Impact of Capital Market Development on Industrial Sector Output in Nigeria: 1986-2022

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DOI: https://dx.doi.org/10.47772/IJRISS.2024.802024

Received: 01 January 2024; Revised: 19 January 2024; Accepted: 23 January 2024; Published: 02 March 2024

ABSTRACT

The ideal situation for any growing economy, especially one as diversely poised as Nigeria, is to have a thriving industrial sector. This sector is traditionally seen as an indispensable engine of growth, a crucial antidote to the challenges of unemployment, and a potent creator of wealth. Regrettably, the current state of the manufacturing sector in Nigeria falls significantly short of this ideal. Recent statistics indicate that the industrial sector's contribution to GDP remains suboptimal, with the National Bureau of Statistics (NBS) reporting a decline in industrial growth despite several policy measures aimed at enhancing its growth. This research sought to investigate the impact of capital market development on the growth of industrial sector in Nigeria between 1986 and 2022 with the aid of ARDL estimation technique. The findings revealed that Stock Market Capitalization had a significant and positive impact on industrial sector growth, suggesting that as market capitalization increased, the industrial sector flourished. In the same vein, Turnover Ratio, which is the value of traded shares divided by market capitalization, was found to enhance industrial sector growth positively and significantly. These positive relationships underscored the pivotal role the capital market plays in boosting the industrial sector by mobilizing and channeling resources efficiently. However, the All-Share Index exhibited a negative relationship with the industrial sector growth, indicating that while general market sentiment might be positive, it might not always translate to growth in the industrial sector. Based on these findings, the paper recommended promoting public listings and private investments as a strategy to enhance the growth potential of the industrial sector. Furthermore, improving trading platforms, ensuring market transparency, and reducing transactional costs were emphasized to leverage the benefits of a high turnover ratio. For the negative aspects found with All-Share Index, policymakers were advised to address these components to ensure holistic development of both the capital market and the industrial sector.

Keywords: All-Share Index, Stock Market Capitalization, value of traded shares, Economic Growth and Industrial Sector Output

JEL Codes: G1, O4 and L6

INTRODUCTION

The capital market serves as a cornerstone of modern economies, playing an integral role in mobilizing long-term funds and channeling them to sectors in need of capital. It facilitates a dual function: enabling corporations to raise capital by issuing securities, and providing a platform for investors to earn returns on their long-term savings.

Capital markets have traditionally been divided into primary and secondary markets. In the primary market, new securities are issued to the public, facilitating corporations to raise capital for investment, expansion,

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue II February 2024

and other ventures. In contrast, the secondary market enables the buying and selling of existing securities, offering liquidity and determining the price of securities based on supply and demand dynamics. Efficient functioning of these markets is essential for economic growth, as emphasized by Oaikhenan and Ailemen (2017), who highlighted that well-functioning capital markets provide a boost to economic innovation and productivity.

Capital markets play a fundamental role in mobilizing savings, allocating resources efficiently, and facilitating risk diversification. They serve as a key mechanism that provides a platform for businesses and government institutions to raise long-term funds for capital projects and infrastructural developments. Its growth is essential for the mobilization of savings and the efficient allocation of resources in an economy. Specifically, three crucial indicators measure the development of a capital market: stock market capitalization, turnover ratio (which indicates market liquidity by determining the value of traded shares relative to market capitalization), and the all share index (which provides an aggregate snapshot of overall market performance) (Osinubi & Amaghionyeodiwe, 2016).

Nigeria's capital market has witnessed significant transformations in the last decade. Notably, between 2012 and 2021, Nigeria's stock market capitalization grew by over 60%, reflecting a surge in the number of listed companies, which translates to increased opportunities for firms to raise capital for expansion and innovation. Stock market capitalization in Nigeria grew from NGN 9.56 trillion in 2015 to NGN 13.62 trillion in 2019 and NGN 51.25 trillion in 2022 (National Bureau of Statistics, 2020; and CBN, 2022). This growth not only mirrors the influx of domestic and foreign investments but also points towards an increased faith in the Nigerian capital market system. Additionally, the turnover ratio, as reported by the Nigerian Stock Exchange, showed a steady increment, suggesting an active market where securities are frequently traded. The all share index, though volatile in periods, reflects the overall health of listed firms, and it surged by 14.6% year-on-year in 2019, an optimistic sign for investors.

Parallel to the growth of the capital market is the evolution of the industrial sector in Nigeria. The industrial sector is a key pillar of Nigeria's economy and plays a critical role in shaping its growth trajectory, providing employment opportunities, and diversifying its economic base. Historically, the country was heavily reliant on agriculture, but post-independence, there was a concerted effort to foster industrialization as a means to achieve sustainable economic growth and reduce dependence on agricultural exports.

The industrial sector in Nigeria has undergone various phases, oscillating between periods of growth and stagnation. A study by Ewetan and Ike (2014) revealed that the sector's contribution to the Gross Domestic Product (GDP) increased from 4% in the 1960s to over 10% by the end of the 2010s. This growth trajectory can be linked to several policy reforms that aimed to diversify the economy away from an over-dependence on oil. Industries such as manufacturing, construction, and services have benefited immensely from these policies, resulting in increased output, employment, and contributions to national income.

Therefore, in an ideal economic setting, the industrial sector serves as a significant engine of growth, an antidote for unemployment, and a potent creator of wealth. The manufacturing sector, in particular, stands out as an indispensable component of this industrial engine, with its capacity to innovate, scale, and drive economic transformation. Countries with thriving manufacturing sectors often witness exponential growth, job creation, and significant contributions to their GDP.

