad direction was in consonance with the third. It retained the stress on heavy industries. But several of the grandiose plans were short changed with onset of the profound economic crisis in the early 1980s. Players in the Nigerian industrial and manufacturing sector can be classified into four, namely: Multinational, National, Regional and Local groups. Apart from the multinational operators most of the other players have disappeared in the last two decades, due to unpredictable policies, lack of basic raw materials, most of which are imported.

Nigeria's manufacturing sector is made up of a wide range of industrial activities ranging from enterprises in the informal sector using simple technology to heavy capital goods industries in the automotive and electrical equipment industries. Consumer goods industries dominate the sector both in terms of relative share in manufacturing value added and employment. These industries account for about 75 percent of the sector's total value added and employment respectively. Food beverages and tobacco were the leading sub-sectors in the consumer goods industries followed by textiles and weaving apparel, paper products and printing, plastic and rubber products in this grouping include leather goods and foot wear, soaps and detergents, pottery, glass and glass production and electrical appliances (e.g. radio and television assembly). In the food sub-sector the key activities includes baking, grain millings, procession of dairy products and sugar and confectionery processing. Beverages include bear, soft drinks and wines. They accounted 20 percent of the manufacturing sectors value added. The textile industry is important in terms of its contribution to manufacturing value added and employment.

The share of intermediate goods industries in value added declined from about 29 percent in 1971/72 to 19 percent in 1984. Their share of manufacturing employment declined slightly from about 24 percent to 18 percent over the same period. Included in this category of industries are chemical and prints, leather tanning and finishing, tires and tubes, saw mills and wood products, building materials and metal working industries. Metal working, chemical and paints were the most important subsectors in this category in terms of their relative contribution of value added while metal working, saws mills and wood products and building materials were the leading subsectors in the terms of employment in the 1970s.

The relative share of chemicals and paints has fallen substantially in the 1980s and 1990s. Cement processing is one of the leading activities in the building materials category. During the 1970s the government in an effort to meet the housing and infrastructural development embarked on the development of the cement industry through the establishment of new plants and expansion of existing ones. In spite of this many of the cement companies are in serious difficulties with low capacity utilization despite the presence of considerable excess demand which has resulted in high retail prices and windfall profits for middlemen.

Capital goods industries are relatively less important in Nigeria. They consist of machinery and equipment, electrical and transportation equipment. Significant changes here occurred in the contribution of this group of industries to manufacturing value added and employment. Their share in value added rose from less than one percent in 1980 (most of the increase being contributed by transportation equipment subsector) to about 7 percent in 1984. The poor performance of the heavily import dependent vehicles assembly plants accounts for the decline in the groups share. The groups share in employment is about 7 percent.

Although manufacturing is usually a small sector in African economies, in terms of share of total output or employment, growth of this sector has long been considered crucial for economic development. This special interest in manufacturing stems from the belief that the sector is a potential engine of modernization, a creator of skilled jobs, and a generator of positive spillover effects (Tybout, 2000).

Evaluation of Interest Rates and Manufacturing Sub-Sector in Nigeria

The 1970s saw different interest rates for different sectors through to mid-1980s as it is observed from this study. The preferential interest rates were based on the assumption that the market rate if universally applied, would exclude some of the priority sectors. Interest rates were, therefore, adjusted periodically to promote increase in the level of investment in the different sectors of the economy. For example agriculture and manufacturing sectors were accorded priority, and the commercial banks were directed (by the central bank) to charge a preferential interest rate (vary from year to year) on all loans and advances to small-scale industries. Currently, the government is pursuing a market-determined interest rate regime which does not permit a direct state intervention in the general direction of the economy. The market demand and supply is the driving force of resources allocation. Thus current formal lending policy does not give special interest rate concession to the manufacturing sub-sector. The interest on loans is based on the risk factor of the sub-sector that the loan is meant for.

