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The Stock Market and Economic Growth in Nigeria: An Empirical Investigation

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Abstract: This study is a contribution to the growing debate on stock market-growth nexus. It examines critically and empirically the causal linkage between stock market development and economic growth in Nigeria between 1970 and 2004. The indicators of stock market development used are market capitalization ratio, total value traded ratio and turnover ratio while the growth rate of gross domestic product is used as a proxy for economic growth. Using the Granger Causality (GC) test, the empirical evidence obtained from the estimation process suggests a bidirectional causality between turnover ratio and economic growth; a uni-directional relationship from market capitalization to economic growth and no causal linkage between total value traded ratio and economic growth. The behaviour of these findings is an indication that the result of the causality test is sensitive to the choice of variables used as a proxy for stock market development. Overall, the result of the GC test seems to suggest that stock market development drives economic growth.

Key words: Stock market, economic growth, granger causality, turnover ratio, Nigeria

INTRODUCTION

The link between capital market and economic growth has been investigated extensively by researchers. Using Granger causality tests to ascertain the causal relationship between financial development and economic growth, Spears (1991) provides evidence of one-way causality from financial markets to economic growth. On the stock market growth nexus, Atje and Jovanovic (1993) find significant correlation between economic growth and the value of stock market trading divided by GDP for 40 countries over the period 1980-88. Similarly, Levine and Zervos (1996) use data on 41 countries over period 1976-1993 and after controlling for other factors that may affect economic growth, conclude that stock market development, remains positively and significantly correlated with long run economic growth. Arestis and Demetriades (1997) show that although, the development of the stock market is correlated with economic growth in Germany, stock market volatility has a negative effect on German output.

On the other hand, Arestis and Demetriades (1997) reveal that in the United States, causality runs from output to the financial system and not vice versa. Levine and Zervos (1998) employ cross-country data involving 47 countries from 1976-1993 and find that stock market liquidity is positively and significantly correlated with current and future rate of economic and political factors. They also discover that measures of both stock market liquidity and banking development significantly predict future rate of growth. Filer *et al.* (1999) also investigate the causality between financial development and economic growth. Using Granger causality test, they find that lagged growth rates are in general, significant predictions of current growth rates.

This effect is quite strong for high and middle-income countries and relatively weak in lower income countries, suggesting that macroeconomic conditions are less stable for the less developed countries in our sample. Turning to it financial variable as expected, they find a positive link between market capitalization (normalized for the level of GDP) and future economic growth. The pattern is striking with respect to turnover velocity which is often argued to be better indicator of the effect of stock markets on growth.

Results suggest that a higher turnover velocity Granger causes growth but only for high and low income countries group. Furthermore, the location of the effect differs between the high and low-income countries. For high-income countries, the link between turnover velocity and growth is entirely within countries while for lower income countries; the linkage is quite strong and is found between countries.

Muslumov and Gursoy (2000) examine causality relationships between stock markets and economic growth based on the time series data compiled from 20 countries for the years 1981 through 1994. Using Sims approach where Granger causality relationship is

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expressed in two pairs of regression equations, it is revealed a two-way causation exits between stock market development and economic growth. Country analyses on the other hand, could not lead to precise conclusions but suggested a somewhat stronger link between stock market development and economic growth in developing countries. Baier *et al*. (2004) examine the connection between the creation of stock exchanges and economic growth with a new set of data on economic growth that spans a large time period than generally available. They hypothesize that a stock exchange can affect the growth rate of input by increasing the growth rate of either aggregate input per worker or total factor productivity per worker.

Their empirical findings indicate that economic growth increases relative to the rest of the world after a stock exchange opens. Their evidence also suggests that increased growth of productivity is the primary way that a stock exchange increases the growth rate of output, rather growth rate of physical capital. It is also found that financial deepening is rapid before the creation of stock exchange and slower subsequently. While the present study acknowledges the extensive debate on the subject, the inconclusive evidence somewhat gives a room for further research. This study is therefore, a contribution to the existing literature on the link between stock market and economic growth while focusing on Nigeria.

