

## Sectoral Allocation of Deposit Money Bank's Credit and Mining Sector Performance in Nigeria

Asuquo, Bridget<sup>1</sup>, Prof. Robinson Monday Olulu<sup>2</sup>

<sup>1,2</sup>*Department of Economics, University Of Port Harcourt, Nigeria*

**ABSTRACT** :In this paper, the impact Deposit Money Bank (DMBs) credit on mining sector performance in Nigeria between 1981 and 2019 was examined. Descriptive statistics, Phillips-Perron unit root test, cointegration test and error correction mechanism were relied upon for data analysis. The unit root test results show that all the variables are stationary at first difference. It was observed from the Johansen cointegration test that the variables have long run relationship. This provides the pre-condition for fitting the error correction model. The parsimonious ECM results revealed that banking sector credit to the mining and quarrying sector was not significant in explaining changes in mining sector's performance. This may be linked to the low value addition and poor linkage with other sectors of the economy. Interest rate was significant in explaining changes in the performance of the mining sector in Nigeria. This confirms the critical role of cost of fund in investment decision and the performance of the economy at large. Additionally, inflation rate was also critical in explaining changes in the performance of the entire sector. Given the findings, the study recommends for business friendly interest rate and improve infrastructure and business environment in the mining sector.

**KEYWORDS:** *Bank credit, mining sector, Deposit Money Bank, Interest rate, inflation rate and Nigeria*

### I. INTRODUCTION

The literature on the efforts of the deposit money banks to provide credit to the real sector in Nigeria is enormous. In the post SAP era, the real sector players had improved access to credit because of the good health and soundness of the Deposit money banks (Agada, 2010). Adem (2006) also observe that bank's traditional roles will include financing of the agricultural sector, manufacturing, commerce and the service sector. At the forefront of the financial intermediation role of the banking sector, the deposit money banks have been an extremely habitual channel of financial intermediation in both developed and emerging economies. However, the real sector of any economy, Nigeria inclusive is the fundamental fulcrum through which growth and economic development are crystalized (Lucas, 1990). Furthermore, the endogenous theory of economic growth fittingly posits that growth in an economy is a function of the huge capital accumulations through savings and its subsequent reinvestment.

The Nigerian financial sector remains sacrosanct as one of the most invaluable sector and has played a pivotal role in the mobilization of financial resources from the surplus economic units through its intermediate function and the allocation of the same to the financial deficit arm of her economy. Some initiatives of the government geared towards supporting the growth of the real sector of the economy includes the agriculture loan guarantee scheme, the agriculture and cooperative bank, Nigerian industrial development bank and the Nigerian bank for commerce and industry to mention but a few. As a rejoinder to the indisputable role of the real sector to the Nigerian economic emancipation, the Central Bank of Nigeria in September, 30th 2019 earmark a whopping three hundred billion naira codenamed Real Sector Support Facility (RSSF). The RSSF as it were at inception is meant to be a financial shock-absorber aimed at supporting the expansion of existing large firms as well as providing financial succour to new startups at an interest rate of 9 per cent. In spite of the growing credit demand by the real sector, the DMBs are cautious because of the growing volume of credit defaults by the real sector. With divergent results on role of bank credit, it becomes imperative to devote research efforts to the nexus between bank credit and performance of mining sector in Nigeria.

#### 1.1 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.

### 1.2 Empirical Literature

Saunders & Schmachter (2000) show in their empirical study over the period of 1989-1995 that implicit interest rate has a significant and positive on net interest rates and current and savings accounts tended to disappear. As a consequence of deregulation, banks have increased the cost of services provision they charge to customers. Ogunleye (2007) stated that along the trade cycle, the rise and fall in the interest rate during boom and slump respectively does not determine investment but expectation. He stated further that funds for investment may be allocated by rationing and this is evident in the Nigerian banking industry where the Central Bank of Nigeria (CBN) would give directive on the sector of the economy to which much of commercial banks loans and advances must go.

Adebanjo *et al.* (2019) conducted the impact of exchange rates on the performance of the manufacturing sector in Nigeria, using the independent variables of exchange rates, inflation rates, capacity utilization rate, the manufacturing sector's foreign direct investments and imports over the period 1990 to 2014. Error correction model was used for analysis. The empirical results of the study showed that the exchange rate has a negative significant relationship, long-run relationship and causal relationship with the performance of the sector. It was also ascertained from the results that inflation rates and capacity utilization rates have a positive significant relationship with the performance of the sector, while exchange rates, imports and manufacturing foreign direct investment have a negative significant relationship with the performance of the Nigerian manufacturing sector.

