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# Bank Lending, Economic Growth and Manufacturing Sector Performance in Nigeria: 1981-2020

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**Abstract.** Despite several government policies to stabilize the manufacturing sector in Nigeria, lots of challenges have continued to bedevil the sector unabated. It is on this basis the study is carried out to examine the nexus between bank lending, economic growth and manufacturing sector performance in Nigeria. The secondary data which spanned through 1981 and 2019 were collected from the Central Bank of Nigeria. The study, due to the strong evidence of long run relationship among the variables, conducted ARDL model to determine the nature of the relationship between the variables. Cointegration test was carried out using ARDL Bounds Test approach to cointegration. The study concluded that interest rate and inflation rate has no significant impact on manufacturing sector output in Nigeria, while commercial bank total loan has a significant impact on manufacturing sector output in Nigeria. The study found evidence of cointegration among the variables. The results implied the presence of cointegrating vectors of long run equilibrium relationships among the variables of interest. Based on the findings, the study recommended among others that the Central Bank of Nigeria in collaboration with other monetary authorities should reduce the interest rate being charged on loans from the commercial banks through the reduction of bank rate and other deposit requirements of the commercial banks, government should ensure that policies to stabilize inflation rate are formulated and implemented to increase the volume of spendable cash in the hands of individuals in order to ensure high turnover in the manufacturing sector and increase their output.

**Keywords:** Interest Rate, Inflation Rate, Exchange Rate, Gross Domestic Product, Manufacturing Output

## Introduction

The manufacturing sector plays crucial and useful roles in the development of the modern economy globally. The manufacturing sector as a sub-sector of the industrial sector refers to the production of goods and services via the combination of raw materials and other factor services such as labour force, land and capital in production process. Also, it can be said to be a segment of the economy that deals with the transformation of raw materials into finished goods through value addition. The manufacturing sector refers to those industries which are involved in the processing and production of items and indulge in either the creation of new commodities or in value addition (Adebayo, 2011).

To Dickson (2010), the manufacturing sector has contributed significantly to the industrial sector in developed countries. In advanced economies, the manufacturing sector is a force to reckon with in all respect. The manufacturing sector creates investment capital faster at a significant rate than any other sector of the economy. As per the Gross Domestic Product (GDP) contribution, the manufacturing sector performance is significant and has surpassed the service sector in several Organization for Economic Co-operation and Development (OECD) countries (Anyanwu, 2010).

The sharp reduction in the output of the manufacturing sector in Nigeria in recent times is a major concern, which had defiled all government strategies aimed at improving

productivity in the industrial sector. This worry is justifiable as posited the Kaldor's first law, which regarded the manufacturing sector as the engine of economic growth (Libanio, 2006). The abysmal performance of the sector in Nigeria has been attributed to aggressive importation of finished goods and inadequacy of financial support for the manufacturing sector, which has culminated in to the decline in capacity utilization of the manufacturing sector in the country.

The economy of Nigeria is dependent on two major priority sectors according to the Central Bank of Nigeria, signalling the necessity for loan distribution in the agricultural sector and the manufacturing sector. In view of this, Nigeria government has continued to formulate policy measures and programmes for the purpose of achieving industrial growth and adequate finance (Orji, 2012). To further appreciate the 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 schemes such as World Bank SME II Loan Scheme (1987), Small Scale Industries Credit Scheme (1971), established Industrial Development Centers, National Economic Reconstruction Fund (NERFUND), Nigerian Bank for Commerce and Industries, Nigerian Industrial Development Bank, all aimed at ensuring the improvement and sustainability of the sector's performance. In 2010, the federal government through the Central Bank of Nigeria made available the sum of N200 billion as Manufacturers' Intervention Fund. The objectives of the fund include: improving the financial position of the Deposit Money Banks; increasing output; generating employment; diversifying the revenue base, as well as increasing foreign exchange earnings, fast-tracking the development of the manufacturing sector of the Nigerian economy by improving access to credit to manufacturers. Also on sustainable basis, it is meant to provide inputs for the industrial sector (CBN, 2010). In the same vein, the involvement of the private sector such as the Dangote group, Honey Well industries among others have been seen as a boost to development in the manufacturing sector.