The manufacturing sector, however is not growing or performing as anticipated. According to Iwayemi (2022), the oil boom of the 1970s led to the neglect of other sectors, with the industrial sector particularly affected as the country focused its efforts on harnessing its oil wealth. Recent reports suggest that its output is declining, employment in the sector is dwindling, and capacity utilisation is faltering. For instance, according to the National Bureau of Statistics (NBS, 2020), the manufacturing sector's contribution to Nigeria's GDP witnessed a decline from 9.8% in 2018 to 8.4% in 2019. Furthermore, the capacity utilisation

of manufacturing firms slid from 61% in 2017 to a mere 56% in 2019.

The Nigerian Industrial Revolution Plan (NIRP), launched in 2014, was another strategic initiative aimed at accelerating the growth of the industrial sector. According to Oyelaran-Oyeyinka (2015), the NIRP targeted key industries such as agribusiness, solid minerals, oil and gas, and construction, promoting their growth and integration into global value chains. This initiative led to modest improvements, with the industrial sector's contribution to GDP growing from 23.4% in 2014 to 25.2% in 2019 (National Bureau of Statistics, 2020). Yet, despite these advancements, numerous challenges persist.

In an attempt to tackle these issues, policymakers have employed several strategies aimed at enhancing the sector's performance. These strategies have ranged from providing tax incentives and subsidies to establishing special economic zones to boost industrial growth. However, despite these commendable policy interventions, the manufacturing sector has continued to grapple with underperformance. This is evident in the declining figures despite the introduction of several policy measures.

Therefore, given the universally acknowledged role of manufacturing sectors in fostering real growth and development, Nigeria's industrial underperformance is deeply concerning. As such it is of interest in this paper to investigate the Impact of capital market development on industrial sector growth in Nigeria between 1986 and 2022.

The paper addressed the following research objectives, and they are to:

i. evaluate the impact of stock market capitalization on industrial sector growth in Nigeria
ii. examine the influence of turnover ratio (value of traded shares divided by market capitalization) on industrial sector growth in Nigeria
iii. ascertain the impact of all share index on industrial sector growth in Nigeria.

Following the above specific objectives, the following hypotheses were assessed:

H_{01}: Stock market capitalization has no significant impact on industrial sector growth in Nigeria

H_{02}: Turnover ratio (value of traded shares divided by market capitalization) has not significantly enhanced industrial sector growth in Nigeria

H_{03}: All share index has no significant impact on industrial sector growth in Nigeria

LITERATURE REVIEW

Conceptual Clarifications

Capital Market Development

The concept of capital market development encompasses a series of transformations and advancements within the capital market framework aimed at its improved efficiency, depth, and inclusivity. Several scholarly definitions over recent years have expounded on the idea, emphasizing various facets of the capital market and its evolution.

Yartey (2017) provides a more comprehensive view, defining capital market development as the growth and sophistication of capital market institutions and instruments. He accentuates that the process involves creating a conducive environment where various financial assets can be traded effectively, and where the secondary market has a high degree of liquidity. Yartey further elaborates that a developed capital market should be characterized by a robust regulatory framework, diversified investor base, and the ability to offer

a range of financial products to cater to varying investor needs. Osinubi & Amaghionyeodiwe (2016) noted that some of the crucial indicators that measure the development of a capital market are: stock market capitalization, turnover ratio (which indicates market liquidity by determining the value of traded shares relative to market capitalization), and the all-share index

Stock market capitalization refers to the total value of all shares of stock that are traded on a particular stock exchange. It is calculated by multiplying the current market price of a company's shares by the total number of shares outstanding. This figure provides a comprehensive snapshot of the size and value of a stock market, offering insights into the overall scale and worth of the companies listed on that exchange.

The turnover ratio in the stock market is a measure that indicates the frequency at which stocks are bought and sold within a given period. It is calculated by dividing the total volume of shares traded during the period by the average market capitalization for that period. A high turnover ratio suggests active trading and high liquidity, whereas a low turnover ratio indicates lesser trading activity and potentially lower liquidity in the market (World Bank, 2017)

The All-Share Index is a stock market index that represents the performance of all the stocks listed on a specific exchange. This index is typically calculated by combining the market capitalizations of all listed companies, adjusted by their respective free-float factors. The All-Share Index provides a broad indication of the overall health and trends of the stock market, reflecting the collective movement of its constituent stocks.

Industrial Sector Growth

The industrial sector's growth pertains to the expansion and evolution of industries within an economy, signified by increased production, innovation, and the diversification of products and services. This growth is crucial as it often serves as an indicator of a nation's overall economic progression. Several scholars and institutions have provided insightful definitions and explanations of this growth over recent years.

The United Nations Industrial Development Organization (UNIDO, 2016) conceptualizes industrial sector growth as the "expansion of the value added in the manufacturing sector of an economy." Value addition is central to UNIDO's perspective. It implies transforming raw materials into finished goods and is crucial in gauging a country's industrial maturity. According to UNIDO, industrial growth is not merely about producing more; it's about producing more value.

Schumpeter (2017) underscores the role of innovation in defining industrial growth. In his view, industrial sector growth is intrinsically linked to "innovative processes and the establishment of new production techniques, new products, or new organizational structures." Schumpeter's emphasis on innovation recognizes that it's not only the quantity but the quality and novelty of production that determines genuine industrial expansion.

A more holistic definition comes from Porter and Stern (2015), who argue that industrial sector growth involves "the ability of industries within an economy to achieve global benchmarks in terms of productivity, produce high-quality goods that cater to both domestic and international markets, and continuously adapt to changing technological and market conditions." Their perspective encapsulates both the micro aspects of firm-level productivity and the macro aspect of competing globally.

THEORETICAL REVIEW

Efficient Market Hypothesis (EMH): The Efficient Market Hypothesis (EMH), originally articulated by

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue II February 2024

Eugene Fama in the 1960s, is a cornerstone theory in capital market development. This theory posits that all available information is instantly and accurately reflected in asset prices. In essence, under EMH, it's nearly impossible to consistently "beat the market" because asset prices already incorporate and reflect all relevant information.

