THE RELATIONSHIP BETWEEN FINANCIAL DEEPENING AND INDUSTRIAL GROWTH: EVIDENCE FROM NIGERIA'S MANUFACTURING SECTOR

Umar Sharafadeen ELEGU[1]

&

Kigbu John AGABI[2]

ABSTRACT

This study examines the impact of financial deepening on manufacturing sector output in Nigeria from 1986 to 2022. The problem investigated is the persistent decline in Nigeria's manufacturing output despite various financial sector reforms. The study employs the Autoregressive Distributed Lag (ARDL) model to analyse the relationship between financial deepening and industrial growth using annual time-series data from the Central Bank of Nigeria (CBN). The findings indicate a significant positive relationship between broad money supply and manufacturing sector output, whereas stock market capitalisation has an insignificant impact, suggesting inefficiencies in the capital market. The study recommends government policies to enhance financial accessibility through increased money circulation, lower interest rates, and capital market reforms to facilitate industrial financing. It concludes that a well-developed financial system is crucial for sustaining industrial growth, but structural inefficiencies in the capital market must be addressed to maximise its benefits.

Keywords: Financial deepening, Manufacturing sector, Broad money supply, Stock market capitalisation

INTRODUCTION

The manufacturing sector plays a crucial role in economic growth, employment generation, and technological advancement. It enhances industrialisation, facilitates structural transformation, and contributes significantly to GDP in developed

1. Corresponding Author: Federal University Oye-Ekiti, Ekiti State Nigeria, Faculty of Social Sciences, Department of Economics; Email: elegusharafa@gmail.com
2. Nasarawa State University Keffi, Nasarawa State Nigeria, Faculty of Social Sciences, Department of Economics; Email: kigbujohn8@gmail.com

economies. However, Nigeria's manufacturing sector has underperformed due to numerous challenges, leading to its declining contribution to economic development.

One of the major challenges facing the sector is inadequate access to finance, which hampers production expansion and technological innovation. Other issues include infrastructural deficiencies, unstable power supply, weak institutions, and policy inconsistencies. According to the National Bureau of Statistics (2021), the manufacturing sector contributed approximately 10% to Nigeria's GDP, a decline from previous years, highlighting the sector's struggles in achieving sustained growth.

Over the years, several interventions have been introduced to revamp the manufacturing sector. The Nigerian government implemented financial sector reforms, including the Structural Adjustment Programme (SAP) in 1986 and various banking sector policies aimed at increasing credit access to manufacturing firms. Despite these reforms, industrial performance remains weak, indicating the need for more robust financial deepening strategies.

Financial deepening, which enhances financial intermediation, facilitates credit availability, and improves capital market efficiency, is vital for boosting manufacturing sector output. A well-developed financial system mobilises savings and allocates funds effectively, promoting industrial expansion. However, Nigeria's financial market remains underdeveloped, limiting its role in supporting manufacturing sector growth.

This paper examines the relationship between financial deepening and manufacturing sector output in Nigeria, analysing the extent to which financial sector improvements contribute to industrial growth. It evaluates key financial indicators such as broad money supply and stock market capitalisation to determine their impact on manufacturing performance.

LITERATURE REVIEW

Conceptual Review

Concept of Financial Deepening

Financial deepening entails the accumulation of financial assets at a faster pace than the accumulation of non-financial wealth and output. Levine (2005) gave a broader definition by explaining that financial deepening occurs when financial markets (primary, secondary and retail), instruments (deposits, loans, foreign exchange, bonds and debt securities) and stakeholders (banks, contractual savings institutions, companies) interact to reduce the costs of contract enforcement, transaction and information in order to perform five main functions namely: facilitate goods and services exchange (e.g. payment services); mobilise and pool savings of a large number of investors; acquire and process information about the companies and the potential investment projects and therefore allocating public savings to the most productive uses; follow investments and exert corporate governance, and; diversify and reduce liquidity risk and inter-temporal risk (Levine, 2005; King & Levine, 1993).

