Stock Market Liquidity and Manufacturing Sector Performance: Evidence from Nigeria

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Abstract: The study examined the impact of stock market liquidity on manufacturing sector performance in Nigeria for the period 1981-2017. The research adopts multiple regression analysis in which Auto Regressive Distributed Lag (ARDL) model was utilized in the analysis. Data on manufacturing sector output (MSO), stock market liquidity proxied by the ratio of market capitalization (SML), All-Share Index (ASI), interest rate (INR) and exchange rate (EXCR) were analyzed in the study. The results revealed that stock market liquidity (LSML) has a positive and insignificant impact on manufacturing sector performance in Nigeria, while All-Share Index (LASI) has a positive and significant influence on manufacturing sector performance. Similarly, the results revealed that interest rate (INR) and exchange rate (LEXCR) have negative and insignificant impact on manufacturing sector performance in the economy. These results imply that any attempt to increase stock market liquidity and All-Share Index by 1% will lead manufacturing sector performance in Nigeria to increase by 0.134%, and 0.136%, respectively. Thus, the study recommends that government should as a matter of fact; intensify efforts in promoting stock market activities in the economy, as that will provide more liquidity needed for more investments in the country by investors thereby leading to improved capacity of the manufacturing sector to produce more goods and services supplied in the economy.
Keywords: Stock Market Liquidity, Manufacturing Sector, Performance, Autoregressive distributed lag model

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I. INTRODUCTION

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. These economies therefore, are known for their involvement in the transformation of raw materials into finished goods. It helps countries to embark on productive ventures that eventually result to increase in the domestic consumption and the foreign exchange earnings of nations. The performance and growth of the manufacturing sector is a prerequisite for the level of industrialization, modernization, urbanization, gainful and meaningful employment for all those who are able and willing to work, equitable distribution of income, improved welfare, income per capita and quality of good life enjoyed by citizens of countries (Kwode, 2015; and Oteh, 2010). Consequently, with global recognition, the manufacturing sector is viewed as an important force that drives economies towards a sustainable growth in both the developing and the developed countries.

Stock market on the other hand, obviously deals with primary market by which shares are initially issued mainly to source out funds for investment expansion and development (Echekoba & Ananwude, 2016). Therefore, companies raise new funding to increase investments in productive capital and economic growth through transaction activities in the stock markets. Theoretically however, Abu-Sharia (2005) cited in Echekoba and Ananwude (2016) argued that in most stock market literature, growth-led factors are prominently found in efficient capital allocation, capital accumulation and saving mobilization. It provides long term capital to the listed firms by helping it to poolout funds from various investors for business expansion as well as offer alternative investment opportunities to investors to enable them invest their surplus funds in the most productive ventures in the economy. Through stock markets, domestic and foreign capitals are often attracted into an economy which play key role in achieving economic growth and improving foreign reserves of a nation via portfolio investment. Levine (1991) cited in Echekoba and Ananwude (2016) revealed that stock market fosters economic growth via reduction in liquidity and productivity risks. This is because; stock markets provide investors the opportunities to invest in numerous companies in both the foreign and the domestic economies across the world. It also helps to diversify economy away from external products' shock and reduce nations' overdependence on mono-product economy. Therefore, liquidity of stock market is very crucial for the industrialization of an economy. Nations with efficient liquid stock markets, industrialize their economies faster than other nations with inefficient liquid stock markets. For example, the level of industrialization in United

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States, India and China, etc among the developed countries are greatly associated with the liquidity of their stock markets.

