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Capital Market Development and Manufacturing Sub-Sector Output in Nigeria

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Abstract: The role of the capital market in generating the funds that fits the long term gestation of the manufacturing sector is sacrosanct for the productive sector in Nigeria. This study examined the effect of the capital market development on the variations in the manufacturing sector output in Nigeria. The study thus modeled manufacturing sector output as a function of market capitalization ratio, turnover ratio, all share index and new issues as proxies for capital market development. Secondary data obtained from the CBN Statistical bulletin were analyzed with Auto-regressive Distributive Lag model. The results showed that capital market development indicators have significant long and short run effect on manufacturing sector output in Nigeria; wherein the causal relationship runs from the manufacturing sector output to market capitalization and new issues, and from turnover ratio (liquidity) to manufacturing sector output. It further showed that the long run effect is driven by the positive and significant effect of the market capitalization ratio on manufacturing output. The short run dynamism revealed the only 19% adjustment of deviation was returned to equilibrium with positive effects from the turnover ratio (liquidity) and new issues ratio (new funds) whereas market capitalization adversely affect growth of manufacturing sector. The study thus conclude that capital market is veritable for the manufacturing sector growth.

Key words: Capital market development, manufacturing sector, sectoral output, Nigeria, New issues, stock liquidity, stock size, stock volatility.

1.0. Introduction

The manufacturing sector converts raw materials into finished goods. Production process in the manufacturing sector is capital intensive. The sources of the huge capital needed to drive the success of the manufacturing sector are better tapped through the capital market that avails the kind of funds that befits long term gestation and repayment plans. The sector is an avenue for increasing productivity in relation to import replacement and export expansion, creating foreign exchange earning capacity, raising employment and per capital income (Eze, Atuma & Ogbonna, 2019).

The capital market is the long term segment of the financial market instrument. It is essentially believed that financial market development necessitates industrial expansion and both must be linked in bidirectional causal relations (Mesagan, Olunkwa & Yusuf, 2018). This avers that a growing manufacturing sector will enhance the development of the financial market and vice versa. This aligns with Gerschenkron (1962), which states that the roles financial system plays in the economic progress of a country basically depend on the structure of the economy. Countries at the entrance of industrialization tend to undergo stages from the bottom to the top. Based on historical perspective of the financial structure, especially, at the point of European countries industrialization, countries like Great Britain have limited role for financial institutions but place much reliance on internal finance of the entrepreneurs. The moderately backward economy such as that of Germany relied heavily on

the financial structure for economic progress due to the limited financial resources available to most business. However, financial structure is insignificant but attributed greater role to public sector for economic progress of the most backward economies.

It is believed that an improved manufacturing sector is a prerequisite for economic development (Campbell & Asaleye, 2016). The manufacturing sector is the hub of a vibrant national economy. According to Oyati (2015), for manufacturing sector to be relevant, the sector must have the ability to harness the various available raw materials, process and transform them into marketable finished or partly finished goods. Asaleye, Adamu and Ogunjobi (2018) lamented that despite the dynamics and improvement in the financial sector due to reforms, manufacturing sector in Nigeria is considerably less developed compared to developed countries. Manufacturing sector in Nigeria, which has been identified as the engine of economic growth and the major determinant in achieving macro-economic goals has continued to decline progressively over the period (Egbuche & Nzotta, 2020). Oyati (2018) noted that the sector has failed to a large extent with regards to its percentage in the total GDP, all because of challenges in the sector. The sector is faced with many challenges, ranging from near non-existent power supply, inadequate funding, insecurity, poor infrastructures, irregular taxes, to poor business development strategies. According to the statistics from CBN (2021), the manufacturing sector output was 10,044.48 billion Naira which accounted for about 8.83% of the total GDP of Nigeria in 2017. This has risen continuously over the years till 2021. It rose from 9.75% in 2018 to 14.83% contributed in 2021 which an output value of 25,725.87 billion Naira. Growth in the manufacturing sector is no doubt, the major factor that leads to economic diversification of most economies of the developed countries of the world (Eze, Atuma & Ogbonna, 2019). The sector helps countries to embark on productive ventures that eventually result to increase in the domestic consumption and the foreign exchange earnings of nations. From this sense, Egbuche and Nzotta (2020) have described the manufacturing sector as an important sector in the global economy as driver of productivity growth, innovative and technological change.