Mohtadi and Agarwal (2004) examine the link between stock market development and economic growth in developing countries. Using a panel data approach that covers 21 emerging markets over 21 years (1977-1997), they find that turnover ratio is an important and statistically insignificant determinant of investments by firms and that these investments, in turn are a significant determinant of aggregate growth. Foreign direct investment is also found to have a strong positive influence on aggregate growth.

The results also show that the initial level of GDP has strong negative influence on the growth rate which is also consistent with the empirical literature. The results also indicate that despite lagged growth being strongly significant, fitted investment is significant for the first set of regressions. The results indicate the both turnover ratio and market capitalization are important variables as determinants of economic growth. The Nigerian Capital Market (NCM) first came into existence in 1960 with the establishment of the Lagos stock exchange but became operational in 1961. The mission statement of the Federal government for the establishment of the capital market is to promote the Nigerian capital market to respond to the socio-economic development need of the nation. Among the functions of the Nigerian capital market include:

- Provide an additional channel for engaging and mobilizing domestic savings for productive investment
- Foster the growth of the domestic financial services sector and the various forms of institutional savings such as life insurance and pension
- Facilitate the transfer of enterprises from the public sector to the private sector
- Provide access to finance for new and smaller companies and encourage institutional development in facilitating the setting up of Nigeria's domestic funds, foreign funds and venture capital funds
- Above all, to stimulate industrial growth as well as sustainable economic growth and development of the Nigerian economy

However, very little achievements have been recorded by the Nigerian capital market in the actualization of the mentioned objectives. Although, the NCM has witnessed phenomenal growth over the years most especially with the re-emergence of civilian rule in the country and its attendant financial reforms, the growth of the real sector and other key sectors of the economy, however has not been substantial (Ologunde *et al*., 2006). Pertinent questions then include:

- Is there a feedback between stock market development and economic growth such that economic growth drives stock market development and stock market development influences economic growth?
- What are the factors affecting the performance of the Nigerian stock market?
- How can we promote sustainable development in the Nigerian Stock market such that it becomes growth-oriented?

Answering these questions forms the basis for this research.

MATERIALS AND METHODS

Data: This study utilizes majorly secondary data sources to gather pertinent information for the successful completion of the research. The secondary data sources include: Annual reports of the Nigerian Stock Exchange (NSE) and Securities and Exchange Commission (SEC); Statement of Accounts and Annual Reports of the Central Bank of Nigeria (various issues) and various publications of the Nigerian Bureau of Statistics (formerly Federal Office of Statistic (FOS). The data for the empirical analysis covers the period 1970-2004.

The model: Based on the strength of the review of related previous empirical analyses and particularly following the specification of Filer *et al.* (1999), a simple bilateral causal model is hypothesized:

$$X_t = \sum_{i=1}^{N} \delta_i X_{t-i} + \sum_{j=1}^{M} \gamma_j Y_{t-j} + u_{1t} \quad (1)$$

$$Y_i = \sum_{i=1}^{N} \phi_i X_{t-i} + \sum_{j=1}^{M} \varphi_j Y_{t-j} + u_{2t} \quad (2)$$

$$E(u_{1t}) = E(u_{2t}) = 0$$

$$E(u_{1t} u_{1s}) = \sigma_{u1}^2 \quad \forall\, t = s \quad \text{where} \quad t,s = 1,2,\ldots,T$$
$$= 0$$

Otherwise:

$$E(u_{2t} u_{2s}) = \sigma_{u_2}^2 \quad \forall\, t = s \quad \text{where} \quad t,s = 1, 2,\ldots,T$$
$$= 0$$

Otherwirse:

$$E(u_{1t} u_{2t}) = 0$$
$$u_{1t} \sim N\left(0, \sigma_{u1}^2\right); u_{2t} \sim N\left(0, \sigma_{u2}^2\right)$$