In Nigeria however, the level of liquidity of the stock market is very infinitesimal and inefficient as indicated by its low industrial production. This situation has led to the country's overdependence on the importation of consumable goods to feed its teeming population, as over 80% of the country's consumable goods are imported from other countries of the world (Echekoba & Ananwude, 2016). Meanwhile, stock market development is absolutely important to raise industrial production because firms by that actions are provided a unique avenue to quickly acquire capital, resulting from the ease by which securities are traded. Researchers argued that the industrial sector remains engine of growth in any economy, because it plays an important role in the economic growth and development of the nation. Industrial sector growth helps to transform into the development of the economy. According to Udoh and Ogbuagu (2012), low growth in the manufacturing sector of Nigeria is one of the factors that bedeviled the the performance of the sector and its expected roles in the economic growth and development of the nation. The situation has overtime led Nigeria's economy to experience low productivity, and high importation of consumable goods. Therefore, the low productivity in the sector was blamed on the poor expertise in the economy, poor technology and lack of adequate finance by government. Consequently, this has over the past decades generated a very great concern to government, operators, practitioners and the organized private sector in the country.

For instance, the Federal Government of Nigeria in its desire to ensure growth in the industrial sector, established Securities and Exchange Commission (SEC) decree No 71 in 1979 to control and regulate the activities of the stock exchange market in Nigeria. With the activities of this commission, the Nigerian stock has overtime performed considerably well. The commission upon commencement of its activities results to a decline in market capitalization from ₦1.6 billion to ₦1.3 trillion between 1980 and 2003. Between 2006 and 2014, the market capitalization rose from ₦5.1 trillion to ₦6.9 trillion; and in 2016, the market capitalization stood at ₦9.6 trillion. This low liquid stock market was attributed to high rate of unemployment and low aggregate demand in the economy due to the inability of some state governments to pay their employees' salaries, which affected many quoted companies alongside the delay in the 2016 budget implementation that also contributed to that development (Echekoba & Ananwude, 2016).

According to Israel (2015), capital market is obviously an integral part of the financial system which efficiently provides mechanism for management, mobilization and allocation of long term capital for domestic investment growth. It comprises the interactions of network of financial institutions and infrastructure to generate, and distribute long term finance for economic development. The role of capital market is relates to the financial market function as one of the financial institutions that specialize in the mobilization and allocation of long term capital for commerce and industry. However, the role of capital market in industrial development and economic growth in Nigeria has continued to generate arguments among the policy makers and economists. Some researchers argued that the performance of capital market to industrial sector in Nigeria is very low. For example, Ariyo and Adelegan (2005) cited in Israel (2015) revealed that the capital market liberalization results to capital market growth; however, the effect of this growth on the macro economy was very insignificant in the economy. On the other hand, Osai-Brown (2009) expressed that the Nigerian capital market earning was one of the worst performing stock market in the world in 2008 after it lost ₦5.1 trillion in market capitalization and 54% in the All-Share Index, after one year it emerged as the world's best performing stock market in 2009 with return of 47%. Accordingly, Israel (2015) stated that Nigeria capital market, represented by stock exchange had witnessed growth as shown by performance indicators of market capitalization which in 2007 stood at ₦13 trillion but decreased to ₦9.91 trillion in 2010 whereas All share -Index fell from 57,990.22 points to 24,770.52 points for the same period.

II. LITERATURE REVIEW

The role of stock market liquidity on the growth and development of an economy cannot be overemphasized. Overtime, it has vehemently generated very much concern among the policy makers, economists and other scholars (Mun, Siong & Thing, 2008 cited in Ifeoluwa & Motilewa, 2015). Stock market is a channel through which capital market activities are carried on; hence, it is a measure of business direction. According to Obadan (2008) cited in Ifeoluwa and Motilewa (2015), an active stock market is a necessary tool used to measure changes in economic activities via stock market index. It could raise economic growth through increase in the financial assets liquidity, make diversification of domestic and global risk possible, facilitates rational investment decisions as well as promote corporate governance by providing solution to institutional problems via increase in the interest of the shareholders (Vector, 2005 cited in Ifeoluwa & Motilewa, 2015).