Though the high cost conditions in Nigeria, occasioned by poor and inadequate infrastructural support services and other policy induced factors pose serious threat, not only for output growth in the manufacturing sector but also for competitiveness. Oyati (2018) argued that inadequate access to credit results in low investment, making it difficult for manufacturers to procure modern machines, information technology and human capital which are vital in reducing production cost, raising productivity and improving competitiveness. He further argued that even when credit is available, high lending rate makes it unattractive and even riskier since returns on investment in manufacturing have consistently been below the rates of borrowing. This is attributable partly to lack of long term, funds that is required to galvanize the sector in providing impetus for inclusive growth and job creation (Egbuche & Nzotta, 2019). Long-term funding which is the bane of manufacturing sector could be achieved through capital market that mobilizes long term funds for development of small and medium scale industries in Nigeria (Kwode, 2015). Thus, it is expected that capital market development drives manufacturing sector output.

The theoretically, a spectrum of views about of the direction on relationship in the capital market and growth nexus exists. The demand following hypothesis supposes that growth drives capital market development whereas the supply leading hypothesis posits the opposite; a scenario where growth in the capital market drives the economy. The supply leading hypothesis is the anchor of most finance supporters as the wheel and fulcrum on which the economy revolves. Another strand of the theory is that both the economy and financial market drives one another as claimed by the bi-directional causal proponents. However, the neoclassical portends that the financial market and economic activities runs at variants and has no recourse to one another in the course of development. These theories are the bane of academic conflict from the era of Schumpeter till date. This study therefore aims to investigate how capital market development has explained and affected the variation in manufacturing sub-sector output in Nigeria. Hypothetically, the study posit that capital market development indicators (market capitalization ratio, turnover ratio, all-share index, and new issues ratio) do not significantly explain and affect the variation in manufacturing sub-sector output in Nigeria.

2.0. Capital Market Indicators and Manufacturing Sub-sectors Nexus

The manufacturing sub-sector is the second largest contributor to Nigeria economy after crop production (CBN, 2021). One of the classical studies from Omonode (2022) investigated the effect of financial intermediation on the manufacturing sector output in Nigeria using time series data from 1991 to 2020. Money supply, credit to manufacturing sector, credit to private sector and interest rate were employed as the independent variables while manufacturing sector output was employed as the dependent variable. Descriptive statistics and error correction model were employed in analyzing the data. The result indicates that a long run relationship was found between the manufacturing sector output and financial intermediation variables. The result of the estimation technique showed that money supply and credit to manufacturing sector had significant positive effect on manufacturing sector output while credit to private sector and interest rate had insignificant effect on manufacturing sector output in Nigeria.

Awe (2021) employed the Vector Autoregressive (VAR) model to examine the relationship between stock market performance and manufacturing growth in Nigeria between 1985 and 2020. The study used the Manufacturing Output to GDP as proxy for manufacturing growth while All Share Index, Equity and Industrial Loan were the stock market indicators with real interest rate as control variable. The reveals that showed that all share index and equity have strong predictive power over manufacturing output, whereas industrial loans and interest rates do not exhibit a significant impact on manufacturing output. The study concluded that stock market performance has a significant influence on manufacturing growth.

Egbuche and Nzotta (2020) studied the effect of stock market on manufacturing sector output in Nigeria for time trends covering 1981 to 2018. A multiple regression model developed for the study employed the manufacturing sector proportion to GDP as the dependent variable, while Market capitalization, Total new issues, Volume of transaction & Equity Stock were the independent variables. The results of the analyses were obtained using the Johansson co-integration and Error Correction Model. The study showed that stock market development had long run impact on the performance of manufacturing sector out. It further revealed that market capitalisation, total new issues, volume of transaction has positive and significant effects on the manufacturing sector output in Nigeria whereas equity stock showed negative effect. The study concluded that stock market effects driver manufacturing sector performance in Nigeria.

Another study from Oyedokun and Shehu (2020) also examined the effect of stock market development indicators on manufacturing sector output s in Nigeria within the time period spanning 1986 to 2018. With value traded ratio, all share index and market capitulation as variables of capital market and GDP proportion to manufacturing sector, the error correction model approach involving ARDL co-integration, ECM and wald tests were employed. The result showed that all share index and market capitalization had no significant effects on manufacturing sector output while valued traded ratio as indicator of market liquidity had positive and significant effect on manufacturing sector output in Nigeria.

