

Financial and Industrial Sectors Development in Nigeria

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Abstract. The study examined the impact of the financial and industrial sectors on the Nigerian economy. Techniques such as the Augmented Dickey-Fuller Test, Bound Test, and Autoregressive Distributed Lag are used. The Central Bank of Nigeria Statistical Bulletin was used to obtain secondary data from 1986 to 2019. According to the results of the Bound Test, there is a long-run relationship between the proportion of the money supply to GDP, credit to the private sector as a percentage of GDP, capital market ratio, lending rate, and total savings to GDP. According to the ARDL findings, money supply as a percentage of GDP has a short-term negative influence on industrial sector productivity but a long-term positive impact. Loans to the private sector as a percentage of GDP had a detrimental influence on industrial sector productivity in both the short and long run, whereas the capital market ratio had a positive impact. Finally, the loan rate and total deposit as a percentage of GDP had a negative impact on industrial sector productivity. When compared to the short run, the study found that financial sector development had little impact on the industrial sector in the long run.

Key Words: financial sector, financial system, industrial sector, deregulation

Introduction

A well developed financial system act as a conduit for the intermediation of financial resources and meeting the financing need of different economic agents in the economy. The financial system comprises financial institutions that engage in the mobilization and allocation of funds in the short, medium or long term. It involves institutions, instruments, facilities, and regulations that facilitate access to funds and investment for growth and development purposes.

The financial system is germane to the development of an economy because of the significant roles it plays in the creation of instruments and facilities that promote investment (Gabriel, Afamefuna & Baridam, 2016). For an effective intermediation process in the economy, financial institutions must identify different sources of funds and facilitates the mobilization of such funds for productive purposes through the reduction of transaction cost and asymmetry information (Allen & Santomero, 2001).

The industrial sector has been recognized as the instrument of growth and development in recent years. The industrial sector represents a group of firms that engage in the production of goods and services through the employment of factors production (Akinwale & Adekunle, 2019). The industrial sector serves as an instrument of sustainable growth and development by increasing productive capacity, enhancing revenue, creating employment opportunities, ensuring effective income distribution, poverty reduction, contribution to export, and gross domestic product (Okoye, Nwakoboy & Okorie, 2016). Major industrialized nations have directed most of their policy thrust towards the development of the industrial sector which

emerging countries have continued to emulate which is as a result of the significant role of the sector in promoting economic growth and development.

However, for the industrial sector to operate optimally there is a need for adequate investment into the production process and capacity which requires huge capital outlay and must be obtained from different sources with the financial system inclusive. Thus, the development of the financial system is important in ensuring that funds flow to the industrial sector for productive purposes. Theories on the effect of financial sector development opined that for an economy to witness sectoral and overall growth, the financial system must experience development in terms of technological innovation and progress with increase in effectiveness and efficiency of financial institutions to intermediate and allocate the funds to the real sector of the economy for sustainable growth and development (Schumpeter 1911; Robinson, 1952). Patrick (1966) hypothesized the supply leading theory which stressed the role of financial sector development in promoting overall growth ensuring that finance is provided by the financial institutions ahead of their demand.

In Nigeria, the performance of the financial system has been the major focus of policymakers and government in recent years which is due to the significant role play by the financial system in the economy. As a result of this, different policies among which include financial system regulation through financial repression, deregulation policy, and interest rate liberalization policy with the aim of deepening the financial system and enhance its performance (Fapetu & Obalade, 2015).

Studies have erupted on the development of the Nigerian financial system with a majority of these studies focusing on the effect of financial system development on economic growth and subsector performance. However, few studies noted focused on the effect of financial sector development on industrial sector productivity. Thus, this study re-examined the effect of financial development on an industrial sector by introducing important variables like market capitalization and total savings. Also, the study established the long-run relationship and direction of causality among the variables for robust findings.