Obviously, liquidity is a very essential factor that aide well-functioning of stock market in an economy. This is because; the case of trade-off in a liquid market is not severe, as price tends to remain stable even as the assets are quickly sold (Florence, Ogechi, Kingsley, Idika & Odili, 2017). Liquidity indeed, shows how large the trade-off between the price stock and sales velocity are actually sold for. Thus, stock market liquidity refers to

the magnitude by which financial assets are quickly traded in the financial market with the asset prices remaining unaltered (Yusuf, 2009 cited in Florence et al., 2017). This indicates that the stock market should be capable of facilitating assets' buying and selling with the prices of financial assets remaining unchanged in the market. According to the theory of market liquidity, "an asset should have the ability to sell at a stable price" without losing significance. Accordingly, Florence et al. (2017) identified some characteristics of a liquid stock market to include: 1) an asset is traded anytime within the trading hours; 2) there is a minimal loss on the value of asset; 3) investors sell the asset with ease; and 4) buyers are always ready and willing to buy.

Theoretical Framework
Theories that are associated with Stock market liquidity and Manufacturing Sector are as follows:
Efficient market hypothesis (EMH)
        The Efficient Market Hypothesis (EMH) is an investment theory whereby share prices reflect all information and consistent alpha generation is impossible. Theoretically, neither technical nor fundamental analysis can produce risk-adjusted excess returns, or alpha, consistently and only inside information can result in outsized risk-adjusted returns. According to this theory, stocks always traded at their fair value on stock exchange, makes it impossible for investors to either purchase undervalued stocks or sell stocks for inflated prices. As such, it should be impossible to outperform the overall market through expert stock selection or market timing, and the only way an investor can possibly obtain higher returns is by purchasing riskier investments (Florence, Ogechi, Kingsley, Idika and Odili (2017).
        This efficient market theory does not require that investors be rational; it only implies that individual investors will act randomly, but as a whole, the market is always "right." In other words, this theory is all about investors whether foreign or domestic having access to a sound regulated financial markets that are proficient in accelerating the growth and development of an economy (Weber, Davis & Lounsbury, 1980; Wikipedia, 2014). The efficient market hypothesis suggests that a market is efficient when it is able to adjust quickly to take account of all available information, such that no single participant in the market gets more information than the information that is already reflected in the market prices. Consequently, the efficient market hypothesis discusses three main dimensions involved in capital market efficiency depending on the set of information available: Weak- form market efficiency, Semi-strong market efficiency and Strong market efficiency (Omuchesie et al., 2014). Weak-form market efficiency exists when current prices fully reflect all historical price information, such that prices automatically adjust to information changes without lags. With semi-strong form efficiency, market prices reflect available public information including company reports, annual earnings, stock splits and company public profits forecasts. The strong form of efficiency however, exists when prices reflect both public and private information about earnings, book values, investment opportunities.

The random walk model
        The theory of random walk suggests that changes in stock prices have the same distribution and are independent of each other. Therefore, the past movement or trend of a stock price or market cannot be used to predict its future movement. In short, this is the idea that stocks take a random and unpredictable path. Accordingly, proponents of the theory believe that the prices of securities in the stock market evolve according to a random walk. A "random walk" is a statistical phenomenon in which a variable follows no discernible trend and moves seemingly at random. The random walk theory as applied to trading, most clearly laid out by Burton Malkiel, an economics professor at Princeton University, posits that the price of securities moves randomly (hence, the name of the theory), and that, therefore, any attempt to predict future price movement, either through fundamental or technical analysis, is futile (Florence et al., 2017).
        Invariably, the random walk model suggests that the price fluctuations at time 't' should be independent of the sequence of price changes in previous time periods (Afego, 2012). This is in tandem with the postulations of the weak-form version of the Efficient Market Hypothesis (EMH) that technical analysis, based on historical price information is worthless since current prices always adjust to all historical information.

