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The Imperative of Stock Market on Economic Growth in Nigeria: "The Endogenous Growth Model"

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Abstract

The study examined the imperative of stock market on economic performance in Nigeria. The objective of the study were to examine the relationship between total value traded in the stock market, market capitalization, trade openness, inflation rate and economic growth in Nigeria. The study was basically time series data based relating to market capitalization, total value traded ratio, real GDP per capita, inflation rate and trade openness of the economy. The data was sourced from Nigerian stock exchange annual reports, CBN statistical bulletine, the Nigerian stock exchange fact book, World Bank database publication and publication from relevant plurals and articles. The study adopted the Ordinary Least Squares (OLS) techniques of multiple regression and co integration test. The E-view 7.1 econometric software was used to run the model. The coefficient of ECM appeared with the right sign and statistically significant at the 5% level. Therefore, it corrects any deviation from long-run equilibrium. Durbin Watson value of 2.3 which is approximately 2.0 suggests a lesser level of autocorrelation. The overall fit is satisfactory with an R-squared of 0.790. The F-statistic of 6.51706 is significant at the 5% level. Moreover, the lag one and two forms of the independent variables (Mcap, TVT and TOP) were positively signed. While the lag one and two forms of the independent variable (INF) are negatively signed. All these conform to apriority expectation. Based on the above findings, the study recommends that the government should implement the reforms already in place as this will boost the activities of the market.

Keywords: Growth; Liberalization; Development; Diversification; Stock

Introduction

Statement of the problem

In emerging economies, studies on the relationship between financial development and economic growth placed more emphasis on the role and importance of the banking sector and viewed it as the only organized sector, while ignoring the strategic role of the stock market for efficient allocation and risk sharing in a liberalized financial market. The stock market contributes to economic growth through the specific services it performs either directly or indirectly. Prominent among the functions of the stock market are mobilization of savings, creation of liquidity, risk diversification, and enhanced incentive for corporate control. Improving the efficiency and effectiveness of these functions, through prompt delivery of their services can foster the rate of economic growth.

The Nigerian stock exchange market is an efficient way of allocating resources or available capital funds to diverse uses in the economy. Most stock markets especially those in the developing countries especially in Nigeria faces constraints which result in serious implications investment and economic growth such as liquidity issues, absence of robust market activities and well-developed investor base. A well-developed stock market is expected to practically increase savings by enhancing the set of financial securities available to savers to diversify their portfolios thus reducing risks and effectively allocating capital to the productive units in an efficient and effective manner**.** Today Nigerian is facing a problem where a low level in savings and investments in Nigeria has reduced capital formation and investment opportunities for both bank-based financial sector and the market which can be used as an engine for spurring economic growth. The Nigerian financial system remains underdeveloped due to the adoption of repressive policies, political corruption/poor macroeconomic management, banks failures, giving rise to insolvencies, low saving rates, and insufficient resource allocation. Evidence from empirical literature has revealed that most of the existing literatures have emphasized the policy framework of the government in enhancing the stock market but not the difficulties and challenges faced by the stock market in a globalized economy thereby neglecting the importance of the stock market in resources allocation and risk sharing in a free financial market hence the need for the study.

Objectives of the study

The objective of the study is to examine the relationship between total value traded in the stock market, market capitalization, trade openness, inflation rate and economic growth in Nigeria.

Theoretical and empirical literature

Theoretical frame work: The endogenous growth theory was developed in the 1980s, as a response to criticism of the neo classical growth model. The endogenous growth theory holds that policy measures can have an impact on the long-run growth rate of an economy. Endogenous growth economists believe that improvements in productivity can be linked to a faster pace of innovation and extra investment in human capital. Endogenous growth theories describe economic growth which is generated by factors within the production process, for example; economies of scale, increasing returns or induced technological change; as opposed to outside (exogenous) factors such as the increases in population [1]. In endogenous growth theory, the growth rate has depended on one variable: the rate of return on capital [2]. Levine, in his work, provides evidence in support of the role of

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the stock market in economic growth. He created an endogenous growth model, where the stock market performed the function of risk allocation. He then examined how the markets alter incentives to invest in ways that alter the growth rate. Levine shows that stock markets enhance economic growth through providing a means for firms to change ownership and not disrupt the production process, as well as providing a means for agents to diversify their portfolio risk. Without the stock markets, lenders facing liquidity constraints would force firms to pay back loans, thus forcing the latter to liquidate fully or partially those assets which they own. Since such assets include capital assets, which embody a firm's technology, this would lower the firm's productivity.

