Commercial Bank Credit and Manufacturing Sector Output in Nigeria

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Abstract
The study examined the effect of commercial bank credit on the manufacturing sector output in Nigeria from 1980 to 2015 using Cochrane-Orcutt method. Five variables of manufacturing sector output, inflation rate, interest rate, loans and advances and broad money supply were used for the study. The variables were tested for unit root using the Augmented Dickey Fuller approach and were found to be stationary at levels. The study found that, inflation rate and interest rate have negative effect on manufacturing sector output while loans and advances and broad money supply have positive effect with manufacturing sector output in Nigeria. The study therefore recommended formulation and implementation of policies that aim at reducing both inflation and interest rates on one hand and on the other hand, increasing both loans and advances as well as broad money supply so as to enhance improvement in the sector’s output.

Key words: Manufacturing Sector, Bank Credit, Cochrane-Orcutt.

1. Introduction
Manufacturing sector plays a crucial role in the development of modern economy the world over. Manufacturing sector as a sub-sector of the industrial sector refers to the productions of goods and services through combined utilization of raw materials and other production factors such as labor force, land and capital or by means of production process. In advanced economies, the manufacturing sector is a leading sector in many respects. It is an avenue for increasing productivity related to import replacement and export expansion, creating foreign exchange earning capacity; and raising employment and per capita income which causes unique consumption patterns. Furthermore, it creates investment capital at a faster rate than any other sector 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 the services sector in a number of Organization for Economic Co-operation and development (OECD) countries (Anyanwu, 2010). In recognition of these potential roles of the sector, successive governments in Nigeria have continued to articulate policy measures and programmes to achieve industrial growth incentive and adequate finance (Orji, 2012). To underscore the pivotal and critical role the manufacturing industry plays in capital formation, domestic savings and its effect in the realization of sustainable economic growth and general prosperity in Nigeria, the federal government at different times introduced a number of schemes such as World Bank SME II Loan Scheme (1987), Small Scale Industries Credit Scheme (1971), established Industrial Development Centres, National Economic Reconstruction Fund (NERFUND), Nigerian Bank for Commerce and Industries, Nigerian Industrial Development Bank all aimed at improving and sustaining the performance of the sector. In 2010, the federal government through the Central Bank of Nigeria made available the sum of ~N=200 billion as Manufacturers’ Intervention Fund. “The objectives of the fund include fast-tracking the development of the manufacturing sector of the Nigerian economy by improving access to credit to manufacturers; improving the financial position of the Deposit Money Banks; increasing output; generating employment; diversifying the revenue base, as well as increasing foreign exchange earnings. It is also meant to provide inputs for the industrial sector on a sustainable basis.”(CBN, 2010). Similarly, the involvement of the private sector such as the Dangote group, Honey well among others in the manufacturing sector has boosted its development.

The role of deposit money bank credits in the efficient and effective performance of the manufacturing sector cannot be overemphasized, hence the Federal Government’s Appropriation Bill in recent years has as one of its broad policy objectives to achieve a high economic growth rate i.e GDP of at least 5% through a better mobilization and prudent use of economic resources. These objectives are not achievable without significant levels of resources from the financial sector being mobilized and deployed to finance business expansion and growth. Banks have to be effective intermediaries for mobilizing and channeling deposits to the productive sector of the economy especially the manufacturing sector. However, in spite of continuous policy strategy to attract credits to the manufacturing sector, the Nigerian manufacturing enterprises have remain unattractive for deposit money bank credits at low lending rate (Ogar, Nkamare, & Efiong,. 2014). For instance, as indicated in the central bank of Nigeria (CBN report, 2009), almost throughout the regulatory era, commercial banks loans and advances to the manufacturing sector deviated persistently from prescribed minima. Accordingly, the
manufacturing sector in Nigeria is faced with the problem of accessibility of funds for productive investment, hence its poor performance in recent years (Edirisuriya, 2008). It is against this back ground that this paper intends to investigate the effects of deposit money bank credit on the manufacturing sector in Nigeria. Also, given the present government’s policy twist of diversifying the economy away from oil towards non oil in which manufacturing sector is central on one hand, and on the other hand increasing the rates of interest on loans as signaled by the recent hike in the MPR from 12 to 14, calls for the investigation of the effect of bank credit which is largely determined by the prevailing interest rate on the manufacturing sector output in Nigeria. Also, from the empirical works reviewed, none of the studies relating to this study made use of the Cochrane-Orcutt approach which has the capability of correcting for serial correlation and none of the studies to the best knowledge of the researchers is up to 2015. This study is therefore seeks to fill these gap.