Table 1: Interest Rates and Manufacturing Sub-sector in Nigeria

Indicators	1973-97	1980-85	1986-89	1990-93	1994-98	2008
Inflation rate	16.8	17.8	23.7	30.6	35.5	11.6
Interest rate:						
- Nominal lending rate	8.0	10.6	17.9	29.5	21.5	21.2
- Real lending rate	- 8.8	- 7.2	- 5.8	- 1.1	- 14.0	16.1
- Nominal deposit rate	6.0	7.7	12.7	16.4	2.6	12.9
- Real deposit rate	-10.8	-10.1	-11.0	-14.2	-22.9	7.9
Exchange rate (N/\$)	0.3	0.7	4.2	14.3	21.9	120.81
Growth rate of manufacturing (%)	55.7	13.6	9.2	6.7	5.0	9.28
Share of manufacturing GDP (%)	9.2	8.5	8.0	6.9	6.0	9.28
Manufacturing capacity utilization (%)	67.4	58.9	40.2	39.5	33.4	53.9
Bank credit to the private sector (%)	15.2	14.9	14.2	8.8	2.6	87.9

Sources: International financial statistics. Central Bank of Nigeria (CBN) statistical Bulletin, 2008

In table above, the average nominal lending rate rose from 8% in 1973- 1979 to 21.2 percent in 2008 and the corresponding inflation rates were 16.8% and 11. 6% respectively. Real lending rates were negatives in most the years excepts 2008, which is a reflection of high inflation rates. This shows that high inflation rate is a contributing factor to high lending rates in Nigeria (Adebiji, 2001).

In the same line, bank credit to the private sector (expressed as a percentage of GDP) declined from 15.2% to 2.6% between the periods 1973 and 1994 – 98 respectively and later rose to 87.9 percent in 2008 as a result of increased capital base of banks. Similar trends were also revealed using other indicators such as manufacturing capacity utilization, share of Manufacturing in GDP, growth rate of manufacturing (in percentage). It can be observed that manufacturing performance in Nigeria during the deregulation era was not encouraging. High lending rate, coupled with the general perception of manufacturing enterprise lack of the traditional bank collateral requirement, meant that the manufacturing sector access to formal bank loans is limited. This explains the reason for the creation of special financial schemes for the growth and development of the manufacturing sub- sector in Nigeria. The evaluation of these institutions revealed that most of them were face with problems arising from weak institutional arrangement and corrupt practices (Adebiji, 2001)

In Nigeria, the commercial banks are highly liquid but they perceive that lending to the manufacturing sub-sector is very risky and increasing credit to the sector is not justified in terms of risk and cost. The high risk arises from difficulties in obtaining information on a firm's true financial condition and performance coupled with weak and inefficient institution on a firm's

true financial condition, makes it difficult for banks to enforce contracts. Again, the business environment in Nigeria is very risky and uncertain coupled with poor infrastructural facilities necessary to bring about high reduction in the risk associated with financial an extremely strained economy. Consequently, ban charge high interest rates, demand high levels of collateral and make few loans of more than a year in term (World Bank, 2002)

Methodology

This study employs the ordinary least squares (OLS) multiple regression as the techniques of statistical analysis to determine the impact of interest rates on the performance of the manufacturing sector in Nigeria. However, prior to performing the OLS multiple regression analysis, we examine the stationarity of the variables by performing the *unit root test*. In the same manner, time series data for the period between 1981 and 2015 are used in the study. The data collected for the study is secondary in nature specifically; the data were collected from the central Bank of Nigeria statistical Bulletin. The secondary data are more suitable for the compilation of quite a large number of statistics. They are obtained because of difficulty in sourcing information on the sport or in the field. The parameters in the regression model will be estimated and, be subjected to relevant hypothesis test to determine the statistical significance, using a given relevant level of significance.

Model Specification

There are different indicators to measure the performance of manufacturing subsector. These include index of manufacturing production, contribution of manufacturing to gross domestic product, employment in the manufacturing subsector, capacity utilization in the manufacturing sub- sector, and manufacturing value- added. The average manufacturing capacity utilization (MCU) was is used as the dependent variable because it is the maximum amount that can be produced per unit of time with existing plant and equipment, provided that the availability of variable factors of production is not restricted and also changes in the manufacturing sub- sector, arising from monetary policies, can easily be observed in this variable. The explanatory variable include: interest rate (IRS), bank's credit to the manufacturing sub- sector (BCM) and inflation rates (INF).

