BANK CREDIT AND MANUFACTURING SECTOR GROWTH IN NIGERIA (1990-2017): A CAUSALITY INVESTIGATION

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Abstract

The study examined a causality investigation of bank credit and manufacturing sector growth in Nigeria for the period of 27-years, 1990-2016. Secondary data were used and obtained from Central Bank of Nigeria Statistical Bulletin. Five variables were employed for this study. These are manufacturing Sector Output proxied for manufacturing Sector Growth as the dependent variable; whereas, Broad Money Supply, Credit to the Private Sector, Interest Rate and Inflation Rate as the explanatory variables. The stationarity test revealed that all the variables of the study are stationary at first difference. Johansen co-integration test showed the existence of at least one co-integrating relationship at 5% level of significance. Vector Error Correction Model revealed that bank credit had no short-run equilibrium significant relationship with manufacturing sector growth in Nigeria. Causality test indicated that bank credit had no causal relationship with manufacturing sector growth in Nigeria. The study concluded that bank credit had not significantly contributed to manufacturing sector growth in Nigeria. The study recommended that for the economy to grow, the manufacturing sector should be encouraged in form of concessional and reduced interest rate. The study suggested that regulatory authorities should stabilize the interest rate which is capable of ensuring price stability and maintaining inflation to a single digit. This may build confidence in the banking institutions and will enable them to introduce innovations to boost manufacturing sector output in the economy.

Keywords: Bank, credit, manufacturing, sector, growth, Nigeria, causality, investigation

INTRODUCTION

Several empirical studies have been conducted in Nigeria on bank credit and manufacturing sector growth nexus by Ujuamani (2013); Emejeoka and Ugbeanu (2014); Alajide (2014); Oluwafemi, Akinlo and Elumilade (2014); Ayani (2014); Imoughele and Ismaila (2014); Ogar, Nkemare and Effiong (2015). These studies reveal a positive significant relationship between bank credit and manufacturing sector growth. While some other studies which were carried out by Abuka and Egesa (2007) in Uganda; Aurangzeb (2012) in Pakistan; Uurty, Sailaja and Demissie (2012) in Ethiopia; OLweny and Chiluwe (2012) in Kenya indicate a negative significant relationship between bank credit and private sector growth with similar time series characteristic of data. Hence, the empirical evidence by the work of Nzotta and Okereke (2009) also established that the financial system had not sustained an effective intermediation, especially credit allocation and a high level of monetization in Nigeria.

Oluitan (2013) also stated that the manufacturing sector seems to have failed to meet the expectations of the Nigerian society in terms of its contributions to the Gross Domestic Product (GDP); because, the sector is unable to provide the required needs for the economy. Hence, Nigeria, like many other developing countries, is not a strong economy in the area of manufacturing. Thus, the sector has remained a major consumer of foreign exchange, rather than being a leading growth sector in socio-economic transformation in Nigeria. As a result, this might lead to poor industrial technologies that will bring about low competitive markets and reduced general welfare of the citizenry. Thus, these conflicting results and problems create a knowledge gap in this study; and, it is against this background that the study attempts to investigate the relationship between bank credit and manufacturing sector growth in Nigeria.

THEORETICAL FRAMEWORK

This study is predicated on financial intermediation theory by Gurley and Shaw (1967). The theory explains the role of bank credit in an economy. The theory emphasized that the business of financial intermediation in any modern economy is to provide a mechanism to draw financial flows from financially exceeding agents to those having a financial need in the economy. This means that banking institution can influence manufacturing sector growth by extending credit to the sector. Recent studies such as Eyas and Abdelraheem (2014), Emecheta and Ibe (2014), Nwaru and Okorontah (2014) reveal that bank credit also promotes the function of financial intermediation in the manufacturing sector-led economy. They conclude that the function of financial services had enhanced manufacturing sector growth and development through an effective capital accumulation and investments in the sector. Lemo (2002) observed that the role of bank credit to manufacturing sector in stimulating economic growth and development cannot

be over emphasized. As a result, this is one of the most important sources of financing firms; especially, in countries where capital markets are not fully developed. Nzotta (2014) posits that bank credit is one of the important aspects of financial intermediation that provide funds to economic entities that can put them to the most productive investment in an economy. They conclude that credit availability for consumption and investment are capable of raising the level of manufacturing sector output and create employment opportunities in the economy. Hence, banks should finance any positive net present value project if the cost of investment is below the expected returns. Based on these contributions, there is a justification for anchoring this study on financial intermediation theory.

EMPIRICAL REVIEW

Leonard (2012) adopted time series econometrics technique to establish the relationship between private sector credit and manufacturing sector growth in Italy which spanned a period of 25 years (1986-2010). Variables used for the study includes Gross Domestic Product, Bank Credit to the Sector, Lending Rate and Exchange Rate. The study reveals a negative significant relationship between private sector credit and manufacturing sector growth in Italy.