The level of the Nigerian manufacturing performance will continue to record a decline since the manufacturers will have even more problems in assessing raw materials due to strong competition from the foreign firms (Enebong, 2003). The manufacturing sector in Nigeria has been bedevilled with the problem of accessibility to funds. The Structural Adjustment Programme (SAP) introduced in 1986, to correct the structural imbalance in the economy for the purpose of liberalizing the financial systems did not achieve the desired results. As opined by Edirisuriya (2008), financial sector reforms are expected to promote a more efficient allocation of resources and ensure that financial intermediation occurs more efficiently. By implication, financial sector liberalization brings about competition in the financial markets, increases interest rate for savings' drive for easy access to loanable fund for investment, and hence economic growth (Asamoah, 2008). To this end, it is logical to assume that financial liberalization influences funds mobilization and accessibility required for manufacturing sector performance and by extension, economic growth.

The irregularity in the performance of the manufacturing sector in Nigeria has contributed negatively to the growth which has been ascribed as the bane of unemployment rate as well as high crime rate. This is also responsible for increase in demand for imported goods thereby making the domestic economy become highly vulnerable to foreign price changes. Basically, the inability of the financial sector to adequately support the manufacturing sector has been attributed to the poor performance of the sector (Levine, 1997; Hassan *et al*., 2018). Apart from this, the monetary policy of the Central Bank and trade policy of government have been unfriendly to the manufacturing sector. Justifiably, the financial sector is supposed to provide solid financial aids to the manufacturing sector by making funds available to manufacturers at a friendly rate of interest to reduce cost of operation and hence boost productivity. However, Nigeria, has not been able to achieve much in terms of the

manufacturing sector productivity due to it is little contribution to the economy measured in terms of output and employment (Shahbaz, 2009).

Despite several government policies on the stability of the manufacturing industry, a lot of challenges have been identified to be facing the growth of the Nigerian manufacturing industry. These challenges include; inadequate raw materials, high government bureaucracy, lack of sufficient funds for manufacturing sectors, inadequate skilled manpower, high interest rate and infrastructural challenges. In any manufacturing outfit, finance is key to its survival. Unfortunately, money is not readily available to manufacturers in Nigeria and the cost of borrowing is high where loanable fund are available for investment. In most cases, a good amount of the profit made by manufacturers is used to defray the loans to the banks. The market forces would raise the value of the foreign currencies at the expense of the domestic currency; leading to a reduction in the value of the nation's currency. The lower the value of the nation's currency, the higher and more expensive it would be the value of the foreign currencies; leading to increased costs of exchange. The more the costs of exchange increase, the less would the production lines consume foreign inputs which have been a big problem to the Nigerian manufacturing sector. Due to the deficit in the agricultural sector, there are not enough raw materials needed by manufacturing companies to increase output. Hence over-dependence on foreign raw materials for production post a lot of challenges on manufacturing industries.

Infrastructural deficit is an important variable hindering manufacturing growth in Nigeria. The manufacturing sector, is a major driver of growth in any economy. However, in Nigeria, it is quite unfortunate that the sector has been performing below expectation, leading to decline in industrial output, which has caused the sector to contribute less than 5% to the Gross Domestic Product (Udoh & Ogbuagu, 2012). Poor storage facilities, bad roads are some of the challenges faced by the Nigeria manufacturing sector. Also, the tendencies for government not providing enabling environment for businesses to strive is another destabilizing factor in Nigeria manufacturing sector. Premised upon this background, the study is therefore carried out to analyse the effect of deposit money banks on the performance of manufacturing sector in Nigeria.

The following research questions have been identified to guide the study:

What is the effect of deposit money bank credits on manufacturing sector performance in Nigeria? Is there any relationship between interest rate and manufacturing sector performance in Nigeria? What is the effect of broad money supply on manufacturing sector performance in Nigeria? Is there any relationship between inflation and manufacturing sector performance in Nigeria? And is there any relationship between economic growth and manufacturing sector performance in Nigeria?

The broad objective of the study is to examine the nexus between bank lending, economic growth and manufacturing sector performance in Nigeria. Specifically, the study seeks to; investigate the effect of deposit money bank credits on manufacturing sector performance in Nigeria; establish the relationship between interest rate and manufacturing sector performance in Nigeria, evaluate the effect of broad money supply on manufacturing sector performance in Nigeria, determine the relationship between inflation and manufacturing sector performance in Nigeria and to examine the relationship between economic growth and manufacturing sector performance in Nigeria.