Empirical literature: Aslan [3] used panel co-integration analysis to investigate the effect of financial development on growth. The study showed that financial development has a significant and positive effect on economic growth. The result of the study of Adelakun [4] also showed that there is a substantial positive effect of financial development on economic growth. Studies carried out by scholars like Ibrahim and Adelakan [4] have reported that there exist a strong positive nexus of financial system development on economic growth. Okodua et al. [5] in their study, Stock Market Performance and Sustainable Economic Growth in Nigeria, using the autoregressive distributed lag (ARDL) estimation technique came to conclusion that the overall output in the Nigerian economy is less sensitive to changes in stock market capitalization as well as the average dividend yield.

Adam and Sanni [6] examine the role of the stock market in Nigeria's economic growth using Granger-causality test. They discovered a one-way causality between GDP growth and market capitalization and a two-way causality between GDP growth and market turn-over. They inferred a positive and significant relationship between the GDP and the capital market.

Osinubi [7] made use of the ordinary least square regression analysis and found out that the effect of stock market on economic growth is weak and insignificant. Also, Achugbu [8] made use of the ordinary least Square regression analysis and found out that liquidity has the propensity to spur economic growth in Nigeria. Nurudeen investigated whether stock market development raises economic growth in Nigeria. This study covers the time period of 1981-2007. The regression analysis employed the error-correction method. The author made use of real GDP as a proxy for economic growth and market capitalization-GDP ratio, market turnover-GDP ratio, openness of the economy-GDP ratio, minimum rediscount rate and the all share index of the Nigerian stock market as variables for the stock market (used as important determinants of economic growth). It was shown that stock market development (market capitalization) contributes positively to economic growth. Achugbu [8] investigated the role of stock market development on economic growth of Nigeria. The stock market capitalization ratio was used as a proxy for market size while value traded ratio and turnover ratio were used as proxy for market liquidity for the variables for the stock market development, also the real capita GDP variable was used as a proxy for economic growth. This study uses a 15- year time series data from 1994 - 2008. The method of analysis used is Ordinary Least Square (OLS) techniques. This result implies that liquidity has propensity to spur economic growth in Nigeria and that market capitalization influences market liquidity.

Osei [9,10] investigates both the long run and the short run relationships between the Ghana stock market and macroeconomic variables. The study establishes that there is co-integration between the macroeconomic variables and Ghana stock market. The results of the short run dynamic analysis and the evidence of cointegration mean that there are both short run and long run relationships between the macroeconomic variables and the index. In terms of Efficient Market Hypothesis (EMH), the study establishes that the Ghana stock market is informationally inefficient particularly with respect to inflation, treasury bill rate and world gold price. Osinubi [7] tried to examine whether stock market promotes economic growth in Nigeria. The indicators for stock market development includes the per capita income (pci), political stability (polca), gross capital formation (gk), lagged growth rate GDP and SAP dummy (sapd). Also the indicator for economic growth is growth rate for GDP. The time period was between 1980 and 2000. The author made use of the Ordinary Least Square regression analysis and the results confirmed that there exists positive relationship between economic growth and the measures of stock market development used. However, these relationships are statistically insignificant meaning that the effect of stock market on economic growth is weak and insignificant.

Enisan et al. examined the effects of stock market development measured by MCP and VALT, on economic growth in seven African countries from 1980 to 2004. The Autoregressive Distributed Lag (ARDL) bounds test and VECM based Granger causality tests were used [11]. They found a long run relationship between stock market development and economic growth. Riman, et al. [12] try to address the question "Is there really a link between stock market performance and economic growth in Nigeria?" This study makes use of the Johansson Vector Error Correction Model (VECM) in establishing whether a long-run relationship does exist between stock market performance and economic growth in Nigeria using annual data from 1970 to 2004. The empirical results suggested that a long-run relationship exists between stock market and economic growth as indicated by the significance of the Error Correction Model (ECM). The study establishes a unidirectional causality: runs from stock market to economic growth. The study also reveals that the stock market is indeed significant in determining economic growth in Nigeria. Adam et al. [12] examined the role of stock market in Nigeria's economic growth using Granger-Causality test and regression analysis. The authors used market capitalization, market turnover, turnover ratio variables as proxies for the stock market and GDP growth variable as a proxy for economic growth. The authors discovered a one-way causality between GDP growth and market capitalization and a two-way causality between GDP growth and market turnover. They also observed a positive and significant relationship between GDP growth turnover ratio. Wang investigates the time-series relationship between stock market volatility and macroeconomic variable volatility for China using Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) and Lag-Augmented VAR (LA-VAR) models and found evidence that there is a bilateral relationship between inflation and stock prices. In addition, a unidirectional relationship exists between the interest rate and stock prices (Appendix 1).

