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CAPITAL MARKET AND MANUFACTURING SECTOR OUTPUT IN NIGERIA 1990 TO 2021

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ABSTRACT

The importance of the capital market to sustained growth and development of an economy cannot be overstated. The capital market acts as a catalyst for rapid and sustained manufacturing growth, especially in capitalist economies. However, the role of the capital market in the development of the Nigerian manufacturing sector has remained unaddressed and the effect has not been felt despite several policy tools by the government aimed at improving the manufacturing sector. The paper investigated the effect of capital market on manufacturing sector output in Nigeria from 1990 to 2021. The ARDL-ECM method of analysis was adopted in carrying out the analysis. Findings from the paper revealed that market capitalization has a positive impact on the manufacturing sector's output. The study recommends steps aimed at improving the capital market and all share indexes as both have a positive and significant impact on the manufacturing sector output as well as put in place measures to ensure that share prices are reflective of their real values.

Keywords: Manufacturing Sector, Capital Market, All Share Index. JEL Codes: N6, G24, C01, N01 and G12.

1.0 INTRODUCTION

There has been insufficient attention given to the manufacturing sub-sector to harness its potential and raise its output in Nigeria. Also, the Nigerian economy is mono-cultural, depending heavily on oil as a source of revenue, and the production sector is skewed to food that is yet to meet the food requirement of the populace. Nigeria has remained more of a consumption economy relying so much on imported goods and self-power generation for internal production because of the government's inability to produce sufficient national power. The overall manufacturing sector output has been on the decrease. For example, the share of manufacturing in GDP has been relatively low in the 1970s. The share of manufacturing output to GDP between 2002 and 2007 witnessed only a marginal average increase of 3.0 percent and rises consistently from 7% in 2010 to 10% in 2014. Recent statistics show that the manufacturing sector’s share of the gross domestic product stood at 9.65% in 2018 and 11.52% in 2019, rising mildly to 12.67 percent in 2020 and further to 14.61% in 2021(CBN, 2021)

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These are despite cumulative policy efforts of over 50 years. The dwindling state of the manufacturing industry in Nigeria could be attributed partly to the lack of long-term funds that are required to galvanize the sector in providing impetus for inclusive growth and job creation. For example, Kwode (2014) argued that long-term funding which is the bane of the manufacturing sector could be achieved through an active capital market that mobilizes long-term funds for the development of small and medium-scale industries in Nigeria

The capital market is an integral part of the financial system that provides an efficient delivery mechanism for the mobilization and allocation, management and distribution of long-term funds. Nigeria's Stock market has experienced remarkable progress since 1981 as evidenced by the major stock market performance indicators such as the number of listed companies, all share price index, and market capitalization. However, the failure of past governments to promote manufacturing growth which has been identified as the engine room of economic growth and the major determinant in achieving the macroeconomic goal in the country motivated the paper to examine the relationship that exists between the capital market and manufacturing sector output in Nigeria.

Moreover, the majority of previous studies have established the nexus between the capital market and economic growth while a paltry number of studies were interested in the impact of the capital market and manufacturing sector output in Nigeria. Findings on the extent to which the capital market impacts the manufacturing sector output are, therefore, limited in Nigeria. The present study was therefore set to investigate the impact of the capital market on manufacturing sector performance in Nigeria.

The rest of the paper is organized into five sections. The next section is a brief review of a conceptual framework, empirical review, and theoretical basis for the capital market indicators and the manufacturing sector output. Sections three contain the methodology and research data. Section 4 provides results and findings. The paper ends in section five with concluding remarks and policy options.

2.0 LITERATURE REVIEW CONCEPTUAL REVIEW

2.1 All Share Index

A stock market index has been succinctly conceptualized by Adeyemi and Olufemi (2016) as a technique used in recognizing trends by using previous high and low points in averages as benchmarks. The stock market indices consist of a set of precepts that collectively provide a framework for evaluating the future of the market using the trend of its past performance. Thus, one of the fundamental roles of stock market indices is their usefulness as a tool for measuring portfolio performance.

2.2 Value of Traded Stock

The concept of the value of a traded stock is crucial for the estimation and analysis of the stock performance market. According to Emeh (2014), the value of shares traded could be captured as the total number of shares traded, which included domestic and foreign, multiplied by their respective matching prices. In computing, the value of a stock the analyst measures the company's price-to-earnings (P/E) ratio. The P/E ratio is the company's stock price or share

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price divided by its most recently reported earnings per share (EPS). The interpretation is that a low P/E ratio suggests that an investor buying the stock is receiving an attractive amount of value otherwise, the investment is not attractive to the investor.

2.3 Manufacturing Output

The term manufacturing output refers to the quantity of a product the company produces within a given period of time. In Nigeria, thirteen manufacturing activities are discernible: oil refining; cement; food, beverages, and tobacco. Others are textile, apparel, and footwear. The manufacturing industry in Nigeria also comprises wood and wood products, pulp paper and paper products, chemical and pharmaceutical products, nonmetallic products, plastic and rubber products, as well as electrical and electronic, basic metal and iron and steel, motor vehicles and assembly, and other Manufacturing products (Edosien & Kayode, 2021).

