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Long and Short Run Relationship between Stock Market Development and Economic Growth in Nigeria

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Abstract: We examined the long and short run association subsisting between stock market development (market capitalisation, value of transactions, number of deal and all share index), and Nigerian economic growth (RGDP) with quarterly data from 1986 to 2017. The Autoregressive Distributed Lag (ARDL) model is applied for the purpose of estimation. The ARDL bound test result revealed that all the indicators of market development exert positive effect on the RGDP in the short run. Further, all the indicators except number of deals, have direct and significant relationship with economic growth. Moreover, we find that market development causes economic growth. Consequently, we recommend a need for the implementation of policies and procedures capable of enhancing investors' confidence and boosting market because of their perceived multiplier impacts on economic growth. Effort should also be focused on the enhancement of stock market size which in turn will provide the needed fund for investment and thus resulting in rise in the RGDP.

Keywords: *Stock Market; Causality; Nigeria; Economic growth.*

1. Introduction

The growth of any nation depends on how well the nation is able to mobilise its savings for investment. Stock market is a structured market where long term financial securities chiefly bonds, shares, debentures are sold to the investors reason being to create long term funds for investment and promote economic growth. The former is a market in which new funds are raised while the latter is meant for trading in second hand securities. According to Fama (2005), stock market is the most important tool that pushes an economy in motion for growth and development. A well-functioning stock market offers low cost of equity capital for firms, enforces control on the investment activities of firms through continuous modification of shares and serves as a mechanism for drawing foreign portfolio investment (Ewah, Esang, Atim and Bassey, 2009). Effort to strengthen the Nigerian capital market brought about the establishment of regulatory authorities namely the Securities and Exchange Commission (SEC) and Nigerian Stock Exchange (NSE) to ensure effectiveness and good organization of the stock market. Anne and Kevin (2013) were of the view that the level of economic growth has a force to bear on the sophistication and efficiency of its financial market; especially, its stock market. The Nigeria economic growth fluctuated tremendously in the early 1980s as a result of shift from the agricultural sector to overdependence on crude oil which necessitated the implementation of economic stabilisation measures and resulted in commencement of Structural Adjustment Programme (SAP) (Ewah et al, 2009).

Two divisions of the capital market exist, namely the primary section and secondary section. Hence, there is an expectation of a strong connection between the two subjects. The introduction of SAP in 1986 helped the government in remedying the widespread macroeconomic and structural discrepancies in the nation's economy and liberalization of stock market which was the major aspect of the SAP programme (Adeusi, Suliaman and Azeez, 2013). Before the global financial crisis, Nigerian stock market was characterised by excessive growth fuelled by banks which were diverting funds from productive sectors to the stock markets for speculation (Sanusi, 2012). However, between 2007 and 2008, Nigeria stock market experienced financial crisis due to international economic crashes characterised by the general rise in oil prices, global food crisis amongst others (Njiforti, 2015). Arunma (2010) opined that the 2008 financial crisis prompted huge portfolio outflows and exodus of foreign participants from the local market. The consequences include sharp drop in stock prices, leading to margin calls and causing local stock market participants to panic. In addition, there were increases in sell orders with concomitant price depression and erosion of investors' confidence. The financial crisis in the stock market affected economic performance of Nigeria by larger education in foreign capital inflows and repatriation of fund by Nigerians abroad. In the same vein, external trade funding reduced drastically for several banks while erstwhile credit lines literally dried out.