Tams-Alasia, Olokoyo, Okoye and Ejemeyovwi (2018) examined the impact of exchange rate deregulation on manufacturing output performance in Nigeria over the period 1980 to 2016. The error correction mechanism was used for the analysis. The empirical findings revealed that the exchange rate has a non-significant positive long-run effect on manufacturing industry output. However, the unidirectional causal impact of exchange rate on manufacturing output was established using the pairwise granger causality test. The study concluded that the monetary authorities should aim at stabilizing the exchange rate through the use of appropriate monetary policy tools as well as support export diversification programmes to enhance foreign exchange inflow. Having studied the impact of exchange rate fluctuation on the performance of manufacturing firms in Nigeria, using firms' profitability as a proxy for performance within the periods 1986 to 2016, Ugwu (2017) adopted the multiple regression method based on the Ordinary Least Squares estimation technique. The findings concluded that there is a statistically significant relationship between exchange rate fluctuations and the profitability of manufacturing firms in Nigeria.

In another research, Akpansung and Babalola (2008), examined the relationship between banking sector credit and economic growth in Nigeria over the period 1970-2008. The causal linking between the pairs of variables of interest were established using Granger causality test while a Two-Stage Least Square (TSLS) estimation technique was used on the recession models. The results of the Granger causality test showed evidence of unidirectional causal relationship from GDP to private sector credit (PSC) and from industrial production index (IND) to GDP. Estimated regression models indicated that private sector credit impacts positively on economic growth over the period of coverage in the study.

Bakare *et al.* (2015) examined the extent to which banks' credit affects economic growth in Nigeria. The data used was collected from the Central Bank of Nigeria statistical bulletin for a period of 24 years from 1990 to 2013. We used credit to the private sector, credit to the public sector and inflation to proxy commercial bank credit while Gross Domestic Product proxies economic growth. Augmented Dickey Fuller (unit root) test was used to test stationarity which reveals that all the independent variables and dependent variable were stationary at first difference, the trace statistics and maximum eigenvalue test were used to test for co-integration. The result shows that the lagged value of credit to the private sector is positively and significantly influencing economic growth in Nigeria while the lagged value of credit to the public sector shows a positively insignificant relationship with GDP. Lagged value of inflation shows a negatively significant relationship with economic growth.

Timsina (2014) assessed the impact of commercial bank credit to the private sector on the economic growth in Nepal from supply side perspectives. The study has applied Johansen co-integration approach and Error Correction Model using the time series data for the period of 1975-2013. The empirical results showed that bank credit to the private sector has positive effects on the economic growth in Nepal only in the long run. Nevertheless, in the short run, a feedback effect from economic growth to private sector credit was observed. More specifically, the growth in real private sector credit by 1 percentage point contributes to an increase in real gross domestic product by 0.40 percentage point in the long run.

Nwandu (2016) examined the effect of rising interest rate on the performance of the Nigerian manufacturing sector. Data for the study spans 1981 to 2015. The models were analyzed using the ordinary least squares. Findings from the study showed that the rising interest rate in Nigeria has a negative effect on the contribution of the manufacturing sector to GDP as well as on the average capacity utilization of the Nigerian manufacturing sector. This implies that the rising interest rate in Nigeria impedes the activities and the performances of the Nigerian manufacturing sector. Thus, the study recommended that interest rate be managed for enhanced economic growth.

## II. MATERIALS AND METHODS

### 2.1 Research Design

The paper adopted the ex-post-facto research design under which provides the empirical pathway for estimating the data.