The Neo-Classical Growth Theory
        Neoclassical growth theory is an economic theory that outlines how a steady economic growth rate results from a combination of three driving forces, including labour, capital, and technology. This theory states that short-term equilibrium results from varying amounts of labour and capital in the production function. The theory also argues that technological change has a major influence on an economy; and thus, economic growth cannot continue without technological advances. Neoclassical growth theory outlines the three factors necessary for a growing economy. These are labour, capital, and technology. However, this growth theory clarifies that temporary equilibrium is different from long-term equilibrium, which does not require any of these three factors. The neoclassical growth theory was developed in the late 1950s and 1960s of the twentieth century as a result of intensive research in the field of growth economics by Robert Solow and Trevor Swan who developed and first

introduced the model of long-run economic growth in 1956. The model first considered exogenous population increases to set the growth rate but, in 1957, Solow incorporated technology change into the model. The theory presumes the supply of goods and services on a production function with constant returns to scale and imperfect substitution between production, capital and labour factors. The model also assumed that aggregate output is produced in a Cobb-Douglas production function. Output elasticity measures the responsiveness of output to any alteration in the levels of labour or capital used in production, all other things being equal. This theory also assume that nations will not move towards the same steady state levels of per capita income regardless of having similar savings and population growth rates and production technologies. Solow's (1956) concluded that although poor countries will grow more rapidly than rich ones, both will move towards the same level of per capita income as per capita growth in the steady state relies completely on exogenous technological progress available to all countries.

Empirical Review

Florence, Ogechi, Kingsley, Idika and Odili (2017) evaluated the impact of stock market liquidity and efficiency on performance of the manufacturing sector in Nigeria. Applying unit root test and ARDL bounds test approach to co-integration for time series data ranging from 1985 to 2011. The variables employed in the investigation include market efficiency proxied by changes in all share index, stock market liquidity proxied by the ratio of market capitalization number of deals in the stock market, stock market turnover ratio proxied by the ratio total value of shares traded in the market capitalization ratio, inflation rate and capacity utilization from the manufacturing sector. The study found that stock market efficiency and number deals were significant variables that explained the changes in the Nigerian manufacturing sector. Ifeoluwa and Motilewa (2015) examined the impact of stock market liquidity on economic growth in Nigeria between 1980 and 2012. Using ordinary least square (OLS) technique, the study found, surprisingly, that stock market liquidity was not a statistically significant variable explaining economic growth in Nigeria for the periods under study.

Popoola, Ejemeyovwi, Alege, Adu and Onabote (2017) investigated the short run effect, long run effect and causal relationship between stock market and economic growth in Nigeria. Using Ordinary Least Squares and Pairwise granger causality method, the result showed that that stock market performance does not granger cause economic growth but economic growth granger causes stock market performance at 5 percent significance level. Kwode (2015) examined the importance of capital market in financing the manufacturing sector using data from 1970- 2012. The results showed that growth in capital market activities did not impact significantly on the manufacturing sector. In fact, the Nigerian manufacturing sector has been on the decline because of non-access to long-term funds from the capital market, high interest rate, volatile foreign exchange and unstable electricity supply.

Dalvi and Baghi (2014) investigated the relationship between performance and liquidity of shares listed on the Tehran Stock Exchange. They examined data from 154 companies listed in Tehran Stock Exchange between 1383 and 1388 with the combinational methods, the relationship between business performance and liquidity was studied. The results showed that between the liquidity and performance scales, a strong correlation was observed. Dragota and Oprea (2014) reviewed empirical results obtained in the investigation of the Romanian stock market's informational efficiency. Tests on the predictability of returns suggested that the Romanian stock market has a low level of efficiency. Furthermore, the impact of new information was intense before and after its release.

Similarly, Udoh and Ogbuagu (2012) used total production framework and autoregressive distributed lag (ARDL) co-integration technique for Nigerian time series data covering the period 1970-2009. It was found that both the long run and short run dynamic coefficients of financial sector development variables had a negative and statistically significant impact on industrial production. Afego (2012), analyzed the weak-form efficient market hypothesis for the Nigerian stock market by testing for random walks in the monthly index returns over the period 1984-2009. The results of the non-parametric runs test showed that index returns on the Nigerian Stock Exchange (NSE) displayed a predictable component; thus, suggesting that traders can earn superior returns by employing trading rules. Olowo, Oluwatoyin and Fagbeminiyi (2011), critically analyzed the efficiency of capital market on the Nigerian economy for the period between 1979 and 2008. The results indicated that the stock market indeed contributed to economic growth as all variables conformed to expectation. The major findings revealed a negative relationship between market capitalization and gross domestic product as well as a negative relationship between turnover ratio and gross domestic product while a positive relationship was observed between the all-share index and gross domestic product.