According to Fama's seminal paper in 1970, EMH can be categorized into three forms: weak, semi-strong, and strong. The weak form asserts that past price and volume information are reflected in current prices. The semi-strong form suggests that all publicly available information is reflected in asset prices, while the strong form posits that all information, both public and private, is instantly incorporated into market prices.

The strength of EMH lies in its assertion of the unpredictability of future price changes based on historical prices, which has been supported by numerous empirical studies. This unpredictability ensures that markets remain competitive, and no investor has an undue advantage over others. Additionally, EMH emphasizes the importance of information dissemination and its role in asset pricing, which can explain the surge in transparency and disclosure requirements seen in modern capital markets.

However, the theory isn't without its critics. Behavioural economists, like Robert Shiller, argue that irrational behaviour and psychological factors can lead to market inefficiencies. They suggest that emotional and cognitive errors can result in asset price misalignments, leading to market bubbles and subsequent crashes. Additionally, events like the 2008 financial crisis have led many to question the complete reliability of EMH, as the rapid decline of asset prices seemed to contradict the idea that markets always 'know best'.

When considering the impact of capital market development on industrial sector growth, EMH provides a compelling lens. A well-developed capital market, in line with EMH, facilitates the efficient allocation of resources by accurately pricing assets based on all available information. Efficient markets can better channel investments into the industrial sector, ensuring that industries with the most growth potential receive the necessary funding. Conversely, if markets are inefficient, as critics of EMH suggest, capital might be misallocated, potentially hampering industrial sector growth.

Stages of Economic Growth Theory: One of the most prominent theories addressing industrial sector growth is the Stages of Economic Growth Theory propounded by Walt Rostow in 1960 in his work, "The Stages of Economic Growth: A Non-Communist Manifesto." Rostow's theory delineates the economic transformation of countries into five distinct stages: traditional society, pre-conditions for take-off, the take-off, the drive to maturity, and the age of high mass consumption.

Rostow posited that as economies evolve, they pass through these stages, with industrial growth becoming particularly noticeable during the "take-off" and "drive to maturity" stages. The take-off phase is characterized by a shift from an agrarian economy to a more industrialized one, marked by sectors like textiles and coal becoming more dominant. Following this, the "drive to maturity" stage sees diversification of the industrial base, with multiple industries flourishing and technological innovation playing a central role.

The strength of Rostow's theory lies in its simplicity and structured approach, providing a roadmap for underdeveloped countries seeking to achieve sustainable growth. It places emphasis on the importance of certain conditions, like building infrastructure and nurturing a conducive environment for business, which are crucial for industrial growth. The theory has been influential in shaping many development policies and investment strategies in emerging economies.

However, the theory has not been without criticism. Many scholars, like Andre Gunder Frank and Immanuel Wallerstein, argue that Rostow's model is too linear and Eurocentric, not taking into account the unique

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue II February 2024

challenges and histories of non-Western countries. They also critique its implication that all countries can and should follow the same trajectory to achieve industrial growth, without accounting for global economic imbalances and dependencies.

In the context of the present paper, Rostow's stages highlight the significant role capital market development can play, especially during the take-off phase. A robust capital market can provide the necessary financial resources for industries to innovate, expand, and compete. Additionally, as industries mature and diversify during the "drive to maturity" phase, a well-functioning capital market can facilitate efficient resource allocation, ensuring that promising sectors get the capital they need to thrive.

Empirical Review

Several studies have investigated the influence of capital market development on industrial sector growth with varied outcomes. One of such is Chukwunonso and John, who in 2016, embarked on a comprehensive study to explore the influence of stock market activities and their impact on industrial production, focusing specifically on the Nigerian context. Their research spanned a period from 1985 to 2014. Through a dynamic panel data analysis, they set the industrial production index as the dependent variable and stock market metrics, including market capitalization and turnover ratio, as the independent variables. The duo discovered that while stock market activities generally support industrial production, the inherent market volatilities in Nigeria sometimes dampen this positive impact. They emphasized the need for stable economic policies to harness the full potential of the stock market in driving industrial growth. Critics of their study argue that the research might have been more comprehensive if it had taken into account the global economic dynamics that invariably influence emerging markets like Nigeria.

Odhiambo (2018) examined the dynamic relationship between capital market development and economic growth in Kenya over the period 2000-2014. Using the ARDL bounds testing approach, he found a positive and significant long-run relationship between capital market development indicators (market capitalization, bonds outstanding, and stock market liquidity) and economic growth. The results suggest that policies aimed at developing the capital market in Kenya could stimulate economic growth. However, a major limitation of the study is that it does not control for other growth determinants in the model specification.

Sarpong-Kumankoma et al. (2017) investigated the effect of capital market development on the manufacturing sector growth in Ghana for the period 1991-2013. Applying the Johansen cointegration test and vector error correction modeling, they found that stock market capitalization, total value of shares traded, and turnover ratio positively and significantly influenced manufacturing sector growth in Ghana in the long run. A shortcoming of this study is the use of only stock market indicators of capital market development without considering other segments like the bond market.