These variables are important because of the following reasons.

In Nigeria, high interest rate hindered the performance of the manufacturing sub-sector. It is allege that this rate is partly responsible for high cost of production in the Nigerian manufacturing subsector (Adebiyi, 2004).

Bank's credit to manufacturing sub-sector, most especially, commercial banks' loans and advance to the manufacturing sub-sector have significant and positive impact on capacity utilization. It is expected that an increase in the commercial banks' loan and advance to manufacturing sub-sector will bring about corresponding increase in capacity utilization. Also, inflation rate which is the persistent increase in the level of price is also inversely related to the manufacturing sub-sector capacity utilization.

Against this background, the model for this study is specified below:

$$MCU = f(BCM, IRS, INF) \dots\dots\dots (I)$$

This can also be explicitly stated as:

$$MCU = a_0 + a_1BCM + a_2IRS + a_3 INF + \mu \dots\dots\dots (ii)$$

Where:

MCU = average manufacturing capacity utilization rates, BCM= commercial bank's total loans and advances to manufacturing sector, IRS = interest rate (Commercial banks' lending rates), INF = inflation rate and μ =Stochastic term (This takes care of every other macroeconomic factors that can influence the manufacturing capacity utilization).

a_0, a_1, a_2 and a_3 are the parameters to be estimated. Based on a prior, I also expect the following:
 $a_1 < 0, a_2 > 0$ and $a_3 < 0$

Statement of Hypothesis

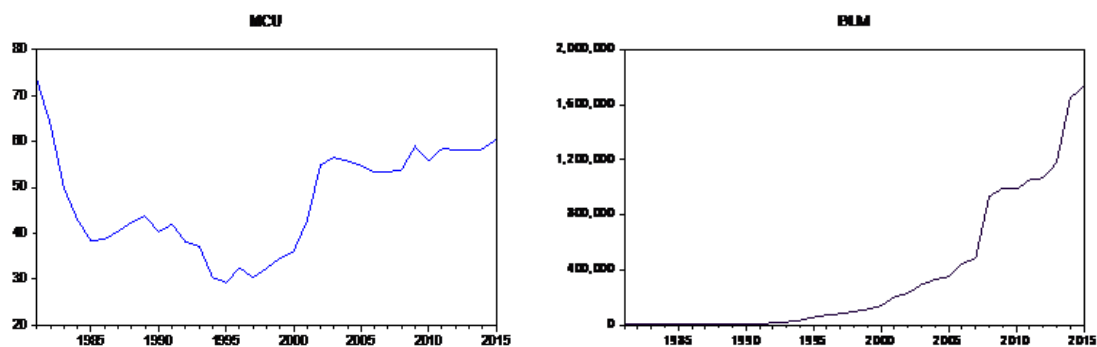
The following two hypotheses become relevant in this study. They are:

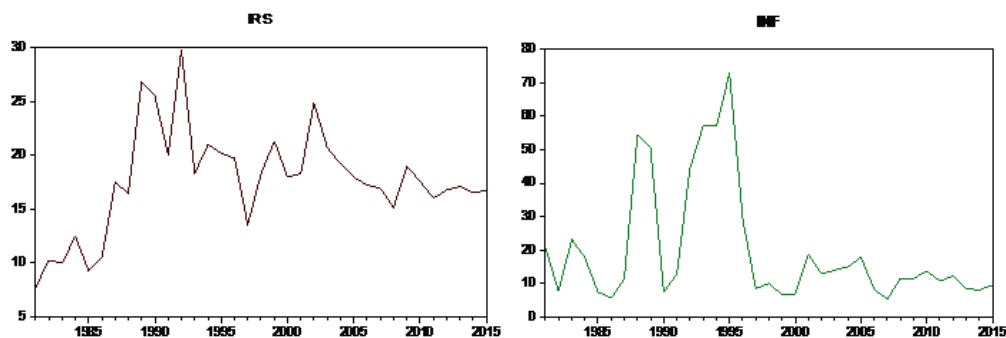
- (i) H_0 : There is no significant and no positive relationship between commercial banks' lending rates and average manufacturing capacity utilization rates in the 1981 – 2015 period
 H_1 : There is significant and positive relationship between commercial banks' lending rate and average manufacturing capacity utilization rates in the 1981 – 2015 periods
- (ii) H_0 : There is no significant and no negative relationship between commercial banks' total loans and advances to manufacturing sector and average manufacturing capacity utilization rates in the 1981 – 2015 periods.
 H_1 : There is significant and negative relationship between commercial banks' total loans and advances to manufacturing sector and average manufacturing capacity utilization rates in the 1981 – 2015 periods.