However, the GDP growth rate raised from 5.99 per cent in 2008 to 6.90 per cent in 2009 as a consequence of remarkable feat in the agricultural sector and the constant adoption of good macroeconomic strategy (Sanusi, 2010). A functional stock market is known to play a tremendous role in boosting economic growth and has been generally recognized in literature (Abbas, Pei and Rui, 2016). To theorists and many scholars, if liquidity is guaranteed by a well-functioning capital market, the stock market will serve as the last resort in the creation of long term capital for funding growth especially in the developing economics (Ezeoha, Ebele, Okereke, 2009). Empirical studies carried out by Okoye, Modebe, Taiwo and Okorie (2016), Taiwo, Alaka and Afieroho (2016), Kolapo and Adaramola (2012) submitted that significant connection exists between economic growth and financial sector. On the contrary, the studies of Anne and Kevin (2013), Ewah, Esang, Atim and Bassey (2009), Oluwatosin, Adekanye and Yusuf (2013), Josiah, Samson and Akpeti (2012) concluded that there is no significant relationship between economic growth and financial sector. It can therefore be concluded that there still exists a puzzle from the available studies. Furthermore, there appears to be a dearth of studies on the assessment of the relationship between stock market development and economic growth in both short and long run. This study extended the model of Osakwe and Anawunde (2017) by examining additional stock market indicators. There is a need to investigate possible short and long run interrelationship between the two important subjects and this is possible with the aid of Autoregressive Regressive Distributed Lag (ARDL) econometric tool. The remaining parts of the study comprise the literature review, research method, result and discussion as well as conclusion and recommendations.

2. Literature Review

Conceptually, stock market is portrayed as a medium by which funds of long-term duration are provided by the savers for the use of deficit economic units (Mbat, 2001). Al-faki (2006) contributed that stock market is a system of specialized financial institution, chains of machinery, process and infrastructure which connect providers and users of medium to long term capital investment for economic development purpose. According to Jhingan (2004), it is a market that trades in long term loans required for socio-economic growth and development of emerging and developed economics. Economic growth is usually measured by the Gross domestic product, viewed as the monetary worth of goods and services created by the residents of a country during a period of time, nationality notwithstanding (Obalade & Obisesan, 2015). Theoretically, Patrick (1966) queried the relationships subsisting between finance and growth through "demand following" cum "supply leading" patterns which are traceable to stages of the development. The formal holds that economic development creates a need for the services of financial markets and the emerging financial sector plays a passive role in meeting the need. The latter pattern, supposes that financial activities and arrangements engender economic growth by directing savings to investors. Thus supply leading is typical of initial phase of development as would be expected of emerging economies, and then slowly swings its active position to the demand following type typical of advanced economies.

Hence, Rondo Cameron (1967) argued that financial sectors could induce growth or be induced by growth. Going by the seminar work of Mckinnon and Shaw (1973) cited in Bouzid (2012), it was reported that developed stock market tend to support economic expansion via her impacts on savings' growth rate. McKinnon-Shaw held that financial intermediation supports growth as it boosts the rate of return on capital when credits are efficiently allocated to investment (Japelli and Pagano, 1994). In essence, demand following and "supply leading", represents an ideal theoretical underpinning for this paper by providing for a two-way explanations on financial sector cum economic growth. From the empirical viewpoint, studies on the relationship between the two subjects have been controversial. A study by Kolapo and Adaramola (2012) disclosed that the indicators of market development and gross domestic product are cointegrated in the long run in Nigeria. Similarly, Ogunleye and Adeyemi (2015) applied co-integration analysis and error correlation mechanism and the study indicated a long-run association between the two subjects in Nigeria. Ananwude and Osakwe (2017) also established a long run relationship between the two subjects in Nigeria and there is a direct relationship which is not statistically significant. Further, Oke (2013) employed cointegration test and established direct link between capital market activities and economic growth in the short-run and the long run respectively. Raymond (2013) explored the nexus between development of stock exchange and growth of Kenyan economy and the test of causality showed that economic growth is stimulated by stock exchange development.

The finding was supported by Osundina and Osundina (2016) in Nigeria by establishing that causality flows from market development to welfare distribution. Conversely, a study of European Union countries by Veronika and Petr (2016) using Auto Regressive distributed Lag (ARDL) disclosed the presence of short- and long run impacts of economic growth on stock market development in long- run and short run but the findings does not hold in the short run for countries that are non-Euro area. Similarly, Azeez and Obalade (2019) using the ARDL bound testing technique examined the key factors of stock market development and proved that GDP is one of the major drivers, suggesting growth also determines market development. Furthermore, Tsaurai (2016) in Belgium also employed ARDL method but discovered that long run causality is insignificant while short run effect is inexistent. In addition, Osakwe and Ananwunde (2017) using ARDL co-integration revealed absence of long run relationship amid the two subjects in South Africa but not in Nigeria. They concluded that market capitalisation and liquidity have no significant effect on growth of the two emerging African economies.