2.4 Market Capitalization

As an important market indicator of the value of shares and the value of companies listed on the stock exchange, the market capitalization of a listed company can be viewed as the product of the price of a share for the number of shares issued and listed. Basically, the sum of the capitalizations of companies listed on a market equals the value of the total capitalization of that financial market. (Toramane et al., 2009; Dias, 2013).

3.0 EMPIRICAL REVIEW

A study conducted by Grbic (2020) investigated the nexus between stock market development and economic growth within the republic of Serbia from quarter one of 2000 to quarter four of 2018. Quarterly time-series data were used. The dependent variable used in the study was Real GDP while the independent variables were the components of the capital market which were market capitalization, total value ratio, and turnover ratio. Data were analyzed using Vector Autoregressive Model, particularly the Toda-Yamamoto-Dolado-Lutkhepohl approach for the granger causality test. Findings revealed a unidirectional Granger causality is moving from stock market development towards economic growth.

Oprea and Stoica (2018) examined the impact of capital markets integration on economic growth in European Union (EU) countries. The aim of the study was to identify the determinants pf capital markets' development and economic growth using panel data of EU countries from 2004 to 2016. The study used GDP growth as the dependent variable. The independent variables were measured using capital mobility, foreign portfolio investments, market capitalization, value traded, turnover ratio, stock indices, unemployment rate, and immigrants. Analysis was executed using the Autoregressive Distributed Lag. Findings showed that the integration of capital markets has a positive impact on economic growth. The determinants of these positive effects were stock market capitalization, capital mobility; value traded, stock indices, immigrants, and foreign portfolio investments.

Corporal, Howells, and Solimanet, (2014) examined the causal relationship between the stock market and economic growth using seven countries across Europe and Asia. Using vector auto-regression (VAR) methodology and data from Argentina, Chile, Greece, Korea, Malaysia, the

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Philippines, and Portugal, the paper found that a well-developed stock market can foster long-run economic growth.

In another study, Carporale et al. (2014) used the vector auto-regression (VAR) framework to test the endogenous growth hypothesis for four countries: Chile, South Korea, Malaysia, and the Philippines. Non-auto-regressive distributed lag (NARDL) was used for data analysis. The paper found that the causality between stock market components, investment, and growth in the manufacturing sector is significant and consistent with the endogenous growth model. Findings also revealed that the level of 38 investments is the channel through which stock markets enhance economic growth in the long run.

While studying the causal nexus between stock market developments and the manufacturing sector's growth in France between 1965 and 2007, Vazakidis and Adamopoulos, (2009) employed Co integration, the Granger Causality test, and the Vector Error Correction model and found that there exists a significant positive association between economic growth and stock markets development. The study is similar to the recent study since both are concerned with capital market performance and manufacturing sector output. However, while the former was conducted in Franc, the present study is domesticated in Nigeria.

In India, Mishra, Mishra, Mishra, and Mishra (2010) examined the impact of capital market efficiency on economic growth in India by using the time series data on market capitalization, total market turnover, and stock price index over the period spanning from the first quarter of 1991 to the first quarter of 2010. Their study reveals that there is a linkage between capital market efficiency and economic growth in India. The relevance of the study to the present study is the use of the capital market as a study variable. However, while the former focused on economic growth in India, the current study was limited to manufacturing sector growth and domesticated in Nigeria.

Brasoveanu, Dragota, Catarama, and Semenescuet, (2008) studied the correlation between capital market development and economic growth for the period 2000 to 2006 in Romania using correctional design. The Granger causality test was used for the analysis of data. Study results indicated that capital market development is positively correlated with economic growth by way of the feed-beck effect. Since the study focused on the capital market, it is related to the present study. However, while the former was concerned with economic growth generally, the present study is restricted to manufacturing sector growth.

Adamu and Sanni (2015) examined the roles of the stock market on economic growth in Nigeria. Granger-causality test and multiple regression were used for data analyses. The study revealed the presence of a one-way causality between GDP growth and market turnover. Study findings also showed a positive and significant relationship between GPD growth and market turnover ratios. The study recommended among others, that government should encourage the development of capital markets since it has a positive effect on economic growth.

Chinwuba et al, (2011) assessed the impact of capital market performance on the economic development in Nigeria. The ex-post facto design was adopted using the time series method. An ordinary least square (OLS) regression model was used for data analysis. The study result indicates that the performance of the capital market impact positively on the economic growth of Nigeria. The study is relevant to the present study because both studies focus on capital

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market performance in Nigeria. However, while the former used OLS for data analysis, the present study used panel regression.

Osinubi and Amaghionyeodiwe (2013) examined the relationship between Nigeria's stock market and economic growth during the period 1980 to 2000. Ordinary least square regression was used for data analysis. The results of the study revealed a positive relationship between stock market development and economic growth. The study recommended among others, that government should pursue policies that are geared toward the rapid development of the stock market.