Salihu and Mohammed (2017), investigated the impact of stock exchange on the manufacturing sector in Nigeria for the period 1980-2015, using co-integration test and error correction model (ECM). The variables used in the study include Index of manufacturing sector as the dependent variable, while the independent variable include market capitalization, total new issue, Value of transaction, total listed securities, exchange rate and interest rate. The study found that there is a long term relationship between stock exchange and the

development of the manufacturing sector in Nigeria, but the growth in stock exchange activities had insignificant impact on the manufacturing sector in the economy.

Okpara (2010) carried out an investigation on the impact of capital market performance on growth of the Nigerian economy. The results showed that there was a long run interaction between the growth of the economy (gross domestic product) and capital market indicators. From the results, one period lag of market capitalization, new issues, value of shares traded and turnover ratio had significant impact on the growth rate of gross domestic product in the country. Yusuf (2009) investigated whether financial liberalization has any significant impact on the liquidity and efficiency of the stock market in sustaining economic growth in Nigeria. Using paired test to analyze the data for twenty years (1986-2005). The study found that financial liberalization has significant positive impact on the liquidity and efficiency of the Nigerian stock market. Guo (2008); tested the efficient market hypothesis (EMH) for the Chinese stock market with respect to monetary policy. The vector auto regression (VAR) model was used to estimate the relationship between stock returns and relative macroeconomic variables related to monetary policy. The estimated VAR equation proved that there were significant impact of lagged changes of interest rate, money supply and gross domestic product on stock returns.

Chordia, Roll and Subrahhmanyam (2001) studied total market spreads, depths and trading activities for U.S. equities over an extended time period. The results revealed that changes in market averages of liquidity and trading activities are highly volatile and negatively serially dependent. Also, the long term and short term interest rates influenced liquidity. On the other hand, depth and trading activities increased just prior to major macroeconomic announcements. More so, Echekoba and Ananwude (2016) studied the nexus between index of industrial production and Nigeria stock market liquidity and the effect stock market liquidity has on industrial production from 1981 to 2015, through the applications of Johansen cointegration test and its associated error correction model (ECM). The variables employed in the study were index of industrial production and value of stock traded ratio to gross domestic product. The result of the Johansen co-integration indicated that long run equilibrium relationship exists between index of industrial production and stock market liquidity. The ordinary least square (OLS) revealed that stock market liquidity has negative influence on index of industrial production.

III. RESEARCH METHODOLOGY

To empirically examine the effect of stock market liquidity on manufacturing sector performance in Nigeria for the period 1981-2017. Unit root test, and autoregressive distributed lag (ARDL) were estimated in the analysis. The unit root test is carried out to investigate the order of integration among the variables, while ARDL model was estimated to examine long run equilibrium relationship and short-run dynamic interactions among the variables under consideration. The variables utilized in the study include manufacturing sector output (MSO), stock market liquidity proxied by the ratio of market capitalization (SML), All-Share Index (ASI), interest rate (INR) and exchange rate (EXCR). Data for these variables were obtained from the statistical bulletin of the Central Bank of Nigeria (CBN) and securities exchange commission (SEC) reports from the period of 1981 to 2017, respectively.

3.1   Model Specification
The model used in this study is specified in functional form as:

MSO = f(SML, ASI, INR, EXCR)

$$1$$

Where; MSO = manufacturing sector output, SML = stock market liquidity, ASI = All-Share Index, INR = Interest rate and EXCR = Exchange rate.

In linear function, the model is expressed as:

$$MSO_t = \beta_0 + \beta_1 SML_t + \beta_2 ASI_t + \beta_3 INR_t + \beta_4 LEXCR_t + e_t$$

$$2$$

Where; MSO is the dependent variable while SML, ASI, INR, and EXCR are the independent explanatory variables; β_0 is the constant term, $\beta$is are the parameters of the regression equations and e_t is the error variable.