Data Analysis and Interpretation of Results

Yearly time series data for the period of 1981 and 2015 are used empirical analysis by examining the characterization of the variables used. This involves testing the stationarity of the data in each variable. I will test for unit root resulting from Augmented Dickey-Fuller (ADF) test. To proceed with the test, the graph of each series is first visually drawn and examined to see whether a trend is present or not as shown below:

Figure 2: The Graph of the Variables to be Regressed.





Sources: Central Bank of Nigeria, Statistical Bulletin, 2015. Appendix II

Notes: MCU stands for average manufacturing capacity utilization; IRS represent commercial banks' lending rates; BCM denotes commercial banks' total loan and advances to manufacturing sector; and INF stands for inflation rate.

As it can be visually observed from figure 2, there is absence of a trend around in the series, only an intercept is included in testing for unit roots. In literature most time series data are non-stationary and using non-stationary variables in the model might lead to spurious regressions (Granger and Newbold 1977). The first or second differenced terms of most variables will usually be stationary (Romanathan, 1992) all the series are tested at levels, first and second differences for stationarity using the Augmented Dickey – Fuller (ADF) test. The Augmented Dickey – Fuller (ADF) test shows that the time series data are stationary at level at 10% level of significance (See Appendix III). Hence, we run the regression with the data being at levels

Regression Result

The equations derived in this study were estimated using OLS multiple regression technique and for casual observation they are presented below:

$$\hat{MCU} = 53.88669 + 1.15BLM - 0.50994IRS - 0.097339INF \dots\dots (iii)$$

$$Se = (6.036843) \quad (3.31) \quad (0.342404) \quad (0.09811)$$

$$t = (8.926303) \quad (3.481143) \quad (-1.489191) \quad (-0.992133)$$

$$R^2 = 0.418153 \text{ or } 42\%$$

$$\text{Adjusted } R^2 = 0.361845 = 36\%$$

$$F = 7.426199$$

$$\text{Durbin Watson (D.W)} = 0.427504$$

$$F_{0.05}(v_1=3, v_2=35) = 2.29 \text{ and } f_{0.01}(v_1=3, v_2=35) = 4.51$$

Sources: Appendix I and F-statistics Table

Considering the property of OLS and the assumptions of the stochastic terms, the regressed equation (iii) can be used for prediction and forecasting of the dependent variable (MCU) with more reliability. The above regression is also free of auto correlation and spurious regression which can be observed from the rule of thumb, that is, Durbin-Watson statistic (D.W) is greater than the coefficient of determination R^2 .

In equation (iii) above, the coefficient of commercial bank's total loans and advances to manufacturing sector (BLM) is positive (1.15) relationship between the average manufacturing capacity utilization in Nigeria. In the same line, since of $F = 7.426199$ is greater than F table at 1% and 5% significant level, it is mandatory to reject the null hypothesis (H_0) in hypothesis (ii) that there is no significant and no negative relationship between commercial banks' loan and advances and the average manufacturing capacity utilization in Nigeria. To further explain, loans and advances to manufacturing sector have a positive significant to the capacity utilization of the sector. For instance, if the purpose of getting loans by a manufacturer is to acquire more capital, that is increase investment, we should expect that an increase in loans and advance would be associated with an increase in productive capacity. If all things remain the same the rate of capacity utilization is bound to increase.