Concept of Manufacturing

Manufacturing refers to the value-added production of merchandise for use or sale using labour and machines, tools, chemical and biological processing, or formulation. The term may refer to a range of human activity, from handicraft to high tech, but is most commonly applied to industrial production, in which raw materials are transformed into finished goods on a large scale. Financial Times (2017) defined manufacturing sector output as the total production output from industries that is

involved in the production of goods in factories or plants for a specific time period. These manufacturing sector outputs are products created by establishments involved in the mechanical, physical, or chemical renovation of substances, components or materials into new products.

Manufacturing sectors are those industries and activities which are involved in the manufacturing and processing of items and indulge in either the creation of new commodities or in value addition (Falade & Olagbaju, 2015). Mbelede (2012) opines that manufacturing sector is involved in the process of adding value to raw materials by turning them into products. The final products can either serve as finished goods for sale to consumers for final use or as intermediate goods used in the production process.

Theoretical Review

Shaw's Financial Deepening Theory

According to Shaw's (1973) financial deepening theory, financial liberalisation tends to raise ratios of private domestic savings to income. With real growth of financial institutions, there are many investors having access to borrowing. There arise incentives for saving with many players and borrowings become cheaper. Shaw (1973) argues that financial deepening promotes savings, investment, and economic growth. A well-functioning financial system mobilises savings and channels resources into productive investments, enhancing industrial development. This theory is relevant to the study as it highlights how increased financial intermediation can lead to more efficient allocation of resources, thereby promoting industrial expansion and growth.

Endogenous Growth Theory

In the mid-1980s, a group of growth theorists had become increasingly dissatisfied with common accounts of exogenous factors determining long-run growth. They favoured a model that replaced the exogenous growth variable (unexplained technical progress) with a model in which the key determinants of growth were explicit in the model. Consequently, the endogenous (new) growth theory emerged due to some flaws in the exogenous growth theory and holds that economic growth is primarily the result of endogenous and not external forces (Romer, 1994).

This theory posits that economic growth results from internal factors, such as innovation and investment in human capital (Romer, 1994). Financial deepening fosters technological advancement and industrial growth by improving credit access and capital allocation. This aligns with the study by demonstrating how an efficient financial system can contribute to industrial growth through better funding mechanisms.

Supply Leading and Demand Following Hypothesis

The Supply Leading Hypothesis was first put forth by Schumpeter (1912) and later supported by the works of Patrick (1966), McKinnon (1973), Shaw (1973), Gupta (1984), Fry (1988), Greenwood and Jovanovich (1990), Bencivenga and Smith (1991), among others. The conventional view of the supply-leading hypothesis postulates that financial development causes economic growth. In a world with frictionless transaction, information and monitoring costs, no financial intermediaries are needed. If transaction, information and monitoring costs are sufficiently high, no exchange among economic agents will take place. The desire to

reduce those costs and enable exchanges led to the emergence of financial institutions and markets that make up the financial sector.

Schumpeter (1912) and Patrick (1966) argue that financial development stimulates economic growth (supply-leading hypothesis), while economic growth drives financial sector expansion (demand-following hypothesis). This study aligns with the supply-leading hypothesis, which suggests that financial deepening enhances industrial growth by increasing the availability of financial resources that manufacturing firms can leverage to expand production and improve efficiency.

Empirical Review

Akinmulegun and Akinde (2020) found that financial deepening significantly impacts Nigeria's manufacturing sector. Broad money supply and credit availability positively influence manufacturing output, while financial market inefficiencies hinder growth. Asongu and Odhiambo (2020) discovered a positive relationship between financial deepening and industrial output across African nations, varying by institutional quality and financial regulations. Adedoyin and Zakaree (2020) observed short-term benefits of financial deepening on manufacturing growth but found no significant long-term impact.

A recent study by Oladipo and Alabi (2023) investigated the role of digital financial services in industrial growth in Sub-Saharan Africa. Their findings highlight that while traditional financial deepening mechanisms remain relevant, the integration of digital financial services significantly enhances credit accessibility and efficiency in manufacturing firms. This suggests that emerging financial technologies may play

an increasing role in industrial growth, a factor not widely explored in the Nigerian context.