Literature Review

Conceptual Framework

Financial sector

The financial sector is the part of any economy that is made up of businesses and institutions that offer financial services to both commercial and retail consumers. This industry area comprises a wide range of companies, including banks, investment firms, insurance companies, and real estate companies. The federal government of Nigeria introduced a structural adjustment program in 1986, and one of the policies was to reform the financial sector, which resulted in financial sector liberalization using lending and deposit interest rates with the primary goal of ensuring efficient resource allocation. This was followed by the liberalization of the financial markets. The necessity of banking sector liberalization for resource mobilization, capital accumulation, and economic development is further emphasized by Gibson and Tsakalotos (1994). As a result, many emerging economies are attempting to loosen banking sector limitations since they know that such policies will boost growth in the long run. This was thus the driving force behind financial liberalization policies in developing countries especially in Asia, Eastern Europe, Latin America, and Nigeria

Financial sector development involves increment in size and depth of the banking system in terms of access of banking services and products to the population as a whole, efficiency in the process of financial intermediation, and stability and resilience of the financial system to negative shocks (World Bank, 2011). Though the relationship between financial sector development has been widely assessed and debated both empirically and theoretically, the

nexus between financial system development and industrial sector productivity has received little attention.

The ability of financial institutions to deliver financial services has improved as a result of financial sector development. Calderón and Liu (2002) state that "innovation and development of new financial services provide the path for both investors and savers to take advantage of new opportunities. According to Schumpeter (1911), financial institution services are necessary by entrepreneurs in order to foster technological innovation and economic growth. On the link between the financial and real sectors of an economy, there are two schools of thinking. The first school of thought (supply-leading hypothesis), based on Schumpeter's (1911) view, contends that financial services are created in anticipation of real-world demand, whereas the second school of thought (demand-following hypothesis), pioneered by Robinson (1952), contends that real-world demand prompts financial institutions to create them. In other words, the former contends that financial sector development occurs before actual sector growth, whilst the latter contends that the opposite is true.

Financial system

The relationship between the supply and demand for capital and other finance-related services can be characterized in broad terms as the financial system. The financial system can be characterized as a set of financial arrangements, institutions, markets, operations, and agents that follow a set of rules and laws. It also includes the method by which they interact with one another inside an economy's financial sector and with the rest of the world; and in the supply of financial services.

The demand side of the financial system, and hence the economic units that may require financial services, is also included in the idea of the financial system. Many economic units demand these services, but the most important are households that accumulate wealth or simply carry income from one period to the next, and businesses that require capital to invest.

The financial system aids in the mobilization and pooling of savings, the promotion of payment services, the production and processing of information about investors and investment projects, the efficient allocation of funds, the monitoring of investments, and the diversification, transformation, and risk management of investments (Demirguc-Kunt, 2006).

Industrial sector

The industrial sector is a key segment of the real sector in Nigeria and has annually contributed more than 15% to her economy in the 21st century.

Kirkpatrick et al (1985) posited that industrialization involves a number of changes in the economic structure of a country such as a rise in the relative importance of the manufacturing industry; a change in the composition of industrial output; and changes in production techniques and sources of supply for individual commodities. Industrialization is, without a doubt, a broad idea. It covers a wide range of businesses and sectors, including manufacturing, banking, building and construction, mining and quarrying, communication, and real estate. (Obioma & Ozughalu, 2005) as well as public utilities (Obioma & Ozughalu, 2005). (Ekpo, 2005). Manufacturing, building, energy, mining, water, and gas industries are among the components of Nigeria's industrial sector, according to CBN (2002).

Deregulation

Simply mean the removal or reducing the state of regulations, in the economic sphere in an economy. Which obviously is by repealing certain governmental regulations in an economy. According to Akiode and Sodobu (1998). The regulatory framework guiding bank operations altered with the deployment of SAP. Interest rates and loan rates have been liberalized. A large number of new banks were authorized to enter the market. Competition increased a great deal among banks and the face of the industry changed within a few years. At different times ceilings on interest rates were removed, replaced, and then removed again.

Theoretical Review

The study is anchored on the theory of financial development. Schumpeter (1911) opined that the development of the economy is directly linked to financial system development through the acceleration of investment by ensuring the intermediation and flow of funds to the industrial sector.

Mckinnon (1973) and Shaw (1973) stressed that the financial sector reduces information asymmetry, monitoring, and transaction costs thereby closing the link between the surplus spending unit and deficit spending unit of the economy.