On the other hand, Dike (2016) focused on financial market effect on growth and concluded that stock market development seems to play a vital role in the growth of African economy. The findings was corroborated by Ogochukwu and Raifu (2017) who explored fixed effect model and submitted that African economic growth is significantly and directly influenced by stock market measures. Quarterly data frequency and Panel estimation technique are used by Osaseri and Osamwonyi (2019) who submitted that market and economic growth in BRICS are positively correlated while the former has significant impact on the later. Conversely, Agu (2018) reported that market capitalization negatively impact GDP in Nigeria using OLS. Most of the empirical literature seems to hold the belief that stock market prompted economic growth as one would expect in a developing economy like Nigeria. However, there are conflicting findings too. Thus the current study is motivated by inconclusiveness of existing study and omission of some market indicators in earlier studies.

3. Research Method

Sources and Description of Data: The time series data used in the study were directly obtained from Central Bank of Nigeria Statistical Bulletin 2017 version and Nigerian Stock Exchange Fact book. The quarterly time series data covered a period of 32 years ranging from 1986Q1 to 2017Q4. The study started from 1986 because of the major macroeconomic policies of the period which led to the introduction of SAP. 2017 was chosen as a result of availability of data. Explanatory variables used are the Market capitalization (MCAP); Value of transaction (VOT); Number of deal (NOD); and All share index (ASI) while the dependent variable is the Real, gross domestic product (RGDP). RGDP is the total market value of all final goods and services produced in the economy during a given period usually a year. GDP per capita is generally acceptable as a measure of a country's standard of living. ASI shows price movement or the overall price performance of the market with one statistic. It is a gauge of how well the stock market is performing. VOT is the total value of shares traded during a period. It is a measure of the liquidity position of the stock market. Market Capitalization is the total market value of an issue derivation, stock on other financial asset.

Estimation Technique and Model Specification: Autoregressive Distributed Lag model (ARDL) was employed in the study. The technique of ARDL became essential for the study because it is capable of establishing the short-run and long-run relationship between economic time series (Almahmoud, 2014). More so, ARDL is superior to Johansen cointegration because it can contain variables with mixed level of stationarity especially I(0) and I(1).We first established through the unit root test that this rule is not violated. Further, the short-run dynamic model is tested within the ARDL modeling.
The functional ARDL model estimated in this study is stated as;

$$\Delta \ln(RGDP)_t = \lambda_0 + \sum_{i-1}^{n} \lambda_1 + \Delta ln(RGDP)_{t-1} + \sum_{i-1}^{n} \lambda_2 + \Delta ln(MCAP)_{t-1} + \sum_{i-1}^{n} \lambda_3 + \Delta ln(VOT)_{t-1} + \sum_{i-1}^{n} \lambda_4 + \Delta ln(NOD)_{t-1} + \sum_{i-1}^{n} \lambda_5 + \Delta ln(ASI)_{t-1} + \beta_0 \ln(RGDP)_{t-1} + \beta_1 ln\,(MCAP)_{t-1} + \beta_2 ln\,(VOT)_{t-1} + \beta_3 ln\,(NOD)_{t-1} + \beta_4 ln\,(ASI)_{t-1} + \mu_{it} \qquad 1.$$