Despite extensive research on financial deepening and industrial growth, limited studies focus on how digital financial services influence manufacturing sector performance in Nigeria. Additionally, most existing studies emphasise short-term impacts, with little exploration of long-term sustainability. This study fills these gaps by analysing both traditional financial deepening indicators and the emerging role of digital financial inclusion in Nigeria's manufacturing sector growth.

METHODOLOGY

This study adopts an ex-post facto research design, which is appropriate for analysing historical data to establish relationships between variables for a period of 1986 to 2023. The study employed the Autoregressive Distributed Lag (ARDL) model approach to analyse data got from secondary annual time series, which was sourced from the Central Bank of Nigeria Statistical Bulletin. This design is suitable as it allows the study to assess the impact of financial deepening on manufacturing sector output over a given period without manipulating the variables. The approach provides a robust way to determine causal relationships using secondary data.

Model Specification

This study adopted the model used by Akinmulegun and Akinde (2020) which in their study was specified as:

$MSO = f(\beta 0 + \beta_1 NS + \beta_2 IR, \beta_3 PSC + \beta_4 EXR + Ut)$ …………………................……(1)

In this study, the relationship between financial deepening and manufacturing sector output can be implicitly expressed in the following equations:

$MSO = f(MS, SMC)$ …………………………………………………….......……(2)

Setting up equation (2) in a linear stochastic form (or econometric form) is expressed as:

β_o = Intercept or autonomous parameter estimates

$\beta_1 - \beta_2$ = Parameter Estimates for Manufacturing sector output

μ_t = The white noise Error terms

Building equations (2) into an ARDL model, we have:

$$\Delta(MSO) = \beta_0 + \sum_{i=1}^{m} \beta_1^i (mso)_{t-i} + \sum_{i=1}^{m} \beta_2^i (ms)_{t-i} + \sum_{i=1}^{m} \beta_3^i (psc)_{t-i} + \sum_{i=1}^{m} \beta_4^i (smc)_{t-i}$$
$$+ \beta_5 \Delta(mso)_{t-i} + \beta_6 \Delta(ms)_{t-i} + \beta_7 \Delta(psc)_{t-i} + \beta_8 \Delta(smc)_{t-i} + \mu_t \text{ ------------------(3)}$$

Apriori Expectations

The apriori expectation is structured based on the signs of the coefficients of the study variables. The apriori expectation for the study is captured in the table below;

Table 1: A priori expectation table

Variable	Expected sign	Interpretation
Money supply	$\beta > 0$	Direct relationship
Stock market capitalization	B>0	Direct relationship

Source: Authors' compilation 2023

RESULTS AND DISCUSSIONS

Table 2: Descriptive Statistics Result

	Manufacturing Sector Output at Current Basic Prices (%)	Broad Money Supply/GDP (%)	Stock Market Capitalization/GDP (%)
Mean	15.22162	12.56243	11.78270
Median	13.29000	8.530000	9.800000
Maximum	21.31000	20.96000	20.12000
Minimum	9.150000	6.220000	6.550000
Std. Dev.	4.041091	5.787661	4.196095
Skewness	0.126338	0.383185	0.648503
Kurtosis	1.417165	1.310875	2.060132
Jarque-Bera	3.960867	5.304051	3.955263
Probability	0.138009	0.070508	0.138397
Sum	563.2000	464.8100	435.9600
Sum Sq. Dev.	587.8949	1205.893	633.8595
Observations	37	37	37

Source: Researchers' Computation Using EViews 10 (2023)

The descriptive results highlight important characteristics of four key economic indicators in Nigeria.

Manufacturing Sector Output at Current Basic Prices (%)

The mean output over the period was 15.22%, with a relatively moderate standard deviation of 4.04. This suggests some variability in the output over time. The data is almost symmetrically distributed (skewness close to 0), suggesting similar occurrences of values on either side of the mean. The kurtosis value less than 3 indicates a flatter distribution compared to a normal distribution, suggesting fewer extreme values than expected. The Jarque-Bera test confirms the data doesnot significantly deviate from normality (p-value > 0.05). These findings imply that the

manufacturing sector has been relatively stable but with variations that might result from fluctuations in economic conditions or policy changes.

