

FINANCIAL SECTOR DEVELOPMENT AND INDUSTRIAL PERFORMANCE IN NIGERIA: AN EMPIRICAL INVESTIGATION

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Abstract

Financial development is one of the most important prerequisites for rapid and sustained industrial. Against this backdrop, this study utilized the techniques of Fully Modified Ordinary Least Squares and Granger causality to appraise the relationship between financial sector development and industrial performance in Nigeria between 1990 and 2019. The findings that came up in the study are presented as follow; out of the three principal variables used to proxy financial sector development in this study, two of them- M3 and interest rate have both direct and significant interlink with industrial performance in Nigeria. As such the study concludes that financial development contributes to a positive and significant industrial performance in Nigeria. The findings from direction of causality show that a unidirectional feedback relationship flows from industrial performance to interest rate in one hand and one way feedback relationship flows from total credit to private to broad money supply on the other hand. In view of these findings, this study recommends the following for the policymakers in Nigeria, and by extension policymakers in Africa that whenever these policymakers desire to achieve industrial development, policy that will drive the development of financial sector should be embarked upon. In addition, the Nigerian monetary authorities should ensure that adequate credit is disbursed to private sector in order to drive better industrial performance in the country.

Keywords: Financial Sector, M3, Interest Rate, Exchange Rate and Credit

JEL classification: G24

1. INTRODUCTION

Financial development is one of the most paramount prerequisites for quick and sustained economic growth and development. This is because efficiency in the economy is attributable to the financial superstructure, which is domiciled in both primary and secondary securities (Goldsmith, 1969). Developing the industrial sector of the economy requires a maximum utilization of the accumulated human and material resources and well developed economy (Chernykh and Theodossiou, 2011). Meanwhile, it has been argued that sustained industrial growth is a function of effective and well-functioning financial institutions which catalyse the transmission of funds to the industrial sector for productive engagements (Ojo, 2010).

Industrial sector is the engine of every economy, as it provides the driving force that mixes raw resources and other factor inputs to create goods and services. Industrialization has been proven to be one of the most reliable means of facilitating the improvement of the living standard in an economy, this is because this sector is critical to the overall expansion and advancement of the economy. This is because production of commodities and services for an ever-rising population as well as the availability of job opportunities, rise in government's revenues via company income taxes, and attraction of foreign investors are made possible by industrial sector (Osinubi & Akinyele, 2006).

However, industrial expansion does exist in an economy without the availability of some conducive business environments. One of these variables is a well-organized, efficient, systematic, and sustainable financial system (Osuji, 2012). A number of reasons exists why the operations and activities of financial sector may have an impact on the pace of expansion of the industrial sector. Financial intermediaries which is the critical channel in which resources are allocated to the most profitable sectors of any economy is one of the primary responsibilities of financial sector. This is done through financial institutions, by moving resources from the surplus sides of the economy to the deficit economic units for the purposes of investment. The financial intermediation is achieved when financial institutions provide funds and advances to both the public and the private sectors for the purpose of expanding domestic output and exports promotion, commercial activities, agricultural production and development of infrastructural facilities.

Meanwhile, the strategic role of industrial sector in any economy cannot be overemphasised because of its impact on the aggregate outputs which is critical for the sustainability of the economy in terms of capacity development and employment generation (Anyanwu, 2010; Adeusi and Aluko, 2015). It is important to stress that the earlier writers such as Shaw (1973) and Mckinnon (1973) have established the existence of a link between the growth of economy and financial intermediation, which serves as foundation for the majority of theories and empirical studies that enunciated the linkage that exists within the financial sector advancement and other macroeconomic variables. In view of the above, recent studies such as Iheanacho

(2016), Balago (2014), Dandume (2014) and Nkoro and Uko (2013) have examined how financial sector development has influenced economic growth in Nigeria. However, these studies have ignored industrial performance sub sector which implies that gap still exists in the literature. This current study would fill this existing gap by examining the contributions of the financial sector development to industrial performance in Nigeria.