Where $LN\ (RGDP)$ the natural logarithm of real gross domestic product is, $LN\ (MCAP, VOT, NOD, ASI)$ were the natural logarithm of stock market development indicators, Δ is the change in each operator and μ_{it} is the *i.i.d* stochastic error term. It can be used to measure the size of the market while Number of Deals is the number of transactions undertaken on the floor of NSE. In investigating the long run association with restriction of coefficients α_1, α_2, α_3, α_4 the null hypothesis in long run was written as follow: $H_0=\beta_1=\beta_2=\beta_3=\beta_4 = 0$. However, for policy reasons, the short-run adjustment of $MCAP, VOT, NOD, ASI$ and GDP is necessary. The significance of error correction model lies in its ability to correct spurious regression results in time series data. The error correction model (ECM) is specified as:

$$\Delta ln(RGDP)_t = \alpha_0 + \sum_{i=0}^{n} \lambda_i\ \Delta ln(MCAP)_{t-1} + \sum_{i=0}^{n} \lambda_i\ \Delta ln(VOT)_{t-1} + \sum_{i=0}^{n} \lambda_i\ \Delta ln(NOD)_{t-1} + \sum_{i=0}^{n} \lambda_i\ \Delta ln(ASI)_{t-1} + (ECM)_{t-1} \qquad 2.$$

Where; ECM_{t-1}= Error correction model; $t-1$shows variables were lagged by one period; Δ = Changes in ECM coefficient.

Model Specification: The empirical model of the study was based on the study of Olokoyo and Ogunnaike (2011) on relationship between stock market crisis and Nigeria's economic growth in Nigeria. Olokoyo and Ogunnaike (2011) model was stated as:

$$RGDP = (MCAP, ASI, NOD, VOT, TNI, INF) \qquad 3.$$

The current study modified equation 3.4 by dropping inflation rate and total number of new issues. Hence, the remaining variables namely, $MCAP, VOT, NOD$ and ASIwere the variables considered useful for our study which is to examine the long and short run relationships between stock market development and economic growth in Nigeria. Therefore, the modified model for the study was stated as:

$$RGDP = (MCAP, VOT, NOD, ASI) \qquad 4.$$

In order to secure normality and homoskedasticity, the equation (3.5) becomes log-linear model through log transformation; this is because the variables are in value and percentage

$$RGDP_t = \alpha_0 + \alpha_1 MCAP_t + \alpha_2 VOT_t + \alpha_3 NOD_t + \alpha_4 ASI_t + \mu_t \qquad 5.$$

Where: $RGDP_t$ = Index of Gross Domestic Product (Real GDP) expressed in naira value; $MCAP_t$ = Market capitalization; VOT_t = Value of transaction; NOD_t = *Number of deal*; ASI_t= All share index; μ_t= error term; t= time series.On *a priori,* it is expected that $MCAP, VOT, NOD, ASI$will positively affect RGDP. This can be summarized as: $\beta_1 > 0;\ \beta_2 > 0; \beta_3 > 0;\ \beta_4 > 0$.

4. Results and Discussion

This unit root test results are presented in Table 1. The aim is to ensure that the order of integration necessary for the estimation of ARDL is not violated.

Unit Root Test: Table 1 revealed that all the variables, namely RGDP, MCAP, VOT, DEAL and ASI were all stationary but at different levels of significance. Precisely, MCAP and ASI were stationary at level while RGDP, VOT and NOD were stationary at first difference. Since there are mixtures of I(0) and I(1) variables, Johansen co-integration methodology cannot be utilized. The ADRL was implemented and bound test used to capture the existence of co-integration.

Table 1: ADF Unit Root Test Results at Level

Variables	ADF Test Statistics	Critical Value	Order (Integration)	Remarks
LnRGDP	-4.447107	-3.445877	I(1)**	Stationary
LnMCAP	-3.122233	-2.884291	I(0)**	Stationary
LnVOT	-6.916601	-4.032498	I(1)***	Stationary
LnNOD	-4.960253	-3.445877	I(1)**	Stationary
LnASI	-2.669980	-2.578981	I(1)**	Stationary

Note: *(**)(***) - Significant at 10%(5%)(1%) percent level respectively
Source: Authors' computation (2019)

Co-Integration: Evidence from Table 2 indicated that the computed F-stat of 12.397720 is higher compared to Upper Bound table value at both 5% level of significant. The implication arising from this is that the null hypothesis of no co-integration is rejected. Hence, it is deduced that long-run relationship exists among the variables. It is derived by multiplying share price by the number of outstanding shares. By implication, it is ideal to estimate long run and short-run dynamics.

