

## **Financial Liberalisation and Industrial Sector Performance In Nigeria**

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### **Abstract**

*Financial liberalization is expected to increase savings and promote investments. However, despite the adoption of a market based interest rate regime in Nigeria, industrial output has been fluctuating with performance below expectation. Thus, this research investigated the effect of financial liberalization on industrial sector performance in Nigeria.*

*This study covered a period of thirty-three years (1986-2018). Secondary data were obtained from Central Bank of Nigeria Statistical Bulletin. Augmented Dickey-Fuller, Johansen Co-integration, Error Correction Model and Pairwise granger techniques were used for analysis.*

*The Augmented Dickey-Fuller unit root test showed that industrial sector output, credit to private sector, capital market capitalization, lending rate, exchange rate and trade openness were stationary at first difference. The Johansen Co-integration test revealed that credit to private sector, capital market capitalization, lending rate, exchange rate and trade openness had long run relationship with industrial sector output. The result of the error correction model revealed that capital market capitalization, lending rate and exchange rate positively influenced industrial sector output with coefficients of 0.341893, 0.002670 and 0.185022 respectively. Also, credit to private sector and trade openness was found to have negative effect on industrial sector output with coefficients of -0.329745 and -0.113838. The Pairwise granger causality result revealed that there is no causal relationship between financial liberalization indices and industrial sector performance.*

*The study concluded that effect of financial liberalization on industrial sector is significant though with little impact due to unstable nature of Nigeria financial system. It was recommended that banks should be encouraged to lend to important sectors of the economy like small and medium scale enterprises, manufacturing sector and agriculture sector. Stringent requirements for entering into the market should be eliminated and more friendly advance financial instruments introduced. Finally, trade policy should be re-visited through an assessment of each policy fireworks for adequate adjustment and improvement.*

**Keywords:** *Co-integration, credit, industry, liberalization, output*

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### **I. Introduction**

Prior to the financial liberalization era, the financial system of the developing countries were subjected to repression with their respective governments using the administrative framework of the financial system to suit their desires. The decision regarding the allocation of resources was made by the government through its agencies ignoring the market forces for effective resources allocation. It was believed that financial repression allows a better control over money supply and a lower interest rate (usually below market rate) which can induce a higher investment (Orji, Anthony-Orji & Mba, 2015).

Financial liberalization refers to measures directed at diluting or dismantling regulatory control over institutional structures, instruments and activities of agents in different segments of the financial sector (Aigbovo & Igbonosa, 2015). Financial repression had costs on the financial system's competitiveness and efficiency (Odili & Florence, 2017). Financial liberalization has been variously characterized in the empirical literature but Niels and Robert (2005) observed that whatever characterization, financial liberalization usually include official government policies that focus on deregulating credit controls, deregulating interest rate controls, removing entry barriers for foreign financial institutions, privatizing financial institutions, and removing restrictions on foreign financial transactions.

Financial liberalization serves as a panacea to financial constraints in a financially repressed economy. Under the financial repression regime, the monetary authorities impose high reserve requirements, bank-specific

credit ceilings and selective credit allocation, mandatory holding of treasury bills and bonds issued by the government, and finally a non-competitive and segmented financial system (Achy, 2003).

The widely spread benefits of financial liberalization have made the government of the developing countries to partially or wholly adopt financial liberalization in order to achieve growth in their incomes, industrial output and balance of payment.

There is a considerable body of literature evidences that a country may also be seen with occasional crisis despite of being removing the controls of financial repressive policies. For instance, the financial liberalization strategy produced adverse effect in Latin American countries, particularly Chile, Argentina, Bolivia and Uruguay (Diaz-Alejandro, 1985; Moretti, 1992). Also, its adoption in Turkey led to heavy financial distress near collapse of financial intermediation (Capoglu, 1990). In the same vein, in Africa, financial Liberalization has been adjudged to be negative accompanied with excessive macroeconomic instability caused by high interest rates, high inflation rates and sharp exchange rate depreciation (Pill & Pradhan, 1997).

In Nigeria, financial repression, which is mainly dominated by policies of direct credit and interest rate ceiling, is believed to have been the reason for imperfections in the operation of the financial market (Akingunola, Adekunle, Badejo & Salami, 2013).

The financial liberalization theory of McKinnon (1973) and Shaw (1973) claimed that financial liberalization policies would increase savings which consistently promote investment. It was argued that through liberalization of repressed financial markets in a developing country, the financial sector enables to offer higher returns on its saving and thus attracts higher levels of savings from the household. Also, there is efficiency in the allocation of resources by the financial sector to generate more efficient investment.

Although, oppositions to McKinnon-Shaw proposition argue that financial liberalization may not lead to increase in output growth rate (Burkett, 1987; Buffie, 1983). Espinosa and Hunter (1994) maintained that a fully liberalized financial sector may not be possible or desirable in a developing economy. They question the role given to financial liberalization in the economic growth process and contend that financial liberalization does not necessarily cause increase in output growth than financial repression in the developing countries. Despite this opposition, financial liberalization has become an important economic policy programme in both developed and developing countries.

Financial liberation policy was adopted in Nigeria to increase savings and promote investment. However, despite operating market based interest rates regime in Nigeria, industrial output has been fluctuating and performed below expectation as opposed the primary claim that financial liberalization will lead to improvement in economic performance through increased competitive efficiency within financial markets, and efficient allocation of capital which can lubricate trade, commerce and industry by facilitating transactions and making liquidity available in difficult times.

In view of the foregoing, this study will examine the effect of financial liberalization indices on the industrial sector performance in Nigeria.