Adekunle (2019) examined the impact of capital market on manufacturing sector using the Autoregressive Distributed Lag technique approach for periods spanning 1985 to 2017. The results showed that capital market indicators (market capitalization, volume of transactions and all share price index) analysed for Bound Test had long run relationship with the manufacturing sector output in Nigeria. The result of the ARDL revealed that market capitalization had significant and positive effect on manufacturing output both in the long run and short run. Also, volume of transactions had positive effect on manufacturing sector output in the short run but negative in the long run while all share price index had negative and insignificant effect on manufacturing output both in the short run and long run. The result of the granger causality test indicated that both market capitalization and all shared price index did not granger cause manufacturing sector output while volume of transaction granger cause manufacturing sector output. The study posited that capital promote manufacturing sector productivity in the short and not in the long run in Nigeria.

Eze, Ini, Ugwu and Onwe, (2019) developed a regression model to study the effect of stock market liquidity on the performance of manufacturing sector in Nigeria. The study employed total value traded ratio, inflation rate, exchange rate and interest rate as the independent variables and the ratio of manufacturing sector output to GDP as the dependent variable. The data covering 32-year period from 1985 to 2017 were regressed using the Johansson cointegration and error correction model. Results showed that stock market liquidity had positive and significant effect on the performance of Nigerian manufacturing sector.

Kwode (2015) examined the place of the capital market on financing the manufacturing sector in Nigeria between 1970 and 2012. The dependent variable is the index of the manufacturing sub-sector while Market Capitalization, Total New Issue, Value of Transaction and Total Listed securities were the variables of capital market development and the independent variables which were complemented with exchange rate and interest rate as the control variables. The ordinary least square method, cointegration test, error correction method and pairwise granger causality were used for data analysis. The results showed that there is a long–term relationship between capital market and the development of the manufacturing firms in Nigeria. it was also found that capital market variables and manufacturing sector had no causal relationship and that the growth in capital market activities did not impact significantly on the manufacturing sector.

Among the grouped industrial sector studies are the work of Uruakpa (2019) which examined the effect capital market on industrial sector development in Nigeria, by regressing all share index, market capitalization, and value of transaction (as proxies for capital market) on industrial sector output. Data obtained CBN Statistical Bulletin covering 1985 to 2017 were analysed using Co-integration and Error Correction Model. The result indicates that capital market indicators proxy by value of transactions, market capitalization, and All Share Index all jointly impact on industrial growth both in the short run and long run. Specifically, ECM revealed a negative and significant market capitalisation, and all share index, and a significant positive value of transaction. However, the granger causality result showed that industrial output causes market capitalization and value of transaction, but no causality between all share index and industrial output in Nigeria. The study supports that supply leading hypothesis.

Also, the work of Uremadu, Onyele and Ariwa (2019) investigated the effect of stock market performance on industrial productivity in Nigeria from 1985 to 2016, with particular interest on the relationship between select stock market performance indices such as market capitalization, all share index, value of shares traded and number of deals on industrial sector contribution to Gross domestic product. The study used unit root test, Johansen co-integration test and vector error correction mechanism to carry out its tests and analysis. The results revealed a long run relationship between industrial sector productivity and stock market performance indicators. It also showed that market capitalization had a negative and significant effect industrial productivity in Nigeria. Other indicators of the capital market (number of deals, value of shares traded and all share index) did not show any significant effect on industrial productivity in Nigeria.

Ini and Eze (2019) estimated the implications of stock market efficiency on manufacturing sector performance in Nigeria from 1985 to 2017 using regression analysis. Manufacturing sector performance was proxied by the ratio of manufacturing sector value added to GDP while stock market efficiency used all-share index as proxy. Inflation rate and exchange rate served as control variables. The findings indicated that all-share index significantly and negatively affected manufacturing sector performance. The manufacturing sector in Nigeria faces low output and economic instability.

Eze, Atuma and Ogbonna (2019) investigated the effects of stock market liquidity on Nigerian manufacturing sector performance from 1981 to 2017 using autoregressive distributed lag technique. The manufacturing sector performance was measured by manufacturing sector output, while stock market liquidity utilized market capitalization ratio and all share index (ASI) as proxies. Interest rate and exchange rate were applied as control variables. The findings revealed that market capitalization ratio to GDP insignificantly and positively affected the manufacturing sector performance. All-share index significantly and positively affects manufacturing sector output.