Empirical Review

Karbo and Adamu (2011) used the autoregressive distributed delay model (ARDL) to examine the relationship between financial development and economic growth in Sierra Leone from 1970 to 2008. They found that financial development had a positive and significant impact on economic growth and investment. Between 1970 and 2009, Udo and Ogbuagu (2012) used ARDL to investigate the relationship between financial development and industrial production in Nigeria. The long- and short-term dynamic coefficients of financial sector development variables have a negative and statistically significant impact on industrial production, according to the results.

Cecchetti and Kharroubi (2012) investigated the impact of the financial system's size and expansion on productivity growth and economic level in 50 nations from 1980 to 2009. It was discovered that the size of the financial industry did not support growth. Shittu (2012) revealed that financial intermediation had a considerable impact on economic growth in Nigeria, using time series data from 1970 to 2010 and analyzing it using PP, ADF, Johansen Co-integration, and error correction model techniques.

Agbada and Osuji (2013) used regression analysis to examine the link between financial intermediation and output (GDP) in Nigeria from 1981 to 2011.. It was found that there exists a positive relationship between financial intermediation and output.

Findings from Ghana by Adusei (2013) using co-integration, Fully-modified ordinary least squares, error correction, and the generalized method of moments techniques to examine the relationship between economic growth and financial development from 1971 to 2010 indicated that financial development did not promote economic growth.

Also, Adekunle, Salami and Adedipe (2013) used ordinary least squares to evaluate the impact of financial sector development on economic growth in Nigeria and it was found that interest rates had a negative relationship with economic growth while money supply and credit to the private sector has a positive effect on economic growth. Nwite (2014) investigated the impact of financial intermediation on Nigerian economic growth by looking at the impact of credit to the private sector, lending rate, and interest rate margin on GDP using Johansen co-integration and ordinary least square analysis. Credit to the private sector and interest rate margin was found to have a positive impact on the gross domestic product, whereas lending rate had a negative impact.

Kiprop et al. (2015) investigated the association between financial development and economic growth in Kenya using autoregressive distributed delay (ARDL). Financial development has had a favourable and considerable impact on Kenya's economic growth, confirming the supply-side argument. Adeusi and Aluko (2015) used the ordinary minimum to examine the impact of financial sector development on the productivity of the real sector in Nigeria and discovered a strong linear link between the financial sector and the real sector.

Gabriel, Afamefuna and Baridam (2016) used time-series data from 1986 to 2014 to investigate the association between financial development and economic growth in Nigeria. Only credit to the private sector (CPS) had a positive and significant impact on the growth of the Nigerian economy, according to the parsimonious error correction model, while broad

money supply, insurance intermediation ratio, and market capitalization ratio had a negative and insignificant impact. Alpha et al. (2016) studied the influence of financial intermediation on economic growth in West Africa using panel data. Interest rate spreads, credit supply, and inflation all have negative effects on growth, whereas broad money supply and financial intermediation (M3) have favourable effects.

According to a study of existing literature, studies mostly focused on the impact of financial sector development on economic growth, with little attention paid to the impact of financial sector expansion on the industrial sector. Despite the findings of studies by Udo and Ogbuagu (2012) and Adeusi and Aluko (2015) on the impact of financial sector development on the industrial sector, there is a need for more empirical research considering the current state of the Nigerian industrial sector. Furthermore, Adeusi and Aluko's (2015) study was not methodologically sound because the researchers failed to assess the stationarity of the variables they used. Finally, this research incorporates capital market variables as well as overall savings as suggested by Adeusi and Aluko (2015) in their works.

Methodology

The data for this study is quantitative in nature obtained from secondary sources from 1986 to 2017. The data were extracted from Central Bank of Nigeria Statistical Bulletin (2017). The model for the study is anchored upon supply leading and financial sector development theory of Schumpeter (1911); Robinson (1952); Patrick (1966) which emphasized the role of financial system development in the growth process of an economy. The theory stressed the role of effective financial institutions that are cable of mobilization and allocating funds to the industrial sector which is germane to achieving sustainable growth and development.