Estimation techniques

The study was basically time series data based relating to market capitalization, total value traded ratio, real GDP per capita, inflation rate and trade openness of the economy. The data was sourced from Nigerian stock exchange annual reports, CBN statistical bulletine, the Nigerian stock exchange fact book, World Bank database publication and publication from relevant plurals and articles. The study adopted the Ordinary Least Squares (OLS) techniques of multiple regression and co integration test. The choice of co-integration test for our analysis was informed by the pitfalls that sometimes characterize time

series data. Hence the use of co-integration tests to help correct these anomalies. The E-view 7.1 econometric software was used to run the model. The unit root test via the ADF test precedes the cointegration and ECM test in order to test for stationarity of the two variables. The unit root model is presented thus:

$$\Delta Y_1 = \alpha Y_{t-1} + \Sigma \beta \Delta Y_{t-1} + \delta + Y_1 + \varepsilon_1 \quad (1) \text{ for levels.}$$

$$\Delta\Delta Y_1 = \alpha \Delta Y_{t-1} + \Sigma \beta \Delta\Delta Y_{t-1} + \delta + Y_1 + \varepsilon_1 \quad (2) \text{ for first difference.}$$

ΔY is the first difference of the series, m is the number of lags and t is the time.

Therefore, assuming the integration of order I(1) and cointegration between the levels of unemployment (Yt), index of agricultural production (AGP_t) and index of industrial production (NDP_t). The following ECM, according to Engel et al. are formulated:

$$\Delta Yt = ln\delta 0 - \Sigma\, \delta i \Delta\, AGPt - \Sigma \delta 2 \Delta NDPt + ECMt_{-1} \quad (3)$$

From equation 1, Δ indicates difference operator, Y represents the dependent variable, t implies time, δ_0 is the intercept and ECMt-1 is the error correction mechanism obtained from the long-run cointegration regression. While δ_1 is the coefficients of explanatory variable. The short run which is inevitable to achieve the long run equilibrium can be provided by the causal relationship between the variables.

Model specification

$$GDP = F(MC, TVT, INF, TOP) \quad (4)$$

Where

RGDP- Real gross domestic product per capita

MC- Market capitalization

TVT- Total value traded ratio

TOP- Trade openness of the economy

Inf- Inflation

$$GDP = B_0 + B_1 MCP + B_2 TVT + B_3 INF + B_4 Top + 'U' \quad (5)$$

Where u = stochastic or error term

In equation (5) B_0 stands for constant of the equation B_1, B_2 B_3 and B_4 are coefficient of MC, TVT, INF and TOP while Ui is the stochastic or random or error term respectively.

Results

Short-run regression analysis

Regression analysis for real gross domestic product (RGDP) model: The model specified in chapter three was tried with both linear and log-linear specifications. The results show that the linear specifications appeared better in the model. This is because it has high R^2 of (0.926) (Table 1).

The short run result of Real Gross Domestic Product as reported in Table 1 in chapter four, shows that the coefficient of determination-R^2 is 0.926, indicating that the variation in real gross domestic production explained by market capitalization, total value traded ratio, degree of openness and inflation rate is 93%. Therefore, the explanatory power of the model estimated is 93%. The coefficient of Mcap (market capitalization) variable appeared with a positive sign and is statistically significant. The regression coefficient of TVT (total value traded ratio) appeared with wrong sign (i.e. negative instead of positive sign) and is statistically not significant at 5% level. The regression coefficient of TOP (degree of openness) appeared with a positive sign and is statistically significant at 5% level. While the regression coefficient of INF (inflation rate) appeared with wrong sign (i.e. positive instead of negative sign) and is statistically not significant at 5% level. Also, the overall model is significant at 5% level given the f-value of 91.7 with the probability of 0.0000. The Durbin Watson value of 1.268 is depicting the presence of serial autocorrelation.

From the analysis so far, it is clear that the regression result is spurious. This is so because some variables are significant while some are not and the Durbin Watson shows the presence of serial autocorrelation. This may be attributed to non-stationarity of time series data that are used for the study. Therefore, there is need to conduct stationarity test and the long run analysis.

Long run regression analysis

Unit root test for stationarity (Augmented Dickey Fuller): Since most short run analyses may be characterized by spurious result, a stationarity test become necessary to stabilize the data. This will be followed by the Johansen co integration test and the error correction mechanism to determine whether a long run equilibrium relationship exists between the variables (Table 1).