## **II. Literature Review**

Financial liberalization has been variously characterized in empirical literature but Niels and Robert (2005) observed that whatever characterization, financial liberalization include official government policies directed at interest rate deregulation, credit control deregulation, removal of barrier from entry into and exit from the financial system, privatization of government own banks and removal of restriction on foreign financial transactions. In other words, financial liberalization has both domestic and foreign dimension. It focuses on introducing or strengthening market based price mechanism and the improvement of the conditions for market competition.

Nwadiubu *et al.*, (2014) examined financial liberalization and economic growth- the Nigerian experience. The study employed Johansen co-integration test and error correction mechanism (EMC) to analyze annual time series data covering 1987-2012. The study adopted GDP (non-oil GDP as proxy for economic growth), financial deepening, degree of openness, exchange rate, Inflation and lending rate as proxies for financial liberalization. The results of the econometric modeling showed the existence of a long-run equilibrium relationship among the variables and co-integration equation at 5% significance level. The EMC showed a very high coefficient of multiple determinations in both the over-parameterized and the parsimonious models. The descriptive statistics showed that financial liberalization has a positive impact on economic growth in Nigeria between the periods under study. The study showed that financial liberalization has helped to ease the binding constraints on investment funding from financial institutions in Nigeria.

Orji *et al* (2015) examined financial liberalization and output growth in Nigeria: empirical Evidence from credit channel. The study examined data spanning 1989-2011 and was analyzed using Ordinary Least Square (OLS) and Co-integration. Real GDP was adopted as proxy for economic growth, credit to private sector, financial deepening ( $M_2/GDP$ ), interest rate, exchange rate and population as independent variables. OLS estimation showed that financial liberalization (proxied by credit to private sector/GDP) is negatively related to

output in Nigeria within the period under review. Also, revealed that the amount of credit to the private sector, as a proportion of credit to the economy, is too negligible to contribute positively to economic growth. The study also established that there is no directional causality between output growth and financial liberalization. The co-integration test revealed that there is a long-run relationship among the variables in the model.

Okoye *et al* (2016) analyzed the impact of economic liberalization on the growth of the Nigeria economy (1989-2015) the study used Co-integration and Error Correction Model in the analyses of data between 1989-2015 adopting GDP growth rate as proxy for economic growth, financial deepening, trade openness, saving rate, inflation and lending rate for financial liberalization. The study produced mixed results for instance, financial liberalization (as shown by lending rate and credit delivery to private sector) shown significant positive impact on the growth of the real economy. Exchange rate showed a non-significant impact on economic growth. Also, there is evidence of non-significant positive on trade liberalization on output growth in Nigeria. Inflation rate showed a negative significant effect on economic growth. However, the study concluded that economic liberalization has significant impact on the economic growth of the Nigerian economy.

Akingunola *et al* (2013) examined the effect of financial liberalization on economic growth. The study employed Vector Error Correction Model and Co-integration for analysis of data collected. Real GDP was adopted as proxy for economic growth. Financial liberalization was represented by M2/GDP (ratio of liquidities to GDP), total deposits of deposit money banks, interest rate and Dummy variance measuring the effect of policy changes. The study revealed that the co-integration test results showed that long run equilibrium conditions are only maintained between the variables when all the exogenous variables are used together between the RGDP and M2/GDP, and between RGDP and total deposits of deposit money banks when regressed separately. It is also showed that all the variables are statistically insignificant. The overall statistics showed that the independent variables were able to explain 7 percent variation in the dependent variable.

Okoye *et al* (2017) examined the effect of economic liberalization on the performance of the industrial sector in Nigeria. The study adopted co-integration and vector error correction model in analyzing data collected, using industrial output to GDP as dependent variable, exchange rate, financial depth, trade openness and inflation as independent variables. The findings from the study provide empirical evidence in support of a long run relationship between selected variables and industrial output in Nigeria. The long run estimate shows that exchange rate and openness have significant positive impact on industrial in Nigeria. There is also evidence of negative impact of the trade openness and financial deepening on industrial output. However, the short run estimate shows that exchange rate and openness have significant negative effects on industrial output while inflation shows a significant positive impact. The result also shows that financial deepening has a positive but not significant effect on output. The study therefore concludes that economic liberalization has significant impacts on the operations of the real sector in Nigeria. However, the financial deepening impact of liberalization does not show significant impact on industrial output.

Agbaeze and Onwuka (2014) investigated the relationship between financial liberalization and investments in Nigeria. The study adopted co-integration for the analysis of data covering 1991-2011. Investment (Bonds, deposits, shares) was adopted as dependent variable, M2/GDP, credit to private sector/GDP, credit to public sector/GDP, stock market capitalization/GDP, Inflation, interest rate and exchange rate as independent variables. The study which examined two important standpoints in the financial liberalization literature carried out a test to determine whether financial liberalization has removed the constraints on the external financing by firms. The regression result using private sector investment and micro-economic data in Nigeria for period 1991-2011 showed that financial liberalization has not removed the binding constraints on the external financing for private sector firms in Nigeria.

Rayyanu (2015) examined financial liberalization and economic growth in Nigeria: An empirical analysis. The study established the long run and short run relationship between liberalization and real output using ARDL and ECM for data spanning 1981-2012. GDP was adopted as proxy for economic growth. KAOPEN-a financial openness index, M2/GDP, and credit to the private sector as a ratio of GDP were adopted as independent variables. The results obtained suggest that there is a positive long run equilibrium relationship between financial liberalization and economic growth. This supports the view that financial liberalization plays a crucial role in the process of economic development; the financial liberalization process in Nigeria has stimulated financial development leading to significant contribution to economic growth.