Model Specification

The model adapted for this study was based on that of Adeusi and Aluko (2015) with little modification by introducing lending rate, capital market ratio, and total savings as a percentage of gross domestic product. Thus, the model for the study is given as:

$$INP = f(MSGDP, CPSGDP, CMR, LR, TSGDP) \quad (1)$$

The linear equation of this model can be written as:

$$\text{Log}(INP_t) = \beta_0 + \beta_1 MSGDP_t + \beta_2 CPSGDP_t + \beta_3 CMR_t + \beta_4 LR_t + \beta_5 TSGDP_t + e_t \quad (2)$$

Where:

INP = Real Gross Domestic Product

MSGDP = Percentage of Money Supply to Gross Domestic Product

CPSGDP = credit to private sector as a percentage of gross domestic product

CMR = Capital Market Ratio

LR = Lending Rate

TSGDP = Percentage of Total Savings to Gross Domestic Product

β_0 = Constant Term

$\beta_1 - \beta_5$ = Parameters of the variables to be estimated

e = Unexplained Error Term

Results and Findings

The estimation of the model without ascertaining the stationarity of the variables may lead to spurious results. Thus, stationarity testing was conducted using the Augmented Dickey-Fuller (ADF). The result of the unit root showed that the variables are integrated at a level and first difference which prompted the adoption of Autoregressive Distributed Lag. The short and long-run coefficients are calculated using the Autoregressive Distributed Lag method. The short-run coefficient is given as:

$$\text{Log}(\text{INP}_t) = \alpha_0 + \sum_{i=1}^p \lambda_1 \Delta \text{Log}(\text{INP}_{t-1}) + \sum_{i=1}^p \lambda_2 \Delta \text{MSGDP}_{t-1} + \sum_{i=1}^p \lambda_3 \Delta \text{CPSGDP}_{t-1} + \sum_{i=1}^p \lambda_4 \Delta \text{CMR}_{t-1} + \sum_{i=1}^p \lambda_5 \Delta \text{LR}_{t-1} + \sum_{i=1}^p \lambda_6 \Delta \text{TSGDP}_{t-1} + \Delta \text{ECT}_{t-1} + \mu_t \quad (3)$$

From equation 3, λ is the coefficients relating to the short-run dynamics of the model, Δ represent the differencing of the variables, ECT_{t-1} is the error correction term resulting from the estimated long-run equilibrium relationship.

However, the long-run coefficient is given as:

$$\text{INP}_t = \alpha_{01} + \sum_{i=1}^p \Theta_1 \text{MSGDP}_{t-1} + \sum_{i=1}^p \Theta_2 \text{CPSGDP}_{t-1} + \sum_{i=1}^p \Theta_3 \text{CMR}_{t-1} + \sum_{i=1}^p \Theta_4 \text{LR}_{t-1} + \sum_{i=1}^p \Theta_5 \text{TSGDP}_{t-1} + e_t \quad (4)$$

However, for the purpose of estimating the long-run relationship among the variables ARDL Bound Test Co-integration is adopted. The model is given as:

$$D(\text{Log}(\text{INP}_t)) = \alpha_{01} + \beta_1 \text{Log}(\text{INP})_{t-1} + \beta_2 \text{MSGDP}_{t-1} + \beta_3 \text{CPSGDP}_{t-1} + \beta_4 \text{CMR}_{t-1} + \beta_5 \text{LR}_{t-1} + \beta_6 \text{TSGDP}_{t-1} + \varepsilon_t \quad (5)$$

Where INP, MSGDP, CPSGDP, CMR, LR, TSGDP are variables of the study, D is the first difference and ε is an error term. Under the above equation, the null hypothesis is that no co-integration exists, whereas the alternative hypothesis is that co-integration exists.

Table 1. Correlation Matrix Result

	INP	MSGDP	CPSGDP	CMR	LR	TSGDP
INP	1.000000					
MSGDP	-0.322118	1.000000				
CPSGDP	-0.206760	0.751524	1.000000			
CMR	-0.046300	-0.125785	-0.136420	1.000000		
LR	-0.112766	-0.201059	-0.222794	-0.043042	1.000000	
TSGDP	-0.349658	0.688452	0.721976	0.110236	-0.035982	1.000000

Source: Researcher's Computation, 2021

Table 1 presents the result of the correlation matrix which indicates the absence of multicollinearity among the variables. The result further shows that the explanatory variables have a negative and weak correlation with industrial productivity in Nigeria.