Discussion of unit root test for stationarity: The summarized result presented in Table 1 in chapter four shows that at various

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	205757.7	24458.75	8.412438	0
MCAP	20.40312	9.801419	2.08165	0.0463
TVT	-0.085358	0.078572	-1.086363	0.2863
TOP	19296.73	2697.091	7.154645	0
INF	101.4109	737.6084	0.137486	0.8916
R-squared	0.926745	Mean dependent var		397470.6
Adjusted R-squared	0.916641	S.D. dependent var		236234.2
S.E. of regression	68205.39	Akaike info criterion		25.23349
Sum squared resid	1.35E+11	Schwarz criterion		25.45795
Log likelihood	-423.9693	Hannan-Quinn criter.		25.31004
F-statistic	91.71967	Durbin-Watson stat		1.268711
Prob (F-statistic)	0			

Source: Computed result from (E-View 7.1)

Table 1: Analysis of regression result for real gross domestic product model.

levels of significance (1%, 5% and 10%), the variables were stationary. Although, all the variables were not stationary at their levels except RGDP and TOP, all other non stationary variables become stationary when differenced. That is, Mcap and INF were integrated of order one 1(1), While TVT was integrated of order three 1(3). Having established stationarity of the variables, the long –run relationship among the variables was conducted using the Johansen approach.

Johansen test for co-integration

Co-integration is conducted based on the test proposed by Johansen. According to Iyoha et al. Co-integration deals with the methodology of modeling non-stationary time series variables. For detail result of the Johansen co-integration (Table 2).

Discussion of johansen test of co-integration: From Table 2 in chapter four, it shows that there are two co-integrating equations at 5% level of significance, meaning that two variables are co-integrated at 5% significance level. This is strong evidence from the unit root test conducted, where we observed that two variables are stationary of first difference while the remaining ones were stationary at level and third difference. Conclusively, there exists a long-run relationship or equilibrium among the variables. That is the Max-Eigen Statistics are greater than the critical values.

Given that there are two co-integrating equations, the requirement for fitting in an error correction model is fulfilled.

Error correction model (ECM)

Error correction model (ECM) is a means of integrating the short-run behaviour of an economic variable with its long-run behaviour. The table below shows an inference error correction test conducted (Table 3).

Table 3 shows the results of the over-parameterized error correction model CRP model. The reason for the over-parameterized specification is to show the main dynamic processes in the model and as well sets the lag length such that the dynamic processes would not be constrained by too long a lag length.

Variables	ADF Test	Critical Value			Order of integration
		1% critical value	5% Critical value	10% critical value	
RGDP	6.675360	-3.653730	-2.957110	-2.617434	I(0)= At Level.
Mcap	-5.842838	-3.661661	-2.960411	-2.6179160	I(1)= 1st Diff.
TVT	-5.817957	-3.679322	-2.967767	-2.622989	I(3)= 3rd Diff.
TOP	3.770457	-3.724070	-2.986225	-2.632604	I(0) = At Level.
INF	-6.655507	-3.653730	-2.957110	-2.617434	I(1) = 1st Diff.

Source: computed result (E-view 7.1)

Table 2: Result of unit root (stationarity) test on variables (1980-2013).

Eigen value	Max-Eigen Statistic	5% critical value	Prob.**	Hypothesized N0 of CE(s)
0.767646	46.70383	33.87687	0.0009	None*
0.623556	31.26353	27.58434	0.0161	At most 1*
0.462312	19.85526	21.13162	0.0746	At most 2
0.260411	9.653151	14.26460	0.2357	At most 3
0.164317	5.744179	3.841466	0.0165	At most 4*

Source: Computed result (E-view 7.1).

Note: *denote rejection of the hypothesis at the 0.05 level. **Mackinnon-Haug-Michelis p-values. Max-Eigen value test indicate 2 co-integrating eqn(s) at 0.05 level.