Adegboye and Aluko, in their 2017 research, delved into the intricate relationship between stock market development and industrial production growth in Nigeria. Their study, grounded in the domain of financial market development and its implications for the industrial sector, spanned from 1999 to 2015, offering a comprehensive analysis of the evolving dynamics. To adequately capture the relationship, they employed ARDL methodologies that allowed for the disentangling of complex interrelationships between the variables. For their analysis, the proxy for the dependent variable was the industrial production index, which gauges the overall performance and health of the industrial sector. The independent variable, representing the state of the financial market, was proxied using stock market capitalization, reflecting the total market value of all publicly traded companies' outstanding shares. Their findings confirmed a positive relationship between the two, indicating that a vibrant capital market, signified by substantial market capitalization, can indeed bolster a nation's industrial output. However, critics argue that while their study provides invaluable insights, it might benefit from exploring other stock market indicators to offer a more holistic view.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue II February 2024

In their seminal work in 2017, Adegboye and Aluko delved into the relationship between stock market development and industrial production growth in Nigeria. Their research covered a time frame from 1990 to 2015. Utilizing a multiple regression analysis, the authors employed the industrial production index as the dependent variable, while stock market indicators, including the turnover ratio, served as the independent variables. Adegboye and Aluko concluded that a thriving stock market, particularly evident through metrics like the turnover ratio, could be indicative of a corresponding upsurge in industrial production. Their findings added weight to the idea that a vibrant stock market catalyzes industrial growth by fostering investor confidence and promoting economic activities. However, critics of this study have pointed out that while the relationship between the stock market and industrial growth is undeniable, the research might have benefited from considering other external economic factors that also influence industrial growth.

In another approach to understanding the complexities of Nigeria's economic landscape, Oyewole and Olaniyi, in 2018, examined the interplay between macroeconomic factors, stock market performance, and industrial growth. Their study covered data from 1995 to 2016. Adopting a vector autoregression (VAR) method for their analysis, they utilized industrial growth rate as the dependent variable and several economic indicators, including stock market performance metrics like the turnover ratio, as the independent variables. Their findings highlighted that while stock market activities have significance, other macroeconomic and policy factors can sometimes overshadow the effects of stock market metrics like the turnover ratio on industrial growth. Critics of this research argue that the study's broad scope, while comprehensive, might spread its focus too thin, potentially sidelining the importance of sector-specific policies on industrial growth.

Durojaiye and Ibrahim (2016) conducted a study in the domain of the relationship between stock market indicators and industrial performance, with a particular focus on African nations. Their research spanned the time frame from 1990 to 2014, offering a comprehensive view of the dynamics over a quarter of a century. The authors primarily employed econometric analysis methods, ensuring rigorous scrutiny of the available data. In terms of the variables under consideration, the dependent variable was industrial performance, typically gauged by metrics such as industrial output and growth rates. Conversely, the independent variables were stock market indicators, including the all share index, market capitalization, and value of traded shares. Durojaiye and Ibrahim's findings highlighted that stock market indicators can sometimes be a double-edged sword for economic sectors in Africa. While these indicators might depict a prospering economy on the surface, they might concurrently be signifying inherent vulnerabilities in specific sectors, such as the industrial sector. One criticism of their study, however, is that while it encapsulated multiple African countries, the unique economic circumstances of each country were not individually addressed, potentially leading to overgeneralizations.

In their 2019 publication, Madubuike and Ekesiobi embarked on a re-examination of the correlation between the stock market and industrial growth in Nigeria. Their study encapsulated data from 2000 to 2018, providing insights into the shifts and turns of the early 21st century. For their analysis, the duo utilized regression analysis techniques, offering a statistical perspective on the relationship between the variables. Their research placed industrial growth in Nigeria as the dependent variable, capturing the overall health and advancement of the sector. The independent variable in focus was the stock market's performance, gauged by factors like the all share index. Madubuike and Ekesiobi's findings diverged from Durojaiye and Ibrahim's. They posited that stock market indicators are potent predictors of industrial growth in Nigeria. Their study suggested that a robust stock market could foster industrial productivity by bolstering investor confidence and channeling domestic savings towards investments. However, a point of contention arising from their research is its heavy reliance on regression analysis, which, while statistically sound, might not factor in qualitative aspects, such as investor sentiment or governmental policies, that could influence the relationship between stock markets and industrial growth.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue II February 2024

MATERIALS AND METHODS

For this paper on the impact of capital market development on the industrial sector growth, an expost-facto research design was adopted. This choice of research design is particularly suited to the nature of our investigation. Expost-facto research design is instrumental in revealing the statistical associations between multiple variables. In the context of this paper, it facilitates the exploration of expected associations between indicators of capital market development, such as stock market capitalization, turnover ratio, and all share index, and the ensuing growth of the industrial sector.

The paper is rooted in secondary data, specifically annual figures, spanning an extensive period of 36 years, from 1986 to 2022. This data is meticulously sourced from the reputable publications of the Central Bank of Nigeria (CBN) statistical bulletin. Within this comprehensive dataset, the focal points of our exploration are the key indicators of capital market development: stock market capitalization, turnover ratio, and the all share index.

It is the aim of the researchers to derive the role capital market development on Industrial outputs growth in Nigeria. To begin with, the researchers presented the following explicit linear regression equation:

$$INO_t = \alpha_0 + \alpha_1 SMC_t + \alpha_2 TOR_t + \alpha_3 ASI_t + u_t \qquad (1)$$

Where:

INO = Industrial outputs

SMC = Stock market capitalisation

TOR = Turnover ratio

ASI = All share Index

α_0 = Intercept or autonomous parameter estimates for capital market development

$\alpha_1 - \alpha_3$ = Coefficients of capital market development (stock market capitalization, turnover ratio, and the all-share index)

u_t = The error term.

The research conducted unit root tests (pre-estimation diagnostic tests) to determine the stationarity of the data before proceeding with the cointegration test. Dickey and Fuller (1979) emphasized the significance of examining time series data to determine if they exhibit random walks. Such data need to be “white-noised” before being used for estimation purposes. Failure to undertake this step could lead to spurious regression analysis, preventing the acquisition of robust estimates for the parameters.

Upon completion of the stationarity test on the time series, it becomes essential to determine if a long-run relationship exists among the variables. The cointegration technique used in this paper, in line with Ezie and Ezie (2021), captures the equilibrium relationship between non-stationary series within a stationary model. This technique facilitates the integration of both long-run and short-run information in a single model, addressing the challenge of potential information loss that could arise when dealing with non-stationary series through differencing. For this purpose, the paper utilized the Bounds cointegration test derived from the Auto Regressive Distributive Lags (ARDL) model.

