

How to Cite:

Chinyere, C. N., & Nneka, M. O. (2017). Appraisal of bank credit extension on the Nigerian industrial sector output (1992 to 2019). *International Journal of Economic Perspectives*, 11(1), 89–99. Retrieved from <https://ijeponline.org/index.php/journal/article/view/45>

Appraisal of Bank Credit Extension on the Nigerian Industrial Sector Output (1992 to 2019)

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Abstract--This study investigated the effect of bank credit extension on the Nigerian industrial sector output. Data for the study spanned from 1992 to 2019. Variables considered include aggregate bank loans and advances, prime lending rate, exchange rate, and inflation rate, and the contribution of the industrial sector to GDP. Data for the study was sourced from the Central Bank of Nigerian Statistical Bulletin (2019). The study adopted the Autoregressive Distributed (ARDL) Lag Model. The F-value reported that bank credit extension has a high statistical impact on the Nigerian industrial sector. Further, the ECM estimated at (-0.17910) signpost that 17.91% of deviation is corrected in the present year. Accordingly, the ARDL short-run result reported that previous values of bank loans and advances, prime lending, and inflation rate exerted a positive impact on industrial sector output. In the Long run, bank loans and advances, prime lending, and exchange rates exerted a direct impact on the Nigerian industrial sector. However, inflation and exchange rate deter the Nigerian industrial sector. More so, bank loans and advances and prime lending rates are statistically significant both in the short and long run. The study Based on the major findings, the study we conclude that bank credit extension jointly contributes significantly to the growth of the Nigerian industrial sector. Based on this, the study recommends that the apex bank should ensure that the present bank loans and advances and prime lending rate should be sustained.

Keywords---appraisal, bank credit extension, Nigerian industrial sector output.

Introduction

Principally one of the activities that contribute to the growth of any given economy is carried out by deposit money banks, they perform an indispensable role by pooling funds together and channeling same to another sector i.e. from the surplus sector of the economy to the deficit sector. Through this role banks have tended to make better the manufacturing sector, hence bank credit has fundamentally improved the manufacturing sector by the acquisition of machinery to advance production. Manufacturing is the process of transforming raw material into intermediate, semi-finished, and finished goods.

Granting credit facilities to the manufacturing sector in Nigeria is considered not justifiable by the financial institution through being highly liquid [Sogules & Nkoro \(2016\)](#). For most developing countries like Nigeria, questions have been raised concerning the poor access to manufacturing finances which have resulted in the nonexistence of growth in most of the sectors in the economy ([Olokoyo et al., 2016](#)). In developing countries' economies, one of the movers of the economy is the manufacturing sector. This is because it acts as a boulevard for an increase in the rate of productivity in the economy about imported goods and exported goods by such it upsurge foreign exchange earning capacity and also increases the rate of employment. However, when it comes to the area of investment capital, they lead the chase of creating faster than any other sector and also aiding the promotion and efficient channels of every other sector. Opined that in contributing to the Gross Domestic product, the dominant sector in this aspect happens to be the manufacturing sector, for it leads the service sector in most of Organization for Economic Co-operation and Development (OECD) countries [Andabai & Eze \(2018\)](#). In Nigeria, several policies have been put in place by the government in other to gain persistent industrial growth and sufficient finance.

The effectiveness of the bank credit in the activities of the manufacturing sector cannot be overemphasized it will always yield greater economic growth than any other sector [Sogules & Nkoro \(2016\)](#). The intermediaries' function of the bank has to be effective in other to enable smooth mobilization and channeling of funds to the manufacturing sector of the economy. Nonetheless, with several policies and strategies put in place in other to attract credit facilities such as loans, advances, and overdraft, to the manufacturing sector, still it remained unattractive to deposit money bank credits at low lending [Andabai & Eze \(2018\)](#). As proved by the central bank of Nigeria report (CBN Report 2009), there occur a persistent deviation of commercial loans and advances from the manufacturing sector. The manufacturing sector of the economy has encountered a lot of problems in recent years. According to ([Otubu, 2019](#)), one major issue that the manufacturing sector has encountered over time is the making available and the accessibility of finances for productive investment, which in return has yielded a poor performance on the economy. And also the majority of manufacturing firms in Nigeria have depended so much on the continual finances that are being generated within which may be as a result security requirement that is involved and the high-interest rate it requires externally and focus, reduces their operating