Table 2. ADF Unit Root Test at Level and First Differences

Variables	Level Form			First Differences			
	t-stat.	5% Critical Value	P-value	T-stat	5% Critical Value	P-value	Order of Int.
INP	1.478030	-3.595026	1.0000	-6.440221	-3.595026	0.0001	1(1)
MSGDP	-0.866608	-2.960411	0.7853	-5.195749	-2.963972	0.0002	1(1)
CPSGDP	-0.795124	-2.960411	0.8065	-5.829043	-2.963972	0.0000	1(1)
CMR	-2.007642	-2.960411	0.2822	-5.717998	-2.963972	0.0000	1(1)
LR	-4.572269	-2.960411	0.0010	-	-	-	1(0)
TSGDP	-2.086983	-2.960411	0.2509	-5.958670	-2.963972	0.0000	1(1)

Source: Researcher's Computation, 2021

The result of the ADF unit root test is presented in table 2 at the level and first difference. The result indicates that only the lending rate is stationary at a level with a significant probability value of 5%. Industrial productivity, money supply to GDP, private sector credit to

GDP, capital market ratio, and total savings to GDP, on the other hand, are stationary at first difference. The ARDL technique was used because the variables were integrated at the level and initial difference.

Table 3. Bound Test

Significance Level	Critical Value Bounds		Test statistics	Value g	Lag
	I0 Bound	I1 Bound	F-test	9.571506	3
10%	2.45	3.52			
5%	2.86	4.01			
2.5%	3.25	4.49			
1%	3.74	5.06			

Source: Researcher's Computation, 2021

From Table 3, the F-statistic value is 9.571506 which is larger than the larger lower bound critical value 5% significance level. Hence, it is concluded that there is a long relationship among the variables.

Table 4: Short Run Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MSGDP)	-0.001124	0.013554	-0.082923	0.9347
D(MSGDP(-1))	-0.031818	0.011174	-2.847539	0.0100
D(CPSGDP)	-0.045726	0.014566	-3.139139	0.0052
D(CMR)	0.001491	0.000818	1.823443	0.0832
D(LR)	-0.002680	0.005561	-0.481813	0.6352
D(TSGDP)	-0.016773	0.011482	-1.460744	0.1596
CointEq(-1)	-0.095620	0.023723	-4.030742	0.0007

Source: Researcher's Computation, 2021

Table 4 shows the result of the short-run co-integration form. The result shows that the ratio of the money supply to gross domestic product has a negative effect on industrial productivity which implies that money supply to a gross domestic product does not simulate industrial sector productivity in the short run.

Also, the ratio of credit to the private sector as a percentage of gross domestic product has a negative and significant effect on industrial productivity with a coefficient of -0.045726 which implies that 1% increase in credit to the private sector will lead to a fall in industrial sector productivity in Nigeria.

However, the result shows that the capital market ratio has a positive effect on industrial sector productivity in Nigeria though with a little coefficient of 0.001491 indicating that a 1% increase in the market ratio will lead to increase in industrial sector productivity.

Conversely, the result shows that the lending rate has a negative and insignificant effect on industrial sector productivity in Nigeria with a coefficient of -0.002680 which implies that a 1% increase in lending rate will lead to a falling in industrial sector productivity in Nigeria. Similarly, total savings to gross domestic product has a negative and insignificant effect on industrial sector productivity in Nigeria indicating that an increase in total savings will lead to falling in industrial sector productivity.

Finally, the co-integrating equation (CointEq(-1)) has a coefficient of -0.095620 which is significant at 5% s and it implies a high speed of adjustment from shocks (variables of real gross domestic product) indicating co-integration and disequilibrium in the long run indicating

that disequilibrium in the previous period will be adjusted at a speed of 9.6% in the current period.