Astede and Adeniji (2008) assessed how financial liberalization has improved the flow of external finance for SMEs in Nigeria. The study used Principal Component Analysis (PCA), correlation among the financial liberalization components was interacted with the ratio of SMEs credit to GDP in order to measure the flow credit to SMEs during the pre-liberalization periods. The result from the PCA shows that the flow of credit to SMEs is mixed. The contributions of the first component are negative, followed by positive contributions in the next three components, thereafter showing positive and negative oscillations in the remaining components. An economic interpretation of the results vis-à-vis ratio of SMEs to GDP is that the contributions of behaviour of credit to the principal components have been relatively unstable.

Odili and Florence (2017) examined financial system liberalization, savings, investment and economic growth in Nigeria. The study adopted co-integration test for the existence of long run relationship for time series data 1970-2014. GDP was adopted as proxy for economic growth;  $M_2/GDP$ , interest rate, savings and investment dummy variable for policy changes represent explanatory variables. The results of the estimation revealed that the explanatory variables were able to influence the growth process positively and significantly in the economy of Nigeria except interest rate which had negative impact and the dummy variable that was not significant.

Ajayi and Adegoke (2018) studied the effect of financial deregulation on manufacturing sector in Nigeria 1986-2015. The study adopted Auto Regressive Distribution Lag (ARDL), Co-integration and Error Correction Mechanism for its empirical analysis. Index of industrial production was adopted as proxy for manufacturing sector, interest rate, exchange rate, inflation, financial deepening, the ratio of money supply to gross domestic product ( $M_2/GDP$ ) and ratio of credit to private sector to gross domestic product (CPS/GDP) as proxies for financial liberalization. The ADRL bound co-integration test revealed the existence of a long run equilibrium relationships among the variables and co-integrating equation at 5% significance level. Also the Error Correction Mechanism (ECM) showed a negative and significance at 5% level. CPS and interest rate are significant in the short run, though; CPS/GDP is negative but significant in the short run. Interest rate has same implication both on short and long run period. The results show that on both short and long run, interest rate has a positive and significant relationship with IIP. This implies that, the lower the interest rate the higher the investment which will ultimately increase the productivity of the manufacturing sector.

Aigbovo and Igbinsosa (2015) examined effect of financial liberalization on financial depth in Nigeria. The study employed Engle and Granger single equation Co-integration test and the Error Correction Mechanism (ECM) on annual data for the period 1987- 2012. ( $M_2/GDP$ ) adopted as proxy for financial depth as the dependent variable, real interest rate as proxy for financial liberalization and real GDP (control variable) as the independent variables. The study revealed that interest rate does not stimulate financial depth in Nigeria but rather inhibited it.

Olanrewaju *et al* (2015) examined banking sector reforms and output growth of manufacturing sector in Nigeria (1970 – 2011). The study adopted Co integration analysis and Error Correction Mechanism (ECM) for a time series data from 1970 – 2011. Manufacturing sector output growth was adopted as dependent variable; real interest rates spread, lending rate, ratio of broad money ( $M_2/GDP$ ) as a measure of deposit money banks liquidity liabilities ( $M_2/GDP$ ), the lending capacity of the banking system is measured by ratio of deposit money banks' assets to total banking assets. The empirical results showed that the effects of bank assets, lending rate, exchange rate and real rate of interest on manufacturing output were positively significant but with very low impact. On the other hand, the financial deepening and interest rate spread negatively and significantly impacted on the output growth of manufacturing sector in Nigeria. The study therefore concluded that the effects of banking performs on the output growth of manufacturing sector were significantly low in the Nigeria economy.

Odinoye and Okorontali (2014) analyzed the relationship between financial liberation and economic development: evidence from Nigeria. The study which investigated the impact of financial liberalization on the economic development in Nigeria using annual data for the period of 1980-2011 adopted Ordinary Least Square technique. GDP adopted as proxy for economic growth; broad money ratio of GDP ( $M_2/GDP$ ), bank credit to the private sector ratio of GDP are used as proxy for financial liberalization; Interest rate and trade openness are used as control variables. The empirical findings suggested evidence of long run equilibrium relationship between financial liberalization on economic growth. It further showed that both the ratio of broad money supply to GDP and the ratio of bank credit to private sector to GDP have positive effect on economic growth in Nigeria. While both effects are positive on economic growth, the effect of the ratio of bank credit to GDP is infinitesimal relative to that of the ratio of broad money supply to GDP suggesting that the effect of financial liberalization on the economic growth depends on the choice of financial liberalization index used.

Awoniyi and Tobias (2017) examined effect of financial liberalization on the performance of small scale and medium scale enterprises in Nigeria. To investigate the effect of financial liberalization, the study adopted the classical linear regression model and the ordinary least square econometric technique. Using return on asset employed as the dependent variable. Interest rate, real exchange rate and domestic credit to SMEs were adopted as independent variables. The main finding emerging from the study indicated that financial liberalization in Nigeria has been significant on her economy growth. Also, the study concluded that financial liberalization has not hindered the manufacturing sectors from seeking funds from banks at the deregulated lending rate.

Erasmus and Nicholas (2014) looked at financial liberalization and economic growth in Nigeria: an ARDL- bounds testing approach. The research work employed the Auto Regressive Distributed Lag (ARDL)- bounds testing approach, and using GDP excluding contributions from oil and gas, as well as the financial service sector as the growths indicator. The capital stock (fixed capital plus new investments), labour force, FDI

(net inflow and outflow) and the combine financial liberalization index from 1969 to 2008. The results showed that the impact of financial liberalization policies on economic growth in Nigeria is positive and statistically significant both in the long run, as well as in the short run. This suggests that the appropriate financial liberalization policies can spur economic growth in Nigeria.