Ayodeji and Ajala (2019) investigated the effect of capital market performance on sectors' output growth in Nigeria from 1984 to 2018 using autoregressive distributed lag model. Capital market performance used all-share index (ASI), number of listed equity, market capitalization, and number of deals, stock market turnover, value of deals (NOD) and value of transactions (VTRAN) as indicators. The sectors' output growth were contribution of agricultural sector to GDP, contribution of industrial sector to GDP, contribution of construction sector to GDP, contribution of trade sector to GDP and contribution of service sector to GDP. The findings revealed that all-share index, market capitalization ratio (MCAP), value of transactions and number of listed equities had significantly positive effects on agricultural sector output in long-run. MCAP and NOD had significantly positive effects on industrial output in long-run. MCAP significantly and positively affected the construction sector output in long-run. MCAP had significantly positive impact on trade sector output in while ASI, VTRAN and NOD insignificantly and positively affected the trade sector output in long run.

3.0. Methodology

The study adopted secondary source of data. The sectoral data for the capital market indicators were found in the stock market activity reported by the CBN Annual Report, while the Gross Domestic Product based on sectoral data were sourced from the CBN Statistical Bulletin. The various editions of the publications was used to obtain data to cover the liberalised era in Nigeria economy spanning 1987 to 2021.

The dependent variable is the Manufacturing Sector Output (MASO), as the proportion of the GDP to manufacturing sub-sector in Nigeria. The independent variables are selected capital market development indicators. These will be the market capitalization ratio (MCR), turnover ratio (TOR), all-share index (ASI), and new issues ratio (NIR).

The model specification for objective two of the study is derived from the expectation that capital market variables will drive growth in the output for the manufacturing sector. The model is derived from the work of Uruakpa (2019) that examined the relationship between capital market and industrial sector development. The model of Uruakpa (2019) is as follows:

GDP of industries = f(ASI, MCR, VTR)

Where:

GDP of Industries = the proportional value of GDP for each sector

ASI = All Share Index

MCR = Market capitalisation ratio

VTR = Value traded ratio

The current model adapted the variables by added new issues and then change the proxy for liquidity from VTR to TOR (turnover ratio). The current model is as follows:

MASO = f(MCR, TOR, ASI, NIR)

Where:

MANUSO = Manufacturing sector output, represented by proportion of Manufacturing sector contribution to Real GDP

MCR = Market capitalization ratio as proxy for market size

TOR = Turnover ratio as proxy for market liquidity

ASI = All-Share index as proxy for market riskiness

NIR = New issues ratio as proxy for primary market efficiency

The model is rewritten in econometric form as:

$MASO = \alpha_0 + \alpha_1 MCR + \alpha_2 TOR + \alpha_3 ASI + \alpha_4 NIR + \varepsilon$

Where:

α_0= constant coefficient

$\alpha_1 - \alpha_4$ = coefficients of the independent variables

ε = error term

In economic principle, each measure of capital market development is expected to have a positive relationship with sectoral output. This means the coefficients of the measures of capital market development should be greater than zero. This is the expected relationship that should exist between and, or among the dependent or independent variables of the model based on the assumption of the Supply-Leading Hypothesis. The observed signs of the independent variables will be interpreted on the supposed footprint of Supply-Leading Hypothesis. Table 1 shows the expected signs of the independent variables in the model.

Table 1: Expected Signs of Independent Variables

Symbol	Variable	Expected Signs
MCR	Market Capitalization Ratio	+
TOR	Turnover Ratio	+
ASI	All-Share Index	+
NIR	New Issues Ratio	+

The Auto-Regressive Distributive Lag (ARDL) estimation technique was applied in estimating the models. E-Views 12 econometric software was used for the analysis of data. The unit root test was used to confirm the most suitable tool of analysis. The ARDL was used since it accommodates models where the variables have a combination of both stationary at i(0) and i(1). This ARDL is adopted because it blends well in estimations with data series from short as well as long run periods.

4.0. Results and Interpretation

4.1. Unit Root Test

The study employed two unit root techniques to determine the stationarity or otherwise of variables used in the study. The Augmented Dicker Fuller (ADF) and Philip Peron (PP) tests are done on level series, first and second order differenced series. It is expected that the result of one will validate the other.

The decision criteria is to reject the null hypothesis, if the computed probability value is less than 0.05 level of significance, otherwise, we accept the null hypothesis. The null hypothesis is that the variable has unit root (that is, not stationary).