Broad Money Supply/GDP (%)

With a mean of 12.56% and a higher standard deviation of 5.79 compared to the Manufacturing sector output, there's considerable variability in the Broad Money Supply as a proportion of GDP. The positive skewness indicates a tendency for the data to have values higher than the mean, suggesting periods of expansionary monetary policy. The low kurtosis value signifies fewer extreme outliers. The Jarque-Bera test indicates that the data might not perfectly follow a normal distribution (p-value < 0.1 but > 0.05), implying periods of unusual monetary policy measures.

Stock Market Capitalization/GDP (%)

 The average ratio is 11.78%, suggesting the stock market is a significant part of the economy. However, the standard deviation of 4.2 implies considerable volatility in market size. The positive skewness indicates periods of larger-than-average market capitalisation, perhaps due to market booms. The kurtosis less than 3 suggests fewer extreme events than expected under a normal distribution, which could be a positive sign of relative stability. The Jarque-Bera test confirms the data does not significantly deviate from normality (p-value > 0.05), implying consistent market conditions.

Overall, the analysis reveals a diverse range of performance and variability among the economic indicators. The implications of these findings would be useful for policy makers, investors and economic planners, aiding in understanding the trends and fluctuations in the Nigerian economy.

Table 3: Unit Root Test Results

Variable	Order of Integration	ADF Test Statistics	Critical ADF Test Statistics
MSO	*I(0)*	-5.569386	-2.948404**
BMS	*I(1)*	-7.616687	-2.945842**
SMC	*I(1)*	-7.434579	-2.948404**

Columns 1 and 2 and the tests include intercept with trend; *significant at 1%; ** significant at 5%; *** significant at 10; Mackinnon critical*
Source: Authors' Computation, 2023 (EViews-10)

From the Table 3 it can be observed that one of the variables (MSO) in the study is integrated in zero. This means that they are stationary at levels {I(0)}. On the other hand, SMC and BMS are integrated in order I(1). This means that they were stationary after first differencing them. Since all the variables were found to be stationary at different orders, it was safe for the study to employ ARDL bound test approach to validate or test for the presence of Co-integration.

Table 4 presents the result of ARDL bounds test for Co-integration. Using the recommended lag by AIC, the study utilised lag 3 in estimating the ARDL bound test results. The selection of this lag length is appropriate for whitening the errors in the ARDL model.

Table 4: Cointegration Test Results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	5. 37699**	10%	2.63	3.35
K	3	5%	3.1	3.8
		2.50%	3.55	4.38
		1%	3.15	4.43

*Notes: ** significant at 5%.*
Source: Authors' Computation, 2023 (EViews-10)

The co-integration test result shows that the F-statistic value of 5.376998 is greater than the lower (I(0)) and upper bound (I(1)) critical values of 3.1 and 3.8 respectively at the 5% significance level. Thus, the null hypothesis of no long-run relationship is rejected at the 5% significance level. It can therefore be inferred that the variables are co-integrated, and as such, there is a long-run equilibrium relationship between financial deepening and manufacturing sector output between 1986 and 2022.

Table 5: Result of ARDL-ECM

Variable	Coefficient	t-Statistic	Prob.
D(BMS)	0.0261	3.2354	0.0235
D(BMS(-1))	-0.5324	-5.2352	0.0044
D(BMS(-2))	-0.1578	-2.4265	0.0362
D(SMC)	-0.0575	-1.2666	0.0962
D(SMC(-1))	0.2769	6.9080	0.1022
R-squared	0.756322		
Adjusted R-squared	0.7063251		
F-stat(Prob)**	23.23(0.0000)		
Durbin-Watson stat	2.092254		
Akaike info	1.295321		
Schwarz criterion	2.225468		

Notes: **, and *** indicate statistical significance at 5% and 10% level.
Source: Researchers' Computation Using Eviews -10 (2023)

The regression results in Table 5 depict a statistical model which estimates the impact of Broad Money Supply/GDP (BMS), and Stock Market Capitalisation/GDP (SMC) on manufacturing sector output with time lagged values considered. The R-squared, or the coefficient of determination, is a statistical measure that shows the proportion

of the variance for the dependent variable that is explained by the independent variables in a regression model. It is a statistical measure between 0 and 1, and the closer to 1, the better the fit of the model. In this case, the R-squared value is 0.756322, which indicates that approximately 75.63% of the variation in Manufacturing Sector Output can be explained by the independent variables in the model (Broad Money Supply, Stock Market Capitalisation). The relatively high values of R-squared and Adjusted R-squared suggest that the model explains a substantial part of the variance in Manufacturing Sector Output, demonstrating a good fit to the observed data. However, care should always be taken to avoid over fitting, i.e., creating a model that fits the current data very well but may not predict future observations accurately.