Madubuko (2016) examined the effect of financial sector liberalization on economic growth in Nigeria. The study adopted the Vector Error Correction Model and Johansen Co-integration test for annual data time series. Real GDP was used as proxy for economic growth while real interest rate, exchange rate inflation rate, total deposit and foreign direct investment were adopted as proxy for financial sector liberalization. The results of the Co-integration test showed existence of a long long-run relationship between the independent variables at a 5% significance level. The Vector Correction Model (ECM) showed a very high coefficient of multiple determinations of 92%. The study therefore concluded that financial sector liberalization has positively reinforced economic growth in Nigeria.

Sulaiman, Oke and Azeez (2012) effect of financial liberalization on economic growth in development countries: the Nigerian experience. The study adopted Ordinarily Least Square (OLS), Johansen Co-integration test and Error Correction Mechanism (EMC) for annual time series data for the period between 1987 and 2009. GDP was used as proxy for economic growth; lending rate, exchange rate, inflation rate, financial deepening and degree of openness was adopted as proxies for financial liberalization. A vivid observation of the results showed that all the explanatory and their lagged variables are positively related to GDP except financial deepening and its lagged variable which has an inverse relationship with GDP. The implication of the negatively of financial deepening which is not in consonance with the a priori expectation means that although financial liberalization can cause financial development but the instability of the financial system and the frequent implementation of financial sector reforms have caused financial deepening not to positively impact on the economy.

Aiyetan and Aremo (2015) examined effect of financial sector development on manufacturing output growth without examining its effect on the disaggregated manufacturing output growth in Nigeria using Vector Auto-regression (VAR) analysis and Johansen co-integration tests. The result suggests that relaxing financial development constraints and deepening the financial sector are crucial to boosting the manufacturing output growth in Nigeria.

Chipote, Mgxekwa and Godza (2014) examined impact of financial liberalization on economic growth: A case of South Africa. The study adopted Johansen Co – integration and the Error Correction Mechanism to obtain long run and short run coefficient of time series data over the period 1990 – 2011. The study used GDP as dependent variable; lending rate, inflation exchange rate and financial deepening ( $M_2/GDP$ ) as financial Liberalization as independent variables. Findings of the study are that inflation, lending rate and financial deepening have positive influence on economic growth whilst exchange rate has a negative impact on economic growth.

Jonas and Daniel (2002) examined international financial liberalization and industry growth. The study adopted integration to analyze data spanning 1980 – 1990 for 42 countries to test the growth effects of international financial liberalization and integration. The main result is that industries highly dependent on external financing do not experience higher growth in value added in countries with liberalized financial market. Liberalization does, however, increase the growth rates of both production and firm creation among externally dependent industries -given that the countries have reached a relatively high level of financial development.

Chibueke (2014) investigated financial sector liberalization in developing countries. The essence of the study was to review the debate and practice of financial liberalization with special focus on developing countries. It shows how international developments have led to the promotion of financial sector liberalization by the international monetary fund and developed countries. These policies have been adopted by developing countries with sometimes disastrous consequences which have been due to planning and sequencing. The study revealed that despite its limitations, financial liberalizations, will aid the economic developing countries more than the failed practice of financial repression.

Zeeshan (2014) in his essays on financial liberalization, financial crises and economic growth first address whether excessive liberalization has caused financial development to its effectiveness in generating economic growth. The study employed a dynamic panel data analysis for 88 countries over the period of 1973 to 2005. The index for the financial sector liberalisation covers seven aspects: credit controls and reserve requirements, interest rate controls, entry barriers, state ownership, policies on securities markets, banking regulations and restrictions on capital market. The study used a comprehensive financial development indicator constructed through principal component analysis of five different indicators: bank private credit to GDP ratio, liquid liability to GDP ratio, deposit money bank assets to total bank assets ratio, deposit money bank assets to GDP ratio, and bank credit to bank deposit ratio. The results indicate that the positive effect of financial development on long-run growth continues to decline as the financial sector becomes more liberalized.

Foluso and Odhiambo (2017) examined the impact of financial liberalization on growth in sub-Saharan Africa. The study applied a dynamic panel estimation to examine the special role of financial liberalization and banking crises on economic growth in Sub-Sahara Africa using a sample of 30 SSA countries over the period of 1980-2015. Log of per capital GDP was adopted as proxy for economic growth. Ratio domestic credit to private to private sector as a share of GDP was used as proxy of financial liberalization. While log of FDI as a share of GDP, log of inflation as a share of GDP, log of gross investment as a share of GDP, secondary school enrolment, and log of export to GDP were adopted as control variables. Dummy variable was adopted for crisis. The SSA countries were categorized into low-income and middle-income countries according to the World Bank's classification of countries. The result showed that financial liberalization dummy's coefficient is positive and significant for SSA. However, the financial liberalization dummy sign changed to negative even though it is statistically insignificant for low-income countries. The results also showed that there is a negative relationship between banking crises and economic growth showing that banking crisis can drastically affect economic growth in SSA countries. The financial development's coefficient showed a significant and positive relationship between the ratio of domestic credit to the private sector as a share of GDP and economic growth. The results of the relationship between the financial liberalization dummy and growth for different country classification are mixed. For low-income countries, the financial liberalization indicator was negative and insignificant, while for middle-income countries the sign was positive and significant. The study concluded with the notion that financial liberalization may not be beneficially to all SSA countries, given different levels of financial development and macro-economic stability in each countries.