2. LITERATURE REVIEW

Elijah and Uchechi (2012) employed ARDL in analysing the influence of advancement in financial sector on the growth of industrial output in the Nigerian economy between 1970 and 2009. It was found out from the study a long run convergence exists between the advancement of financial sector and industrial production in Nigeria. Also, financial sector development caused a major adverse relationship with industrial production in the immediate and the long run. Also, Udoh and Ogbuagu (2012) explored how financial development contributed to industrial growth from 1970-2009 with the application of ARDL. The authors affirmed that industrial production experienced a negative impact from financial development in the country. In another related work, Nwachukwu *et al.* (2014) explored a technique of Error Correction Model (ECM) in examining how the reforms in financial sector could enhance development of industrial sector between 1980 and 2010. It was established in the study that industrial development was facilitated by the financial reforms. Ewetan and Ike (2014) applied Error Correction Model (VECM) in the assessment of the linkage between development of financial sector and industrialization between 1981 and 2011 in Nigeria. The authors submitted that industrial output was positively responded to the funds bank disbursed to the firms operated in the private sector in the country. But the reverse was the case of the response of industrial output to the broad money stock. The results from the Granger causality test indicated that one way causal relationship exists between the advancement of financial development and industrialization.

While utilizing a Vector Autoregression (VAR) to appraise the response of reform in financial sector to the advancement of manufacturing output between 1986 and 2012 in Nigeria, Aiyetan and Aremo (2015) argued that both liberal financial system and a financial sector deepening enhanced expansion of manufacturing sector in the country.

However, Mesagan *et al.* (2018) interrogated how the advancement of financial sector could interfere with the performance of manufacturing sector in the Nigerian economy between 1995 and 2015 with the aid of dynamic error correction and auto-regressive (AR) techniques of estimation. It was reported from the study that supply of money and credit to private sector recorded a direct but insignificant impact on capacity utilization and output. Whereas, a reverse case was recorded for manufacturing value added and supply of money in the short run. Credit disbursed to the private sector and the supply of money orchestrated a direct impact on output from manufacturing outlets

Asaleye *et al.* (2018) appraised how financial sector influenced the outputs recorded in manufacturing sub-sector in Nigeria between 1981 and 2016 with the application of Granger Non-Causality, Dynamic Ordinary Least Squares and Vector Error Correction Model. The authors asserted that other financial signs except broad money supply and deposit liability had a direct and prominent impact on manufacturing output in the long run. In Indian economy, Raj and Vikas (2018) used Granger causality and ARDL to examine the linkage that caused the growth of industries and the development of entities that operate in financial sector in the economy between 1991 and 2014. The outcomes in the study attested that the advancement of financial sector had a strong relationship with industrial growth in the country. Likewise, a two way feedback effect existed between the improvement of financial sector and industrial advancement in the economy. Akinmulegun and Akinde (2019) utilized Error Correction Model (ECM) to analyse how financial deepening affected performance of manufacturing sector in Nigeria between 1990 and 2017. The submission of the author was that manufacturing sector experienced a positive expansion as a result of financial development, whereas in interest rate contributed an adverse effect to the expansion of manufacturing sector in the country. Oludele (2019) applied ARDL to interrogate the relationship that exists in the reforms of banking sector and industrialization considering Nigeria as a case study between 1981 and 2015. The author enunciated that changes in financial sector contributed direct and significant influence to the country's industrialization.

Furthermore, Akintola *et al.* (2020) explored the response of the Nigerian economic expansion to financial sector development within the period of 2000 and 2019. The outcomes from the estimated ARDL established that liquidity in banking system, financial deepening, and the all-share index contributed to significantly positive impact and significant long-run effects on expansion of real output in the long run. But the exchange rate led to dwindling the performance of real output growth in the country. In the same vein, Raheem (2020) assessed the contribution of financial growth to industrial sector in Nigeria between 1986 and 2018. The author employed ARDL to affirm that the advancement of financial sector sponsored a positive contribution to economic growth. Meanwhile, industrial development caused an insignificant output in the economy.

In summary, it is evident from the reviewed studies that examination of financial improvement and performance of industries in Nigeria through the technique of FMOLS has not been well articulated. Hence, the uniqueness of this study.

3. METHODOLOGY

3.1. DATA COLLECTION

Study considers an expo facto research design as its objective involves how explanatory variables explains variation in the dependent variable. Equally, paper extracted secondary data from 1990-2019 from World Development Indicators (WDI) and CBN statistical bulletin simultaneously.