In log function, it is expressed as:

$$MSO_t = \beta_0 + \beta_1 LSML_t + \beta_2 LASI_t + \varphi_3 INR_t + \varphi_4 LEXCR_t + e_t$$

$$3$$

This equation represents the relationship between stock market liquidity and manufacturing sector performance in Nigeria.

3.2   A Priori Expectation
Theoretically, it is expected that all the variables such LSML, LASI will have positive relationship with the manufacturing sector output, while INR and LEXCR will have negative relationship with the manufacturing sector output in the Nigeria's economy.

3. Empirical Results and discussions

This stage of the research illustrates the estimation results and consequently, discusses the results in accordance with the study's objectives.

4.1 Stationarity Test

Stationarity test is carried out to examine the order of integration of the data series used in the study by applying the Augmented Dickey-Fuller (ADF) unit root test. The results of the ADF unit root test are revealed in the table 1 below.

Table 1: ADF Unit Root Test

Intercept

| Variables | Level | | First Difference | | | |
	ADF Statistic	5% Critical Value	ADF Statistic	5% Critical Value	Order	Remarks
LMSO	-0.560281	-2.945842	-4.489648	-2.948404	1(1)	Stationary
LSML	-0.449169	-2.945842	-4.559098	-2.948404	1(1)	Stationary
LASI	-1.914422	-2.945842	-4.094570	-2.948404	1(1)	Stationary
INR	-3.236303	-2.945842	-8.221819	-2.948404	1(0)	Stationary
EXCR	-2.229411	-2.945842	-5.510585	-2.948404	1(1)	Stationary

Source: Researcher's compilation from E-view 9

From the table 1 above, the results of the ADF unit root test, conducted at both level and first difference at 0.05 (5%) level of significance, indicate that at level, all the variables including LMSO, LSML, LASI, and LEXCR except INR were non-stationary at level. However, the results revealed that all the variables become stationary after first differencing at 5% level of significance. These claims are evident by the ADF statistics and its critical values as shown in the table 1 above. Thus, since the same order of integration is achieved among the variables at both level, and first difference; it therefore, indicates that the data series used in the study possessed long run properties, which implies that their mean, variance and covariance are constant overtime. In addition, since the results indicate the same order of integration at first differencing, it implies that the series do not contain unit root at that level. Therefore, they can be used in the investigation as the results obtained from the estimation procedures will not produce spurious results.

4.2 Auto Regressive Distributed Lag (ARDL) Bounds Cointegration Tests

ARDL Bounds cointegration test is an estimation procedure used in the analysis of the short-run dynamic and long-run relationship interactions among the underlying variables. The model was developed by Pesaran and Shin (1999) and Pesaran, Shin and Smith (2001) in an effort to investigate the long-run and short-run coefficients of the variables under study. ARDL model is applied when there is mixed order of integrations among the variables [i.e. I(1) and I(0)]. It is relatively more efficient even when the size of the data is finite and small. The technique ensures unbiased estimation results of the long run model (Harris & Sollis, 2003). The results of the ARDL model are shown in table 2 below.

Table 2: ARDL Bounds Cointegration Test

Dependent Variable: LMSO

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LMSO(-1)	1.395121	0.220117	6.338086	0.0000
LMSO(-2)	-0.542000	0.200610	-2.701756	0.0130
LSML	0.132646	0.076221	1.740296	0.0958
LASI	-0.187882	0.086696	-2.167131	0.0413
LASI(-1)	0.136490	0.064442	2.118039	0.0457
LASI(-2)	-0.164776	0.054988	-2.996605	0.0066
LASI(-3)	0.082982	0.045998	1.804058	0.0849
INR	-0.000865	0.005867	-0.147442	0.8841
INR(-1)	0.014693	0.006457	2.275340	0.0330
LEXCR	-0.088158	0.077848	-1.132438	0.2696
LEXCR(-1)	0.160190	0.074825	2.140870	0.0436
C	0.912691	0.417558	2.185781	0.0398