Chadi *et al* (2017) examined "the impact of financial liberalization on economic growth: the indirect link". The study adopted Ordinary Least Square (OLS) to investigate the effects of foreign banks entry on growth through its effects on financial development. It first examined the impact of foreign banks entry on financial development. Profits, overhead costs and interest margin were used as proxy for the efficiency of financial development. Liquid liabilities and bank credit represents the financial sector size and activity respectively. The number and share of foreigners banks in the domestics market are used as indicators of foreign banks existence (Financial liberalization). The study covered a sample of 33 developing countries that have GDP per capital of less than 3,595 dollars for the period between 1995 and 2006. The study found a negative and significant effect of financial liberalization on economic growth through its effect on the level of financial development. Even though the influence of financial development on economic growth was positive for these countries, the effect of financial liberalization on financial development (size and activity of the financial sector) was negative and statistically significant.

Dawood and Howard (2017) examined financial liberalization and economic growth: A preliminary Analysis. The study adopted Ordinary Least Square (OLS) in its analysis of data on two linear models capturing the characteristics of the two legs. Private savings/GDP was adopted as dependent variable in the first leg, credit to private sector, real deposit rate, broad money/GDP, stock market turnover/GDP and Stock Market capitalization/ GDP as independent variable in both first and second leg. Credit to domestic sector was adopted as dependent variable for second leg. The findings showed that liberalization exerted positive effects on the financial system through a more efficient banking sector and more actively performing securities market in Pakistan.

### III. Methods

#### Model Specification

This study was anchored upon the theory of financial liberalization. However, the empirical model of Osuji and Chigbu (2012) was adapted in this study. According to Osuji and Chigbu (2012),  $GDP = f(MS, CPS)$ .....1

Where: Where: GDP = Gross Domestic product; MS = Money supply M2; CPS = Credit to private sector.

Thus, by modification, capital market capitalization and interest rate will be included in the model as important variables of financial liberalization while trade openness was employed to measure the degree of openness in terms of openness to international market through liberalization policy. Finally, the study used industrial sector output as the dependent variable to capture industrial sector performance. Thus, the model for the study is given as:

$$ISO = f(CPS, CMC, LDR, TOP, EXR).....2 \quad \text{This is given}$$

as econometrically as:

$$ISO = \beta_0 + \beta_1CPS_t + \beta_2CMC_t + \beta_3LDR_t + \beta_4TOP_t + \beta_5EXR_t + e_t.....3$$

Where:

- ISO = Industrial Sector Output
- CPS = Credit to Private Sector
- CMC = Capital Market Capitalization
- LDR = Lending Rate

TOP= Trade Openness  
 EXR= Exchange Rate  
 $\beta_0$  = Constant  
 $\beta_1 - \beta_5$  = Parameters of the explanatory variables  
 e = Error Term  
 t = time period

#### IV. Results

##### Descriptive Statistics

**Table 1 Descriptive Statistics**

	LISO	LCPS	LCMC	LR	LEXR	TOP
Mean	7.615327	6.809335	6.644584	18.73242	3.988373	0.413030
Std. Dev.	1.896984	2.411691	2.767632	3.732175	1.406687	0.236266
Kurtosis	1.983155	1.696774	1.689629	4.735360	2.307761	9.227560
Jarque-Bera	2.455791	2.449975	2.913088	9.567581	3.702173	79.26765
Probability	0.292908	0.293761	0.233040	0.008364	0.157066	0.000000
Observations	33	33	33	33	33	33

Source: Authors' Computation (2020)

Table 1 presents the result of descriptive statistics for the variables. The result indicates that the data series have positive mean values. The standard deviation values indicate that the variables disperse around the mean with standard deviation values of less than 3.

The result also reveals that log of industrial sector output, log of credit to private sector, log of capital market capitalization and log of exchange rate are platykurtic because their kurtosis values are less than 3 which imply that the variables are normally distributed. However, while lending rate and trade openness are leptokurtic since their Kurtosis values are greater 3 which indicate departure from normality.

Finally, the result from Jarque-Bera statistics which is used to support the normality result shows that log of industrial sector output, log of credit to private sector, log of capital market capitalization and log of exchange rate are normally distributed since their respective probability value are greater than the acceptance region of 0.05. Finally, lending rate and trade openness are found to be not normally distributed since their respective probability values are less than 0.05 acceptance region.

##### Correlation Matrix

**Table 2 Correlation Matrix**

	LISO	LCPS	LCMC	LR	LEXR	TOP
LISO	1.000000					
LCPS	-0.012993	1.000000				
LCMC	0.520021	0.150248	1.000000			
LR	0.365664	-0.092177	0.184980	1.000000		
LEXR	0.097258	0.031633	-0.128364	0.371508	1.000000	
TOP	-0.050497	0.364704	-0.280699	-0.264258	-0.220241	1.000000

Source: Authors' Computation (2020)

The result of the correlation matrix is presented in Table 2. The result indicates the absence of multi-collinearity problem since the independent variables have less than 70% correlation values in relation with the dependent variable. The correlation result shows that log of credit to private sector and trade openness have negative correlation with log of industrial sector output. However, log of capital market capitalization, log of exchange rate and log of lending rate have positive correlation with log of industrial sector output.

Analysis of Unit Root Test

Table 3 Summary of Augmented Dickey-Fuller Unit Root Test

Unit Root Test at Level			Unit Root Test at First Difference			
Variables	Test Statistic	Prob.	Test Statistic	Prob.	Level	S/NS
LISO	-1.497686	0.8094	-5.362480	0.0008	I(1)	S
LCPS	-1.095742	0.9137	-4.156860	0.0135	I(1)	S
LCMC	-0.657298	0.9679	-4.511669	0.0060	I(1)	S
LR	-3.397215	0.0721	-5.042758	0.0021	I(1)	S
LEXR	-2.435753	0.3556	-5.830855	0.0002	I(1)	S
TOP	-3.122597	0.1184	-6.511630	0.0000	I(1)	S

Source: Authors' Computation (2020)

Table 3 presents the summary of the unit root result using Dickey-Fuller unit root test. It is necessary to conduct from the fact that non stationary series yields regression results that are robust in terms of diagnostic test statistics even when there is no economic sense in the regression analysis. The result in Table 3 indicates that the variables namely log of industrial sector output, log of credit to private sector, log of capital market capitalization lending rate, log of exchange rate and trade openness are not stationary at level since their respective probability values are insignificant at 5%. Thus, the null hypothesis of unit root is accepted for all the variables at level.