In an investigation to ascertain whether stock market development raises economic growth in Nigeria, Abu (2009) employed the Error Correction Approach for data analysis. Results showed that stock market development raises economic growth. The study recommended that the Securities and Exchange Commission should facilitate the growth of the market, restore the confidence of stock market participants and safeguard the interest of shareholders by checking the sharp practices of market operators.

In a similar study, Amadi, Oneyema, and Odubo, (2010) employed multiple regressions to estimate the functional relationship between money supply, inflation, interest rate, exchange rate, and stock prices in Nigeria. Pearson Product Moment Correlation (PPMC) was used for data analysis. The study found that the relationship existing between stock prices and the macroeconomic variables is in line with theoretical literature and cross-country results of empirical studies. However, results also revealed that the relationship between stock prices and inflation is not consistent with some other works done outside Nigeria.

The review of empirical studies has shown that the majority of previous studies have established the nexus between the capital market and economic growth while a paltry number of studies were interested in the impact of the capital market and manufacturing sector output in Nigeria. There is, therefore, an empirical gap on the extent to which the capital market impacts on the manufacturing sector output are, therefore, limited in Nigeria which this study is set to contribute its part to the bridge. It was observed that the majority of the study used Vector Autoregressive (VAR) Model and Ordinary Least Squares (OLS) for data analyses. However, since most economics series are not stationary at levels, Auto-regressive Distributed Lags (ARDL) The model which takes take care of data with differenced and mixed order of integrated features was considered most appropriate and hence used in the present paper.

4.0 THEORETICAL REVIEW

4.1 The Neo-Classical Model

The Neo-Classical Model was propounded by Solow and Swan in 1956 while working on the same subject matter in different studies. The theory states that long-run total output can be enhanced by technological expansion. The underlying assumption of the neo-classical theory is that progress in technological advancement is capable of propelling the production function upward, leading to the overall growth of an economy. The tenet of the theory is that a rise in savings rate will bring about a momentary increase in total output or production in the short run but in the long run, the output will adjust to a new level and savings accumulation will only affect aggregate output and not its growth rate (Ndako, 2010). The implication of the theory to

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the present study is that financial development will have no momentous effect on the long-run cumulative output irrespective of the saving rate in Nigeria.

Within the neo-classical model, the effect of the capital market on economic growth can be captured by using the unrestricted neo-classical growth model of the Cobb-Douglas (C-D) type. This type of growth model enables the introduction of modifications and extensions to bring it more in line with empirical phenomena of related variables accounting for increasing returns (Ndebbio, 1991). Thus, increased investment in the capital market supplies investible funds required for investment in the country and leads to economic growth in general and could be a veritable route for enhancement of manufacturing sector output in Nigeria.

4.2 The Endogenous Growth Model

The Endogenous Growth Model was propounded by Economist Paul Romer in the mid-1980s. The emergence of the model followed the criticisms laid against the neo-classical growth model. In view of the new model, the growth rate of aggregate output can be determined within the model rather outside the model through savings and investment. The financial market, therefore, plays an important role in the Endogenous Growth Model framework (Caporale, Howells & Soliman, 2004). According to Olweny and Kimani (2011), the financial market has a long-run effect on economic growth by mobilizing savings into a productive investment which leads to the growth rate of output. Therefore, an efficient and functional financial market can lead to an increase in aggregate output.

4.3 The Capital Asset Pricing Model

Allen and Morris used the case of expected utility to propound a theory of portfolio choice in 1993. The theorists considered the scenario of investors who are strictly focused on the mean and variance of the profits of available portfolios. This expected utility provided a unique case of investors' utility of consumption as the quadratic and/or asset returns are multi-normally distributed. The theorists further stated that the models involving competitive markets are based on symmetric information and row frictions such as transaction costs. Hence, the sole across-assets variations in returns could be attributed to differences in risk. Under this scenario all information known to the investors is reflected in stock prices and no investor can earn higher returns except by bearing more risk. The idea that the differences in returns are due to differences in risk came to be known as the efficient markets hypothesis.

5.0 METHOD OF RESEARCH

Research Design: ex-post facto research design was employed for this study. It is used because it describes the statistical relationship between two or more variables which implies cause and effect. The use of this study allows for the testing of the expected effect of market capitalization on the manufacturing sector output in Nigeria and enables us to make predictions regarding their outcome.

5.1 Sources of Data Collection

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The data used for this study are annual secondary data collected from the Central Bank of Nigeria Statistical Bulletin. The data collected are data on market capitalization, interest rate, exchange rate, and manufacturing sector output

Methodology: This study conducted the pre-estimation diagnostic test (unit root test) using the Philip Perron (PP) to ascertain the stationarity of the data before carrying out the co-integration test. Dickey-Fuller 1979 also emphasized the importance of investigating time series data to find out if they exhibit random that need to be white-nosed before using them for estimation purposes.

After conducting the stationarity test it is important to find out if the variables have a long-run relationship with each other and the use of the cointegration technique allowed the study to capture the equilibrium relationship between nonstationary series within a stationary model following Adam (2009). It allowed the combination of the long run and short run information in the model and overcame the problem of losing information which could have occurred when attempting to address nonstationary series through differencing. The study made use of the Auto Regressive Distributed Lag Model (ARDL).