3.2. MODEL SPECIFICATION

The model to achieve the objective of this study is adapted from the works of Omoyele *et al.* (2021), Mesagan *et al.* (2018) and Zhang *et al.* (2012). The adapted model is structured to suit the objective of this present study as follows

$$MVA_t = f(TCPS_t, M2_t, IR_t, ER_t, INF_t) \quad (1)$$

Where:

MVA – represents industrial performance, and manufacturing value added as a % of GDP is used to proxy it.

TCPS – connotes total credit that belongs to private sector. M2 – broad money supply. IR – rate of interest. ER – exchange rate. INF – inflation rate and t- time period

If model 1 is transformed into econometric model, it produces the following model as follows:

$$\text{LogMVA}_t = \alpha + \beta_0 \text{LogTCPS}_t + \beta_1 \text{LogM2}_t + \beta_2 \text{IR}_t + \beta_3 \text{ER}_t + \beta_4 \text{INF}_t + \mu_t \quad (2)$$

Where μ = error term. α = Intercept of the Model $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ = Coefficient of Parameters

Moreover, the second leg of this study which involves the estimation of direction of causality among the variables of interest requires the use of a Granger causality model, which is specified below, following Lawal *et al.* (2022), Olaoye *et al.* (2020), Aderemi *et al.* (2020) and Aderemi *et al.* (2019).

$$MVA_t = \beta_0 + \sum_{i=1}^m \beta_1 MVA_{t-i} + \sum_{j=1}^n \beta_2 TCPS_{t-j} + \sum_{k=1}^o \beta_3 M2_{t-k} + \sum_{l=1}^p \beta_4 IR_{t-l} + \mu_{1t} \quad (3)$$

$$TCPS_t = \alpha_0 + \sum_{i=1}^m \alpha_1 TCPS_{t-i} + \sum_{j=1}^n \alpha_2 M2_{t-j} + \sum_{k=1}^o \alpha_3 IR_{t-k} + \sum_{l=1}^p \alpha_4 MVA_{t-l} + \mu_{2t} \quad (4)$$

$$M2_t = \gamma_0 + \sum_{i=1}^m \gamma_1 M2_{t-i} + \sum_{j=1}^n \gamma_2 IR_{t-j} + \sum_{k=1}^o \gamma_3 MVA_{t-k} + \sum_{l=1}^p \gamma_4 TCPS_t + \mu_{3t} \quad (5)$$

$$IR_t = \delta_0 + \sum_{i=1}^m \delta_1 IR_{t-i} + \sum_{j=1}^n \delta_2 MVA_{t-j} + \sum_{k=1}^o \delta_3 TCPS_{t-k} + \sum_{l=1}^p \delta_4 M2_{t-l} + \mu_{4t} \quad (6)$$

3.3. ESTIMATION TECHNIQUES

Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) unit roots test were the apparatus used to interrogate the existence or otherwise of stationarity of the data series, and Johansen Cointegration test was applied in checking if the long run equilibrium is present among the investigated variables. Also, the stationarity or otherwise of set of data is a prominent test to be ignored in an empirical work, this is because the validity of the result in the test helps in the avoidance of a spurious result that could emanate from this study. Meanwhile, the presence of unit root in the data set affirms the variables only have a short run relationship. This implies that the need for the cointegration test is important in checking for the long run relationship. The study also made use of Fully Modified Ordinary Least Square (FMOLS) in checking how the advancement of the Nigeria's financial sector influences expansion of the nation's industrial output. In the same vein, the study

verify for the causal relationship among the variables in the data set using the Pairwise Granger Causality. And eviews 8 software was used to run the analysis

4. RESULT AND DISCUSSION

Table 1: Descriptive Statistics

	MVA	TCPS	M2	IR	ER	INF
Mean	12.67288	5566.682	9.15E+12	3.127071	121.6749	18.25826
Median	11.19196	1755.195	2.37E+12	5.918908	127.2299	12.38637
Maximum	20.92708	17436.99	3.49E+13	18.18000	306.9210	72.83550
Minimum	6.552817	0.000000	5.76E+10	-31.45257	8.038285	5.388008
Std. Dev.	4.660963	6211.713	1.12E+13	10.63006	88.82773	16.89387
Skewness	0.439718	0.660256	1.007591	-1.329318	0.587832	2.076106
Kurtosis	1.640042	1.851637	2.647445	5.110485	2.781039	6.157526
Jarque-Bera	3.278617	3.828110	5.231570	14.40311	1.787665	34.01354
Probability	0.194114	0.147481	0.073110	0.000745	0.409085	0.000000
Sum	380.1863	167000.5	2.75E+14	93.81213	3650.247	547.7478
Sum Sq. Dev.	630.0127	1.12E+09	3.62E+27	3276.946	228820.6	8276.684
Observations	30	30	30	30	30	30