Table 2: Summary of Unit Root Test for Stationarity

Variables	At Level		First Difference		Order of Integration
	t-Statistic	Prob.	t-Statistic	Prob.	
Augmented Dicker Fuller Test					
MCR	-1.7175	0.4137	-6.5132	0.0000	1(1)
TOR	-2.4521	0.1358	-7.7394	0.0000	1(1)
LogASI	-2.4235	0.1431	-4.4107	0.0014	1(1)
NIR	-3.0293	0.0424	-3.8244	0.0067	1(0)
MASO	-1.1930	0.6651	-2.8000	0.0695	1(2)
Philip Peron Test					
MCR	-1.5302	0.5065	-9.4978	0.0000	1(1)
TOR	-2.3595	0.1603	-8.1893	0.0000	1(1)
LogASI	-3.0110	0.0439	-4.0764	0.0033	1(0)
NIR	-2.0240	0.2756	-5.4696	0.0001	1(1)
MASO	-1.3021	0.6172	-5.4541	0.0001	1(1)

The result stationarity test is shown on Table 2. The results showed presence of both level and first differenced stationarity among the variables, in a mixed order. The variables for MASO, MCR,

TOR, are not stationary but become stationary at the first difference for both ADF and PP statistics. Thus, these variables are found to be stationary at 1(1). However, LogASI is seen as stationary at first difference 1(1) for ADF statistics but at level 1(0) for PP statistics. Then NIR become stationary at level 1(0) but stationary at first difference 1(1) in the PP statistics. More so, MASO is stationary at second difference using the ADF but stationary in first difference for the PP statistics. These behaviours depict presence or of traces of 1(0), 1(1) and 1(2).

Considering the presence of combined stationarity status, the most suitable tool of analysis is the Autoregressive Distributive Lag technique (ARDL). The variables stationary at level implies that they are not time variant while the ones stationary at first deference suggest that they respond to changes in time periods.

4.2. Estimation of Effect of Capital Market Development on Sectoral Output

Table 3: Estimation of long run relationship and cointegration for manufacturing sector model

ARDL Long Run Form and Bounds Test

Dependent Variable: D(MASO)

Sample: 1987 2021

Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCR	1.098928	1.270511	0.864950	0.0095
TOR	-0.235081	0.971490	-0.241980	0.8142
LOGASI	-11.98102	10.80700	-1.108635	0.2963
NIR	11.09793	12.19032	0.910389	0.3864
C	33.14704	19.57064	1.693713	0.1246
EC = MASO - (1.0989*MCR -0.2351*TOR -11.9810*LOGASI + 11.0979*NIR +				
33.1470)				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic : n=1000	
F-statistic	**8.767117**	10%	2.2	3.09
K	4	**5%**	**2.56**	**3.49**
		2.5%	2.88	3.87
		1%	3.29	4.37

The analysis of the presence of long run relationship between capital market development indicators and manufacturing sector output in Nigeria is shown on Table 3. The bound test F-value is 8.7671 which is greater than both the i(0) and i(1) values at 0.05 level of significance. Since the F-value is higher than i(1), we reject null hypothesis and conclude that long run relationship and cointegration exist. Thus, the study posits that capital market development indicators had significant effects on manufacturing sect output in Nigeria. The nature of the long run relationship is captured in the ARDL Long Run Form as shown on equation below.

EC = MASO - (1.0989*MCR -0.2351*TOR -11.9810*LOGASI + 11.0979*NIR +33.1470)

From the results on Table 3, coefficients for MCR (1.0989) and NIR (11.09793) are positive while those of TOR (-0.2350) and LogASI (-11.981) indicate negative relationship with manufacturing sector output. The p-values of the coefficients are: MCR (0.0095), TOR (0.8142), LogASI (0.2963), and NIR (0.3864). Only the p.value for MCR is less than 0.05 and thus the null hypotheses is rejected for MCR and cannot be rejected for TOR, LogASI and NIR respectively. The study posit

that MCR has a positive and significant effect on manufacturing sector output, whereas TOR, LogASI and NIR did not have significant effect on MASO.

The short run dynamism of the model is analysed using the Error Correction Model (ECM) on Table 13. The results shown on Table 13 explains the speed of adjustment to equilibrium as well as the nature of short run relationship between capital market development indicators and manufacturing sector output in Nigeria.