**Review of Empirical Studies**

Many research works have been carried out to examine the relationship between banks' lending, economic growth and manufacturing sector in Nigeria. Several conclusions were made by the various authors who examined this relationship. For instance, Obamuyi, Edun and Kayode (2010) in a study to investigate the effect of bank lending and economic growth on the manufacturing sector in Nigeria made use of time series data covering a period of 36years

ranging from 1973-2009. The data was analysed using Co-integration and Vector Error Correction Model (VECM). The study revealed that bank lending rates and manufacturing capacity utilization significantly affect manufacturing output in Nigeria. However, the relationship between manufacturing output and economic growth could not be ascertained.

Aurang (2012) studied the contribution of the commercial banking sector on economic growth in Pakistan. The study examined 10 banks for the period of 1981-2010 using Ordinary Least Square (OLS) method and Granger Causality test. The regression results indicated that deposits, investments, advances, profitability and interest earnings had significant positive impact on economic growth. The Granger Causality test revealed that there was a bidirectional relationship between deposits, advances and profitability and economic growth in Pakistan.

In a slightly different manner, Tawose (2012) investigated the effect of bank loans and advances on industrial performance in Nigeria covering the period of 34 years (1975-2009) using Cointegration and Error Correction Model. The study showed that commercial banks' loans and advances to the industrial sector, aggregate savings, interest rate, inflation rate are major long run determinants of industrial performance in Nigeria.

Odior (2013) investigates the impact of macroeconomic factors on manufacturing productivity in Nigeria over the period 1975-2011. The study adopted the vector Error Correction Model (VECM). Findings showed that credit to the manufacturing sector in the form of loans and advances and foreign direct investment have the capacity to sharply increase the level of manufacturing productivity in Nigeria, while broad money supply has less impact.

Similarly, Ogar, Nkamare and Effiong (2014) examined the impact of commercial banks' loans on manufacturing sector performance. The study made use of Ordinary Least Square of multiple regression model to establish the relationship between the dependent variable and the independent variables and the study revealed that commercial banks' loans had a positive significant relationship with the manufacturing sector in Nigeria.

Ogunsakin (2014) investigated the impact of financial sector reforms on the performance of the manufacturing sector in Nigeria using time series data which spanned through 1980-2009. Data was analysed using the multivariate co-integration method by Johansen and Jeselius and the study revealed that financial sector reforms does not have significant impact on the growth of manufacturing output in Nigeria.

Also, Sogules and Nkoro (2016) studied the impact of bank credits on the performance of the manufacturing sector in Nigeria between1970-2013. The Error Correction Model result revealed that bank credits exhibited a negative significant impact on the performance of the manufacturing sector in Nigeria. The author established the reason for this negative relationship as credit diversion for personal use (high risks exposure), rising cost of doing business and inadequate infrastructure which tends to surpass the effect of bank credits in Nigeria.

Muchingami, Monamets and Paradza (2017) examined the impact of bank lending on manufacturing sector performance in Zimbabwe 2009-2015 using ordinary least square (OLS) regression model. The study established a positive relationship between commercial bank loans and volume of manufacturing index.

.Otubu (2019) examined the impact of bank credits on the manufacturing sector in Nigeria from 1980 to 2015. The study adopted the ordinary least squares, co-integration, error correction model and granger causality test. The study found out that bank credits had a positive impact on the manufacturing sector output. In addition, the granger causality result reveals that there is causal relationship between bank credits and manufacturing sector output in Nigeria.

Okere, Okere, and Nwaneto (2020) investigated the effects of bank credits on the manufacturing sector output in Nigeria from 1981 to 2018. The study adopted the Auto-Regressive Distributed Lag (ARDL) bound cointegration test approach and error correction. In the bound test following the ARDL, it investigated that the variables of interest in the model are bound together in the long-run and error correction term displayed a negative and

statistically significant. The negative value showed that there exists a modification speed from short-run disequilibrium towards the long-run balance. Given the error correction instrument outcome, the study revealed that bank credits exhibited an optimistic and significant relationship with the manufacturing sector in Nigeria.

Idih, Oluwagbemigun and Adewole (2020) examined the impact of commercial banks credit and the performance of real sector in Nigeria. Findings from the study revealed that bank credit and bank lending rates do not have significant impact on real sector performance in Nigeria.