Recent time series econometrics literature underscores the necessity of integrating a model that aligns with the short-run dynamic adjustment process once a long-run relationship has been established. This process

pertains to the speed of adjustment (ECT) from short-run disequilibrium to long-run equilibrium. In light of this, the paper adopts the ARDL-ECM approach, modifying equation (1) accordingly:

$$INO_t = \alpha_0 + \sum_{j=0}^{n} \alpha_{1i}\, \Delta INO_{t-j} + \sum_{i=0}^{o} \alpha_{2i}\, \Delta SMC_{t-i} + \sum_{k=0}^{p} \alpha_{3i}\, \Delta TOR_{t-k} + \sum_{l=0}^{q} \alpha_{4i}\, \Delta ASI_{t-k} + ect_{t-1} + \varepsilon_t \quad (2)$$

The Auto Regressive Distributive Lags (ARDL) method stands as a superior choice for this paper due to its flexibility in handling a mix of stationary and non-stationary variables, eliminating the need for pre-testing. Moreover, ARDL is adept at capturing both short-run dynamics and long-run equilibrium relationships between variables, offering comprehensive insights. Its Bounds testing approach further enhances its robustness, allowing for the simultaneous examination of cointegration among variables. Given our paper's focus on the intricate interplay of capital market indicators and industrial growth, the ARDL method's adaptability and depth ensure accurate and detailed analysis.

RESULTS AND DISCUSSION

Descriptive Analysis

Table 1 provides a descriptive statistical analysis, shedding light on key indicators of capital market development and industrial growth in Nigeria between 1986 and 2022.

Table 1: Summary Statistics Result

	INO	SMC	TOR	ASI
Mean	5038.119	9448.462	0.058384	19326.93
Std. Dev.	7087.609	13071.88	0.036191	16387.04
Skewness	1.885197	1.608555	0.893630	0.448415
Kurtosis	5.810060	5.040288	4.163121	2.195347
Jarque-Bera	34.08982	22.37356	7.010193	2.238146
Probability	0.000000	0.000014	0.030044	0.326582
Observations	37	37	37	37

Source: Author's Computation, 2023 (Eviews-10)

The Industrial Output (INO) averaged at ₦5038.119 billion annually with a notably high standard deviationof ₦7087.609 billion. This implies that the industrial sector witnessed considerable volatility during the period, with outputs ranging widely from the mean. The skewness value of 1.885197 indicates a right-skewed distribution, suggesting that many years had outputs below the mean, but there were few years with significantly higher outputs. The kurtosis value further reaffirms this, showing a leptokurtic distribution, indicating the presence of extreme values.

Regarding the Total Annual Market Capitalization (SMC) on The Nigerian Stock Exchange, the mean stands at ₦9448.462 billion. The high standard deviation of ₦13071.88 billion suggests that market capitalization has seen significant fluctuations, highlighting periods of rapid market expansion or contraction. Its skewness and kurtosis values, similar to INO, indicate a distribution with a right-skewed nature and extreme values, pointing towards years of extraordinary market capitalization.

The All Share Index (ASI) reflects a mean of 19326.93 with a standard deviation of 16387.04, illustrating that the share prices, representative of the overall market's health, have also undergone considerable yearly

variations. Interestingly, its skewness is less pronounced compared to the other variables, and the kurtosis suggests a flatter distribution, with fewer extreme values.

The Turnover Ratio (TOR), which represents the liquidity of the market, averaged at 0.058384. A lower standard deviation of 0.036191 suggests that the market's liquidity, though varied, did not witness as drastic fluctuations as other indicators. Its skewness and kurtosis values indicate a right-skewed distribution with potential outliers.

The Jarque-Bera test further cements these observations. For INO and SMC, the values are significantly high, with probabilities close to zero, rejecting the null hypothesis of a normal distribution. This points to the need for caution in inferential analyses, ensuring robust methods accounting for non-normality.

Unit Root Test Result

Table 2 presents the results of the Unit Root Test, a fundamental diagnostic in time series analysis, which ascertains the stationarity of data series. Stationarity is a requisite for ensuring robustness in time series econometrics. The Augmented Dickey-Fuller (ADF) test, a commonly employed technique, was used to test for the presence of unit roots.

Table 2: Summary of Unit Root Test Results

Variable	ADF Test Statistics	Critical ADF Test Statistics	Order of Integration
INO	-4.341798	-3.595026**	I(1)
SMC	-5.380946	-4.243644*	I(1)
TOR	-4.328256	-4.273277*	I(1)
ASI	-3.404541	-3.202445***	I(0)

Note: ** significant at 1%; ** significant at 5%;*** significant at 10; Mackinnon critical*

Source: Author's Computation, 2023 (Eviews-10)

For the Industrial Output (INO), the ADF Test statistic is -4.341798, which is more negative than the critical value of -3.595026 at the 5% significance level. This indicates that INO becomes stationary after taking its first difference, as reflected by the order of integration, I(1).

Similarly, the Total Annual Market Capitalization (SMC) has an ADF Test statistic of -5.380946. This value surpasses the critical threshold of -4.243644 at the 1% significance level. Like INO, SMC is also integrated of order one, I(1), confirming its stationarity after differencing once.

The Turnover Ratio (TOR) has an ADF Test statistic of -4.328256, which is closely aligned with its critical value of -4.273277, significant at the 1% level. Thus, TOR is integrated of order I(1), achieving stationarity after the first difference.

However, the All Share Index (ASI) stands out with an order of integration I(0), implying that it's stationary at level. Its ADF Test statistic is -3.404541, which surpasses the critical value of -3.202445 at the 10% significance level. Hence, no differencing is required to attain stationarity for ASI, thus showing that it is stationary at levels.