Obamuyi, Edun and Kayode (2013) used a Vector Error Correction Model (VECM) to investigate the relationship between bank lending and the performance of the manufacturing sector output in Nigeria of a period of 36 years (1973-2009). Manufacturing Production, Lending Rate, Exchange Rate, Inflation, Gross Domestic Product and Financial Deepening Rate were used as variables for the study. The study shows a positive significant relationship between manufacturing sector output and bank lending in Nigeria. Based on the foregoing results, the importance of financial system as a catalyst for manufacturing sector growth and development cannot be over-emphasized.

Ogar, Nkamare and Effiong (2014) determined the relationship between commercial bank credit and its contributions to the manufacturing sector growth for a period of 21 years (1992-2012). Ordinary Least Square (OLS) was used for the analysis. Commercial Loan to the Private Sector, Interest Rate and Broad Money Supply were used as variables for the study. Commercial bank credit has a positive significant relationship between manufacturing sector output. Their findings show that commercial bank credit needed to be channeled to the credit worthy customers.

Yusuf and Ahmed (2012) adopted time series econometrics techniques to investigate the relationship between private sector credit and manufacturing sector growth in Nigeria over the period, 1985-2011. Gross Domestic Product, Lending Rate, Credit to the Private Sector, Broad Money Supply and Interest Rate were used as variables for the study. The results show a

positive significant relationship between private sector credit and manufacturing sector growth in Nigeria.

Ogujobi and Chizoba (2015) employed time series econometrics techniques to examine the activities of bank credit and manufacturing sector growth in Nigeria for a period of 30 years (1984-2013). The study used three variables namely: Gross Domestic Product, Broad Money Supply and Credit to the Private Sector. The results indicate a positive significant relationship between bank credit and the growth of the manufacturing sector in Nigeria. The study concludes that the sector has remained a major consumer of foreign exchange, with a high level of dependency on foreign products and capital goods, therefore, making relatively low contributions to foreign exchange earnings in Nigeria.

METHODOLOGY

The study applied *ex-post-facto* research design to source requisite information. An *ex-post-facto* research design is a systematic empirical inquiry that requires the use of variables which the researcher does not have the capacity to change its state or direction in the course of the study. Data for this study were sourced from the Central Bank of Nigeria Statistical Bulletin, 1990-2016.The rationale of selecting this time series data is; because, it covers a major economic reforms such as 2005 banking sector reforms in Nigeria. The variables used for this study are stated as follows: MFSO, CPS, INT, M_2 and INFL. Where: MFSO = Manufacturing Sector Output as the dependent variable of the study. Bank credit variables (explanatory variables) include: CPS= Credit to the Private Sector. INT=Prime Lending Rate. M_2=Broad Money Supply. INFL= Inflation Rate.

Model Specification

Multivariate linear regression model is used to test the null hypotheses proposed for the study: There is no long-run equilibrium relationship between bank credit and manufacturing sector growth in Nigeria, there is no causality between bank credit and manufacturing sector growth in Nigeria. Based on the formulated hypotheses, a model is adopted from the work of (Ogujobi&Chizoba, 2015).

The model is stated as: GDP = f(CPS, M_2)

Where: GDP = Gross Domestic Product as proxy for manufacturing sector output as the dependent variable, CPS= Credit to the Private Sector, M_2 = Broad Money Supply. The above model is modified in this study by introducing manufacturing sector output as proxy for GDP and was employed as dependent variable; whereas, interest rate and inflation rate were employed

as explanatory variables. Interest rate and inflation rate are introduced because multicollinearity does not exist.

The modified model was stated as: MFSO = f(CPS, INT, M_2, INFL).......................(1)

The mathematical equation becomes:

$LnMFSO = d_0 + d_1LnCPS + d_2LnM_2 + d_3INT + d_4INFL + \mu$……………………………(2)

Where: MFSO = Manufacturing Sector Output is proxy for Gross Domestic Product as dependent variable, CPS = Credit to the Private Sector, M_2 = Broad Money Supply, INT= Interest Rate (Prime Lending Rate) is the control variable and this is added to capture the reaction of investors to changes in the investment decision (cost of investment). INFL= Inflation rate is also the control variable and this is added to capture the reaction of economic trend to aggregate private sector output from the manufacturing sector. d_0 = intercept and d_1, d_2, d_3 and d_4 are the coefficients of the regression equation. μ is the stochastic or error term, while Ln is the natural log of the variables. Log transformation is necessary to reduce the problem of heteroskedasticity; because, it compresses the scale in which the variables are measured, thereby reducing a tenfold difference between two values to a twofold difference (Gujarati, 2004).