R-squared	0.998667	Mean dependent var	6.598484
Adjusted R-squared	0.998001	S.D. dependent var	1.826079
F-statistic	1498.756	Durbin-Watson stat	1.815370
Prob(F-statistic)	0.000000		

Sources: Researcher's computation from E-view 9

The table 2 above depicts the results of ARDL model, which shows the relationship between stock market liquidity and manufacturing sector performance in Nigeria. The results indicate that stock market liquidity (LSML) at lag zero has a positive and insignificant impact on manufacturing sector performance in Nigeria, while all-share index (LASI) at lag 1 has a positive and significant effect on manufacturing sector performance. More so, the results revealed that interest rate (INR) and exchange rate (LEXCR) at lag zero have negative and insignificant impact on manufacturing sector performance in the economy. Meanwhile, these claims are evident by the coefficients and the p-values of the estimated variables. From the results, the coefficients of LSML, LASI, INR, and LEXCR are 0.132646, 0.136490, -0.000865 and 0.088158, respectively with the corresponding p-values being 0.0958, 0.0457, 0.8841 and 0.2696, respectively. The R^2 is 0.998667, which implies that 99.9% of the changes in the dependent variable are accounted for, by the independent variables. The results also showed F-statistic value of 1498.756 with a Prob(F-statistic) value of 0.000000, which indicates a statistical significant of the joint influence of the explanatory variables on the explained variable in the model. More so, the Durbin-Watson stat of 1.815370 as shown by the estimation result indicates that there is no evidence of serial correlation in the model; thus, the application of the model in the investigation cannot produce spurious results. To further test for the presence of serial correlation, Breusch-Godfrey Serial Correlation LM test was carried out, and the results revealed Observed R-squared of 3.776316 while its Prob.Chi-Square(2) is 0.1514, which further confirmed the earlier assertion. The study as well tested for homoscedasticity, and the results obtained showed evidence of homoscedasticity in the model. Thus, the results indicate Obs*R-squared value of 1.959158 with Prob.Chi-Square(1) of 0.1616, which is greater than the 5% chosen critical value. Similarly, the study also tested for non-stability of the model using Ramsey RESET test, and the results indicate evidence of model stability. This is evident by the F-statistic and t-statistic of 0.534616 and 0.731175, respectively with the p-value of 0.4759, which further evidenced the claim.

These results imply that 1% rise in stock market liquidity (LSML) and All-Share Index (LASI) will increase manufacturing sector output (LMSO) by 0.134%, and 0.136% respectively. Similarly, the results further imply that 1% increase in INR and LEXCR will result to 0.001% and 0.09% decreases in manufacturing sector output (LMSO), respectively. These findings are in accordance with the Efficient Market Hypothesis, which opined that efficient market transactions determine the volume of goods and services and the growth of the economy. Thus, it was argued that positive relationship exists between growth of the economy and the stock market liquidity in any economy ((Omuchesie et al., 2014).

Table 3: ARDL Bounds Test on monetary variables and net exports

Test Statistic	Value	K
F-statistic	1.042881	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Researcher's compilation from E-view 9

The table 3 shows the results of ARDL test bounds. From the results, the estimation indicates no evidence of long-run relationship among the variables under consideration, since the F-statistic of 1.042881 is less than even the lower 5% critical value bounds. Thus, the study concludes that no evidence of long-run relationship is found among the variables.