Y_t represents level of economic growth at time t (i.e., current level of economic growth) while X_t denotes vector of stock market development indicators at time t (current level of stock market development). In Eq. 1, it can be seen that current level of economic growth depends on past values of itself (i.e., Y_{t-j}) as well as that of stock market (i.e., X_{t-i}). In the same vein, Eq. 2 postulates that stock market depends on its past values as well as that of economic growth. We have unidirectional causality from X to Y if the estimated coefficients on the lagged Y in Eq. 1 are statistically different from zero (i.e., $\sum \gamma_j \neq 0$) and the set of coefficients on the lagged X in Eq. 2 is not statistically different from zero (i.e., $\sum \phi_i = 0$). Conversely, we have unidirectional causality from X to Y if the estimated coefficients on the lagged Y in Eq. 1 are not statistically different from zero (i.e., $\sum \gamma_j \neq 0$) and the set of coefficients on the lagged X in Eq. 2 is statistically different from zero (i.e., $\sum \phi_i \neq 0$).

Bilateral causality, however exists when the sets of coefficients on X and Y are statistically and significantly different from zero in both equations. There is no causality when the sets of coefficients on X and Y are not statistically and significantly different from zero in both equations (Gujarati, 2005). In line with Levine and Zervos (1995) and Demirguc-Kunt and Levine (1996), the individual indicators of stock market size and liquidity are used in this study. This is based on the postulation that stock market size and liquidity affect economic growth. The size of the stock market is expected to be positively correlated with ability to mobilize capital and diversity risk. The size of the stock market is therefore, measured using the ratio of market capitalization divided by GDP where market capitalization equals the total value of all listed share.

Two measures of the liquidity of the stock market on the other hand are used, namely total value traded ratio and the turnover ratio. The former (ratio of total value traded on Nigerian stock exchange of GDP) measures the value of equity transactions relative to the size of the economy while the latter (the value of total shares traded on the Nigerian stock exchange divided by market capitalization) measures the value of equity transactions relative to the size of the equity market. The liquidity indicators measure the degree of trading, compared with the size of the economy and the market rather than the ease with which agents can buy and sell securities at posted prices.

The Stock Market Development Index (SMD1) is obtained by averaging the individual indicators of size and liquidity (i.e., the market capitalization ratio, the total value traded ratio and the turnover ratio) over the relevant period. For economic growth, the value of real GDP growth over the relevant period is employed. Therefore, individual indicators of stock market development are represented by MCR (Market Capitalization Ratio), TVTR (Total Value Traded Ratio) and TR (Turnover Ratio). The null hypothesis is therefore that Y does not Granger cause X in the first regression and that X does not Granger cause Y in the second regression.

Estimation technique: This study employs Granger causality test to ascertain whether a unidirectional or feedback causality exists between indicators of stock market development and economic growth. As a precondition for the Granger causality test, the Unit root test is carried out to ascertain the stationarity of the series considered in the model. In addition to the Granger causality test, we also quantify the impact of stock market on economic growth in Nigeria using the least squares technique based on the results obtained from the unit root.

RUSULTS AND DISCUSSION

In this study, the researchers present and interpret results obtained from the estimation process. Basically, the estimation results were obtained from the Unit root test, the Granger causality lest and Ordinary least square analysis.

Unit root test: As a preliminary step to testing for Granger causality, we execute Augmented Dickey-Fuller (ADF) unit root test statistics on the series used. The results are shown in Table 1. The results indicate that all the series are stationary at levels. The null hypothesis of non-stationarity is therefore, rejected. Given the finding that series considered appear to be stationary at a conventional level of statistical significance we are therefore, justified to test the granger causality between stock market development and economic growth.