Several researchers have made attempts to investigate the nexus among bank lending, economic growth and manufacturing sector performance in both within and outside Nigeria. It was observed from their findings that these studies employed data period below 2020, hence, a study with data period extended to 2020is believed to have the capacity to produce more reliable outcome. Most of the past studies have been observed to have created research gap since they were unable to reach a consensus due to the divergencies in their findings. This, no doubt, has made their works inconclusive. Also, the methodology adopted by most past studies were generally static, which produces spurious results. The need to adopt more robust and sophisticated technique and an attempt to fill the observed research gap necessitated the examination of the relationship among bank lending, economic growth and manufacturing sector performance in Nigeria.

## Methods and Materials

### Model Specification

This study examined the bank lending, economic growth and manufacturing sector performance in Nigeria. The model specification is based on Schumpeter's Innovation Theory which explains that bank credit which is interest elastic is an essential tool for increasing productive capacity of an economy. The work of Ogar, Nkamare and Effiong (2014) was adopted for the study with modification by the inclusion of inflation rate and exchange rate as determinants of manufacturing output in Nigeria as shown in the work of Imoughele and Ismaila (2014). Thus, the model is specified as follows:

$$MSO = f(BL, INT, INF, EXCR, GDP) \quad (1)$$

Which means MO is a function of BL, INTR, INF, EXCR and GDP

Econometrically, transforming the models by introducing constant parameter and error term, the following model is developed:

$$MSO = \beta_0 + \beta_1 BL_t + \beta_2 INT_t + \beta_3 INFt + \beta_4 EXCR_t + \beta_5 EXCR_t + \mu_t \quad (2)$$

Where: MSO = Manufacturing sector output; BL = Banks' lending to the manufacturing sector in Nigeria; INT= Interest rate in the Nigerian economy; INF= Inflation rate in the Nigerian economy; EXCR= Exchange rate in the Nigerian economy; GDP = Gross domestic product in the Nigerian economy; $\beta_0$= Intercept of the regression; $\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$and $\beta_5$ = Parameters to be estimated; $\mu$= Stochastic error term.

### A-Priori Expectations

$\beta_1 > 0$: The expectation is that when BL increases, the MO will also increase. Hence, the coefficient is expected to be greater than zero.

$\beta_2 < 0$: An increase in INT will serve as a constraint to borrowing since credits are interest elastic, thus it is expected that MO decreases. Therefore, the coefficient is expected to be negative.

$\beta_3 > 0$: As INF increases, there will be an increase in the prices of MO and as a result of the effect of money illusion experienced by the workers, production increases. Thus the coefficient is expected to be positive.

$\beta_4 < 0$: An increase in EXCR means depreciation in the value of naira which will cause an increase in the price of imported raw materials. The increase in the cost of production leads to a decrease in MO. Thus, the coefficient is expected to be negative.

$\beta_5 > 0$: As GDP increases, the MO will also increase. Hence, the coefficient is expected to be greater than zero.

**Estimation Techniques**

The methods of estimation employed for this study are based on Autoregressive Distributed Lag (ARDL) approach. The study analyses time series properties of the research variables using the Augmented Dickey Fuller (ADF). The advantage of the ARDL method is that, it can be applied to the model whether the independent variables are stationary at I (0) or I (1). The dependent variable must stationary in I (1).

**Statistical Tools**

***Testing for Unit Roots***

A unit root test is vital in observing the stationary of time series data. It is main to estimate about the variables observed have a tendency to return to the long term trend follow a shock (stationary) or the variables follow a random walk which containing a unit root. If the variables follow a random walk after a temporary or permanent shock, the regression between variables is spurious (Amiruddin, Nor & Ismail, 2007). According to the Grauss-Markov's theorem, in such cases, the series do not have a finite variance. Hence the OLS will not produce consistent parameter estimates.

A stationary series is one whose basic properties, for example it mean and its variance, do not change it over time. In contrast, a non-stationary series has one or more basic properties that do change over time. If the time series variable is stationery,

i) The mean of is constant over time

ii) The variance of is constant over time

iii) The simple correlation coefficient between variable depends on the length of the lag (k) but on no other variable (for all k).