The rest of the paper is divided into five sections of literature review; theoretical and empirical review; methodology of the study; analysis of the result; and conclusion and policy recommendations.

2. Literature Review

This sub-section of the paper reviews literature commercial bank credit and manufacturing sector output in Nigeria.

Commercial Bank Credits

Credit is the extension of money from the lender to the borrower. Ajayi (2000) noted that credit implies a promise by one party to pay another for money borrowed or goods and services received. Credit cannot be divorced from the banking sector as banks serve as a conduit for funds to be received in form of deposits from the surplus units of the economy and passed on to the deficit units who need funds for productive purposes (investment). Banks are therefore debtors to the depositors of funds and creditors to the borrowers of funds.

According to CBN (2003), the amount of loans and advances given by the banking sector to economic agents constitute bank credit. Credit is often accompanied with some collateral that helps to ensure the repayment of the loan in the event of default. Credit channels savings into investment thereby encouraging economic growth. Thus, the availability of credit allows the role of intermediation to be carried out, which is important for the growth of the economy.

According to Nzotta (2002), the factors that determine lending in Nigeria include contact position of the bank, risk and profitability of various types of bank credit, economic condition, monetary policies, ability and exposure of bank personnel, credit need of the area served and the nature of the source of bank. Nzotta said bank credit is said to mean the act of a bank giving out advances to a debtor after considering the risk and profitability that must follow such lending decision.

Anuolam (2008) defined commercial bank credit as a process where a commercial bank provides loan or advance to a single borrower or group of individual or client. It is believed that bank credit contributes significantly to banks’ profitability, with its disparities explained by the difference in their lending rates, lending policies and unavoidable competition that may be between banks.

The credits granted by Nigerian commercial banks are predominantly of a short-term nature. This perhaps, is to be expected in view of the fact that the activities of commercial banks over time concentrated in the financing of foreign trade. With the growth of the economy and the wider outlets for bank funds which this has brought about, there has been a change in the pattern of bank lending. In particular, the rapid growth of industrial production has increased the demand for bank credit on the part of industrial firms. Financial institutions such as commercial banks and merchant banks have increasingly been providing finances for industries, some of which are managed by a rapidly growing number of indigenous entrepreneurs. Indeed, under the credit guidelines prescribed by the Central Bank since 1964, the banks have been encouraged to reallocate credit and re-channel it to the productive sectors of the economy (Olajide, 1976).

Bank credit can be described as a process of making fund available to another sector of the economy based on some agreed terms in respect of repayment with interest. Loan may be simple, fixed payment, coupon bond and discount bond.
Bank credits to the manufacturing are often referred to as business loans/advances. Business loan provides financial assistance for either small businesses that are in dire need of capital or large ones that need additional funding for expansions (Sanusi, 2009). The term ‘loan’ refers to the amount borrowed by one person or organization from another. The amount is in the nature of loan and refers to the sum paid to the borrower. Thus, from the view point of borrower, it is ‘borrowing’ and from the view point of bank, it is ‘lending’.