However, at level, the data series namely log of industrial sector output, log of credit to private sector, log of capital market capitalization lending rate, log of exchange rate and trade openness become stationary i.e. I(1) since their respective probability values are highly significant at 5%. This implies that all the variables were integrated of the same order, i.e. I(1). Thus, the right technique for the estimation of long run relationship is Johansen Multivariate Co-integration technique which is presented in Table 4 and 5.

The test for Co-Integration Result for the Model

Table 4 Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.914832	210.5641	117.7082	0.0000
At most 1 *	0.776212	136.6703	88.80380	0.0000
At most 2 *	0.736302	91.75864	63.87610	0.0000
At most 3 *	0.590529	51.77013	42.91525	0.0052
At most 4	0.440033	24.98345	25.87211	0.0642
At most 5	0.223458	7.587143	12.51798	0.2873

Trace test indicates 4 cointegratingeqn(s) at the 0.05 level  
\* denotes rejection of the hypothesis at the 0.05 level

Source: Authors' Computation (2020)

Table 4 reveals the result of co-integration test for the study in to establish long run relationship among the variables. The result of the trace statistics shows that there exist four co-integrating vector in the model. This implies that log of credit to private sector, log of capital market capitalization lending rate, log of exchange rate and trade openness have long run relationship with log of industrial sector output

Table 5 Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.914832	73.89384	44.49720	0.0000
At most 1 *	0.776212	44.91164	38.33101	0.0076
At most 2 *	0.736302	39.98850	32.11832	0.0045
At most 3 *	0.590529	26.78668	25.82321	0.0372
At most 4	0.440033	17.39631	19.38704	0.0951
At most 5	0.223458	7.587143	12.51798	0.2873

Max-eigenvalue test indicates 4 cointegratingeqn(s) at the 0.05 level  
\* denotes rejection of the hypothesis at the 0.05 level

Source: Authors' Computation (2020)

Table 5 presents the result of maximum eigenvalue and it is in tandem with the trace statistics result indicating four co-integrating vector among the variables. This lead to the conclusion that log of credit to private sector, log of capital market capitalization lending rate, log of exchange rate and trade openness have long run relationship with log of industrial sector output in Nigeria. Hence, the null hypothesis of no co-integration relationship between the independent variables credit to private sector, capital market capitalization lending rate, exchange rate and trade openness and the dependent variable proxy by industrial sector output is rejected. The



implication of this result is that financial liberalization is a good determinant of industrial sector output in the long run in Nigeria.

**Interpretation of Model Results**

**Table 6 Error Correction Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT(-1)	-0.375843	0.103829	-3.619830	0.0021
D(LISO(-1))	0.277838	0.068907	4.032061	0.0009
D(LCPS(-1))	-0.329745	0.021451	-15.37237	0.0000
D(LCPS(-2))	0.341893	0.111736	3.059832	0.0071
D(LCMC(-1))	0.337065	0.019714	17.09788	0.0000
D(LCMC(-1))	-0.108393	0.049536	-2.188178	0.0429
D(LR(-1))	0.002670	0.006232	0.428418	0.6737
D(LR(-2))	-0.002207	0.002082	-1.059893	0.3040
D(LEXR(-1))	0.185022	0.024372	7.591641	0.0000
D(LEXR(-2))	-0.238537	0.031443	-7.586205	0.0000
D(TOP(-1))	-0.113838	0.046611	-2.442315	0.0258
D(TOP(-2))	0.097990	0.033761	2.902451	0.0099
C	0.083571	0.011580	7.216797	0.0000
R-squared	0.672957			
F-statistic	2.915080			
Prob(F-statistic)	0.021822			
Durbin-Watson stat	1.856147			

Source: Authors' Computation (2020)

The error correction model result is presented in Table 6 revealing the effect of credit to private sector, capital market capitalization lending rate, exchange rate and trade openness on industrial sector output in Nigeria.

Error Correction Term has a negative sign in the model which is significant at 5%. This implies that the model will rightly restore back to equilibrium within the system in case of any deviation from it equilibrium state in the short run. The Error Correction Term's coefficient of -0.375843 implies that about 37.5% of disequilibrium in the system is offset by short-run adjustment in order to maintain equilibrium in the long run.

The result further reveals that the log of the first period lag of industrial sector output has positive and significant effect on industrial sector output indicating that rises in previous industrial sector output will lead to rises in current industrial sector output.

The result shows that at lag one, log of credit to private sector has negative and significant effect on log of industrial sector output with a coefficient of -0.329745 which implies that a percentage increase in credit to private sector will lead to 33% fall in industrial sector output. However, at lag two, credit to private sector has a coefficient and probability value of 0.341893 and 0.0071 respectively. This indicates that 1% increase in credit to private sector will lead to 34% increase in industrial sector output in Nigeria.

Also, the result indicates that at lag one, log of capital market capitalization has a coefficient of 0.337065 which is significant at 5% as reported in Table 4.6. This implies that 1% increase in capital market capitalization will lead to 33% increase in industrial sector output in Nigeria. However, the second period lag of capital market capitalization has positive and significant effect on industrial sector output with coefficient of -0.108393 which implies that 1% increase in capital market capitalization at lag two will lead to 10% fall in industrial sector output in Nigeria.