The unit root test can be separated into 2 tests, that is Augmented Dickey Fuller (ADF) test and Phillips Perron (PP) test. This will test for level (original series), first differences and second differences (changes). If stationary at level, then the series are integrated of order zero, I(0) and if stationary at first differences and second differences, the series are integrated of order one and two, I(1) and I(2) respectively. The Augmented Dickey-Fuller test statistic and Phillips-Perron test statistic to estimate the stationary for the variables. For the purpose of this study, the researcher choose to use The Augmented Dickey-Fuller test statistic. The results are and the hypothesis will indicate as below:

*Hypothesis:*

Ho: No stationary

Ha: Stationary

Hence, if p-value is smaller than 0.05, then rejected Ho, that is stationary, if failure to reject Ho, that means no stationary.

***Dickey-Fuller and the Augmented Dickey-Fuller Tests***

Dickey and Fuller (1979) consider three different regression equations that can be used to test the presence of a unit root. Basically, the three regressions differ due to the presence of the deterministic elements $\alpha_1$ and $\alpha_2 t$ and they are given as follows:

$$\Delta Yt = \alpha Yt_{-1} + \mu t \quad 3.1$$

$$\Delta Yt = \alpha 1 + \alpha_1 Yt_{-1} + \mu t \quad 3.2$$

$$\Delta Yt = \alpha 1 + \alpha_2 t + Yt_{-1} - \mu t \quad 3.3$$

Where $Y_t$ is the required time series, $\Delta$ is the difference operator, t is the time trend and $\mu_t$ is the pure white noise error term which should satisfy the following assumptions: normality, constant variance and independent error terms. Equation (3.1) is a pure random walk, equation (3.2) adds an intercept or drift term and equation (3.3) includes both a drift and linear time trend. The test involves estimating the equations using the OLS in order to obtain the estimated value of $\alpha$, and the associated standard error and compare the resulting t-statistic with appropriate value reported in the Dickey-Fuller (DF) tables. The weakness of the DF test is that it does not take account of possible autocorrelation in the error process or term ($\mu_t$). To cater for the above mentioned problem associated with DF test, the Augmented Dickey-Fuller (ADF) can be used.

***Cointegration test***

Regression of one non-stationary variable on another is very likely to yield impressive-seemingly results which are wholly spurious (Mukherjee *at al*., 1998). In general, if two time series variables are both non-stationary in levels but stationary in first-differences, they are integrated of order 1, I(1), then there could be a linear relationship between them which is stationary, I(1) and as such all the series of interest should be integrated of the same order, preferably I(1).The two time series variables that satisfy this requirement are considered to be cointegrated. Variables are cointegrated with one another if the residuals from the levels regression are stationary.

## Results and Discussion

### Presentation of Results

***Unit Root Tests***

In time series analysis with econometrics results, before running any test it is important to distinguish between correlation that arises from a share trend and one associated with an underlying causal relationship. Regression of nonstationary time series will lead to spurious estimates. Unit Root tests deal with the situation where estimation result claim statistical significance of the long run relation between variables in a given regression analysis just because of trending relations among these variables than presence of true momentous casual relations.

The Augmented Dickey-Fuller (ADF) unit root test results for the time series variables are presented in Table 1 below.

The use of ARDL models does not impose pre-testing of variables for unit root problems. However, the unit root test was conducted in this study to find out if there are mixtures in the order of integration of our variables. The order of integration of the time series was investigated by applying the Augmented Dickey and Fuller (1979) test with maximum lag of five (5) as suggested by the AIC criteria.

**Table 1. Unit Root Test Results**

| Variable | ADF Test Statistic | 95% Critical ADF Value | Order of Integration | Remark |
|---|---|---|---|---|
| D(MSO) | 8.453** | 3.557 | *I* (1) | Stationary |
| D(BL) | 4.809** | 3.533 | *I* (1) | Stationary |
| D(INT) | 4.833** | 3.536 | *I* (1) | Stationary |
| D(INF) | 6.315** | 3.536 | *I* (1) | Stationary |
| D(GDP) | 5.408** | 3.533 | *I* (1) | Stationary |
| D(EXR) | 4.470** | 3.533 | *I* (1) | Stationary |

Source: Authors' Computations, 2022

Note: ** = 5 percent significance

From Table 1, the ADF test statistic for each of the variables is greater than the respective critical values. Thus, we accept the hypothesis of unit roots in each of the time series. In the final evaluation, all the variables became stationary after first difference. Hence, they are integrated of order *I* (1).