Loan may be regarded as ‘credit’ granted where the money is disbursed and its recovery is made on a later date. It is a debt for the borrower. While granting loans, credit is given for a definite purpose and for a predetermined period. Interest is charged on the loan at agreed rate and intervals of payment. ‘Advance’ on the other hand, is a ‘credit facility’ granted by the bank. Banks grant advances largely for short-term purposes, such as purchase of goods traded in and meeting other short-term trading liabilities. There is a sense of debt in loan, whereas an advance is a facility being availed of by the borrower. However, like loans, advances are also to be repaid. Thus a credit facility- repayable in installments over a period is termed as loan while a credit facility repayable within one year may be known as advances. However, in the present study, these two terms shall be used interchangeably.

Overview of the Nigerian Manufacturing Sector

The manufacturing sector has been widely acknowledged as the springboard for sustainable economic development. In particular, developing countries including Nigeria have since the 1970s shown increased interest in the promotion of this sector for three main reasons: the failure of past industrial policies to generate efficient self-sustaining growth; increased emphasis on self-reliant approach to development and the recognition that dynamic and growing real sector can contribute substantially to a wide range of developmental objectives (Olorunshola, 2009). In the development process, the manufacturing sector is considered critical as it is expected to absorb excess agricultural labour released from the rural environment (Ogunrinola and Osabuohien, 2010). ‘Essentially, the process of modernization and development commence when a country undertakes effort to aggressively embrace manufacturing sector’ (Sagagi, 2007:4). Thus, it is safe to say that if any state in the federation desires to develop and create prosperity for its people, it must as a matter of fact, create an environment where manufacturing activities are facilitated and supported to grow.

Structurally, across the Manufacturers Association of Nigeria (MAN)’s classification of the sector into large, medium and small scales, the following sub-sectors or groups constitute the Nigerian manufacturing sector: Food, Beverages & Tobacco; Chemical and Pharmaceuticals; Domestic and Industrial Plastic and Rubber; Basic Metal, Iron and Steel and Fabricated Metal Products; Pulp, Paper & Paper Products, Printing & Publishing; Electrical & Electronics; Textile, Wearing Apparel, Carpet, Leather & Footwear; Wood and Wood Products Including Furniture; Non-Metallic Mineral Products; Motor Vehicle & Miscellaneous Assembly (Jide, 2010).

Although Nigeria had a long history of productive manufacturing sector with Lagos, Kano, Ibadan, Kaduna, Warri and Port Harcourt being the major hubs of manufacturing activities, however, the fortune of the sector in the last three decades have dwindled. It is obvious that the growth, performance and productivity of Nigeria’s manufacturing sector at present has taken the turn for the worse and the sector no longer plays the key role it played to propel the economy about three decades ago (Ku, Mustapha and Goh, 2010). According to the Manufacturers Association of Nigeria (MAN) in 2009, about 2,850 manufacturing firms either permanently closed shop or temporarily halted production in the last two decades, rendering thousands jobless and causing serious multiple ripples across several sectors of the economy (Mazi, 2010 and Sangosanya, 2011). The conditions of the sector can only be said to have deteriorated given the fact that the much needed enabling environment of economic and social infrastructures have all gotten worse. Capacity utilization in the sector over the last five years has been anything but encouraging averaging at about 37% just as demand for home manufactured goods has flattened as imported goods which are cheaper and of slightly higher quality are more patronized (Corporate Nigeria, 2012). According to Ladeinde (2011), the fact that most Nigerians still prefer imported goods is partly because of status symbol perception but the truth remains that most locally-made goods do not measure up to minimum acceptable quality standards. Still some other people believe that poor quality of our manufactured goods is not really the problem but the lack of funding.