### 2.2 Model Specification

This study examines the impact of deposit money banks' credit on Nigeria's mining sector performance. The theoretical underpinning of this study is the Cobb-Douglas production function and the model is provided as:

$$MIGDP = BCMIS^{a_1} INTR^{a_2} INFR^{a_3} U^e \quad (1)$$

$$\ln MIGDP = \alpha_0 + \alpha_1 \ln BCMIS + \alpha_2 \ln INTR + \alpha_3 \ln INFR + e \quad (2)$$

Equation (1) above could also be transformed into a linear form thus:

Where: Ln = Natural Logarithm,  $\alpha_0 - \alpha_3$  = parameters, MIGDP = Mining sector contribution to Real Gross Domestic Product, BCMIS = Banking sector Credit to the mining sector, INTR = Interest rate, INFR = Inflation rate,  $e$  = Random term, The model a-priori theoretical assumption is as stated as:  $\chi_1 > 0$ ,  $\chi_2 < 0$ ,  $\chi_3 < 0$

### 2.3 Data Analysis Techniques

The time series data for this study sourced from the CBN Annual Statistical Bulletin were analyzed using the descriptive analysis, the unit root test, cointegration test and error correction model (ECM) among others techniques of data analysis. The Phillips-Perron (PP) test was applied in testing for the unit root test. Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. The stationary linear combination is called the cointegrating equation and may be interpreted as a long-run equilibrium relationship between the variables. The ECM method was adopted because of the inherent theoretical compatibility with the Johansen cointegration test.

## III. RESULTS AND DISCUSSION

### 3.1 Descriptive Statistics

The descriptive statistics for the variables are summarized in table 1.

**Table 1: Descriptive Statistics for the variables**

Statistic	MIGDP	BCMIS	INTR	INFR
Mean	3380.12	452.62	22.11	19.12
Median	975.78	22.85	21.55	12.22
Maximum	13648.66	2215.74	36.09	72.84
Minimum	8.00	0.09	10.00	5.38
Std. Dev.	4338.39	738.48	6.18	17.07
Skewness	1.09	1.38	-0.064	1.78
Kurtosis	2.74	3.33	2.69	4.99
Jarque-Bera	7.82	12.61	0.18	27.17
Probability	0.02	0.001	0.91	0.00
Sum	131824.8	17652.19	862.17	745.72
Sum Sq. Dev.	7.15E+08	20723245	1453.069	11078.23
Observations	39	39	39	39

#### Source: Researcher's Computation (e-view)

The descriptive statistics reported in table 1 shows that there is a wide deviation from the mean of all the variables under investigation. This is evidence in the value of standard deviation for mining sector contribution to economic growth (MIGDP), deposit money banks' credit to the agricultural sector (BCAS), deposit money

banks' credit to the manufacturing sector (BCMAS), deposit money banks' credit to the mining sector (BCMIC), interest rate on credit (INTR) and price level or inflation rate in Nigeria (INFR). These wide disparities reveal the extent of deviation and instability in real sector performance and deposit money banks' credit to the real sector. The wide fluctuation in the variables is also evidenced in the minimum and maximum values. Very high disparities suggest that banking sector credit to the real sector and the performance of the sectors have been inconsistent.

### 3.2 Unit Root Test

The Phillips-Perron unit root test results are summarized in table 2-3.

**Table 2: Unit Root Test Using Philip Perron Procedure at Levels**

Variable	Philip Perronstatistic	1 %	5 %	10 %	Decision
Log(BCMIS)	-1.542	-3.616	-2.941	-2.609	Not Stationary
Log(INTR)	-2.582	-3.616	-2.941	-2.609	Not Stationary
Log(INFR)	-3.275	-3.616	-2.941	-2.609	Stationary at 5 & 10%
Log(MIGDP)	-0.943	-3.616	-2.941	-2.609	Not Stationary

**Source: Researcher's computation (e-view)**

The results of the Phillips-Perron unit root test at levels reported in table 2 reveal that all the series were not stationary at the conventional 5 percent level of significance. This is because in absolute terms the Phillips-Perron test statistics are less than their corresponding critical values. Thus, the null hypothesis of unit root in each of the variables cannot be rejected at levels. In other words, all the variables were not stationary at order zero. The evidence of non-stationarity in all the variables necessitated the differencing of the series to check if they can become upon first differencing.