capacity. Hence the credit should be channeled into the manufacturing sector because it's perceived to be in demand of credit than other sectors in the economy such as the banking sector. It is on the premise that this research seeks to investigate the effect of bank credit transfer and economic growth. The will be significant in the following ways; the results and successive recommendations if applied will aid the policymakers to come up with policies and strategy that will enhance economic growth, and also improved investment in the manufacturing sector which will in return leads to employment. It is important to note firmly, that the study will be beneficial to researchers, academicians, statisticians among others, as it will fill the gap of literature by adding to the existing ones. The structure of this 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 (Nwoko, 1981; Agbaeze et al., 2017).

Literature Review

Conceptual clarification

The movement of finances from the lender to the borrower. Okafor et al. (2016), opines that the pledge made by a certain individual, organization, and institution to recompense another individual, organization, and institution for finances taken on loan or for goods and services. Bank and credit are inseparable because banks act as a means for accepting cash as a deposit from the surplus sector of the economy and channeled the same to the deficit sector of the economy, which demands cash for productive investment purposes. CBN (2003), the amounts of loans and advances received by economic agents from the banking sector is what constitutes bank credit. One feature of credit is that it is always followed by collateral in other to ensure the reimbursement of the loan. Hence, the accessibility of credit is very important because it enables the operation of intermediation to be carried out effectively which result in economic growth,

Mesagan et al. (2018), observe in their study that in every economy the risk and profit of several banks' credit, the monetary policies, economic condition, are some of the factors that determine the lending in a given country mostly in Nigeria. One of the contributors to the profitability of banks is the bank credits it contributes significantly to banks' profit with its variance explained by the discrepancy in their lending policies, lending rate, and also the competition that is between the banks. Hence Muchingami et al. (2017), defined bank credit as the provision of loans to organizations and individuals by the bank.

On the other hand, industrial sector output has been broadly recognized as the catalyst for consistent economic development. In most developing countries such as Nigeria, the administration has shown interest in the manufacturing sector because this sector generates effective self-sustaining growth, and self-reliance to expansion and the acknowledgment that the energetic and growing real sector can add significantly to an extensive range of developmental objectives (Style, 2020). In the development process, the manufacturing sector is well thought-out to be decisive as it is projected to mitigate surplus agricultural labor free from the rural environment (Style, 2020). fundamentally, the procedure of rejuvenation

and expansion originates when a country undertakes an attempt to assertively hold the manufacturing sector.

Theoretical underpinning

Endogenous growth theory: The emerging endogenous growth theory birthed a superior scope of economic growth and the banking sector it proposes that a well-built banking sector stimulates economic growth and also holds the growth rate of an economy can be traceable to efficient policy measures. Surrounded by these models, [Romer et al. \(1990\)](#), improved the definition of investment to include human capital and also permit for externalities in investment. However, he recommended that return on investment are to some extent diminishing or even non-diminishing. Subsequently, this suggestion has it those financial institutions such as banks when appropriately satisfying their responsibilities that can produce externalities in investment and by so doing make safe non-diminishing returns to investment in the endogenous growth model ([Okorie, 1992](#); [Emmanuel et al., 2017](#)). The major proposition of this theory, therefore, is that banking policies that accepted competition, ingenuousness, revolutionize and modernization will enhance economic growth.