ANALYSIS AND FINDINGS

The tests for stationary of the variables were done using the Augmented Dicker Fuller (ADF) Unit Root Tests. The results in table 1 show that all the variables are integrated at levels i.e. 1(1) at the 5% or 1% level of significance.

Table 1: Unit Root Tests Analysis (E-views 8.0 output)

Variables	ADF test Statistics	Mackinnon critical vale @ 5%	No of the time difference	Remark
MFSO	3.1002345	-0.352779	1(1)	Stationary
M_2	-6.2745974	-2.030475	1(1)	Stationary
INFL	-5.8860041	-2.163728	1(1)	Stationary
CPS	3.7387972	-1.046384	1(1)	Stationary
INT	3.2345644	1.220537	1(1)	Stationary

Notes: (1) 1% level of significance, 5% level of significance, 10% level of significance.

(2) The tests accepted at 5% level of significance.

(3) Decision rule -The critical value should be larger than the test statistical value for unit root to exist.

Co-integration Test

Having established that all the variables in the model are stationary, the study then moves on to test for long-run relationship between the dependent and the independent variables using the Johansen Co-integration test (Johansen, 1991).

Table 2: Co-integration Test for MFSO, CPS, M_2, INT, INFL

Hypothesized	Max-Eigen		Trace	
No. of CE(s)	Statistic	Critical Value	Statistic	Critical Value
None	41.31151*	33.87687	76.47553*	69.81889
At most 1	19.24901	27.58434	35.16402	47.85613
At most 2	11.40328	21.13162	15.91502	29.79707
At most 3	4.475003	14.26460	4.511735	15.49471
At most 4	0.036732	3.841466	0.036732	3.841466

Trace test indicates 1 co-integrating equation (s) at 5% significant level

Max-eigenvalue test indicates 1 co-integrating equation (s) at 5% significant level

* denotes rejection of the hypothesis at 5% significant level

The result in table 2 examines the presence of long-run relationship among bank credit variables (CPS, M_2, INFL and INT) and manufacturing sector growth (MFSO). Based on the FPE and AIC lag selection criteria, the lag length adopted for the model is 1 to 2. From the results in table 2, Max-Eigen and Trace statistics indicate the presence of one co-integrating equation in the model.

Vector Error Correction Mechanism

Vector Error Correction Mechanism (VECM) was conducted to determine the speed of adjustment between bank lending and manufacturing sector growth relationship in Nigeria. Hence, this is to find out whether short-run disequilibrium can be returned to long-run equilibrium trend.

Table 3: Vector Error Correction Mechanism Test for Bank Credit and MFSO

Error Correction:	D(MFSO)	D(CPS)	D(INFL)	D(M_2)	D(INT)
CointEq1	**0.008221**	-0.020475	-14.97666	-0.023053	-0.234144
	(0.04781)	(0.01383)	(2.44279)	(0.00839)	(0.80706)
	[0.17195]	[-1.48024]	[-6.13096]	[-2.74877]	[-0.29012]

() is standard error and [] are the t-statistics

From table 3 the error correction result is positive (0.008221) therefore not rightly signed. This shows that the short-run adjustment to long-run equilibrium is not statistically significant. The study therefore, concludes that bank lending has no significant short-run relationship with manufacturing sector growth in Nigeria.

Granger Causality Analysis

Granger causality test is used to examine the causal direction; that is, which of the variables (dependent and independent variable) influences the relationship between them. The null hypothesis is: Independent variable does not granger cause the dependent variable.

Table 4: Granger Causality/Block Exogeneity Wald Test for Bank Credit
and Manufacturing Sector Growth

Variable	Chi-sq	Df	Prob.
CPS	0.049327	1	0.8242
INFL	6.31E-05	1	0.9937
M_2	0.185218	1	0.6669
INT	0.585647	1	0.4441
All	0.934623	4	0.9195

Note: Dependent variable: MFSO, * denotes significant at 1%, ** denotes significant at 5%; *** denote significant at 10%.

Based on the Chi-Square statistics and their corresponding probability values, none of the bank credit variables (CPS, INFL, M_2, and INT) has a causal relationship with manufacturing sector growth in Nigeria. The joint Chi-Square values and its corresponding probability values also indicate that bank lending variables do not jointly granger-cause manufacturing sector output. Hence, the study concludes that bank lending variables (CPS, INFL, M_2 and INT) do not have a causal relationship with manufacturing sector growth in Nigeria.