Table 2: PesaranShin (1999) Bounds Test Table

Test Statistics	Value	Regressors(k)
F-statistics	12.397720	4
Critical Value Bounds	I(0) Bound	I(1) Bound
10%	3.03	4.06
5%	3.47	4.57
2.5%	3.89	5.07
1%	4.4	5.72

Source: Authors' computation (2019)

Long and Short Run Estimation Coefficients: The result of the long run relationship is presented in Table 3. From the result, the MCAP has a positive coefficient which is statistically significant. By implication, a unit increase in MCAP increases Nigeria's RGDP by about 1.366022 units in the long run. Similarly, a unit increase in the VOT and ASI increases GDP by 0.001039 and 5.230241 units respectively. Conversely, the coefficient of NOD is negative and statistically insignificant at 5%, hence, a unit change in NOD brings about a decrease of about -0.202091 units in RGDP.

Table 3: Long Run Co-Integrating Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.740336	0.484970	9.774488	0.0000
MCAP	1.366022	0.441598	3.080226	0.0026
VOT	0.001039	0.000258	-4.023105	0.0005
NOD	-0.202091	0.117923	-1.713749	0.0892
ASI	5.230241	1.655864	3.158618	0.0020

Source: Authors' computation (2019)

Table 4 shows that the sign of the ECM coefficient is correct (-1) and significant. The ECM value of -0.262519 showed that approximately 26% of the short-run inconsistencies is corrected per annum which is a slow adjustment rate. The short run result further revealed that coefficients of stock market development indicators are positive and significant in relation to GDP; hence a percentage change in MCAP, VOT, NOD and ASI increase RGDP by 0.667213, 0.161418, 0.050293 and 0.079025 percent.

Table 4: Short-Run Dynamic and ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MCAP)	0.667213	0.162643	4.102325	0.0262
D(VOT)	0.161418	0.025635	6.296788	0.0000
D(NOD)	0.050293	0.023713	2.120879	0.0423
D(ASI)	0.079025	0.037082	2.131099	0.0352
ECM(-1)	-0.262519	0.064943	-4.042279	0.0001

Source: Authors' computation (2019)

Granger Causality Test Result: In this study, Pairwise Granger Causality test was used to explore the causality between MCAP, VOT, NOD, ASI and RGDP in Nigeria. In essence, the result signifies that the variables jointly contribute to economic growth in the short run and in the long run except for the NOD which has inverse long run effect (however insignificant) on GDP. Aside this, the remaining variables are consistent in the direction of their long run impact on GDP. This involves the comparison of F-statistic with probability value to determine the causality. Causality between variables is established if F-statistic is greater than 2 and prob. value is less than 5% level, otherwise, there is no causality. The causality results are shown in Table 5.

Table 5: Causality Test

Null Hypothesis:	F-Statistic	Prob.	Decision
MCAP does not Granger Cause RGDP	1.31406	0.2725	Reject
RGDP does not Granger Cause MCAP	1.93703	0.1486	Reject
VOT does not Granger Cause RGDP	0.08523	0.9184	Reject
RGDP does not Granger Cause VOT	4.52804	0.0127	Accept
NOD does not Granger Cause RGDP	0.45871	0.6332	Reject
RGDP does not Granger Cause NOD	1.08414	0.1289	Reject
ASI does not Granger Cause RGDP	0.71082	0.4933	Reject
RGDP does not Granger Cause ASI	0.31647	0.7293	Reject
VOT does not Granger Cause MCAP	0.23132	0.7938	Reject
MCAP does not Granger Cause VOT	5.01564	0.0081	Accept
NOD does not Granger Cause MCAP	0.09044	0.9136	Reject
MCAP does not Granger Cause NOD	4.24801	0.0165	Accept
ASI does not Granger Cause MCAP	5.40338	0.0115	Accept
MCAP does not Granger Cause ASI	12.6790	0.0001	Accept
NOD does not Granger Cause VOT	0.05426	0.9472	Reject
VOT does not Granger Cause NOD	5.83408	0.0038	Accept
ASI does not Granger Cause VOT	5.97575	0.0034	Accept
VOT does not Granger Cause ASI	1.21513	0.3003	Reject
ASI does not Granger Cause NOD	4.88458	0.0091	Accept
NOD does not Granger Cause ASI	0.39163	0.6768	Reject