Empirical review

[Style \(2020\)](#), investigated the effects of bank credits on the manufacturing sector output in Nigeria from 1981-2018. Central Bank of Nigeria (CBN) statistical bulletin was used to source data. The study adopted the Auto-Regressive Distributed Lag (ARDL) bound cointegration test approach and error correction. The study recommends that policies geared towards deepening the financial sector and enhancing the health and soundness of banks should be vigorously pursued. [Otubu \(2019\)](#), examined the impact of bank credits on the manufacturing sector in Nigeria from 1980 to 2015. The econometrics methods of ordinary least squares, co-integration, error correction model, and granger causality test was used as the main analytical tools. From the estimated error correction model, the study out found that bank credits to the manufacturing sector had a positive impact on the manufacturing sector output. In addition, the granger causality result reveals that there is a causal relationship between bank credits and manufacturing sector output in Nigeria ([Okorie, 1988](#); [Edomah, 2019](#)).

[Andabai & Eze \(2018\)](#), examined a causality investigation of bank credit and manufacturing sector growth in Nigeria for the period of 1990-2016. Secondary data were used and sourced from the Central Bank of Nigeria Statistical Bulletin. Vector Error Correction Model was used and it revealed that bank credit had no short-run equilibrium significant relationship with manufacturing sector growth in Nigeria. The causality test indicated that bank credit had no causal relationship with manufacturing sector growth in Nigeria. [Muchingami et al. \(2017\)](#), examined the impact of bank lending on manufacturing sector performance in Zimbabwe 2009-2015 using the ordinary least squares (OLS) regression model. The study established a positive relationship between commercial bank loans and the volume of the manufacturing index.

Ume et al. (2017), examined the relative impact of Bank credit on the manufacturing sector in Nigeria' 1986-2013. The study adopt the autoregressive dispersed lag (ARDL) bound addition test approach and error correction demonstration and found out that it is significant between bank credit and developed sector in Nigeria. This result is corroborated by the Dynamic ordinary least square results as well as the long-run estimate of the ARDL. This study collaborated with the study of Mbu-Ogar et al. (2017), investigated the effects of banks' intermediation role on industrial output in developing economies from 1981 to 2011. The study employs the Error correction model test. The results revealed an inelastic relationship between bank credits and industrial output in the long run.

Mesagan et al. (2018), examined the financial sector development and manufacturing performance in Nigeria from 1981 to 2015. The study employs the Error Correction Model to run the analysis. The result of the study reveals that credit to the private sector and money supply positively but insignificantly improved capacity exploitation and productivity, but negatively impacted the value-added of the manufacturing sector in the short run. Sogules & Nkoro (2016), evaluated the impact of bank credits on the performance of m manufacturing sector using annual time series data from 1970-2013. Co-integration and error alteration was adopted in the study. The result of the study reveals that bank credits have a negative and significant relationship with the developed sector in Nigeria.

Olanrewaju et al. (2015), empirically study the effect of banking sector reforms on the output of the developed sector in the Nigerian financial system between 1970 and 2011 to investigate the extent of the impact of banking sector reforms on the developed sector. The study uses yearly time series data from 1970 to 2011. The study adopts the addition analysis and error correction mechanism (ECM). The result revealed that lend rate, bank assets, an exchange rate (EXR) and genuine attention rate have low and significant effects on developed output while financial deepening and interest rate have a negative and significant crash on the output growth of the developed sector in Nigeria. Iorember & John (2016), examined the effect of commercial bank credit on the manufacturing sector output in Nigeria from 1980 to 2015 using the Cochrane-Orcutt method. Variables considered include interest rate, loans and advances inflation rate, and broad money supply. The Augmented Dickey-Fuller approach was adopted to test the unit root. The result of the study shows that interest rate and inflation rate hurt manufacturing sector output while loans and advances and broad money supply have a positive effect on manufacturing sector output in Nigeria.

Methodology

The Ex-post facto research design was adopted for the study because the study is historical. Accordingly, we sourced data from CBN Statistical Bulletin from 1992 to 2019. The data analysis technique of this study includes unit root test, Auto-regressive Distributed Lag (ARDL) Bound Co-integration test, and ARDL Co-integrating and Long-form. All these techniques were made possible via Econometric Views version 9.0. Based on the literature discussed, the model for the study is specified below:

$$INDQ = \beta_0 + \beta_1 BLA + \beta_2 PLER + \beta_3 EXCR + \beta_4 INFR + \mu \dots \dots \dots 2$$

Where:

INDQ	=	Industrial sector output
BLA	=	Bank Loans and Advances
PLER	=	Prime Lending rate
EXCR	=	Exchange Rate
INFR	=	Inflation rate
β_0	=	Intercept
β_1 - β_4	=	Coefficient of the independent variables or parameters
μ	=	Stochastic variable/error term.