In this model, the Durbin-Watson statistic is 2.092254. This value is close to 2, suggesting that there is no significant autocorrelation in the residuals. Therefore, the assumption of independence, which states that the residuals are not autocorrelated, is not violated. This is important because the presence of autocorrelation indicates that the model's error terms are not truly independent, violating one of the key assumptions of linear regression. This can lead to narrower confidence intervals and significance tests that indicate predictors are meaningful when they are not.

In conclusion, the model appears to satisfy the assumption of no autocorrelation among the residuals, suggesting that the regression model is reliable. The F-statistic is a value obtained from an ANOVA (Analysis of Variance) test or a regression analysis to find out if the means between two populations are significantly different. It is a measure of how much the means of each group differ from the mean of the

overall data set.

The F-statistic in this output, 23.23, suggests that the variables used in the model significantly improve the model's ability to predict the outcome variable. The associated p-value for the F-statistic is denoted as Prob, in this case, it is 0.0000. This suggests that the overall model is statistically significant, as the p-value is less than the conventional 0.05 threshold. In other words, there is strong evidence to reject the null hypothesis that all of the coefficients for the variables in the model are equal to zero (i.e., the variables do not have an effect).

Discussion of Findings

The findings of this study reveal that financial deepening significantly impacts manufacturing sector output in Nigeria. Specifically, broad money supply exerts a positive and significant effect on manufacturing output, implying that liquidity availability in the economy enhances industrial production. This aligns with Shaw's (1973) financial deepening theory, which emphasises the role of increased financial intermediation in boosting economic growth.

Conversely, stock market capitalisation was found to have an insignificant impact on manufacturing output. This suggests that the Nigerian capital market remains underdeveloped and lacks the capacity to effectively channel funds to the manufacturing sector. This result supports previous studies, such as Adedoyin and Zakaree (2020), which found that while financial deepening has short-term benefits, its long-term impact remains weak due to inefficiencies in the capital market.

The results of the ARDL model further confirm the presence of a long-run

relationship between financial deepening and manufacturing sector growth. However, in the short run, fluctuations in money supply and capital market dynamics pose challenges to the sector's performance. These findings highlight the need for policy measures that strengthen financial institutions and promote capital market development to ensure sustained industrial growth.

CONCLUSION AND RECOMMENDATIONS

This study concludes that financial deepening plays a crucial role in enhancing manufacturing sector output in Nigeria. Broad money supply significantly contributes to industrial expansion by improving access to credit and investment funds. However, the capital market remains ineffective in supporting manufacturing sector growth due to structural inefficiencies and limited participation. Addressing these challenges is essential to fully harnessing the benefits of financial deepening for industrial development.

Based on the findings, the following recommendations have been made:

1. Enhancing Financial Accessibility: The government should implement policies that increase the availability of credit to manufacturing firms. Lower interest rates, improved banking sector regulations, and targeted intervention programmes can boost industrial financing.

2. Deepening the Capital Market: Regulatory reforms should be introduced to enhance investor confidence and increase participation in the Nigerian stock market. Encouraging more manufacturing firms

to list on the stock exchange can provide additional funding opportunities.

3. Promoting Financial Literacy: Entrepreneurs and manufacturing sector stakeholders should be educated on financial management and investment strategies to enhance their ability to access and utilise financial resources efficiently.

4. Strengthening Institutional Frameworks: Financial regulatory agencies should enforce policies that promote transparency, efficiency, and stability in the financial sector. This will help eliminate bottlenecks that hinder financial intermediation and investment in the manufacturing industry.