The methodology used in this paper is prompted by the desire to investigate the long-run and short-run relationships between the capital market and manufacturing sector output. The ARDL error correction modeling was used because it has three distinct advantages over VAR and other error correction models. Firstly, it can be used with data that are integrated in a mixed order. Secondly, ARDL ECM is more efficient for small and finite data sizes and thirdly, its estimates of the long-run model are unbiased (Harris & Sollis, 2003). ARDL involves unit root test for variables among many available methods (Augmented Dickey-Fuller test, Phillips Perron test, etc.), the co-integration test using bounds testing approach to estimate the possibility of the existence of a level relationship or long run (equilibrium) relationship between the variables (dependent and explanatory variables) and, if the variables are found to be co-integrated, that is if the co-integration test indicates the existence of a level relationship between the variables, then an error correction model shall be estimated, as co- integration is a condition for error correction representation according to the Granger Representation Theory.

5.2 Model Specification

The theoretical underpinning of this paper is the Endogenous Growth Model which acknowledges the role of financial markets in the process of economic growth. In the endogenous growth model, the growth rate of aggregate output can be determined within the model rather than outside the model through savings and investment. Within the endogenous growth model, theoretical literature such as Caporale, Howells, and Soliman (2004) has held that the financial market has a long-run effect on economic growth by mobilizing savings into a productive investment which leads to the growth rate of output.

The theory suggests that manufacturing sector output which is a component of economic growth is a function of capital market performance. This is illustrated as follows:

$$MSGI = a0 + \alpha MCap + \alpha VTS + \alpha ASI + \alpha INTRATE + \alpha EXCHRATE + \varepsilon \quad 1$$

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Where: MSGI = Manufacturing Sector Growth Index (MSGI); VTS = Value of Traded Securities (VTS); MCap=Market Capitalization (MCap); ASI=All Share Index (ASI); INTRATE=Interest rate; EXCHRATE = Exchange rate; α0=Constant Coefficient; α1-5= Coefficients; ε=error term. The use of the model is in line with the works of Ajayi (2012) and Kwode (2015).

Then the model of this study was specified based on the following disaggregated relationship which can be implicitly stated as follows;

MFO =F (MCAP, VTS, ASI) (2)

Where:

MFO = Manufacturing sector output MCA= Market capitalization

VTS = Value of traded stock ASI = All share index

Bo = intercept or the autonomous parameter estimate

B1 to B2 is the slope of the coefficient of the dependent variables to be determined μ = error term

Transforming the above equations into a natural log and true regression form,

$$\Delta Ln\text{MFO} = \beta_0 + \beta_1 \Delta Ln\text{MCA} + \beta_2 \Delta Ln\text{ASI} + \beta_3 \Delta Ln\text{VTS} \qquad (3)$$

The ARDL model of any identify co-integrating vector is re-parameterized into ECM, which result gives short run dynamics and long run relationship of the variables of a single model. However, when there are multiple co-integrating vector, ARDL approach to co-integration cannot be used. For the sake of this study, the co-integration process pertaining to health indicators, economic development entry starts with the re-modification of equations above into ARDL framework.

$$\Delta MFO = \beta_0 + \sum_{l=i}^{P} \beta_1 \Delta \ln MFO_{t-i} + \sum_{l=i}^{Q} \beta_2 \Delta \ln MCA_{t-i} + \sum_{l=i}^{R} \beta_3 \Delta \ln ASI_{t-i} + \sum_{l=i}^{S} \beta_4 \Delta \ln VTS_{t-i} + \varphi_1 \Delta \ln MFO_{t-i} + \varphi_2 \Delta \ln MCA_{t-i} + \varphi_3 \Delta \ln ASI_{t-i} + \varphi_4 \Delta \ln VTS_{t-i} \qquad (4)$$

Where is the difference operator, while is the parameter for the manufacturing sector output. - represent the short-run parameters, the terms with the summation signs represent the error correction dynamics, and - are the long-run parameters. The co-integration test requires setting up the two hypotheses (null hypotheses against the alternative hypothesis as follows:

H0 = = = = = Null hypothesis

H0 = = = = = Alternative hypothesis

If the F-statistic is greater than the upper critical bound value, the null hypothesis is rejected confirming the existence of the long-run relationship and vice versa. After establishing the long-run relationship, the next step is to estimate the long-run model started as follows:

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$$\Delta MFO = \beta_0 + \varphi_1 \Delta MFO_{t-i} + \varphi_2 \Delta MCA_{t-i} + \varphi_3 \Delta UASI_{t-i} + \varphi_4 \Delta VT \qquad (5)$$

After estimating the ARDL long run specification and the connected long run multipliers, the error correction model needs to be estimated too. Thus, the error correction model mainly formulated to estimate the short run dynamics. This is started as follows:

$$\Delta LMFO = \beta_0 + \sum_{l=i}^{P} \beta_1 \Delta \ln MFO_{t-i} + \sum_{l=i}^{Q} \beta_2 \Delta \ln MCA_{t-i} + \sum_{l=i}^{R} \beta_3 \Delta \ln UASI_{t-i} + \sum_{l=i}^{S} \beta_4 \Delta \ln VTS_{t-i} + \varphi_1 ECM_{t-i}$$

(6)

Where - represent the short-run parameters and is the speed of adjustment parameter which is expected to be less than zero. ECM is the lagged error correction term obtained from the estimated co-integration model equation above.