**Table 3: Unit Root Test Using Philip Perron Procedure at First Difference**

Variable	PP Statistic	1%	5%	10%	Remark
Log(Bcmis)	-5.150	-3.621	-2.943	-2.610	Stationary at 1 <sup>st</sup> difference I(1)
Log(Intr)	-8.177	-3.621	-2.943	-2.610	Stationary at 1 <sup>st</sup> difference I(1)
Log(Infr)	-9.699	-3.621	-2.943	-2.610	Stationary at 1 <sup>st</sup> difference I(1)
Log(MiGdp)	-6.379	-3.621	-2.943	-2.610	Stationary at 1 <sup>st</sup> difference I(1)

**Source: Researcher's computation (e-view)**

Unit root test result displayed in table 3 shows that all the variables for investigation were stationary at order one. This implies that they attain stability by first differencing. It also shows that the null hypothesis of presence of unit root was rejected after first differencing for all the variables. The attainment of stability is a precondition for testing for long run relationship among the variable. Testing for long run relationship among the variables was carried out using the Johansen cointegration test. The choice of this test is based on the same order of stationarity for all the variables under investigation.

### 3.3 Cointegration Test Result

**Table 4: Johansen cointegration test result**

Series: LOG(MIGDP) LOG(BCMIS) LOG(INTR) LOG(INFR)				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.595639	65.54217	47.85613	0.0005
At most 1 *	0.398781	32.04058	29.79707	0.0271
At most 2	0.183060	13.21516	15.49471	0.1071
At most 3 *	0.143565	5.734125	3.841466	0.0166
Trace test indicates 2 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.595639	33.50158	27.58434	0.0077
At most 1	0.398781	18.82542	21.13162	0.1020

At most 2	0.183060	7.481034	14.26460	0.4339
At most 3 *	0.143565	5.734125	3.841466	0.0166
Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

**Source: Researcher's computation (e-view)**

The test of long run dynamics among the variables in the mining sector share of GDP model reported in table 4.6 indicates that there exist two cointegration equation in the trace and one cointegration equation in the maximum eigenvalue equations. This implies that at least one of the variables tend to adjust speedily to long run dynamics. The existence of long run relationship is a pre-condition for fitting the error correction model.

### 3.4 Estimation of ECM

The parsimonious ECM portraying the empirical relationship between bank credit and manufacturing sector performance is reported in table 5.

**Table 5: Parsimonious ECM**

Variable	Coefficient	t-Statistic	Prob.
C	0.171227	2.091474	0.0460
DLOG(BCMIS(-1))	-0.099957	-1.152769	0.2591
DLOG(BCMIS(-2))	0.294405	1.594823	0.1224
DLOG(INTR)	0.588023	1.905308	0.0674
DLOG(INTR(-1))	-1.030498	-3.150744	0.0040
DLOG(INFR)	0.095539	0.933051	0.3591
DLOG(INFR(-2))	0.255284	2.371374	0.0251
DLOG(MIGDP(-2))	-0.236936	-1.501023	0.1450
ECM(-1)	-0.256872	-1.771965	0.0877

R-squared = 0.45; Adjusted R-squared=0.29; F-statistic = 2.78; Prob (F-statistic) =0.02; DW Stat =1.72

Source: Researcher's computation (e-view)

The parsimonious error correction/long run result of mining sector's share of GDP reported in table 4.9 indicates that deposit money banks' credit to the mining sector has mix effects on the performance of mining sector by having both negative and positive sign. However, deposit money banks' credit to the mining sector is insignificant at 5 percent level. This implies that increases in deposit money banks' credit stimulated output in mining sector at lag 2 but reduced output in the sector at lag 1. Interest rate on credit also follow same trend as deposit money banks' credit with a mix effect. At level, interest rate is positively and insignificantly related to mining sector performance while at lag 1, interest rate is negatively and significantly related to mining sector performance. At lag 1, interest rate conforms with economic theory and theoretical expectation. This implies that reduction in cost of fund stimulates mining sector output and vice versa. Inflation rate has positive implication on the performance of mining sector by bearing positive sign at level and lag 2. It is also significant at 5 percent level at lag 2 but insignificant at level. This implies that price level has serious implication in the long run on mining sector's performance in Nigeria over the period under investigation. The negative sign of the error correction model and its insignificance at 5 percent level reveals that the variables in the mining sector performance model respond slowly to changes in long run dynamics. However, the goodness of fit shows that only about 45 percent of the systematic variation in mining sector performance is explain by deposit money banks' credit to the mining sector, interest rate and inflation rate.