Source: Authors' computation (2019)

From table 5, it is evident that there exists a bi-directional causality between MCAP, NOD, ASI and RGDP. This implies that one can use RGDP to predict the explanatory variables and vice versa. However, there exists a unidirectional causality between RGDP and VOT. Here, causality runs from RGDP to VOT. This implies that RGDP can be used to predict the future value of VOT. Specifically, the test indicates that, there exists no causality between ASI and MCAP as evidenced by their probability values. Conversely, the test equally shows that there is two-way causality between MCAP and VOT; MCAP and NOD; VOT and NOD; ASI and VOT and ASI and NOD. This can be revealed by their probability values which are less than 0.05. Based on unidirectional causality that flows from RGDP to VOT, it connotes the existence of one-way causation arising from economic growth to value of traded transactions on stock market in the country. It implies that the level of economic development will inform development of the stock market in Nigeria.

Discussion and Implication of Findings

This study examined long and short run relationships between stock market development and economic growth. The rejection of the null hypothesis of no co-integration implies that there is a long run relationship between two subjects. This suggests that stock market is growth-inducing in the long run. Also, the implication arising from this is that Nigeria stock market is contributing her quota in the pooling of resources and allocation of same to the required sectors. This is in line with the study of Ananwude and Osakwe (2017) in Nigeria. We also show that market capitalization is induces growth. It suggests that short and long run economic growth is driven by market size. This finding agrees with earlier positions of Kolapo and Adaramola (2012), Araoye, Ajayi and Aruwaji (2018) despite the differences in estimation techniques. Similarly, the study also disclosed that value of transaction significantly impact on short- and long run economic growth. Thus the liquidity position of the stock market enhances the wealth of the nation by stimulating rise in demand for stocks. This result is consistent with Agu (2018) who found similar positive relationship between the variables.

The study further revealed the significant effect of All Share Index on RGDP in Nigeria. This validates the study of Oke (2013) and Ozurumba and Chigbu (2013) on the association between all share index and GDP in Nigeria. The positive effects could be accounted for by the regulatory framework and lower degree of price

volatility on the stock market. Diagnostic test revealed that the models used are valid and adequate. It implies that that the result can be relied upon by researchers and policy makers for policy making decisions and forecasting. Lastly, the Pairwise causality check indicated a uni-directional causality running from economic growth to value of transaction. This implies that the level at which an economy develops has a force to bear on the liquidity and operations of the market. This is consistent with Adamu and Sanni (2005), Okonkwo, Ananwude and Echekoba (2015) whose studies reported similar finding.

5. Conclusion and Recommendations

The study concluded that measures of stock exchange development significantly affect economic growth in Nigeria. The granger causality connotes the existence of a unidirectional relationship running from economic growth to stock market liquidity. Overall, stock market performance portends significant effect on growth. This finding is consistent with the general trend in the literature and the a priori expectation. The study suggests that policies and procedures that will enhance investors' confidence and boost the performance of the stock market be implemented because of the multiplier effect on economic growth. Effort should be focused on the enhancement of stock market size which in turn will provide needed fund for investors to invest and thus resulting in rise in the GDP. In addition, since, economic growth enhances liquidity of stock market; the government may consider instituting policies that will support the growth of the economy. There is the need to make less difficult the registration and operating procedures so that individuals and organisations can easily partake in the stock market activities. Lastly, efforts must be made to internationalise the Nigerian stock market to draw more foreign investments, thereby increasing the size of market capitalisation and value of transactions traded on stock exchange for the economic growth and development.

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