Table 5. Long Run Coefficient

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MSGDP	0.766362	0.246459	3.109496	0.0055
CPSGDP	-0.478202	0.198184	-2.412911	0.0255
CMR	0.119109	0.020304	5.866137	0.0000
LR	-0.028023	0.055092	-0.508657	0.6166
TSGDP	-0.175408	0.120549	-1.455074	0.1612
C	4.381247	2.029255	2.159042	0.0432

Source: Researcher's Computation, 2021

Table 5 presents the long-run result of the study. The result shows that the percentage of the money supply to gross domestic product significantly and positively influences industrial sector productivity with a coefficient of 0.766362 which is significant at 5%. This implies that a 1% increase in supply to a gross domestic product will lead to a 77% increase in industrial productivity which is in line with the theoretical expectation.

Credit to the private sector, on the other hand, has a negative and significant coefficient as a proportion of GDP of -0.478202 meaning that a 1% increase in credit to the private sector as a percentage of gross domestic product will result in a 48% fall in industrial sector productivity which does not conform to the theoretical expectation.

The long-run result shows that the capital market ratio has a coefficient of 0.119109 which is significant at 5% meaning that a 1% increase in the capital market ratio will lead to a 12% increase in industrial sector productivity.

It is further revealed that the lending rate has a negative and insignificant effect on industrial sector productivity with a coefficient of -0.028023 which is not significant at 5%. This implies that a 1% increase in lending rate will lead to a 2.8% fall in industrial sector productivity.

Finally, the percentage of total savings to gross domestic product has a negative and insignificant effect on industrial sector productivity with a coefficient of -0.175408 at 5%. This implies that a 1% increase in the percentage of total savings to a gross domestic product will lead to an 18% fall in industrial sector productivity.

Table 6. Diagnostics Results

Diagnostics test	Observed value	P-value (Chi-square)
Normality Test	1.325124	0.5155
Breusch-Godfrey LM Serial Correlation	6.663391	0.0834
Heteroskedasticity Test: Breusch-Pagan-Godfrey	8.460072	0.4885
Ramsey RESET Test	2.530265	0.1282

Source: Researcher's Computation, 2021

Table 6 shows the diagnostics test for the regression result. The table reveals that the residual is normally distributed given a probability value of 0.5155 which is statistically not significant. Likewise, the result of the serial correlation indicates that the residual is not serially correlated given a p-value of 0.0834 which is statistically insignificant at 5%. Also, the result shows that the residual of the regression has no Heteroskedasticity problem. Finally, Ramsey reset test shows the absence of misspecification in the model.

Discussion of Findings

This study investigated the effect of financial sector development on the industrial sector in Nigeria. Augmented Dickey-Fuller unit root test, Bound Co-integration test, and ARDL techniques were employed. The result of the unit root test indicated that lending rate was stationary at a level while money supply to gross domestic product, credit private sector to gross domestic product, capital market ratio, and total savings to the gross domestic product were stationary at first difference.

Furthermore, evidence of a long-run relationship was established among the variables from the Bound Co-integration test. The result of ARDL showed that money supply as a percentage of the gross domestic product had a negative effect on industrial sector productivity in the short run but positively influenced industrial sector productivity in the long run. Also, credit to the private sector as a percentage of the gross domestic product had a negative effect on industrial sector productivity both in the short and long run. However, in the short and long run, the capital market ratio had a positive effect on industrial sector productivity in Nigeria. Finally, lending rate and total deposit as a percentage of gross domestic product negatively influenced industrial sector productivity. The implication of these findings is that despite the empirical findings that financial sector development positively affects economic growth in Nigeria, the effect of the sector on the industrial sector is not large which result from high lending rate and low savings from which financial resources will be made available to the industrial sector.

Conclusion and Recommendation

Based on the research findings, it was concluded that financial sector development has little impact on the industrial sector in the long run when compared to the short run. In line with this, this study recommended that the financial sector should especially deposit money banks should be encouraged to direct more credit to the industrial sector at affordable lending rates. Also, from a policy perspective, there is a need for the establishment of more financial institutions in the rural areas in order to increase the savings mobilization capacity of the industrial sector. Finally, the government should focus on the short and long-term stability of the financial sector to enhance the performance of the sector.

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