**Table 6: Diagnostic Test Result**

Test	F-statistic	Probability	Decision
Breusch-Godfrey Serial Correlation LM Test	0.39	0.68	Accept $H_0$
Normality Test	2.2	0.33	Accept $H_0$
Breusch-Pagan Godfrey Heteroskedasticity Test	0.50	0.84	Accept $H_0$
Ramsey Rest Test	2.16	0.15	Accept $H_0$

Researcher's Computation (e-view)

The diagnostic test results of the mining and quarrying sector performance presented in table 6 shows no evidence of autocorrelation given the Breush-Godfrey LM test statistic and its probability. In like manner, the result indicated that the error term is normally distributed around it mean based on the probability value of the JaqueBera statistic. The test for heteroscedasticity shows that it is absent in the model hence the variables has constant mean and variance. Furthermore, the Ramsey RESET test indicated that no variable is missing in the model. These results provide evidence that variables/data conform to the basic assumptions of ordinary least squares estimation hence good for predication and forecast.



#### IV. CONCLUDING REMARKS

The crux of this study is on the empirical relationship between deposit money banks' credit to the real sector and performance of the mining sector. Banking sector credit to the mining and quarrying sector was not significant in explaining changes in mining sector's performance in Nigeria. The low value addition, poor linkage with other sectors of the economy and the influence of external shocks (control of output and pricing by the oil cartel OPEC) may have contributed to low investment and performance of the oil sector. Based on the findings, the study recommends for business friendly interest rate and improve infrastructure and business environment in the mining sector. These will provide incentives to investors and a veritable market for products of the sector.

#### REFERENCES

- [1]. Adebajo, J.F., Oluwasegun, E., Adegbola, O., Festus, A., Peter, O., Ben-Calab, E., Bamisele, R., Niyi-Oyebanji, M. &Damilola, E. (1999).Impact of exchange rate on the manufacturing sector in Nigeria.*International Journal of Mechanical Engineering and Technology (IJMET)*, 10(2), 1568-1583.
- [2]. Adem, W.A. (2006). The informal sector and employment generation in Nigeria: The role of credit in employment generation in Nigeria. Selected paper for the annual conference of Nigeria Economic Society, Calabar.August 22nd to 24th.
- [3]. Akpansung, A. &Babalola, S. (2011). Banking sector credit and economic growth in Nigeria: An empirical investigation.*CBN Journal of Applied Statistics*, 2(2), 51-62.
- [4]. Aqada, A.O. (2010). Credit as an instrument of economic growth in Nigeria.*Bullion*, 34(2). CBN Publication, Abuja.
- [5]. Bakare, I.A.O., Akano, A.I. &Kazeem, H.S. (2015). To what extent does banks' credit stimulate economic growth? Evidence from Nigeria.*Journal of Research in Development*, 13(1), 128-139.
- [6]. Emecheta, B.C. &Ibe, R.C. (2014). Impact of bank credit on economic growth in Nigeria: Application of reduced Vector Autoregressive (VAR) technique. *European Journal of Accounting Auditing and Finance Research*, 2(9), 11-21.
- [7]. Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 251-276.
- [8]. Nwandu, E. (2016). Impact of rising interest rate on the performances of the Nigerian manufacturing sector.*European Journal of Business and Management*, 8(10), 125-134.
- [9]. Nwaru, N.M. &Okorontah, C.F. (2014).Banks' credit as an instrument of economic growth in Nigeria.*International Journal of Business and Law Research*, 2(2), 25-33.
- [10]. Nzotta, S.M. (2014).Money, Banking and Finance: Theory and Practice.Revised Edition, HudsonJude.Owerri, Nigeria
- [11]. Saunders, A., & Schumacher, L. (2000). The determinants of bank interest rate margins: an international study. *Journal of international Money and Finance*, 19(6), 813-832.
- [12]. Tams-Alasia, O., Olokoyo, F.O., Okoye, L.U. &Ejemeyovwi, J.O. (2018).Impact of exchange rate deregulation on manufacturing sector performance in Nigeria.*International Journal of Environment, Agriculture and Biotechnology (IJEAB)*, 3(3), 994-1001.
- [13]. Timsina, N. (2014). Impact of bank credit on economic growth in Nepal.*NRB Working Paper No. 22*.
- [14]. Ugwu, O.J. (2017). Foreign exchange rate dynamics and manufacturing firms' performance in Nigeria.*International Journal of Humanities and Social Science Invention*, 6(9), 09-14.