The Structure of Manufacturing Sector in Nigeria

According to the Bureau of Public Enterprise (BPE) (2006), players in the Nigerian industrial and manufacturing sector can be classified into four groups, Multinational, National, Regional and Local. However, the Manufacturers Association of Nigeria has categorized its industries into Large, Medium and Small Scales in line with the National Council of Industries (NCI) classification.
The Manufacturers Association of Nigeria (MAN) (2009), Standard Organization of Nigeria (SON), (2011), and the Raw Materials Research and Development Council (RMRDC), (2013), classified manufacturing sectors on the basis of the following products sectoral groups in Nigeria: Food, Beverages & Tobacco; Chemical and Pharmaceuticals; Domestic and Industrial Plastic and Rubber; Basic Metal, Iron and Steel and Fabricated Metal Products; Pulp, Paper & Paper Products, Printing and Publishing; Electrical and Electronics; Textile, Wearing Apparel, Carpet, Leather and Footwear; Wood and Wood Products Including Furniture; Non-Metallic Mineral Products; Motor Vehicle and Miscellaneous Assembly.

### The Performance of the Manufacturing Sector in Nigeria

The performance of the manufacturing sector output in Nigeria is encapsulated in Table 1 and Figure 1.

<table>
<thead>
<tr>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output (N' billion)</td>
<td>1,387.78</td>
<td>1,416.79</td>
<td>1,670.73</td>
<td>1,592.49</td>
<td>1,505.66</td>
<td>2,143.45</td>
<td>3,578.66</td>
<td>6,586.62</td>
</tr>
</tbody>
</table>


Table 1 showed manufacturing sector output in Nigeria from 1980 to 2015 while Figure 1 revealed the growth rate. It is evident from Figure 1 that, apart from the 1985 which marks the eve of Structural Adjustment Program, the manufacturing sector output has never increased above 20%. This epileptic growth rate in spite of the several government efforts is unencouraging.

### 3. Theoretical/Empirical Review

The Loanable Funds Theory of Interest Rate

This paper adopted the loanable funds theory of interest rate given its vagaries in explaining the dynamics of bank credit and the cost of the credit vis-à-vis investment decisions. According to the theory, the rate of interest is the price of credit which is determined by the demand and supply of loanable funds. The demand for loanable funds has primarily three sources; government, businessmen and consumers who need them for purposes of investment, hoarding and consumption. The government borrows money for constructing public works or for war preparations. The businessmen borrow for the purchase for capital goods and good starting investment...
projects. Such borrowings are interest elastic and depend mostly on the expected rate for profit as compared with the rate of interest. The demand for loanable funds on the part of consumers is for the purchase of durable consumer goods. Individual borrowings are also interest elastic. The tendency to borrow is more at a lower rate of interest than at a higher rate. Therefore, the demand curve for investment funds according to this theory slopes downward showing that less funds are borrowed at a higher rate and more at a lower rate of interest.

The theory of loanable funds provides a link between commercial bank credits and manufacturing sector output in that, it buttresses the fact that borrowing for investment in the manufacturing sector is interest rate elastic since it is determined by the existing rate of interest.

Several studies have previously empirically investigated the effect of the commercial bank credit on the manufacturing sector. Some of these studies are reviewed below:

Ebi and Emmanuel (2014) investigated the impacts of commercial bank credit on Nigeria industrial subsectors between 1972 and 2012 using the Error Correction Model (ECM). They found that commercial bank credits impacted positively and significantly on the manufacturing sub-sector in Nigeria, commercial bank credits to mining and quarry is a positive and significant determinant of the current year Mining and Quarry output in Nigeria, previous year bank credits to real estate and construction is a positive determinant of the current year real estate and construction output, bank credits to manufacturing, mining and quarry as well as bank credits to real estate and construction correlated positively with aggregate industrial output with bank credits to real estate and construction having greater and a significant impact on industrial output. Interest rate was not an important determinant of industrial sector and industrial sub-sectors outputs, exchange rate is a negative and significant determinant of industrial sector’s outputs in Nigeria. These results point to the conclusion that, increase bank credits to industrial sector is indispensable in stimulating industrial sector growth in Nigeria.