***ARDL Bounds Test Approach to Cointegration***

In line with the result of the unit root test, cointegration test will be carried out using ARDL Bounds Test approach to cointegration. The choice of this approach is premised on the fact that our variables are integrated of different orders [(I(0) and I(1)], thus negating the use of Engle-granger and Johansen Cointegration test approach. Pesaran and Shin (1999) and Pesaran, Shin, and Smith (2001) developed the ARDL cointegration approach which has three major advantages over other traditional cointegration approaches. Firstly, the ARDL framework does not require that all the variables under study be of the same order of integration; it accommodates series which are I(0) or I(1) or both. Secondly, it is relatively more efficient using small sample sizes. Thirdly, the ARDL framework obtains unbiased estimates of the long-run model.

The rule of ARDL Bounds test of cointegration states that the null hypothesis should be rejected if the value of the computed F-statistic is greater than the upper bounds value and accepted if the F-statistic is less than the lower bounds value. The ARDL cointegration test will be said to be inconclusive should the computed F-statistic fall within the lower and upper bound.

**Table 2. ARDL Bounds Test Result**

| Significance Level | Critical Value | | Computed F-Statistics |
|---|---|---|---|
| | Lower (I0) Bound | Upper (I0) Bound | |
| 10% | 2.08 | 3 | |
| 5% | 2.39 | 3.38 | 15.65847 |
| 2.5% | 2.7 | 3.73 | |
| 1% | 3.06 | 4.15 | |

The Bounds critical values for k=5

Source: Author's Computation, 2022

Accordingly, Table 2 shows that the computed F-statistic (15.65847) falls above the upper bound critical value at 10, 5, 2.5 and 1 percent level of significance. This implies that there is a long-run relationship among Manufacturing sector Output as percentage share of real gross domestic product, , Banks' Lending to the manufacturing sector in Nigeria, Interest Rate, Inflation Rate, Exchange Rate and Gross Domestic Product in Nigerian economy.

**Table 3. Auto-Regressive Distributed Lag (ARDL) Result**

| Variable | Coefficient | Std. Error | t-Statistic | Prob.* |
|---|---|---|---|---|
| BL | -0.072974 | 0.127617 | -0.571816 | 0.5772 |
| EXCR | 5.658013 | 2.661990 | 2.125483 | 0.0533 |
| GDP | 0.156954 | 0.026478 | 5.927707 | 0.0001 |
| INF | 2.965212 | 2.512367 | 1.180246 | 0.2590 |
| C | -39.05280 | 172.1902 | -0.226800 | 0.8241 |
| R-squared | 0.999548 | Mean dependent var | | 3424.994 |
| Adjusted R-squared | 0.998783 | S.D. dependent var | | 4538.169 |
| S.E. of regression | 158.3171 | Akaike info criterion | | 13.22629 |
| Sum squared resid | 325836.1 | Schwarz criterion | | 14.23798 |
| Log likelihood | -215.0731 | Hannan-Quinn criter. | | 13.57939 |

| | | | | |
|---|---|---|---|---|
| F-statistic | 1306.635 | Durbin-Watson stat | | 2.170180 |
| Prob(F-statistic) | 0.000000 | | | |
| *Note: p-values and any subsequent tests do not account for model selection. | | | | |

Source: Author's Computation, 2022

Table 3 presents the ARDL result using industrial output (Y) as the dependent variable. The Durbin-Watson statistics value is 2 which implies that there is no autocorrelation problem in the model which is good for the study. The F-statistics measure the joint significance of the variables. The F-statistics value is 1306.635 with the probability value of 0.000000; this indicates that the independent variables jointly explained the dependent variable at a 5% significance level. The R-squared measures the determination of coefficient, measuring the fit of the model. The value of the R-squared is 0.999548, this shows that about 99% variation in the dependent variable is been explained by the variations in the independent variables. Hence, there is a good fit in the model. Likewise, the adjusted R squared measure the goodness of fit with putting the degree of freedom into consideration. The value is 0.998783, showing that the model has a good fit at 99%.