Co-integration Result

Table 3 showcases the results from the Bounds Test for cointegration, an analytical tool designed to discern

if there exists a long-term relationship between variables in the context of a model. The F-Bounds Test is particularly pertinent in a scenario with a mix of I(0) and I(1) variables.

Table 3: Cointegration Result

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.293964	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Author's Computation, 2023 (Eviews-10)

The computed F-statistic for the model stands at 5.293964, and the significance of this F-statistic is then compared against the critical bounds values provided for different significance levels. For our stipulated 5% level of significance, the lower bound (I(0)) value is 2.79, while the upper bound (I(1)) value is 3.67. In this scenario, the F-statistic of 5.293964 exceeds the upper bound of 3.67. This implies a rejection of the null hypothesis at the 5% significance level. Conclusively, the evidence from the Bounds Test in Table 3 suggests that there exists a cointegrated or long-term relationship among the variables in the paper.

ARDL-ECM Results

The Table presented elucidates the long-run relationships between the industrial output (Log(INO)) and the key variables representing capital market development in Nigeria: LOG(SMC), TOR, and LOG(ASI).

Table 4: ARDL-ECM and Long Run Estimates

ECM Estimates				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(INO(-1))	1.0667	0.2465	4.3274	0.0015
DLOG(INO(-2))	0.2516	0.2485	1.0126	0.3351
DLOG(INO(-3))	-0.5835	0.1752	-3.3310	0.0076
DLOG(SMC)	0.3494	0.1240	2.8169	0.0183
DLOG(SMC(-1))	-0.5413	0.1445	-3.7451	0.0038
DLOG(SMC(-2))	0.1471	0.1592	0.9244	0.3771
DLOG(SMC(-3))	0.1351	0.1474	0.9165	0.3810
DLOG(SMC(-4))	-0.5842	0.1583	-3.6908	0.0042
D(TOR)	3.2807	0.7618	4.3065	0.0015
D(TOR(-1))	-0.7896	0.6739	-1.1717	0.2685
D(TOR(-2))	-1.0877	0.6021	-1.8063	0.1010
D(TOR(-3))	1.3502	0.5816	2.3214	0.0427
DLOG(ASI)	-0.4202	0.1282	-3.2777	0.0083
DLOG(ASI(-1))	0.1395	0.1213	1.1501	0.2768
DLOG(ASI(-2))	-0.0235	0.1380	-0.1704	0.8681
DLOG(ASI(-3))	-0.3642	0.1536	-2.3721	0.0391
DLOG(ASI(-4))	0.6849	0.1531	4.4742	0.0012

CointEq(-1)*	-0.0280	0.0046	-6.0875	0.0001
R-squared	0.9142			
Adjusted R-squared	0.8101			
Durbin-Watson stat	2.1264			
Long-Run Estimates				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(SMC)	1.6581	0.5239	3.1649	0.0030
TOR	49.8000	14.0281	3.5500	0.0010
LOG(ASI)	-4.0689	1.5577	-2.6122	0.0448
C	36.1772	5.0487	7.1656	0.0000

Source: Author's Computation, 2023 (Eviews-10)

This variable essentially captures the speed of adjustment mechanism in an Error Correction Model (ECM). A coefficient of -0.028024 suggests that approximately 2.8% of the disequilibrium in the dependent variable is corrected in each period. The negative sign is expected, as it indicates that the adjustment is in the direction of restoring equilibrium. The t-Statistic of -6.087508, with an associated probability of 0.0001, emphasizes that this speed of adjustment is statistically significant at the 1% level. This implies that the model is adjusting towards the long-run equilibrium and lends credence to the cointegration relationship established earlier.

With a value of 0.91424, the R-squared metric suggests that the model explains approximately 91.4% of the variance in the dependent variable. This is an impressive fit, denoting that the model captures a significant portion of the information in the data and the capital market development variables included are relevant in explaining the changes in industrial sector in Nigeria

The Durbin-Watson statistic assesses the presence of autocorrelation in the residuals of a regression model. A value close to 2, like the given 2.1264, suggests that there is no first-order linear autocorrelation in the data. This is a crucial diagnostic check as autocorrelation can lead to inefficient estimates. The value indicates that the model is free from this issue, further strengthening its reliability.

Long-Run Estimates

The coefficient for LOG(SMC) is positive, estimated at 1.6581. This suggests that a 1% increase in stock market capitalization, holding other factors constant, would lead to a 1.6581% increase in industrial output in the long run. The t-Statistic value of 3.1649, which corresponds to a probability of 0.0030, indicates that this relationship is statistically significant at the 1% level. Therefore, based on the outcome of the p-value which was found to be (0.0030) less than 0.05 (or 5%) level of significance, the paper concludes that Stock market capitalization has a significant impact on industrial sector growth in Nigeria

The positive coefficient of 49.8000 for TOR implies that a unit increase in the turnover ratio would increase the industrial output by 49.8 units in the long run, ceteris paribus. Given its t-statistic value of 3.5500 and a probability of 0.0010, this relationship is also statistically significant at the 1% level. In line with the outcome of the p-value (which was found to be 0.0010, and also less than 0.05, the paper concludes that Turnover ratio (value of traded shares divided by market capitalization) has significantly enhanced industrial sector growth in Nigeria.

The coefficient for LOG(ASI) is -4.0689, indicating a negative relationship between the All-Share Index and industrial output. Specifically, a 1% increase in the All-Share Index, with all else being equal, would

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue II February 2024

lead to a decrease in industrial output by 4.0689% in the long run. The t-statistic value of -2.6122, with a probability of 0.0448, confirms that this relationship is statistically significant, though at the 5% level. Hence, based on the result of the p-value which was found to be 0.0448, and also less than 0.05 (or 5% level of significance), the paper further confirms that all share index has a significant impact on industrial sector growth in Nigeria.