Granger causality test: As earlier stated, the preoccupation of this research research is to examine the causal linkage between stock market development and economic growth using Nigerian data hence, the consideration of Granger Causality (GC) test as the most suitable for the analysis. The indicators of stock market development used for the GC test include market capitalization ratio (XI), total value traded ratio (X2) and turnover ratio (X3) while the growth rate of gross domestic product (Y) was used as a proxy for economic growth. The results of the GC test are shown in Table 2. The result obtained from granger causality test carried out on market capitalization and economic growth as shown in Table 2 suggests that the direction of causality is from market capitalization to economic growth since the estimated F value is statistically significant at the 5%. On the other hand, there is no reverse causation from economic growth to market capitalization since, the F value is statistically insignificant.

The result obtained from Granger causality test carried out on total value traded ratio and economic growth as shown in Table 3 suggests that there is no causal linkage between total value traded ratio and economic growth since the estimated F values are statistically insignificant. The result obtained from granger causality test carried out on turnover ratio and economic growth as shown in Table 4 suggests that there is bidirectional causality between turnover ratio and economic growth since the estimated F values are statistically significant at the 5%.

Table 1: Results of Unit root test at level

Series	ADF with constant	ADF with constant and trend term
Y	-5.559*	-5.500*
XI	8.526*	5.706*
X2	12.964*	10.795*
X3	-1.842	-2.548
X3	-7.558*	-7.499'*
Critical values (5%)	-2.930	-3.500

*Satistically significant at 0.05%. Y: Economic growth; X1: Market capitalization ratio; X2: Total value traded ratio and X3: Turnover ratio

Table 2: Market capitalization and economic growth

Direction of causality	F value	Decision
X1→Y	12.89*	Reject
Y→X1	0.514	Do not reject

*Statistically significant at 0.05%; Critical value (5%) = 3.32

Long run regression results: The long run regression results are obtained using the OLS technique since all the series are stationary at level and in fact at the same order of integration. The results of the OLS estimation carried out revealed that the model explains approximately 66% of the total adjusted variations in the level of economic growth in Nigeria between 1970 and 2004. This implies that the independent variables included in the model namely market capitalization ratio, total value traded ratio and turn over ratio, account for 66% of the total adjusted variations in the level of economic growth in Nigeria. (Table 5). Also suggestive from this result is the fact that stock market development account for the said percent of the variations in the level of growth in the country. Corroborating the result of the coefficient of determination is the F value also suggesting that the model has a high goodness of fit.

In relation to the magnitude and statistical significance of each of the explanatory variables, the market capitalization ratio gave the most satisfactory result. It has a statistically significant positive effect (t* = 3.40) on economic growth and also contributes approximately 2.5% to the level of economic growth in Nigeria. That is, it is statistically significant at 99% level. Turn over ratio also has a statistically significant positive effect (t* = 2.90) on economic growth and contributes about 1.3% to growth. Total value traded ratio, however although, depicted positive relations, it is not statistically significant at any of the conventional levels of significance (i.e., 5, 10 and 1%) (Table 6).

When we estimated the log function of the model, the following was obtained. The estimation of the log function did not seem t give a satisfactory result. Apart from the fact that there is evidence of serial correlation problem, the economic criterion of positive relationship between stock market and economic growth was not fully satisfied. To further ascertain whether the deregulation

Table 3: Total value traded ratio and economic growth

Direction of causality	F value	Decision
X2→Y	1.427	Do not reject
Y→X2	2.249	Do not reject

*Statistically significant at 0.05%; Critical value (5%) = 3.32

Table 4: Turnover ratio and economic growth

Direction of causality	F value	Decision
X3→Y	14.123*	Reject
Y→X3	5.115	Reject

*Statistically significant at 0.05%; Critical value (5%) = 3.32

Table 5: GDP (Dependent variable)

Variables	Coefficient	t-statistic
MCR	0.025	3.370**
TVTR	0.013	1.080
TR	0.004	2.902**
C	10.165	16.622
Adjusted R^2	0.660	-
Durbin watson stat	1.920	-
F-statistic	16.310	-

**Significant at 99%

Table 6: LogGDP (Dependent variable)

Variables	Coefficient	t-statistic
logMCR	0.028	1.152
logTVTR	0.084	2.515*
logTR	-0.031	-3.398**
C	10.397	36.808**
Adjusted R^2	0.790	-
Durbin watson stat	0.610	-
F-statistic	31.980	-