Similarly, Imoughele and Ismaila (2013) corroborated this finding in a study on the impact of commercial bank credit accessibility and sectoral output performance in Nigerian economy for the period which spanned between 1986 and 2010. They found that, commercial bank credit has direct and insignificant impact on sectoral output performance but cumulative supply and demand for credit in the previous period has direct and significant impact on the growth of agriculture, manufacturing and the services sectors output.

Somoye (2008), investigated the performance of commercial banks in post-consolidation period in Nigeria. The paper analyzed published audited accounts of twenty (20) out of twenty-five (25) banks that emerged from the consolidation exercise and data from the central bank of Nigeria (CBN). The results revealed that consolidation programme has not improved the overall performance of banks significantly and also has contributed marginally to the growth of the real sector for sustainable development.

Adegbaju and Olokoyo (2008), investigated the lending of commercial banks to the real sector in Nigeria and found that the main key profitability ratio such as the yield on earnings assets (YEA), return on equality (ROE) and Return on Asset (ROA) were significant meaning that there is statistical differences between the mean of the bank before 2001 recapitalization and after 2001 recapitalizations. This suggested that banks also increased their lending to the real sector in order to in turn increase their profits and develop the real sector. Also, Kul and Khan (1999) in their study assessed the impact of long-run relationship between financial sector development and real sector growth using frame works of bivariate for different county samples. The outcome was that the causality pattern varies across countries according to the success of financial generalization policies implemented in each country and the level of development of the financial sector.

4.0 Methodology and Model Specification

The study employed a Cochrane-Orcutt approach within the framework of the Ordinary Least Square (OLS) method as the main econometric tool for determining the effect of commercial bank credit on manufacturing sector output in Nigeria. The coefficient of multiple determination was used to ascertain the extent to which the explanatory variables influenced the manufacturing sector output in Nigeria. The student t-test and F-statistic were used to test for both individual and overall significance of the regression while the Durbin-Watson test was applied to test for serial correlation.

The model for this study was adapted and modified from Scott and Charleen (1988), whose work was focused on the money market lending to the real sector in Canada. The model is expressed in a mathematical form of the modified model is expressed as:
Mot = f(LA, LR, INF, M2)  \hspace{1cm} 1

Where MO is Manufacturing output, LA is Loans and Advances, LR is Lending Rates, INF is Inflation Rates and M2 is Broad Money Supply.

The model is expressed in stochastic form as:

\[ MO_t = b_0 + b_1 LA_t + b_2 LR_t + b_3 INF_t + b_4 M2_t + U_t \hspace{1cm} 2 \]

Where \( b_0 \) is the intercept, \( b_1 \) – \( b_4 \) are parameter estimates and \( U_t \) is the disturbance term.

On a priori grounds,

\( b_1 \) and \( b_4 > 0 \) while \( b_2 \) and \( b_3 < 0 \)

4. Estimation and Discussion of Results

In order to determine the stationarity properties of the variables used in the study, the Augmented Dickey Fuller Test was performed. The unit root results which indicate the order of integration of each of the variables is presented in Table 2 below:

Table 2: Unit Root Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF Value @ level</th>
<th>Mackinnon Critical value @ 5%</th>
<th>Order of Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO</td>
<td>-4.9777</td>
<td>-2.9919</td>
<td>I(0)</td>
</tr>
<tr>
<td>INF</td>
<td>-3.9841</td>
<td>-3.0124</td>
<td>I(0)</td>
</tr>
<tr>
<td>LA</td>
<td>-4.2546</td>
<td>-2.9862</td>
<td>I(0)</td>
</tr>
<tr>
<td>LR</td>
<td>-4.9196</td>
<td>-2.9862</td>
<td>I(0)</td>
</tr>
<tr>
<td>M2</td>
<td>-5.5316</td>
<td>-2.9862</td>
<td>I(0)</td>
</tr>
</tbody>
</table>

Source: Author’s computation

The results of the Augmented Dickey Fuller Test in the table above revealed that, all the variables are stationary at level and are integrated of order zero. This implies that, no long run information is lost thus, the application of ordinary least squares in the estimation process is therefore appropriate and not likely to yield spurious estimates.