5.3 A Priori Expectation

According to economic theory, it is expected that market capitalization (MCA)and all share index (ASI) will have a positive impact on the manufacturing sector output, while the value of the traded stock (VTS)will have a negative impact on the MFO. These a priori expectations are expressed mathematically below:

<0 or >0, <0

6.0 DATA ANALYSIS, RESULTS, AND DISCUSSIONS

Table 1: Descriptive Statistics

	MFO	VTS	MCA	ASI
Mean	4290.255	545.6763	9323.951	20716.62
Median	3585.022	366.595	4010.48	22335.84
Maximum	6684.218	2350.88	42054.5	57990.2
Minimum	2898.474	0.23	16.3	513.8
Std. Dev.	1407.532	600.0845	11433.3	15162.86
Skewness	0.703128	1.022385	1.310056	0.334695
Kurtosis	1.794113	3.667258	4.125234	2.326764
Jarque-Bera	4.575624	6.168426	10.84152	1.201772
Probability	0.101488	0.045766	0.004424	0.548326
Sum	137288.1	17461.64	298366.4	662931.7
Sum Sq. Dev.	61415552	11163142	4.05E+09	7.13E+09
Observations	32	32	32	32

Source: Authors' computation using e-views 10

From Table 1, the skewness of the MFO is positive with a value of 0.703128 which tends towards the right. Also, the MFO and ASI are skewed towards the right because their values are all positive. The kurtosis of a normal distribution is 3. If it exceeds 3 it means the

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distribution is leptokurtic. On the other hand, if less than 3, it indicates the distribution is platykurtic relative to the normal distribution. From table 1, the kurtosis value of MFO, VTS, MCA, and ASI which are 1.794113, 3.667258, 4.125234 and 2.326764 respectively shows that MFO and ASI are less than 3, and VTS AND ASI are greater than 3. These mean that VTS and ASI are leptokurtic because they are greater than 3, while both MFO and MCA are platykurtic because they are less than three relatives to the normal distribution.

For the Jarque-Bera statistics, the Null Hypothesis which states that the distribution is normally distributed is rejected at a 5% level of significance. From table 1, the probability values of the Jarque-Bera show that MFO and VTS, are normally distributed with their probability values of0.101488, and 0.548326 which are greater than 5%, while ASI and MCA are not normally distributed because its probability value is less than 0.05%.

6.2 Unit Root Test Result

The Augmented Dicker-Fuller (ADF) unit root test is used to conduct a pre-diagnostic test to ascertain the underlying properties of the time series variables. This test is important because estimating a model in the presence of a non-stationary time series variable usually leads to spurious (meaningless) regression output with biased and inconsistent estimates of the standard errors of the coefficients, which could lead to misleading inference. Table 2 shows the summary of the computed Augmented Dicker Fuller Unit Root test for each of the variables.

Table 2: Summary of Augmented Dicker Fuller Stationarity Test

Variable	ADF Test Statistics	Critical ADF Test Statistics	Probability Value	Order of Integration
MFO	-3.480335	-2.963972	0.0157	I (1)
MCA	-4.454966	-2.963972	0.0014	I (1)
VTS	-3.640790	-3.562882	0.0424	I (1)
ASI	-5.9177033	-2.967767	0.0000	I (0)

Source: Authors Computation using E-view 10

From the summary of Table 2, it could be seen that the MFO, MCA, and VTS are stationary at first difference while ASI is stationary at levels. Based on the combination of the order of integration of I(0) and 1(1)without integration at (2), we shall proceed to estimate the variables using the Autoregressive Distributed Lag (ARDL) Model.

6.3 ARDL Bound Test for Co-integration

The bound test is performed to show the levels of Co-integration among the variables. It helps to show if there is a long-run relationship among the variables.

$$\Delta LMFO = \beta_0 + \sum_{l=i}^{P} \beta_1 \Delta \ln MFO_{t-i} + \sum_{l=i}^{Q} \beta_2 \Delta \ln MCA_{t-i} + \sum_{l=i}^{R} \beta_3 \Delta \ln ASI_{t-i} + \sum_{l=i}^{S} \beta_4 \Delta \ln VTS_{t-i} + \varphi_1 \Delta \ln MFO_{t-i} + \varphi_2 \Delta \ln MCA_{t-i} + \varphi_3 \Delta \ln ASI_{t-i} + \varphi_4 \Delta \ln LVTS_{t-i} \quad \ldots\ldots\ldots\ldots (7)$$

Table 3: Result of ARDL Bounds Test for Co-integration

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Test Statistics	Value	Significance	I(0)	I(1)
F-statistic	**5.715534**	10%	3.47	4.45
K	3	5%	4.01	5.07
		1%	5.17	6.36