Also, the coefficient of commercial banks' lending rate (IRS) is negative (-0.50994) relationship between the average manufacturing capacity utilization (MCU). From our F - statistic we can test for the significant of the coefficient. F calculated is 7.426199 and the F -table is $F_{0.01}(3, 35) = 4.51$, $F_{0.05}(3, 35) = 2.92$. Since $F = 7.426199$ is greater than the F table at both the 1% and 5% level of significance, it is justifiable to reject null hypothesis (H_0) of the first hypothesis, that there is no significance and no positive relationship between commercial bank' lending rates and average manufacturing capacity utilization in Nigeria between 1970 to 2008. This result indicates that interest rate reduces capacity utilization in manufacturing sector. It is also agreed that it is partly responsible for the high cost of production of goods and services in the manufacturing sub sector in the Nigerian economy. High interest rate scare investor which makes the potentials in manufacturing sub- sector not fully realized.

Furthermore, the coefficient of the current rate of inflation is statistically insignificant at 1% and 5% level and is also inversely related to the average manufacturing capacity utilization in Nigeria within the period of the study. This relationship indicates that the inflation rate (INF) will also contribute to bottlenecks faced by the manufacturing subsector in Nigeria. Finding suggests that the inflation rate is a contributing factor to high lending rate in Nigeria as observed by Adebisi, 2001.

Finally, the estimated equation explains 42%, which is the value of R^2 , of the total variation in the average manufacturing capacity utilization in Nigeria (MCU). The F –statistic is insignificant at the 1% and 5% level, indicating that the equation has a fairly goodness of fit. Also since the Durbin – Watson statistic (D.W) is greater than the F statistic, then, it is justifiable to say that the regression is not a spurious regression and that the D. W. value also denote the regression is free of autocorrelation as it is quite low (i.e., 0.42).

Conclusion and Recommendations

From the OLS regression, several interesting conclusions can be drawn; first, interest rates and the inflation rate have a weak, insignificant on the performance of the manufacturing sub-sector in Nigeria. This is as result of the fact that the two macroeconomic variables partly contribute to high cost of production of goods and services in Nigeria. In other words, increase in the interest rate and inflation rate will bring about decrease in the manufacturing capacity utilization .

Also, the study empirically reveals that the commercial banks' loan and advances has promoted manufacturing growth between the periods 1970 to 2008 as it is seen in the regressed model.

On the basis of this research finding, the following recommendation are made too offset the weak, negative significant value of interest rates on the performance of manufacturing sectors:

1. Banks' interest rates that have been stochastic over the years, should be socialize to give confidence and encouragement to the investors and industrialists to increase investment in the manufacturing sector and hence journey toward rapid industrialization and economic development will be achieved.
2. Interest rates policies should be geared towards eliminating obstacles to establishment of new investment or expanding the already existing ones. This can be done by eliminating all obstacles to profits from investment, such as high cost of raw material and high exchange rate. To this end, the elimination or ban of some raw materials from export items would be commendable as this would go a long way, all things being equal, in enhancing increased capacity utilization in the manufacturing sector.
3. To reduce inflationary expectation, government should promote policy transparency. Transparency tends to lower inflationary expectation by providing an implicit commitment mechanism on the part of the central bank. This makes the policy to become more credible and the public can form expectations that are closer to the policy target.

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Appendix I
The Rgression Result from 7 Versions of Eviews

Dependent Variable: MCU
Method: Least Squares
Date: 11/03/16 Time: 16:25
Sample: 1981 2015
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	53.88669	6.036843	8.926303	0.0000
BLM	1.15E-05	3.31E-06	3.481143	0.0015
IRS	-0.509904	0.342404	-1.489191	0.1465
INF	-0.097339	0.098111	-0.992133	0.3288
R-squared	0.418153	Mean dependent var	47.14029	
Adjusted R-squared	0.361845	S.D. dependent var	11.32160	
S.E. of regression	9.044217	Akaike info criterion	7.349339	
Sum squared resid	2535.734	Schwarz criterion	7.527093	
Log likelihood	-124.6134	Hannan-Quinn criter.	7.410699	
F-statistic	7.426199	Durbin-Watson stat	0.427504	
Prob(F-statistic)	0.000692			