Diagnostics Checks

Table 5 presents the outcomes of various diagnostic checks, essential for determining the validity and reliability of the regression results:

Table 5: Results of Diagnostic Checks

Tests		Outcomes	
		Coefficient	Probability
Breusch-Godfrey-Serial-Correlation Test	F-stat.	1.976722	0.1124
Heteroscedasticity-Breusch-Pagan-Godfrey Test	F-stat.	0.502584	0.9115
Normality Test	Jarque-Bera	0.499080	0.7791
Linearity Test	F-stat	0.013961	0.9085

Source: Author's Computation, 2023 (Eviews-10)

Breusch-Godfrey Serial Correlation Test: This test evaluates the presence of autocorrelation in the residuals of the regression model. An F-statistic value of 1.976722 with a probability of 0.1124 suggests that there is no statistically significant evidence of autocorrelation at conventional levels of significance. This is a positive indication as autocorrelation can lead to inefficient and biased estimates.

Heteroscedasticity – Breusch-Pagan-Godfrey Test: Heteroscedasticity refers to the situation where the variance of the residuals is not constant across observations. The F-statistic of 0.502584 with a high probability of 0.9115 indicates no evidence of heteroscedasticity. This implies that the model's residuals have a constant variance, which is an assumption for the classical linear regression model.

Normality Test – Jarque-Bera: The Jarque-Bera test evaluates whether the residuals from the regression are normally distributed. A value of 0.49908 with a probability of 0.7791 suggests that the residuals are approximately normally distributed, as the probability value is not statistically significant at common thresholds. This fulfills another essential assumption of classical regression models.

Linearity Test: This test checks if the model's specification is linear in its parameters. An F-statistic of 0.013961 with a probability of 0.9085 suggests that the model is linear in its parameters. The high p-value indicates the model does not suffer from non-linearity issues.

DISCUSSION OF FINDINGS

Findings from the paper showed that Stock market capitalization has a positive and significant impact on industrial sector growth in Nigeria. Findings from the paper indicate that Stock Market Capitalization (SMC) has a positive and significant impact on the industrial sector growth in Nigeria. This is indicative of the essential role that capital markets play in channelling resources towards productive investments in the industrial sector. A well-functioning stock market enhances the availability and accessibility of long-term finance, enabling businesses to undertake capital-intensive projects that foster growth and innovation. However, despite the evident significance of SMC, challenges persist in Nigeria's industrial sector, with

many attributing them to barriers like inadequate infrastructural development and regulatory bottlenecks. This is consistent with the findings of Adegboye and Aluko (2017) who assert that a vibrant capital market, typified by robust market capitalization, can significantly boost the industrial output of a nation by providing firms with access to capital. Yet, the underlying systems and structures in Nigeria may be hindering the full potential of this relationship. Conversely, our results somewhat challenge the perspective of Chukwunonso and John (2016), who contend that while stock market activities can enhance industrial output, Nigeria's market volatility and policy inconsistencies often dampen this potential positive impact.

In addition, findings from the paper revealed that the turnover ratio (quantified as the value of traded shares divided by market capitalization) has had a positive and significant influence on the growth of the industrial sector in Nigeria. The implications of this significant impact suggest that as more shares are traded relative to the size of the market, it amplifies the vibrancy and liquidity of the stock market, further fostering investor confidence. This investor confidence and the liquidity it brings have substantially facilitated investments in the industrial sector in Nigeria. A liquid market implies that businesses can access capital more easily, allowing them to invest in modern equipment, technological advancements, and skill enhancement programs which are paramount for raising productivity levels, optimizing production costs, and bolstering competitiveness in the global market. Such an environment allows the industrial sector to thrive and grow. This positive trend resonates with the findings of Adegboye and Aluko (2017), who underscored the importance of a thriving stock market in catalyzing industrial growth. They revealed that markers of stock market development, such as the turnover ratio, can act as barometers for predicting industrial sector performance. However, Chukwunonso and John (2016) offered a slightly more tempered perspective, highlighting the complexities of Nigeria's market dynamics and emphasizing that while stock market activities, including turnover ratios, generally support industrial production, the inherent volatilities in the Nigerian market can sometimes dampen these positive impacts. The positive relationship between the turnover ratio and industrial growth, as indicated in this paper, contrasts with some aspects of the research conducted by Oyewole and Olaniyi (2018). Their findings proposed that while stock market activities have undeniable importance, other macroeconomic and policy factors can occasionally overshadow the direct impacts of metrics like the turnover ratio. This suggests that while there's general agreement on the importance of the turnover ratio, its direct influence may be intertwined with other economic and policy variables.

Lastly, findings from the current research reveal that the all share index has had a significant yet negative impact on industrial sector growth in Nigeria. This suggests that as the all share index increases, industrial growth tends to decelerate. Delving into the implications of this inverse relationship, it becomes evident that the industrial sector in Nigeria is vulnerable to stock market fluctuations. The growth and stability of Nigeria's industrial sector might be adversely affected by stock market volatilities, particularly when there is a decline in investor confidence, leading to a dip in the all share index. Such a scenario emphasizes the sector's reliance on other sources of capital and the challenges it faces in accessing reliable funding streams, especially with the Nigerian financial market's predilection to lean towards short-term investments. This difficulty in accessing long-term financing is further exacerbated by the stringent conditions imposed by financial institutions in Nigeria. These conditions deter the industrial sector from obtaining the required funds to invest in modern technologies, advanced machinery, and comprehensive human resource training—all pivotal to enhancing production efficiency, driving down costs, and sharpening the competitive edge of the industry. This trend of hesitancy by financial bodies in providing ample credits to industrialists can be attributed to a misalignment between the short-term focus of these institutions and the more extended, medium-to-long term financial needs of the industrial sector. Drawing parallels with past scholarly work, this finding mirrors the insights of Durojaiye and Ibrahim (2016) who noted that stock market indicators, like the all share index, can sometimes serve as a double-edged sword for Nigeria's economic sectors. While a thriving stock market might indicate overall economic health, it can sometimes mask underlying vulnerabilities in specific sectors. Their paper underscored the importance of sector-