Sources: Authors Computations using E-views 10

The bound test null hypothesis states that if the value of the F-statistics is lower than the value of the lower and upper bound, the null hypothesis cannot be rejected. However, if the value of the F-statistics is greater than the lower and the upper bound, the null can be rejected and the alternative accepted that there is a long run relationship amongst the variables. From the results presented in Table 4.3, the value of bounds test of the F-statistics is 5.715534 and higher than the values of the upper and lower bound limit which are 4.01 and 5.07 at 5% critical level of significance, respectively. This means that there is a long run equilibrium relationship between the variables MFO, MCA, ASI and VTS. Having established that there is long run relationship between the variables, the next step is estimating the Error Correction Model

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCA	0.097461	0.053183	1.832543	0.0941
ASI	2.920660	0.742070	3.935830	0.0023
VTS	-0.118761	0.022795	-5.209864	0.0003

EC = MFO - (0.0975*MCA + 2.9207*VTS – 0.1188*ASI)

The long-run form of the model in terms of magnitude, the coefficient of MCA which gave a value of 0.097461 which implies market capitalization positively affects MFO in Nigeria. It means for every 1% increase or decrease in MCA will lead to 0.01% s increase or (decrease) in MFO. It will on average, lead to 0.097461 percent increase (or decrease) in MFO. This suggests that market capitalization is not a fundamental determinant for the improvement in manufacturing sector output in Nigeria. The total value of the manufacturing companies'shares of stock in Nigeria therefore, does not necessarily determine their performance in the market.

With respect to the coefficient of ASI which gave a value of 2.920660 shows that for every 1% increase (or decrease) in ASI, will on average lead to 2.920660 percent decrease (or increase) in MFO. Thus, All Share Index impacts more on the manufacturing sector output in Nigeria. This means that the dynamism in share prices in the stock market do affect the level of manufacturing sector output in Nigeria. Also with respect to the coefficient of VTS which gave a value of -0.118761 shows that for every 1 % increase (or decrease) in VTS, will on average lead to -0.118761 percent decrease (or increase) in MFO. This suggests that the level of manufacturing sector output growth does not need to be necessarily predicated on value of traded stock in Nigeria. Thus, the total number of shares traded, both domestic and foreign, and their respective prices are not fundamental to the growth of manufacturing sector output in Nigeria.

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6.4 Error Correction Model (ECM)

Since there is long-run relationship among the variables, we shall proceed to estimate the ECM.

The Error Correction Model is shown as follows:

$$\Delta LMFO = \beta_0 + \sum_{i=i}^{P} \beta_1 \Delta \ln MFO_{t-i} + \sum_{i=i}^{Q} \beta_2 \Delta \ln MCA_{t-i} + \sum_{i=i}^{R} \beta_3 \Delta \ln ASI_{t-i} + \sum_{i=i}^{S} \beta_4 \Delta \ln VTS_{t-i} + \varphi_1 ECM_{t-i} \quad (8)$$

Variable	Coefficien	Std. Error	t-Statistic	Prob.
C	2010.207	381.2105	5.273222	0.0003
@TREND	109.4529	20.76593	5.270791	0.0003
D(MFO(-1	-0.22715	0.150382	-1.5105	0.1591
D(MCA)	-0.04592	0.020271	-2.26535	0.0447
D(MCA(-1	-0.06238	0.025921	-2.40641	0.0348
D(MCA(-2	-0.22512	0.064854	-3.47115	0.0052
D(MCA(-3	-0.18352	0.065907	-2.78458	0.0178
D(VTS)	0.550371	0.098021	5.614827	0.0002
D(VTS(-1)	-0.88714	0.267349	-3.31826	0.0069
D(ASI)	0.016728	0.007154	2.338398	0.0393
D(ASI(-1))	0.076204	0.017127	4.449367	0.001
D(ASI(-2))	0.076181	0.020831	3.65713	0.0038
D(ASI(-3))	0.044488	0.01803	2.467498	0.0313
CointEq(-	-0.83944	0.155619	-5.39419	0.0002
R-squared	0.907437	Mean dependent		94.70882
Adjusted	0.821486	S.D. dependent va		358.2398
S.E. of reg	151.3597	Akaike info criteri		13.18405
Sum squa	320736.7	Schwarz criterion		13.85015
Log likelih	-170.577	Hannan-Quinn crit		13.38768
F-statistic	10.55757	Durbin-Watson sta		2.643237
Prob(F-sta	0.000043			
* p-value incompatible with t-Bounds distribution.				

The results of the Error Correction Model (ECM) presented in the above Table shows the short-run relationships between the dependent and the independent variables. The rule of thumb is that the value of the Error Correction Term (ECT) must be negative and less than 1 and should be statistically significant. In table 4.5, the probability value of 0.000043 of the F- statistics was less than 0.05. This indicates that there is a short-run relationship between the MFO, MCA, ASI, and VTS. The ECT shows the speed of adjustment from a disequilibrium state. Its value being -0.83944 meets its criteria of being negative, less than 1, and statistically significant and implies that the speed of adjustment from the short run to the long run is 83%. Hence, it will take 83% speed of adjustment for the model to adjust within a year from the short run to the long run. The R-square value of 0.907437 revealed that the MCA, ASI, and VTS jointly accounted for about 90 percent of the variation in MFO while the remaining 10 percent is accounted for by other factors outside the model.