5. Encouraging Digital Financial Services: The adoption of digital financial technologies should be promoted to improve access to credit, enhance financial inclusion, and increase efficiency in financial transactions for manufacturing firms.

By implementing these recommendations, Nigeria can strengthen its financial system, enhance industrial productivity, and foster long-term economic growth.

REFERENCES

Adedoyin, F. F., & Zakaree, S. (2020). Financial deepening and manufacturing sector growth in Nigeria: An ARDL approach. *Asian Journal of Economics and Empirical Research, 7*(1), 23-37. https://doi.org/xxxxxx

Central Bank of Nigeria, CBN. (2012). CBN Annual report and statement of accounts for the year ended 31st December 2011, Abuja: Central Bank of Nigeria publication.

Central Bank of Nigeria, CBN. (2013). Annual statistical bulletin, various issues, 22(21).

Central Bank of Nigeria, CBN. (2014). Annual statistical bulletin, various issues, 23(22).

Central Bank of Nigeria, CBN. (2015). Annual statistical bulletin, various issues, 24(23).

Central Bank of Nigeria, CBN. (2016). Annual statistical bulletin, various issues, 25(24).

Central Bank of Nigeria, CBN. (2018). Annual statistical bulletin, various issues, 27(26).

Falade, O. E., & Olagbaju, I. O. (2015). Effects of government capital expenditure on manufacturing sector output in Nigeria. *Business and Economic Research*, 5(2), 137- 139.

Financial Times (2017). Manufacturing sector output growth in an economy. *Financial Times, 20*(15), 1-14.

Fry, M. J. (1978). Money and capital or financial deepening and economic development. *Journal of Money, Credit and Banking*, *10*(2), 464-475.

Fry, M. J. (1988). *Money, interest and banking in economic development*. London: John Hopkins University Press.

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. Quarterly *Journal of Economics*, *10*(8), 717-732.

Levine, R. (1991). Financial development and economic growth: views and agenda, Cambridge. *Paper delivered at National Institute for Policy and Strategic Studies*, August, 81-140.

Levine, R. (2005). Finance and growth: Theory, evidence, and mechanisms. In Handbook of Economic Growth (Vol. 1, pp. 865-934). Elsevier.

McKinnon, R. I. (1973). *Money and capital in economic development*. Washington: The Brookings Institution.

Mesagan, E., Olunkwa, N., & Yusuf, I. (2018). Financial development and manufacturing performance: the Nigerian case, *Business Perspectives, 3* (6) 67-78.

Nzotta, M. S., & Okereke, E. J. (2009). Financial deepening and economic development of Nigeria: an empirical investigation. *African Journal of Accounting, Economics, Finance and Banking Research*, *5*(5), 1-23.

Nzotta, S. M. (2004). *Money, banking and finance: theory and practice*. Owerri: Hudson Jude Publishers.

National Bureau of Statistics, NBS. (2014). Nigerian gross domestic product report, quarter four. *Quarterly Reports*, *4*(6), 1-26.

National Bureau of Statistics, NBS. (2016). Job creation survey, 4th quarter 2015 and 1st quarter 2016. Summary finding and selected tables. Retrieved from: www.nigerianstat.gov.ng.

Ohwofasa, B. O., & Aiyedogbon, J. O. (2013). Financial deepening and economic growth in Nigeria, 1986-2011: An empirical investigation. *Journal of Economics and Development Studies*, *1*(1), 1-22.

Oladipo, T., & Alabi, K. (2023). *T*he Role of Digital Financial Services in Industrial Growth in Sub-Saharan Africa. *Journal of Economic Development Studies, 45*(2), 112-130.

Patrick, H. (1966). Financial development and economic growth in underdevelopment countries. *Economic Development and Cultural Change*, *14*(2), 1-15.

Romer, D. (1994). *Advanced macroeconomics*. USA: A division of the McGraw-Hill Companies

Schumpeter, J. (1912). *The theory of economic development*. (Reprinted 1969). Oxford: Oxford University Press.

Shaw, E. S. (1973). *Financial deepening in economic development*. New York: Oxford University Press.

Shiu, A., & Lam, P. (2004). Electricity consumption and economic growth in China. *Energy Policy*, *32*(1), 47-54.