Table 4: Estimation of short run dynamics for capital market development and manufacturing sector output

ARDL Error Correction Regression

Dependent Variable: D(MASO)

Sample: 1987 2021

Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MASO(-1))	**0.398795**	**0.098436**	**4.051312**	**0.0029**
D(MASO(-2))	**0.488638**	**0.085466**	**5.717325**	**0.0003**
D(MASO(-3))	**0.368415**	**0.095141**	**3.872300**	**0.0038**
D(MCR)	0.046258	0.029319	1.577740	0.1491
D(MCR(-1))	**-0.243477**	**0.042421**	**-5.739524**	**0.0003**
D(MCR(-2))	**-0.209468**	**0.046782**	**-4.477545**	**0.0015**
D(MCR(-3))	**-0.224646**	**0.043171**	**-5.203655**	**0.0006**
D(TOR)	**0.236736**	**0.071841**	**3.295264**	**0.0093**
D(TOR(-1))	**0.479350**	**0.082300**	**5.824417**	**0.0003**
D(TOR(-2))	**0.340627**	**0.070687**	**4.818844**	**0.0009**
D(TOR(-3))	**0.242029**	**0.049444**	**4.894986**	**0.0009**
D(LOGASI)	**8.297179**	**1.589217**	**5.220923**	**0.0005**
D(LOGASI(-1))	-0.620585	1.534117	-0.404523	0.6953
D(LOGASI(-2))	**5.855401**	**1.589302**	**3.684258**	**0.0050**
D(LOGASI(-3))	**-6.741998**	**1.174297**	**-5.741306**	**0.0003**
D(NIR)	**2.841813**	**0.367189**	**7.739378**	**0.0000**
CointEq(-1)*	**-0.191197**	**0.021137**	**-9.045796**	**0.0000**
R-squared	0.928101			
Adjusted R-squared	0.845931			

* p-value incompatible with t-Bounds distribution.

The short run dynamism of the manufacturing sector output model is explained using the Cointegration Equation Error Correction (CointEq(-1)*) on Table 4. The Coefficient has a negative sign (-0.191197) with a p-value of 0.0000. The coefficient with negative sign implies that capital market development indicators have an error correction effects. The negative sign indicates ability to adjust back to equilibrium within the short run period of one year. Since the p.value is less than 0.05 level of significance, it indicates that the coefficient has significant effect. The study thus posits that the speed of adjustment to equilibrium is 19%. This means that about 19% of the changes from equilibrium will be adjusted to normalcy within the short run period of one year.

The results on Table 4 also shows the ARDL ECM analyses of the short-run effect of capital market development indicators (MCR, TOR, LogASI and NIR) on manufacturing sector output in Nigeria. The coefficients of the endogenous MASO variable are: lag 1 (0.398795), lag 2 (0.488638) and lag 3 (0.368415) with p.values of 0.0029, 0.0003 and 0.0038 respectively. This indicates that manufacturing sector output is an endogenous variable in the model, and has positive and significant effect on itself within a period of three years consecutive lags from 1 to 3.

The coefficient of Market Capitalization Ratio (MCR) has a positive relationship at current period (0.046258), and negative relationship at lag 1 (-0.243477), lag 2 (-0.209468) and lag 3 (-0.224646). The p.value is greater than 0.05 in the current year (p = 0.1491) but less than 0.05 at lag 1 (p = 0.0003), lag 2 (p = 0.0015) and lag 3 (p = 0.0006). Thus, we only reject the null hypothesis at lags 1 to 3 and cannot reject the null hypothesis for the current year. This means that MCR have negative and significant effects on the manufacturing output from lags one to three years.

The coefficients for Turnover ratio (TOR) are positive for all the periods from the current year (0.236736), lag 1 (0.479350), lag 2 (0.340627), and lag 3 (0.242029). The p.values are all less than 0.05 level of significance (see Table 13). Thus the study posit that TOR have a positive and significant effect on manufacturing sector output in the short run.

The coefficient of regression for All Share Index (LogASI) are 8.297179 for the current year, -0.620585 for lag 1, 5.855401 for lag 2 and -6.741998 for lag 3. The p.value are less than 0.05 level of significance, in the current year, lag 2 and 3 but greater than 0.05 level at lag 1. Thus, the study posits that All Share Index had significant positive effects in the current year and lag 1 but changed to statistically significant negative effect in lag 3. It posit that All Share Index has a negative and insignificant effect on manufacturing output in the short run.