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The finding of this paper is contrary to that of Grbic (2020) Iand Vazakidis and Adamopoulos, (2009), whose study on the nexus between stock market development and economic growth within the republic of Serbia, and the causal nexus between stock market developments and manufacturing sector's growth in France, respectively, discovered a unidirectional Granger causality moving from stock market development (market capitalization) towards economic growth. The findings also contradict that of Mishra, Mishra, Mishra and Mishra (2010) whose study on the impact of capital market efficiency of economic growth on India revealed that there is a linkage between capital market efficiency and economic growth in India.

The finding was however, consistent with that of Amadi, Oneyema and Odubo, (2010) which estimated the functional relationship between money supply, inflation, interest rate, exchange rate and stock prices and found that the relationship between stock prices and inflation does not agree with some other works done outside Nigeria. Thus, All Share Index (using stock price changes as proxy) contributes positively to economic growth, particularly with regards to manufacturing sector output in both studies in Nigeria.

6.5 Serial Correlation Result

Table 5: Serial Correlation LM Test

F-statistic	6.923424	Prob. F(2,9)	0.0151
Obs*R-squared	16.97003	Prob. Chi-Square(2)	0.0002

Sources: Authors Computations using E-views 10

In line with the rule of the Breusch-Godfrey Serial Correlation LM Test, the probability value of 0.0154 of the F-statistics indicates that the model has some elements of serial correlation because the probability value is less than 5%.

6.6 Stability Test

A CUSUM test assesses the stability of coefficients and whether there is a structural change in a model.

The CUSUM chart is shown in Figure 4.1

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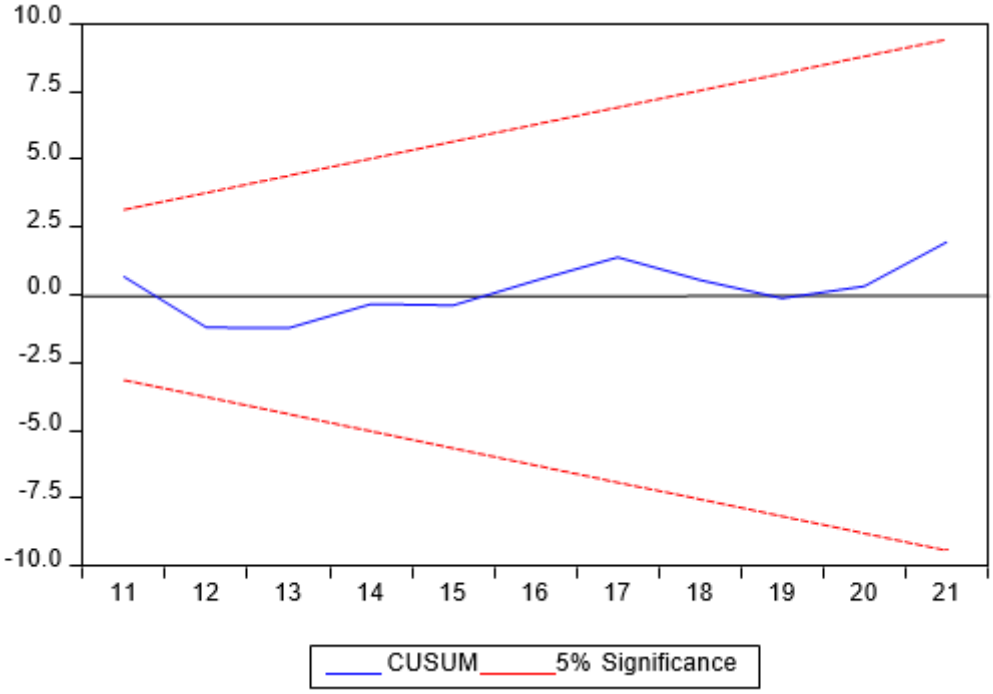