The result further shows that at lag one, lending rate has a coefficient of 0.002670 which is not significant at 5% which implies that percentage increase in lending rate will lead to 0.26% increase in industrial sector output in Nigeria. However, the second period lag of lending rate is found to have negative and insignificant effect on industrial sector output with coefficient of -0.002207 indicating that 1% increase in lending rate will lead to 0.22% fall in industrial sector output in Nigeria.

Base on the result reported in Table 6, at lag one, log of exchange rate has a coefficient of 0.185022 and probability value of 0.0000 indicating that relative percentage change in exchange rate will lead to 18% increase in industrial sector output in Nigeria. Conversely, the second period lag of exchange rate is found to have negative and significant effect on log of industrial sector output with a coefficient of -0.238537 which implies that 1% relative percentage change in exchange rate at lag two will lead to 23% fall in industrial sector output in Nigeria.

The error correction model result reported in Table 6 shows that at lag one, trade openness has negative and significant effect on log of industrial sector with a coefficient of -0.113838 such that 1% increase in trade openness will lead to 11% fall in industrial sector output in Nigeria. However at lag two, trade openness has positive and significant effect on log of industrial sector output with a coefficient of 0.097990 which implies that 1% increase in trade openness will lead 9.5% increase in industrial sector output.

Looking at the summary of the statistics, it is indicated that the model has a fairly good fit with coefficient of determination (R-Squared) of 0.672957 which implies that the regressors explained about 67% variation in real gross domestic product and the remaining 33 are explained by other variables not captured in the study's model.

The F-statistic which measures the overall significance of the regression plain gives a value of 2.915080 and probability value of 0.021822 implies that credit to private sector, capital market capitalization lending rate, exchange rate and trade openness have joint and significant effect on industrial sector output in Nigeria. The Durbin-Watson statistic which is 1.856147 is within the acceptance region of 1.5 and 2.5 denoting the acceptance of the null hypothesis of absence of autocorrelation.

**Test of Hypotheses**

This part deals with the validation of research hypotheses formulated in the study by employing t-statistics and probability value. The hypotheses are tested at lag one as reported in Table 6. The result of the regression presented in table 6 reveals that log of credit to private sector has t-value of -15.37237 and probability value of 0.0000 which is significant at 5%. This lead to the rejection of the null hypothesis that credit to private sector has no significant effect on industrial sector output

Also, the t-value for capital market capitalization is given as 17.09788 with a probability value of 0.0000 which denotes the rejection of the null hypothesis that Capital market capitalization has no significant effect on industrial sector output

Finally, the result of the t-value for lending rate is given as -0.428418 given a probability value of 0.6737 which is insignificant at 5%. Thus leading to the rejection of the null that Lending rate has no significant influence on industrial sector output.

**Diagnostics Test**

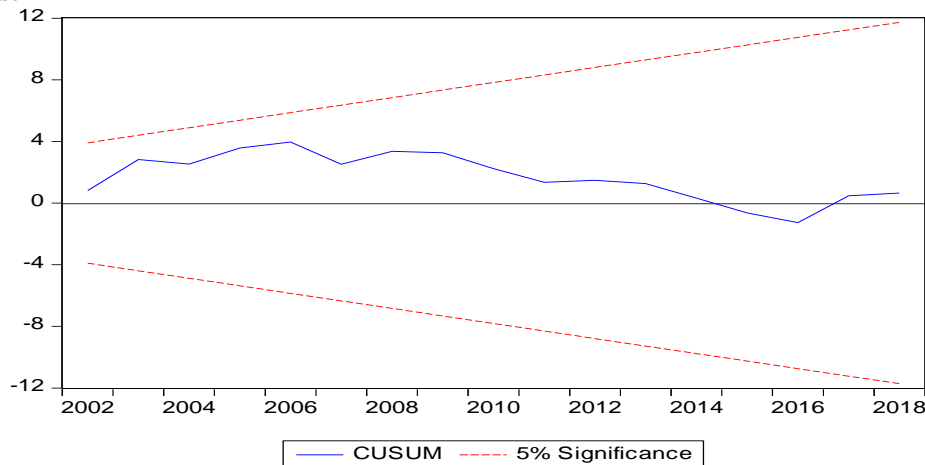
**Table 7 Diagnostics**

Diagnostics test	Observed value	P-value (Chi-square)
Normality Test	0.949982	0.62189
Breusch-Godfrey LM test for autocorrelation	2.838884	0.2418
Heteroskedasticity Test: Breusch-Pagan-Godfrey	17.29124	0.4348

Source: Author's Computation (2020)

Table 7 presents the results of residuals diagnostics test for the model. The Jarque-Bera normality test revealed that the residual of the model is normally distributed with a probability value of 0.949982 which is greater than the critical value of 5%. Also, it was indicted the residual is not serially correlated since the Breusch-Godfrey LM test for serial value of 0.2418 insignificant at 5%. Finally, the result indicates that the residual is homoscedatic with a p-value of 0.4348.

**Stability Test**



The result above shows the stability test for the regression model. A relatively stable model regression model Cusum's line is expected to be in the acceptable region and it is indicated in the result above that the regression model is relatively stable

Granger Causality Result

Table 8 Pairwise Granger Causality Tests

Null Hypothesis	Obs	F-Stat.	Prob.	
LCPS does not Granger Cause LISO	32	1.32429	0.2592	LCPS $\nrightarrow$ LISO
LISO does not Granger Cause LCPS		7.26505	0.0116	LISO $\rightarrow$ LCPS
LCMC does not Granger Cause LISO	32	0.02525	0.8748	LCMC $\nrightarrow$ LISO
LISO does not Granger Cause LCMC		5.21767	0.0299	LISO $\rightarrow$ LCMC
LR does not Granger Cause LISO	32	1.56880	0.2204	LR $\nrightarrow$ LISO
LISO does not Granger Cause LR		9.10421	0.0053	LISO $\rightarrow$ LR

Source: Authors' Computation (2020)

The result of the causality analysis is presented in table 8. The result indicates that there is unidirectional relationship between log of credit to private sector and log of industrial sector output. The result reveals that industrial sector output granger cause credit to private sector while credit to private sector does not granger cause industrial sector output.