The coefficient of regression for New Issues Ratio (NIR) is 2.841813 with a t-value (t = 7.739378, p.value = 0.0000) in the current period of the study. Since the p.value is less than 0.05 level of significance, it posit that NIR has a positive and significant effect on manufacturing output in the short run.

The study further instigated the causal direction of the effects in the models with the pairwise granger causality result on Table 15.

Table 5: Estimation of causal relationship between capital market development indicators and manufacturing sector output

Pairwise Granger Causality Tests

Sample: 1987 2021

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
MCR does not Granger Cause MASO	33	0.26173	0.7716
MASO does not Granger Cause MCR		**4.65911**	**0.0179**
TOR does not Granger Cause MASO	**33**	**8.41212**	**0.0014**
MASO does not Granger Cause TOR		1.76492	0.1897
LOGASI does not Granger Cause MASO	33	0.74633	0.4833
MASO does not Granger Cause LOGASI		0.08907	0.9150
NIR does not Granger Cause MASO	33	1.15658	0.3291
MASO does not Granger Cause NIR		**3.36028**	**0.0492**

The pairwise granger causality between MCR and MASO has p.value greater than 0.05 for MCR → MASO (p = 0.7716); and p.value less than 0.05 for MASO → MCR (p = 0.0179). Thus we cannot reject the null hypothesis for granger causality from MCR to MASO; but we reject the null hypothesis from MASO to MCR. This means that there is uni-directional causal relationship between manufacturing and market capitalisation ratio. The study posit that manufacturing sector output granger cause market capitalisation ratio.

For the causal relationship between turnover ratio (TOR) and manufacruring sector output (MASO), the p.values are: TOR → MASO (0.0014); MASO → TOR (0.1897). Since the p.value less than 0.05 for causal relationship from TOR to MASO we reject the null hypothesis; but we cannot reject the null hypothesis for causal relationship from MASO to TOR. This means that there is uni-directional

causal relationship between turnover ratio to market capitalisation ratio. The study posit that turnover ratio (TOR) granger cause manufacturing sector output in Nigeria.

For All Share Index and Manufacturing sector output, both directions have p.values greater than 0.05: LogASI → MASO (p = 0.4833) and MASO → LogASI (p= 0.9150). The study cannot reject the null hypothesis for either direction and thus causal that there is no causality between all share index and manufacturing sector output.

In the case of New Issues Ratio and Manufacturing Sector output, the pairwise granger causality are: NIR → MASO (p = 0.3291); and MASO → NIR (p = 0.0492). Thus we cannot reject the null hypothesis for granger causality from NIR to MASO; but we reject the null hypothesis from MASO to NIR. This means that there is uni-directional causal relationship between manufacturing and NIR. The study posit that manufacturing sector output granger cause new issue ratio.

4.3. Discussion and Conclusion

The result revealed that capital market development indicators have significant long and short run effect on manufacturing sector output in Nigeria; wherein the causal relationship runs from the manufacturing sector output to market capitalisation and new issues, and from turnover ratio (liquidity) to manufacturing sector output. It further showed that the long run effect is driven by the positive and significant effect of the market capitalisation ratio on manufacturing output. The short run dynamism revealed the only 19% adjustment of deviation was returned to equilibrium with positive effects from the turnover ratio (liquidity) and new issues ratio (new funds) whereas market capitalisation adversely affect growth of manufacturing sector. The supports that the capital market is essential for the manufacturing sector activities in Nigeria. Thus, the study further posits that a uni-directional causal relationship exists between manufacturing and NIR, wherein the manufacturing sector output growth leads to more funds injection.

The results follows that demand following hypothesis that posits that the real sector is the driver of financial sector activities. This implies that the need for more funds is a result of the growing manufacturing sector. This is supports the theoretical assertion that the manufacturing sector is capital intensive. Hence, the necessity to drive more production is the sector requires more funding sector capital market.

The outcome of the study tends to support some of the extant studies such as awe (2021), Egbuche and Nzotta (2020), Adekule (2019), Uruakpa (2019) and Kwode (2015) among others. Most of these studies posit that capital market have both long and short run effects on the manufacturing sector output in Nigeria and beyond. The capital market has been impactful on the manufacturing sector in Nigeria. This supposes that the growth of the markets is essential for the manufacturing sector productivity in Nigeria.

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