The long run estimation coefficient of Banks' Lending to the manufacturing sector in Nigeria (BL) carries negative sign (-0.072974) implying that there is negative relationship between banks' lending and manufacturing sector performance in Nigeria and its t-value is (0.571816) with the p.value of 0.0729 which is statistically not significant at 5% level. This implies that banks' lending has not influence manufacturing output performance significantly in the long-run in Nigeria. The long run coefficient did not conform to the apriori expectation of the study. It is estimated from the findings that 1% increase in (BL), on the average, will lead to 57% decrease in manufacturing output (MSO) in the Nigerian economy in the long run.

Interest rate exhibited a positive (1.686776) relationship with manufacturing output in Nigeria though statistically not significant. This means that interest rate has the potential of increasing manufacturing output growth in Nigeria. The result of the long-run model indicated that interest rate has significant impact on manufacturing output in Nigeria. A percentage increase in interest rate would reduce output of manufacturing sector by 16%. Therefore, at a lower interest rate manufacturing firms tend to be pushed to borrow money and investing on industrial sector.

The long run estimated coefficient for inflation rate (INF) is 2.965212; this implies that if we hold all other variables affecting manufacturing sector output constant, a unit increase in inflation rate will lead to a 29% increase in manufacturing sector output on the average. This study shows that inflation and the manufacturing sector output are linked in the long run. This implies that an increase in the values of the inflation rate will bring about an increase in the manufacturing sector output in Nigeria. This is inconsistent with our a priori expectation. Changes in the manufacturing sector productivity are explained by changes in inflation in the long run and vice versa. This study finds that inflation affects manufacturing output positively though not significant. This negates the postulation of the quantity theory of money that an up-surge in the supply of money would result in inflation in the short-run, which is harmful in terms of the productivity.

In the long run, Exchange rate had a positive (5.658) and significant effect at 5% level of significance on manufacturing sector performance in Nigeria as a control variable. This implies that, the rate of exchange of the country currency has favoured the performance of the manufacturing output. This could be as a result of naira devaluation policy implementation towards increasing exportation of locally made products and restricted the importation of foreign product in Nigeria. It was expected that the result should be negative but statistically, it was positive. The impact of exchange rate was positive, indicating that one percent

depreciation in exchange rate improves manufacturing output by 56%, implying that currency depreciation improves price competitiveness.

The long run estimation coefficient of Gross domestic product in Nigeria (*GDP*) carries positive sign (0.156954) implies that there is positive relationship between gross domestic product and manufacturing output in Nigeria and its t-value is (5.927707) with the p.value of 0.0001 which is statistically significant at 5% level. Therefore, Gross domestic product as expected has a positive and significant effect on manufacturing output growth in Nigeria.

**Table 4. ARDL Short-run Relationship Result**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| CointEq(-1)* | -3.012650 | 0.238024 | -12.65694 | 0.0000 |
| R-squared | 0.989953 | Mean dependent var | | 405.3104 |
| Adjusted R-squared | 0.981492 | S.D. dependent var | | 962.5923 |
| S.E. of regression | 130.9552 | Akaike info criterion | | 12.89295 |
| Sum squared resid | 325836.1 | Schwarz criterion | | 13.64073 |
| Log likelihood | -215.0731 | Hannan-Quinn criter. | | 13.15395 |
| Durbin-Watson stat | 2.170180 | | | |
| * p-value incompatible with t-Bounds distribution. | | | | |

Source: Author's Computation, 2022.

Table 4 showed the result of the short-run relationship between bank lending, economic growth and manufacturing sector performance in Nigeria. To investigate the existence of a short relationship among the variables of interest, restricted error correction model regressions was estimated. The most important thing in ECM (CointEq(-1)*) model is the sign and significance status of the error term. It measures the speed by which the short term deviations in the model can converge back to, or diverge from its long run equilibrium. In this case, it is negative and highly significant implying that any short term distortions in the model could be corrected; and the short term deviations could converge towards the long run equilibrium at the annual speed rate of -3.012650. The equilibrium adjustment level reported that about 301% of disequilibrium will be adjusted periodically. It revealed that the model will revert to its equilibrium path whenever shocks occurs. The coefficient of error term is -3.01 indicating that Nigeria manufacturing output corrects its disequilibrium at a speed of 301% yearly. The error correction term is significant at 0.05% level since the p-value is less than 0.05%. it thus means that our short run is given validity that bank lending, economic growth and manufacturing sector performance in Nigeria have long run relationship under the period of study. We can accept this model because the value of $R^2$ is smaller (0.93) than the value of Durbin-Watson statistic (2) which means that the model is not a spurious model hence can be accepted.