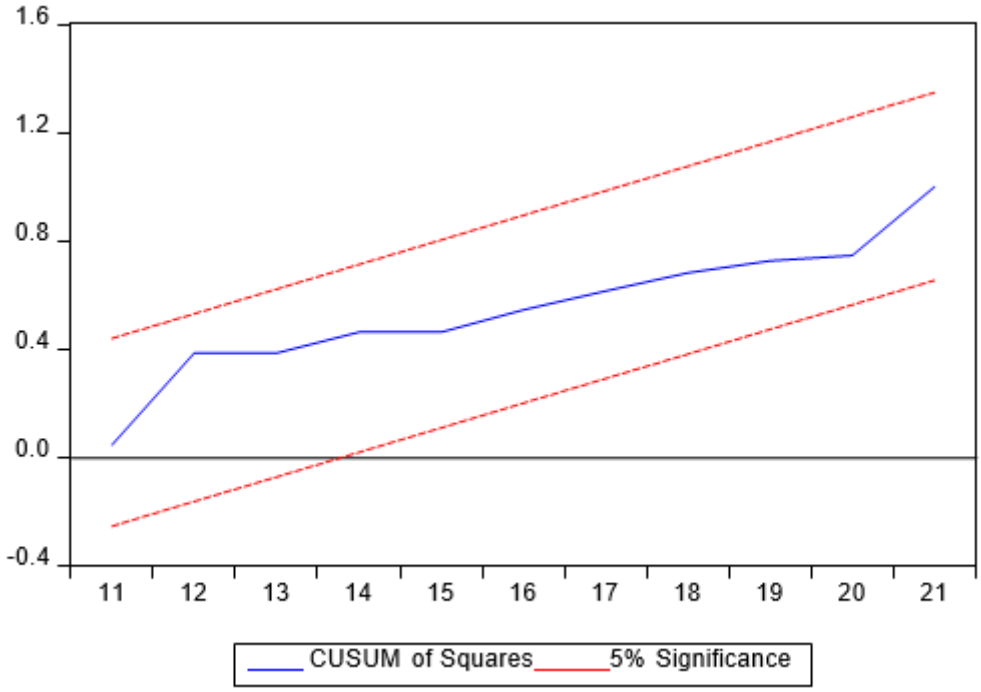

The null hypothesis for the CUSUM test states that the parameters are stable while the alternate hypothesis states that the parameters are not stable. The guideline is that if the blue line lies within the red line, we accept the null hypothesis that the parameters are stable. On the other hand, if the blue line crosses the red line, we reject the null and accept the alternative hypothesis that the parameters are not stable. From figure 4.1, it could be seen that for both CUSUM AND CUSUM SQ the blue line lies between the two red lines. This means that the model is stable.

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7.0 CONCLUSIONS AND RECOMMENDATIONS

The paper investigated the effect of selected capital market indicators on the manufacturing sector in Nigeria for the period from 1990 to 2021 using the ARDL-based Bounds test approach to co-integration and error correction model. The study concludes as follows:

i. market capitalization (MCA) positively affects MFO in Nigeria but such impact is not significant;
ii. All Share Index (ASI) positively affects MFO in Nigeria and the impact is significant; and
iii. Value of traded assets (VTA) positively affects MFO in Nigeria and the impact is significant

In light of the empirical evidence, the following are recommended for policy consideration:

i. There is need for capital market recapitalization, as this will improve the manufacturing sector output and performance. This is in consideration of the observed positive impact of (increase in) MCA on the MFO.\
ii. Considering the fact that VTS negatively affected MFO in both (short-run and long-run) models, there is need for the authorities to strengthen policies and procedures of arriving at prices of quoted shares and securities to reflect their real value instead of allowing operators to continuously be ripping off investors. This will greatly affect the manufacturing sector positively hence and improvement in MFO.
iii. Government should also fine turn ways of improving on the volume of traded stocks in the market as this will allow investors invest in multiple company's thereby helping them improve productivity. This is because of the positive impact of the ASI from the regression results.

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DATA USED FOR ANALYSIS

YEAR	MFO (NB)	MCA(NB)	ASI	VTS(NB)
1990	3825.609	16.3	513.8	0.23
1991	4165.392	23.1	*783*	0.24
1992	4667.757	31.2	1,107.60	0.49
1993	3850.411	47.5	1,543.80	0.8
1994	3364.568	66.3	2,205.00	0.99
1995	2898.474	180.4	5,092.20	1.84
1996	2990.689	285.8	6,992.10	6.98
1997	3051.911	281.9	6,440.50	10.33
1998	2908.214	262.6	5,672.70	13.57
1999	2975.615	300	5,266.40	14.07
2000	2980.652	472.3	8,111.00	28.15
2001	3050.505	662.5	10,963.10	57.68
2002	3591.402	764.9	12,137.70	59.41
2003	3203.242	1,359.30	20,128.94	120.4
2004	3169.211	2,112.50	23,844.50	225.82
2005	3242.197	2,900.06	24,085.80	262.94
2006	3268.55	5,120.90	33,189.30	470.25
2007	3271.654	13,181.69	57,990.20	1,076.02
2008	3369.713	9,562.97	31,450.78	1,679.14
2009	3491.294	7,030.84	20,827.17	685.72
2010	3578.642	9,918.21	24,770.52	799.91
2011	4216.191	10,275.34	20,730.63	638.93
2012	4783.659	14,800.94	28,078.81	808.99
2013	5826.358	19,077.42	41,329.19	2,350.88
2014	6684.218	16,875.10	34,657.15	1,338.60
2015	6586.619	17,003.39	28,642.25	978.05
2016	6302.232	16,185.73	26,874.62	577.82
2017	6288.897	21,128.90	38,243.19	1,078.49
2018	6420.59	21,904.04	31,430.50	1,203.37
2019	6469.832	25,890.22	26,842.07	931.48
2020	6291.592	38,589.58	40,270.72	1,086.18

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2021	6502.258	42,054.50	42,716.44	953.87

Source: CBN Statistical bulletin 2021, Bureau of Statistical publication 2021 and World bank 2021 publication