Our error correction representation of the ARDL model is specified as:

$$\begin{aligned} \Delta \log INDQ_t = & \alpha_0 + \alpha_1 \Delta \log INDQ_{t-1} + \sum_{i=0}^m (\Delta BLA_{t-i}) + \sum_{j=0}^n (X_j \Delta \log PLER_{t-j}) \\ & + \sum_{k=0}^p (\partial_k \Delta \log EXCR_{t-k}) + \sum_{k=0}^q (\partial_k \Delta \log INFR_{t-k}) + \Omega ECT_t - 1 + \xi_t \end{aligned}$$

Data Analysis

Pearson correlation matrix

To determine the strength or magnitude of a linear relationship (association) between the variables under investigation, the Pearson Correlation Analysis was carried out and the result is presented in table 1 below:

Table 1
Pearson correlation analysis (all study variables were logged)

Study Variables	RGDP	BLA	PLER	EXCR	INFR
RGDP	1.000000				
BLA	0.964716	1.000000			
PLER	-0.469185	-0.543064	1.000000		
EXCR	0.376737	0.497872	-0.256147	1.000000	-0.429753
INFR	-0.469901	-0.559401	0.470854	-0.429753	1.000000

Source: E-Views Version 9.0 (2020)

The Pearson Correlation Analysis revealed that there is a strong linear relationship between bank credit extension and industrial sector output throughout the study. This, therefore, implies that bank loans and advances are strong determinants of industrial sector output. However, a moderate negative relationship among bank lending rate, inflation rate, and industrial sector output throughout the study. This suggests that an increase in bank lending rate and inflation rate brings about a significant reduction in economic growth. This result should also be taken into consideration by policy analysts while formulating policies as it has been found to have a negative but strong significance on economic growth ([Ade-Agoye, 2011](#); [Ollor & Okoye, 1983](#)).

Stationarity test

To avoid the issue of Spuriousity, we subjected each of the study variables to the Augmented Dicker-Fuller (ADF) test. The results are summarized results are presented thus:

Table 2
Summary of ADF test for all study variables

AT LEVELS					
Study Variables	ADF T-Test	ADF Test critical values @ 5% level	Prob.*	Order of Integration	Conclusion
Industrial Sector Growth	- 0.349561	-2.976263	0.9766	1(0)	Non-stationary
Bank Loans and Advances	-2.215556	-2.971853	0.2055	1(0)	Non-stationary
Prime Lending Rate	-4.017080	-2.971853	0.0045	1(0)	Stationary
Inflation Rate	-2.126706	-2.971853	0.2363	1(0)	Non-stationary
Exchange Rate	-1.857068	-2.971853	0.3466	1(0)	Non-stationary
FIRST DIFFERENCE					
Study Variables	ADF T-Test	ADF Test critical values @ 5% level	Prob.*	Order of Integration	Conclusion
Industrial Sector Growth	-4.660819	-2.981038	0.0010	1(1)	Stationary
Bank Loans and Advances	-4.896350	-2.976263	0.0005	1(1)	Stationary
Prime Lending Rate	-6.379020	-2.981038	0.0000	1(1)	Stationary
Inflation Rate	-5.348832	-2.976263	0.0002	1(1)	Stationary
Exchange Rate	-5.275435	-2.976263	0.0002	1(1)	Stationary

Source: Extracted From E-view 9.0 (2021)

Table 2 above reported that Prime Lending Rate (PLER) attained stationarity at its natural levels. However, when the model was subjected further, industrial sector output, bank credit extension proxy, exchange rate, and inflation rate attained stationary at first differencing.