**Discussion of Findings**

This study determines the relationship between bank lending, economic growth and manufacturing sector performance in Nigeria 1981-2020 at both short and long run levels.

From the regression analysis, the long run estimation coefficient of Banks' Lending to the manufacturing sector in Nigeria (BL) was negatively relative to the manufacturing sector output in Nigeria following the value of t-value at 0.57 with the p.value of 0.0729 which is statistically not significant at 5% level. Supporting this findings is the work of Okere, Okere, and Nwaneto (2020), who investigated the effects of bank credits on the manufacturing sector output in Nigeria between 1981 and 2018. Negative relationship was established between bank credits and manufacturing sector in Nigeria.

Interestingly, from the study of Otubu (2019) study 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 were used as the main analytical tools. The study established that bank credits to the manufacturing sector had a positive impact on the manufacturing sector output. Also, corroborating our study is the work of Andabai and Eze (2018) that 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 Central Bank of Nigeria Statistical Bulletin and concluded that bank credit had not significantly contributed to manufacturing sector growth in Nigeria.

The findings of the study established that Interest rate exhibited a positive relationship with manufacturing output in Nigeria though statistically not significant. Supporting this outcome is the study of Idih, Oluwagbemigun and Adewole (2020), who extensively examined the arguments and counterarguments within the scientific discussion on commercial banks credit and the performance of real sector in Nigeria. Concluded that Lending rate does not have significant impact on manufacturing sector output performance in Nigeria.

The long run estimated coefficient for inflation rate (INF) shows that inflation and the manufacturing sector output are linked in the long run. This implies that an increase in the values of the inflation rate will bring about an increase in the manufacturing sector output in Nigeria. Negating this outcome is the work of Oluwafemi *et al.* (2014) investigated the impact of bank credit to output growth in the manufacturing and agricultural subsectors of the economy over the period 19802010. The study established that Inflation rate have negative effects on manufacturing output growth in both short run and long run in the study area. The work of Aminu and Anono (2012) corroborated with the findings of this study in such a way that inflation possessed a positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity.

The findings in the long run exhibited that exchange rate had a positive and significant effect at 5% level of significance on manufacturing sector performance in Nigeria as a control variable. This is against the work of Oluwafemi *et al.* (2014) who investigated the impact of bank credit to output growth in the manufacturing and agricultural subsectors of the economy over the period 1980-2010. Using exchange rate as a control variable exchange rate depreciation have negative effects on manufacturing output growth in both short run and long run.

Finally, the findings from the study showed that the F-statistics value indicates that the independent variables jointly explained the dependent variable at a 5% significance level.

**Conclusion and Policy Recommendation**

This study empirically confirmed the effect of bank lending and economic growth on manufacturing sector performance in Nigeria. It was discovered that both the short run and the long run, bank lending and economic growth affect the manufacturing sector output. The study therefore concludes that interest rate and inflation rate has no significant impact on manufacturing sector output in Nigeria, while commercial bank total loan has a significant impact on manufacturing sector output in Nigeria. Focusing on the short run relationship, the study found every explanatory variable significant functions of MSO at 5%. In the bound test following the ARDL, the study found that evidence in favour of cointegration among the variables regardless of whether they are stationary or not given that the observed test statistic exceeds the upper critical band. Our results imply the presence of co integrating vectors of long run equilibrium relationships among the variables of interest.

Based on the findings and conclusion, this study recommended the following;

- ✓ The Central Bank of Nigeria in collaboration with other monetary authorities should reduce the interest rate being charged on loans borrowed from the commercial banks through the reduction of bank rate and other deposit requirements of the commercial banks in order to make funds available to the manufacturing sector to boost output.

- ✓ the authorities in charge of formulating the stabilization policies of the country should formulate policies which keeps inflation at a bearable position which will increase the volume of spendable cash in the hands of individuals who will patronize the manufacturing sectors and increase their output.
- ✓ banks should be directed to channel their credits towards the manufacturing sector to facilitate overall economic growth and development in Nigeria.
- ✓ In this regard, monetary policy must work towards ensuring the stability of the exchange rate given its direct implication for the cost of production, the price of manufacturing and the overall competitiveness of manufactured exports.

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