Table 3: Johansen co-integration test result for RGDP model.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9032.605	5342.313	1.690767	0.1218
D(RGDP(-1))	0.726972	0.264926	2.744058	0.0207
D(RGDP(-2))	0.045492	0.316716	0.143638	0.8886
D(RGDP(-3))	-0.027571	0.09706	-0.284058	0.7822
D(MCAP)	32.36424	15.40276	2.101198	0.062
D(MCAP(-1))	73.4814	32.74653	2.243944	0.0487
D(MCAP(-2))	-14.67676	19.21921	-0.763651	0.4627
D(MCAP(-3))	6.198416	9.472171	0.654382	0.5276
D(TVT)	-0.562136	0.273627	-2.054383	0.067
D(TVT(-1))	-0.134825	0.055983	-2.408338	0.0368
D(TVT(-2))	0.108222	0.114976	0.941262	0.3688
D(TVT(-3))	-0.265381	0.128436	-2.066245	0.0657
D(TOP(-1))	-7020.803	3348.444	-2.096736	0.0624
D(TOP(-2))	3242.305	2490.174	1.30204	0.2221
D(TOP(-3))	-6102.694	4433.239	-1.376577	0.1987
D(INF)	-283.3847	236.1414	-1.200063	0.2578
D(INF(-1))	529.8242	207.0487	2.558935	0.0284
D(INF(-2))	-248.7139	272.4763	-0.912791	0.3828
D(INF(-3))	39.9776	204.2177	0.19576	0.8487
ECM(-1)	-33585.16	22357.56	-1.502183	0.164
R-squared	0.859881	Mean dependent var		25952.86
Adjusted R-squared	0.593655	S.D. dependent var		23390.11
S.E. of regression	14910.06	Akaike info criterion		22.29218
Sum squared resid	2.22E+09	Schwarz criterion		23.22631
Log likelihood	-314.3827	Hannan-Quinn criter.		22.59102
F-statistic	3.229894	Durbin-Watson stat		2.437868
Prob(F-statistic)	0.030839			

Source: computed result (E-view 7.1)

Table 4: Inference error correction test.

The over-parameterized is the transform in order to achieve the parsimonious ECM to make it more interpretable for policy implementation. The parsimonious error correction result is presented in Table 4.

Discussion of parsimonious error correction results: Table 5 shows that the coefficient of ECM appeared with the right sign and statistically significant at the 5% level. Therefore, it corrects any deviation from long-run equilibrium. Also, Durbin Watson value of 2.3 which is approximately 2.0 suggests a lesser level of autocorrelation. The overall fit is satisfactory with an R-squared of 0.790, thus 79% of the systematic variation in real gross domestic product is explained by the ECM. The F-statistic of 6.51706 is significant at the 5% level, meaning that the overall model is satisfactory.

Moreover, the lag one and two forms of the independent variables (Mcap, TVT and TOP) were positively signed. While the lag one and two forms of the independent variable (INF) are negatively signed. All these conform to apriori expectation. But for the three periods, the independent variables were not statistically significant at 5% level except the lag one forms of both total value traded ratio and inflation that were statistically significant. With these results, the study concludes on the following: (i) there is no significant relationship between RGDP and market capitalization (ii) there is no significant relationship between RGDP and degree of openness (iii) there is no significant relationship between RGDP and total value traded ratio in the lag two form and (iv) there is no significant relationship between RGDP and inflation rate

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5988.167	3733.729	1.603803	0.1253
D(RGDP(-1))	0.76723	0.126513	6.064439	0
D(RGDP(-2))	0.011074	0.080842	0.136979	0.8925
D(MCAP(-1))	3.878149	2.703308	1.434594	0.1677
D(MCAP(-2))	11.97574	6.054678	1.977931	0.0626
D(TVT(-1))	0.081319	0.039771	-2.044679	0.055
D(TVT(-2))	0.038458	0.022855	-1.682697	0.1088
D(TOP(-1))	1405.119	1172.649	-1.198243	0.2456
D(TOP(-2))	13.39556	98.55521	1.359194	0.19
D(INF(-1))	-46.23585	16.49398	2.803196	0.0113
D(INF(-2))	-17.17814	160.0384	-0.107338	0.9156
ECM(-1)	-25.45878	15.60051	-1.63192	0.1192
R-squared	0.79049	Mean dependent var		24661.25
Adjusted R-squared	0.669194	S.D. dependent var		24095.16
S.E. of regression	13858.5	Akaike info criterion		22.19583
Sum squared resid	3.65E+09	Schwarz criterion		22.75092
Log likelihood	-332.0354	Hannan-Quinn criter.		22.37678
F-statistic	6.517064	Durbin-Watson stat		2.38818
Prob(F-statistic)	0.000204			

Source: computed result (E-view 7.1)

Table 5: Parsimonious error correction mechanism for RGDP model.

in the lag two form. What these suggest is that stock market (proxied by market capitalization, total value traded ratio, degree of openness and inflation rate) alone will not impact very significantly on economic growth (proxied by real gross domestic product) in Nigeria during the period under review (Appendix 2).

Based on the above findings, the study recommends that the government should implement the reforms already in place as this will boost the activities of the market. Awareness campaign should be put in place to sensitize the investing public on the usefulness of the market in economic growth in Nigeria.

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