Cochrane–Orcutt estimation

Following the result of the ADF test in Table 2, the study made use of the technique of the Cochrane-Orcutt rather than the conventional ordinary least squares for the regression analysis (OLS) since it was found via the Durbin–Watson statistic form the OLS result that the error term is serially correlated over time.

Table 3: Effect of Commercial Bank Credit on Manufacturing Sector Output in Nigeria.

Method: Cochrane – Orcutt Method AR(1)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Explanatory Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO</td>
<td>INF</td>
<td>-0.004337</td>
<td>0.00098</td>
<td>-4.425510</td>
<td>0.0021</td>
</tr>
<tr>
<td></td>
<td>LA</td>
<td>1.420742</td>
<td>0.41254</td>
<td>3.443889</td>
<td>0.0195</td>
</tr>
<tr>
<td></td>
<td>LR</td>
<td>-2.871006</td>
<td>0.78023</td>
<td>-3.679692</td>
<td>0.0125</td>
</tr>
<tr>
<td></td>
<td>M2</td>
<td>0.112380</td>
<td>0.04601</td>
<td>2.442512</td>
<td>0.0364</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>1.017104</td>
<td>0.22793</td>
<td>4.462352</td>
<td>0.0018</td>
</tr>
<tr>
<td></td>
<td>AR(1)</td>
<td>0.054122</td>
<td>0.04020</td>
<td>1.346318</td>
<td>0.2447</td>
</tr>
</tbody>
</table>

\[ \bar{R}^2 = 0.68 \hspace{1cm} D.W = 2.14 \hspace{1cm} F-Statistic = 9.36 \hspace{1cm} \text{Prob}(F-Stats) = 0.0004 \]
The result of the model using Cochrane-Orcutt method in Table 3 clearly showed that all the variables are correctly signed and statistically significant at 5% level of significance after correcting for the serial correlation. The result revealed that inflation rate (INF) and lending rate (LR) are negatively related to manufacturing sector output. A unit change in each of these variables affects manufacturing sector output (MO) negatively by 0.004337 and 2.871006 units respectively. On the other hand, loans and advances (LA), and money supply (M2) are positively related to manufacturing sector output (MO). A unit change in the variables affects manufacturing sector output positively by 1.420742 and 0.112380 units respectively. These findings conforms to the findings of Imoughele and Ismaila (2013) and Ebi and Nathan (2014).

Further, the form of possible autocorrelation specified as being from an autoregressive model of order 1 [AR(1)]:

\[ H_0: \epsilon \approx AR(1), \rho \neq 0 \]

is accepted on the strength of the probability level implying that \( \rho \) is not zero and hence, the model is free from autocorrelation. This is corroborated by the high value (2.24) of the Durbin Watson statistic.

The adjusted \( R^2 \) of 0.68 showed that 68 percent of the systematic changes in the manufacturing sector output is explained by the explanatory variables while the remaining 32% is unexplained by the model. The high F-statistic value coupled with its significant probability values indicated the overall significance of the model. However, the unexplained variation of 32% is quite high which suggests to the fact that, the manufacturing sector output in Nigeria may also be affected by other critical variables other than the ones included in this model. This therefore calls for further studies in this regards with the inclusion of variables such as corruption among others.

5. Conclusion and Policy Recommendations

The study found a positive and significant effect of commercial bank credit on the manufacturing sector output in Nigeria. Specifically, the study found out that, inflation rate and interest rate (cost of capital) negatively affects manufacturing sector output. While loans and advances and money supply positively affects manufacturing sector output. It is therefore recommended that, government through the Central Bank of Nigeria should pursue policies that lower interest rate (cost of capital) and reduce inflation on one hand and increase money supply as well as loans and advances to the investors in order to increase the output of the manufacturing sector which is capable of stimulating economic growth.

References