Table 4: ARDL Short-run and Long-run Coefficients Test

Short Run Coefficient

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMSO(-1))	0.799451	0.225769	3.541007	0.0027
D(LMSO(-2))	-0.445620	0.207143	-2.151273	0.0471
D(LMSO(-3))	0.317609	0.194029	1.636917	0.1212
D(LSML)	0.047116	0.192554	0.244690	0.8098
D(LSML(-1))	-0.335946	0.135695	-2.475750	0.0249
D(LASI)	-0.071138	0.203153	-0.350167	0.7308
D(LASI(-1))	0.525351	0.143542	3.659905	0.0021
D(LASI(-2))	-0.142298	0.077224	-1.842665	0.0840
D(INR)	-0.002770	0.007778	-0.356180	0.7264
D(INR(-1))	0.015473	0.007217	2.143935	0.0477
D(INR(-2))	-0.011540	0.007633	-1.511827	0.1501
D(LEXCR)	0.094808	0.080276	1.181018	0.2549
ECT(-1)	-0.313247	0.137097	-2.284868	0.0363

Cointeq = LMSO - (0.7042*LSML -0.3171*LASI + 0.0601*INR + 0.3027
*LEXCR + 3.2025)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LSML	0.704166	0.129135	5.452923	0.0001
LASI	-0.317134	0.301311	-1.052512	0.3082
INR	0.060058	0.033066	1.816287	0.0881
LEXCR	0.302661	0.213976	1.414462	0.1764
C	3.202454	1.283387	2.495314	0.0239

Source: Researcher's compilation from E-view 9

The results in the table 4 above depict ARDL long-run and short-run coefficients tests. From the estimation results, the ECT value is -0.313247, while its associated p-value of 0.0363, which is less than the 5% chosen critical value. This result indicates that the adjustment speed of the variables from the short-run deviation towards long-run equilibrium relationship is 31.3% annually. The ECT is negative, fractional and statistically significant. The significance of the ECT satisfies all conditions and the negative sign satisfied the order condition required in the application of the econometric approach in any study of this nature.

4.4 Policy Implications of the Results

This study investigated the impact of stock market liquidity on manufacturing sector performance in Nigeria for the period 1981-2017, through the application of Auto Regressive Distributed Lag (ARDL) model. The results indicate that stock market liquidity (LSML) has a positive and insignificant impact on manufacturing sector performance in Nigeria, whereas All-Share Index (LASI) has a positive and significant effect on manufacturing sector performance. Furthermore, the results illustrated that interest rate (INR) and exchange rate (LEXCR) have negative and insignificant impact on manufacturing sector performance in the economy. These results imply that 1% increase in stock market liquidity (LSML) and All-Share Index (LASI) will lead manufacturing sector output (LMSO) to increase by 0.134%, and 0.136% respectively. More so, the results also imply that 1% increase in INR and LEXCR will result to 0.001% and 0.09% decreases in manufacturing sector output (LMSO), respectively in the economy.

V.   CONCLUSION AND RECOMMENDATIONS

The study investigated the impact of stock market liquidity on manufacturing sector performance in Nigeria for the period 1981-2017. Auto Regressive Distributed Lag (ARDL) model was utilized in the analysis. Data generated from the statistical bulletin of the Central Bank of Nigeria (CBN), volume 27, 2017 on manufacturing sector output (MSO), stock market liquidity proxied by the ratio of market capitalization (SML),

All-Share Index (ASI), interest rate (INR) and exchange rate (EXCR) were analyzed in the study. Stationarity test was conducted through the application of the Augmented Dickey-Fuller (ADF) unit root test. The results indicated that all the variables except INR were non-stationary at level at 5% level of significance. However, stationarity among the variables were attained after first differencing at 5% level of significance. The results of the ARDL model revealed that stock market liquidity (LSML) has a positive and insignificant impact on manufacturing sector performance in Nigeria, while All-Share Index (LASI) has a positive and significant influence on manufacturing sector performance. Similarly, the results revealed that interest rate (INR) and exchange rate (LEXCR) have negative and insignificant impact on manufacturing sector performance in the economy

These results imply that an attempt to increase stock market liquidity by 1% leads to increase in manufacturing sector performance in Nigeria by 0.134%, and 1% rise in All-Share Index (LASI) will also increase manufacturing sector output by 0.136%. Hence, the study recommends that government should as a matter of fact; intensify efforts in promoting stock market activities in the economy, as that will provide more liquidity needed for more investments in the country by investors thereby leading to improved capacity of the manufacturing sector to produce more goods and services supplied in the economy.

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