*Significant at 95%, **Significant at 99%

Table 7: GDP Pre-Sap 1970-1985 (Dependent variable)

Variables	Coefficient	t-statistic
MCR	0.103	2.311*
TVTR	0.028	0.687
TR	0.002	0.900
C	6.215	5.906
Adjusted R^2	0.960	-
Durbin watson stat	2.040	-
F-statistic	14.630	-

*Significant at 95%

Table 8: Post-Sap 1986-2004 (Dependent variable: GDP)

Variables	Coefficient	t-statistic
MCR	0.024	3.363**
TVTR	0.017	1.331
TR	0.002	1.080
C	1.030	16.320
Adjusted R^2	0.550	-
Durbin watson stat	2.180	-
F-statistic	18.300	-

**Significant at 99%

policy has favoured the capital market particularly in terms of its contribution to growth, we divided the study period into two sub-periods (1970-1985 and 1986-2004) and consequently, we carried out OLS estimation on each sub-period. The results obtained are shown in Table 7. Table 7 is the estimation result in respect of the pre-deregulation period, 1970-1985. All the explanatory variables have the expected positive sign.

However, in terms of statistical significance only market capitalization ratio was found, to be statistically significant at 95% level (t* = 2.311416). In terms of the degree of impact, a 1% change in market capitalization ratio, total value traded ratio and turnover ratio increases the growth level by approximately 10, 3 and 0.2%, respectively. Other statistics such adjusted R^2, F-statistics and Durbin-Watson result further confirm the statistical desirability and reliability of the estimation.

Even when the post-deregulation period was considered as shown in Table 8, there seems to be no significant difference in the results as compared with what we obtained under the pre-deregulation period. Although, all the explanatory variables have the expected positive sign, only market capitalization ratio was found to be statistically significant (t* = 3.3627). In overall, the result of the GC test is an indication that stock market development drives economic growth. In fact the empirical results generated from our estimation are consistent with some previous empirical studies among which include Mohtadi and Agarwal (2004), Filer *et al.* (1999) and Baier *et al.* (2004).

For example, Mohtadi and Agarwal (2004) examine the link between stock market development and economic growth in developing countries using a panel data approach that covers 21 emerging markets over 21 years (19771-1997). In their two-staged model, both the market capitalization ratio and turnover ratio have statistically significant impact on growth while the value of shares traded is negative and only marginally significant. The consistency therefore, in the empirical evidence between stock market development and economic growth points to the importance of capital market in lubricating the productive sector for improved growth and development.

CONCLUSION

This study has examined critically and empirically the causal linkage between stock market development and economic growth in Nigeria between 1970 and 2004. The empirical evidence obtained from the estimation process suggests that stock market development causes growth. The finding is also consistent with previous studies among which include Mohtadi and Agarwal (2004), Filer *et al.* (1999), Baier *et al.* (2004) and Oke (2005). In fact, the consistency in the empirical evidence between stock market development and economic growth points to the importance of capital market in lubricating the productive sector for improved growth and development.

The Nigerian capital market has witnessed tremendous changes over the years particularly in terms of the number of operators and the public involvements. Dealer/stockbrokers, companies registered and stocks and shares have increased tremendously increased. These have posed various challenges among which include:

- Low level of public awareness of the market
- Unhealthy and sharp practices by the operators
- Policy inconsistencies

The capital market in Nigeria is most especially important now that the country is just recovering from its deteriorating state occasioned by the recurring military intervention in government. The government through the regulatory agencies and the capital market actors/ operators should pursue adequate sensitization of the public on the enormous potentialities derivable from investing in the capital market. Also, effective supervisory and regulatory measures should be put in place to prevent/discourage unhealthy/ unethical/sharp practices by the actors/ operators in the capital market. This implies that all aspects of the financial services sector must begin to reflect transparency and honesty in all their dealings.

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