Note: MCU represent average manufacturing capacity utilization
IRS= interest rate BLM= Commercial Banks' Loans and Advances to the
Manufacturing Sector
INF= Inflation Rates

Appendix II
Data for Regression Analysis

obs	MCU	BLM	IRS	INF
1981	73.30000	2659.800	7.750000	20.81282
1982	63.60000	3037.600	10.25000	7.697747
1983	49.70000	3053.100	10.00000	23.21233
1984	43.00000	3083.500	12.50000	17.82053
1985	38.30000	3232.200	9.250000	7.435345
1986	38.80000	4475.200	10.50000	5.717152
1987	40.40000	4961.200	17.50000	11.29032
1988	42.40000	6078.000	16.50000	54.51123
1989	43.80000	6671.700	26.80000	50.46669
1990	40.30000	7883.700	25.50000	7.364400
1991	42.00000	10911.30	20.01000	13.00697
1992	38.10000	15403.90	29.80000	44.58884
1993	37.20000	23110.60	18.32000	57.16525
1994	30.40000	34823.20	21.00000	57.03171
1995	29.29000	58090.70	20.18000	72.83550
1996	32.46000	72238.10	19.74000	29.26829
1997	30.40000	82823.10	13.54000	8.529874
1998	32.40000	96732.70	18.29000	9.996378
1999	34.60000	115759.9	21.32000	6.618373
2000	36.10000	141294.8	17.98000	6.933292
2001	42.70000	206889.0	18.29000	18.87365
2002	54.90000	233474.7	24.85000	12.87658
2003	56.50000	294309.6	20.71000	14.03178
2004	55.70000	332113.7	19.18000	14.99803
2005	54.80000	352038.3	17.95000	17.86349
2006	53.30000	445792.6	17.26000	8.239527
2007	53.38000	487576.0	16.94000	5.382224
2008	53.84000	932799.5	15.14000	11.57798
2009	58.92000	993457.0	18.99000	11.53767
2010	55.82000	987641.0	17.59000	13.72020
2011	58.40000	1053213.	16.02000	10.84079
2012	58.20000	1068342.	16.79000	12.21701
2013	58.10000	1179700.	17.10000	8.475827
2014	58.30000	1647500.	16.50000	8.057383
2015	60.50000	1736200.	16.77000	9.620000

Note: MCU represent average manufacturing capacity utilization rate
 IRS= interest rate(%)
 BCM= Commercial Banks' Loans and Advances to the Manufacturing Sector (Million Naira)
 INF= Inflation Rates(%)

Source: Central Bank of Nigeria, Statistical Bulleting, 2015

Appendix III

Augmented Dickey-Fuller Unit Root Test at Level for the Variable MCU

Null Hypothesis: MCU has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.207249	0.0112
Test critical values: 1% level	-4.252879	
5% level	-3.548490^^	
10% level	3.207094^^^	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Unit Root Test at Level for the Variable BLM from

Null Hypothesis: BLM has a unit root

Exogenous: None

Lag Length: 8 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.025305	0.0430
Test critical values: 1% level	-2.656915	
5% level	-1.954414^^	
10% level	1.609329^^^	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Unit Root Test at Level for the Variable IRS

Null Hypothesis: IRS has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.377113	0.0190
Test critical values: 1% level	-3.639407	
5% level	-2.951125^^	
10% level	2.614300^^^	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Unit Root Test at Level for the Variable INF

Null Hypothesis: INF has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.746130	0.0769
Test critical values: 1% level	-3.639407	
5% level	-2.951125	
	-	
10% level	2.614300^^^	

*MacKinnon (1996) one-sided p-values.

Note:

^Significant at 1 percent level

^^Significant at 5 percent level

^^^Significant at 10 percent level