Also, the result of the causality test reported in Table 8 shows that there is unidirectional causality between log of capital market capitalization and log of industrial sector output in Nigeria. The result shows that though causality runs from industrial sector output to capital market capitalization, however, capital market capitalization does not granger cause industrial sector output.

Finally, the result of the Pairwise granger causality test shows that there is unidirectional causality between lending rate and industrial sector output. The result shows that though industrial sector output granger cause lending rate, causality does not flow from lending rate to industrial sector output in Nigeria.

Hence, since the independent variables have insignificant probability values, 0.2592 for credit to private sector, 0.8748 for capital market capitalization and 0.2204 for lending rate, it is concluded that financial liberalization indices do not granger cause industrial sector output. Therefore, the null hypothesis there is no significant causality between the indices of financial liberalization and industrial sector performance is accepted.

V. Summary of Findings

This study examined the effect of financial liberalization on industrial sector performance in Nigeria. The study found that credit to private sector had negative and significant effect on industrial sector output in Nigeria. The implication of this result is that the flow of credit to industrial sector through financial liberalization has no capacity to enhance industrial sector output in Nigeria. This may result from inability of the banking sector to adequately mobilize funds due to low savings from which more credit can be given to the industrial sector. This result does not conform to the theoretical expectation of McKinnon–Shaw (1973); King and Levin (1993), Levine (1997) theory of financial liberalization. This result does not corroborate with the empirical analysis of Odinoye and Okorontali (2014); Foluso and Odhiambo (2017); Dawood and Howard (2017) but corroborate with the result of Sulaiman *et al* (2012); Chadi *et al* (2017).

Furthermore, the study revealed that capital market capitalization produced positive and significant effect on industrial sector output in Nigeria. The implication of this result is that increase in market capitalization through increase firms that are listed on the stock market, there will be more avenues to raise long term funds which enhance industrial sector activities and output. These findings corroborate to financial liberalization theory of McKinnon–Shaw (1973); King and Levin (1993), Levine (1997). This finding is in line with the result of Idyu, Ajekwe and Korna (2013); Victor, Kenechukwu and Eze (2013); who found positive relationship between market capitalization and industrial sector output.

Also, it was established based on findings that lending rate had positive and insignificant effect on industrial sector output in Nigeria. This may be due to commercial banks no taken cognizance of the market lending rate during granting of credit to the industrial sector. This does not conforms to theoretical expectation of negative relationship between lending rate and industrial sector output. This result is line with the findings of Chipote *et al* (2014); Olanrewaju *et al* (2015); Ajayi and Adegoke (2018); Awoniyi and Tobias (2017) who established positive relationship between lending rate and performance.

Furthermore, it was found that exchange rate had positive and significant effect on industrial sector output in Nigeria. The implication of this finding is that stable exchange rate will make it easy for industrial sector to obtain important foreign materials which enhance their production activities and output. This result conforms to the result of Olanrewaju *et al* (2015); Ajayi and Adegoke (2018) who established that exchange rate had positive effect on performance of manufacturing sector.

Trade openness was also found to have negative and significant relationship with industrial sector output. This may result from the preference of Nigeria for imported goods rather that the consumption of local made manufactured goods which reduce demand for local goods and hence output. This result is not in line with theoretical expectation of positive relationship between trade openness and industrial sector output. This result is not in line with the analysis of Okoye *et al* (2017).

### **Implication of Findings**

The implication of these findings is that financial liberalization has the capacity to enhance industrial sector performance but the instability of the financial system and the frequent implementation of financial sector reforms have caused the effect of financial liberalization to positively influence industrial sector to be minimal.

### **VI. Conclusion**

The role of financial liberalization in promoting sectoral performance has attracted the attentions of scholars and experts in the recent years with the policy having mixed effect on the economy. The policy was adopted in order to move towards a market determinants based in the economy where movements in macroeconomic variables are determined by market forces. Thus, the study investigated the effect of financial liberalization on industrial sector performance. In line with findings, it was concluded that effect of financial liberalization on industrial sector is significant though with little impact due to unstable nature of Nigeria financial system.

### **VII. Recommendations**

Based on the findings of this research, it was recommended that:

1. Given the negative effect of credit to private sector on industrial sector output, banks should be encourage to lend to important sectors of the economy like small and medium scale enterprises, manufacturing sector and agriculture sector in order to ensure that funds are effectively utilized to enhance growth of the industrial sector and its contribution to the economy.
2. Current capital market policies and reforms should be improved upon. Policies should be formulated to enhance the performance of capital market. Stringent policies impending entering into the market should be eliminated and more advance financial instruments introduced.
3. Lending rate should be fixed at the level in which industrial sector would be encourage to borrow from banks. Interest rate on lending should be set at minimum level for core sector like manufacturing sector, mining and agriculture sector.
4. There is need for monetary authority to formulate policy that will continue to ensure naira stability vis-à-vis the currency of major countries. The exchange rate should be totally liberalized for effective performance so as to make importation of raw materials cheap.
5. Given the negative effect of trade openness on industrial sector output, there is need for the re-visitation of the Nigeria trade policy through an assessment of each policy fireworks for adequate adjustment. This would encourage the consumption of local goods, support the impetration of major raw materials and discourage the consumption of foreign goods that are produce locally.

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