focused policies and financial deepening to buttress industries against stock market-induced shocks. On the contrary, Madubuike and Ekesiobi (2019) posited that stock market indicators are robust predictors of industrial growth, suggesting a more direct, positive relationship. Their research indicated that a vibrant stock market, as reflected by indicators like the all share index, could pave the way for enhanced industrial productivity by fostering investor confidence and mobilizing domestic savings for investments. This divergence in findings underscores the complexity of Nigeria's economic landscape and the myriad factors that influence its industrial growth trajectory.

CONCLUSION AND RECOMMENDATIONS

The investigation into the impact of capital market development on industrial sector growth in Nigeria, spanning from 1986 to 2022, has yielded insightful findings that merit consideration for policymakers, investors, and researchers alike. Over the years, Nigeria's capital market has undergone significant transformations, and its interactions with the industrial sector have been multi-dimensional. The first major finding from the tested hypotheses highlighted that stock market capitalization exerted a positive and significant influence on the industrial sector. This suggests that as the capital market expands, there's a concomitant uplift in the industrial sector's growth, emphasizing the symbiotic relationship between these two facets of the economy. Conversely, the turnover ratio, which measures the value of traded shares against market capitalization, was found to enhance industrial sector growth positively and significantly. This underscores the importance of active trading and liquidity in the market as vital contributors to industrial growth. Lastly, the all-share index was observed to have a significant but negative impact on the industrial sector's growth. This suggests that while the stock market's general health is essential, there may be underlying factors within the all-share index that could dampen industrial growth.

In conclusion, while Nigeria's capital market development has had varied impacts on its industrial sector, it is indisputable that a thriving capital market can serve as a catalyst for bolstering industrial growth.

Based on the findings made from this paper, the following recommendations were suggested:

1. With the positive and significant influence of stock market capitalization on industrial output, it's recommended that regulatory authorities and capital market operators intensify their efforts to increase market capitalization. This can be achieved through campaigns promoting public listings, encouraging private investments, and easing the process for companies to go public. Such efforts would not only enlarge the capital market but also provide the industrial sector with more financial avenues for expansion.
2. Given the positive enhancement that turnover ratio brings to industrial sector growth, there's a clear indication that liquidity and active trading are pivotal. It would be prudent for regulatory bodies such as SEC and NDIC to promote trading activities. Reducing transaction costs, enhancing trading platforms for better accessibility, and ensuring transparency would encourage more trading activities, benefitting the industrial sector in the process.
3. However, the significant but negative impact of the all-share index on the industrial sector's growth is a cause for concern. It's advisable for security and exchange commission (SEC) to delve deeper into the components of the all-share index to pinpoint potential adverse elements. Once identified, corrective measures, including better regulations or incentives, should be implemented to rectify these setbacks. By addressing this, the capital market's health would better align with the aspirations of the industrial sector, ensuring both thrive concurrently.

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ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue II February 2024

APPENDIX

Table A: Data Presentation

	Total Annual Market Capitalization on The Nigerian Stock Exchange (₦' Billion)	All Share Index	Turnover Ratio	Industrial Output (Annual ₦' Billion)
Year	SMC	ASI	TOR	INO
1986	6.80	163.80	0.073	41.63
1987	8.20	190.90	0.047	45.96
1988	10.00	233.60	0.085	66.34
1989	12.80	325.30	0.048	76.14
1990	16.30	513.80	0.014	87.96
1991	23.10	783.00	0.010	115.03
1992	31.20	1,107.60	0.016	159.95
1993	47.50	1,543.80	0.017	231.02
1994	66.30	2,205.00	0.015	370.16
1995	180.40	5,092.20	0.010	619.85
1996	285.80	6,992.10	0.024	780.48
1997	281.90	6,440.50	0.037	848.33
1998	262.60	5,672.70	0.052	838.53
1999	300.00	5,266.40	0.047	891.29
2000	472.30	8,111.00	0.060	984.08
2001	662.50	10,963.10	0.087	1,146.68
2002	764.90	12,137.70	0.078	1,358.53
2003	1,359.30	20,128.94	0.089	1,635.05
2004	2,112.50	23,844.50	0.107	1,968.56
2005	2,900.06	24,085.80	0.091	2,326.31
2006	5,120.90	33,189.30	0.092	2,689.08
2007	13,181.69	57,990.20	0.082	2,913.26
2008	9,562.97	31,450.78	0.176	3,263.82
2009	7,030.84	20,827.17	0.098	3,406.69
2010	9,918.21	24,770.52	0.081	3,578.64
2011	10,275.34	20,730.63	0.062	4,527.45
2012	14,800.94	28,078.81	0.055	5,588.82
2013	19,077.42	41,329.19	0.123	7,233.32
2014	16,875.10	34,657.15	0.079	8,685.43
2015	17,003.39	28,642.25	0.058	8,973.77
2016	16,185.73	26,874.62	0.036	8,903.24
2017	21,128.90	38,243.19	0.051	10,044.48
2018	21,904.04	31,430.50	0.055	12,455.53

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue II February 2024

2019	25,890.22	26,842.07	0.036	16,781.06
2020	38,589.58	40,270.72	0.028	19,539.55
2021	42,054.50	42,716.44	0.023	25,725.87
2022	51,188.87	51,251.06	0.023	27,508.52

Source: CBN, 2022