ARDL bound co-integration test

The ARDL Bound co-integration test is presented below:

Table 3
ARDL bound co-integration test

Test Statistic	Value	K
F-statistic	5.293312	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01

Source: Extracted From E-view 9.0 (2021)

The ARDL Bound Test reported in table 3 affirmed that the model cointegrated. This is because the ARDL f-statistics value (5.293312) is higher than the estimated upper bound value (4.01).

Diagnostic tests

We conducted various diagnostic tests to ascertain the appropriateness, of the regression results. They are presented below:

Table 4
Robustness test of all study variables

TEST	Chi-Square/F-statistics	P-value	Decision
Breusch-Pagan Test	0.806968	0.5570	Presence of Homoskedasticity
Reset Test	3.605252	0.0714	Model is correctly specified

Source: Extracted From E-view 9.0 (2021)

Breusch-Pagan / Cook-Weisberg testsuggested that the model ishomoscedastic. This reaffirmed the four assumptions of classical linear regression. Meanwhile, the Ramsey Reset test affirmed that the model is correctly specified.

Regression result

In this section, we presented the short-run dynamics using the error correction model alongside the long-run coefficient using the ARDL long-run result.

Table 5
Short run and long-run dynamics

Dependent Variable: RGDP				
Selected Model: ARDL(1, 0, 0, 0, 0, 0)				
Date: 12/06/21 Time: 16:28				
Sample: 1992 2019				
Included observations: 28				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BLA)	0.064123	0.015920	4.027761	0.0007

D(PLER)	0.129693	0.043872	2.956140	0.0078
D(EXCR)	0.000704	0.004069	0.172898	0.8645
D(INFR)	-0.001453	0.012773	-0.113759	0.9106
CointEq(-1)	-0.179100	0.051403	-3.484222	0.0023
Cointeq = INDQ - (0.3580*BLA + 1.2760*PLER - 0.0308*EXCR - 0.0081 *INFR + 2.0456)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BLA	0.358027	0.031012	11.544909	0.0000
PLER	1.276020	0.489129	2.608757	0.0168
EXCR	-0.030778	0.016228	-1.896597	0.0724
INFR	-0.008113	0.072457	-0.111967	0.9120
C	2.045628	0.616311	3.319151	0.0034
		Durbin-Watson stat		1.625612
R-squared	0.997817	F-statistic		1306.018
Adj. R-squared	0.997053	Prob. (F-statistic)		0.000000

Source: Extracted From E-view 9.0 (2020)

The R-Squared (R^2) (99.78%) evidenced that the model has high explanatory power. The difference between the R-Squared and the adjusted R^2 is about 6.48% (99.78%- 99.71%). This shrinkage means that if the model were derived from the population rather than a sample it would account for approximately 0.07% less variance in the outcome. In addition, the Durbin Watson Statistics stood at 1.625612 (approximately 2) is within the acceptable benchmark of no of serial autocorrelation in the series (Oshikoya, 1989; Osuagwu & Nwokoma, 2017). Moreover, F-value above estimated at 0.000000 is highly significant. Hence, we conclude that bank credit extension has a high statistical impact on the Nigerian industrial sector.

Furthermore, the ECM estimated at (-0.17910) signpost that 17.91% of deviation is corrected in the present year. Accordingly, the ARDL short-run result reported that previous values of bank loans and advances, prime lending, and inflation rate exerted a positive impact on industrial sector output. In the Long run, bank loans and advances, prime lending, and exchange rates exerted a direct impact on the Nigerian industrial sector. However, inflation and exchange rate deter the Nigerian industrial sector (Kroszner et al., 2007; Adenikinju, 1998). More so, bank loans and advances and prime lending rates are statistically significant both in the short and long run.

Conclusion and Recommendation

We reiterate that banks all over the world are growth-inducing. However, they are faced with myriads of challenges in the discharge of this core duty. Hence, we investigated the effect of bank credit extension on the Nigerian industrial sector output. Based on the major findings, the study we conclude that bank credit extension jointly contributes significantly to the growth of the Nigerian industrial sector. Based on this, the study recommends that the apex bank should ensure that the present bank loans and advances and prime lending rate should be sustained.

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