Source: Authors` Computation (2022)

The first two descriptive statistics are the mean and the median which are measures of central tendency for the variable. As observed from the table, broad money supply (M3) has the highest mean value and rate of interest possesses the lowest value. Also, broad money supply (M3) has the highest median value and the rate of interest exhibits the lowest median value. The standard deviation measures the amount of variation or dispersion or how close to the mean, broad money supply (M3) has the largest value while manufacturing value added as % of GDP (MVA) has the lowest.

Table 2: Augmented Dickey-fuller Test and Phillips PerronTest

Variables	Augmented Dickey-Fuller Test				
	Level	Probability	1 st Diff	Probability	Remark
MVA	-2.967767	0.7008	-2.971853	0.0010	I(1)
TCPS	-2.967767	0.9988	-2.971853	0.0079	I(1)
M2	-2.967767	1.0000	-2.971853	0.0039	I(1)
IR	-2.967767	0.6286	-2.971853	0.00027	I(1)
ER	-2.967767	0.9883	-2.971853	0.0072	I(1)
INF	-2.971853	0.1260	-2.967767	0.0019	I(1)
Variables	Phillips Perron Test				
	Level	Probability	1 st Diff	Probability	
MVA	-2.967767	0.6813	-2.971853	0.0009	I(1)
TCPS	-2.967767	0.9981	-2.971853	0.0077	I(1)
M2	-2.967767	1.0000	-2.971853	0.0033	I(1)
IR	-2.967767	0.6286	-2.971853	0.00027	I(1)
ER	-2.967767	0.9867	-2.971853	0.0105	I(1)

INF	-2.967767	0.1812	-2.967767	0.0020	I(1)
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Source: Authors` Computation (2022)

Spurious results have always been one of the drawbacks of the employment of data that is highly trended like time series data. This could spell doom for empirical findings and policy implication of the study. Therefore, in overcoming this issue, the Augmented Dickey-Fuller (ADF) and the Phillips Perron (PP) tests were utilized to address this. It is important to stress that the estimated results in Table 3 show that all the variables in the data set were all stationary after the first differencing. This implies that all the data used in this study possess unit root.

Table 3: Johansen Cointegration test

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	Prob.	Max-Eigen Statistic	Prob.**
None *	0.888690	165.6286	0.0000	61.47220	0.0001
At most 1 *	0.804443	104.1564	0.0000	45.69333	0.0013
At most 2 *	0.605418	58.46305	0.0037	26.03803	0.0778
At most 3 *	0.556453	32.42502	0.0244	22.76267	0.0292
At most 4	0.288392	9.662352	0.3076	9.526367	0.2449
At most 5	0.004845	0.135985	0.7123	0.135985	0.7123

Source: Authors` Computation (2022)

A set of data that possesses unit root could have short run disequilibrium, meanwhile, this short run disequilibrium have a tendency to disappear in the long run. To ensure whether a long run equilibrium exists in this study, a multivariate cointegration test by Johansen and Juselius (1990) was estimated. The results displayed in Table 3 show that at most 5 cointegrating vectors exist among the variables. This is an indication that a long run relationship is in existence among the variables.

Table 4: Impact of Financial Sector Development on Industrial Performance in Nigeria

Dependent Variable: Manufacturing Value Added as a % of GDP

Selected Model: FMOLS

Variable	Coefficient	T-Statistic	Prob.
TCPS	-0.001965***	8.552266	0.0000
M2	1.19E-12***	8.685162	0.0000
IR	0.087706**	1.779337	0.0884
ER	-0.047837***	6.104261	0.0000
INF	0.100509**	3.289788	0.0032
R-squared	0.855691		

*Significant at 10%, **Significant at 5%, *** Significant at 1%

Source: Authors` Computation (2022)

Table 4 shows the estimated result of the regression analysis used to analyse the impact of the advancement of financial sector on industrial performance in Nigeria within the framework of Fully Modified Ordinary Least Squares. The test that shows the reliability of the model in this work is relatively good as financial sector development variables and other control variables jointly explained about 85% of the systematic variations in dependent variable as indicated by the result of

R-Squared. All variables showed the expected sign except total credit to private sector (TCPS) and exchange rate (ER).