CONCLUSION

The findings indicate that bank credit has no significant relationship with manufacturing sector growth in Nigeria. This is consistent with the argument by Oluitan (2013) that the manufacturing sector seems to have failed to meet the expectations of the Nigerian society in terms of its contribution to the growth of the Gross Domestic Product. This study is limited by the difficulty in sourcing for the most suitable variables that are used to measure bank credit and Manufacturing

Sector growth. To surmount this, the study used various bank credit and Manufacturing Sector growth variables such as Manufacturing Sector Output (MFSO), Broad Money Supply (M$_2$), Credit to the private sector (CPS), Interest Rate (INT) and Inflation (INFL) etc. The study is limited to these variables; because, they are intended to capture all the activities within the scope of the study from 1990 to 2016. Thus, another limitation is the accuracy of the data that were used for this study, empirical investigation of bank credit and private sector growth in Nigeria. This limitation was overcome by using Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics data. Data from these sources have been accepted as the most reliable on the subject and which have also been used by governments and its agencies in their various economic planning activities. Finally, it is accepted by other recognized international financial institutions like the International Monetary Fund (IMF) and World Bank as the most credible official data from Nigeria. Hence, there is no short-run equilibrium significant relationship between bank lending and manufacturing sector growth in Nigeria. This implies that economic policies that are geared to increase credit to the manufacturing sector have not significantly improved productivity in the sector within a short period in Nigeria.

THE POLICY IMPLICATIONS AND RECOMMENDATIONS.

The study recommends that government should formulate functional policies such as price stability, full employment, exchange rate stability, economic growth and favourable balance of payment in order to cushion short-run economic problems such as inflation rate, interest rate and exchange rate fluctuations in the manufacturing sector. The regulatory authorities should encourage the private sector through concessional and reduced interest rate. Though, low interest package for the private sector has been provided by the Bank of Industry (BOI); thus, efforts should be made by government at all levels to encourage investors in the sector to access these funds. The monetary authorities should stabilize the interest rate which is capable of ensuring price stability and maintaining inflation to a single digit. This may build confidence in the banking institutions and will enable them to introduce innovations to the sector`s output in the economy. The study suggests that CBN and the policy makers should have a common ground in order to establish specialized banking institutions that will be responsible for financing the manufacturing investments in the economy.

CONTRIBUTION TO KNOWLEDGE

The study was able to modify the model and expanded the existing literature and updated data that will enable researchers and scholars to use it for further studies. Hence, from the results this study has also contributed to knowledge by discovering that bank credit has no significant

positive relationship with manufacturing sector output in Nigeria. The factors responsible for this can be traceable to economic and political instability and inability to implement the formulated policies by the regulatory authorities.

SCOPE FOR FUTURE STUDY

The study made the following suggestions for further research:

i. Future investigation could be carried out to ascertain the extent of relationship between bank credit to the manufacturing sector and private sector growth in Nigeria.

ii. Further research could use Generalized Method of Moment (GMM). The non-application of this model may limited knowledge; and therefore, suggest for further investigation.

iii. Finally, the study suggests that the period should be 1980-2016 to accommodate the 1986 financial liberalisation era in Nigeria.

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APPENDIX 1: Bank Credit and Manufacturing Growth in Nigeria (1990-2016)

Years	Agricultural Sector Growth (N' Billions)	Lending Rates (Prime)%	Broad Money Supply (N' Billions)	Inflation Rate %	Credit to the Private Sector (N' Billions)
1990	40.8	25.50	52.86	3.6	33.55
1992	98.6	29.80	111.11	48.8	58.12
1993	144.4	18.32	165.34	61.3	127.12
1994	165.9	21.00	230.29	76.8	143.42
1995	219.9	20.18	289.09	51.6	180.00
1996	295.8	19.74	345.85	14.3	238.60
1997	350.6	13.54	413.28	10.2	316.21
1998	382.6	18.29	488.15	11.9	351.96
1999	395.8	21.32	628.95	0.2	431.17
2000	426.2	17.98	878.46	14.5	530.37
2001	468.0	18.29	1,269.32	16.5	764.96

2002	535.8	24.85	1,505.96	12.2	930.49
2003	507.8	20.71	1,952.92	23.8	1,096.54
2004	465.8	19.18	2,131.82	10	1,421.66
2005	349.3	17.95	2,637.91	11.6	1,838.39
2006	408.4	17.26	3,797.91	8.5	2,290.62
2007	478.5	16.94	5,127.40	6.6	3,668.66
2008	520.9	15.14	8,008.20	15.1	6,920.50
2009	585.6	18.99	9,419.92	13.9	9,110.86
2010	612.3	17.59	11,034.94	11.8	10,157.02
2011	643.1	16.02	12,172.49	10.3	10,660.07
2012	694.8	16.79	13,895.39	12	14,649.28
2013	761.5	16.72	15,158.62	8.0	15,778.31
2014	823.9	16.55	17,680.52	8	17,128.98
2015	816.4	17.02	15,158.62	18.4	15,778.31
2016	8,014.2	17.54	17,680.52	19.9	17,128.98

Source: Central Bank of Nigeria Statistical Bulletin, 2016.