Consequently, total credit to private sector and industrial performances had a significant negative relationship. This implies that a unit change total credit to private sector brings about 0.00002% reduction in industrial performances in Nigeria. Whereas, M3 – total money in circulation had both positive significant relationship with industrial performances in Nigeria. As the M3 increases by a unit, industrial performance increases by 0.019% in the country. Furthermore, interest rate and industrial performance had a direct relationship, which shows 10% level of significance. A unit change in interest rate brings about 0.001% rise in industrial performance in the country. Moreover, inflation rate and industrial performance had a positive and significant relation in Nigeria. This shows that a unit change in inflation rate causes a 0.1% rise in industrial performance in the country. Meanwhile, exchange rate had a negative and significant relationship with industrial performance in Nigeria. A unit change in exchange rate causes 0.04% reduction in industrial performance in the country.

In a nutshell, out of the three principal variables used to proxy financial sector development in this study, it is evident that two of them, namely M3 and interest rate have both positive and significant relationship with industrial development in Nigeria. Therefore, this study submits that financial development contributes to a positive and significant industrial performance in Nigeria. This finding is in tandem with the submissions of Aiyetan and Aremo (2015), Oludele (2019), Kazeem (2020) and Raj and Vikas (2018) in similar studies. Meanwhile, the finding in this study contradicts the results of Elijah and Uchechi (2012) and Udoh and Ogbuagu (2012) in related studies.

Table 5: Pairwise Granger Causality Test

Null Hypothesis	F-Statistic	Prob.	Decision	Causality
TCPS does not Granger Cause MVA	2.21235	0.1322	Accept	
MVA does not Granger Cause TCPS	2.21589	0.1318	Accept	
M2 does not Granger Cause MVA	2.14322	0.1401	Accept	
MVA does not Granger Cause M2	2.61042	0.0951	Accept	
IR does not Granger Cause MVA	2.72675	0.0866	Accept	
MVA does not Granger Cause IR	9.43169	0.0010	Reject	Unidirectional
M2 does not Granger Cause TCPS	0.49556	0.6156	Accept	
TCPS does not Granger Cause M2	3.56224	0.0449	Reject	Unidirectional
IR does not Granger Cause TCPS	0.14871	0.8626	Accept	
TCPS does not Granger Cause IR	1.12577	0.3416	Accept	

IR does not Granger Cause M2	0.05841	0.9434	Accept
M2 does not Granger Cause IR	0.76333	0.4776	Accept

Source: Authors` Computation (2022)

There is a need to establish the flow of causality among the various variable of interest in this paper, further effort was made to present the estimated results of Granger causality in table 5. It was discovered that a unidirectional causal relationship which flows from industrial development to interest rate in Nigeria. This connotes that industrial advancement is necessary condition for the improvement of the financial sector in Nigeria. Similarly, total credit to private sector Granger causes broad money supply in Nigeria. This indicates that broad money supply in Nigeria is driven by total credit disbursed to the private sector.

4.2. CONCLUSION AND POLICY IMPLICATIONS

The techniques of Fully Modified Ordinary Least Squares and Granger causality have been used in this study with a purpose of ascertaining the relationship between financial sector development and industrial performance in Nigeria between 1990 and 2019. The findings that came up in the study are presented as follow; out of the three principal variables used to proxy development of financial sector in this study, two of them- M3 and interest rate have both direct and significant relationship with industrial output in Nigeria. As a result of this, the study concludes that financial development contributes to a positive and significant industrial performance in Nigeria. The findings from direction of causality shows that a unidirectional feedback relationship flows from industrial performance to interest rate in one hand and one way feedback relationship flows from total credit to private to broad money supply on the other hand. Against these findings this study recommends the following for the policymakers in Nigeria and by extension policymakers in Africa that whenever these policymakers desire to achieve industrial development, policy that will drive the development of financial sector should be embarked upon. In addition, the Nigerian monetary authorities should ensure that adequate credit is disbursed to private sector in order to drive better industrial performance in the countries.

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