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STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH IN NIGERIA: APPLICATION OF GRANGER CAUSALITY TEST

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Abstract
This study examines whether there is a long run relationship between stock market development and economic growth in Nigeria as well as the direction of causality between selected capital market indicators of performance and economic growth. The study employs ordinary least square regression method in addition to the Granger casualty test. Findings from the study show that there exists a long-run relationship between market capitalization, volume of transactions and market turnover. However, the direction of causality between the capital market measures and economic growth is mixed, unidirectional from economic growth to market capitalisation and no directional relationship between market turnover and volume of transactions.

Keywords: Stock Market, Economic Development, Granger Causality Test.

I.   Introduction

The capital market is the framework of institutions that arrange for long term financial assets such as shares, debentures, stocks, mortgages among others(Alile and Anao, 1986) . (Olowe 2011) opines that the market provides an additional channel for engaging and mobilizing domestic savings for productive investment.

Capital markets globally are essential ingredients of economic development. The Nigerian capital market is made up of two segments namely; the market for direct negotiated long-term funds and the securities market.

An efficient capital market mobilizes and allocates a greater proportion to those companies with the highest prospective rates of returns after giving due allowance for risk. This allocative function is critical in determining the overall growth of the economy. If capital resources are not provided to those economic areas, especially industries where demand is growing and which are capable of increasing production and productivity, the rate of expansion of the economy inevitably suffers (Onyuike 2003).

Economic growth on the other hand refers to a positive change in the level of production of goods and services produced by a country over a period of time. When measured over the population of a given country, then economic growth can be stated in terms of per capita income according to which the aggregate production of goods and services in a given year is divided by the population of the country within the given period (Ogbulu 2009).

Economic growth can be measured in nominal term which include inflation or in real terms which are adjusted for inflation.

Very often, a clear line of distinction is not easily drawn   between economic growth and economic development. Torado and Smith (2009) propose that the component of economic growth include capital accumulation, growth in population and technological progress. Some economic development scholars' like Kindleberger and Herrick (1977), Jhingan (2008) as well as Torado and Smith, (2009), admitted that the two concepts are used synonymously. However, the earlier work of Kindleberger and Herrick (1977:3) present a very clear attempt at differentiating between economic growth and development.

They insist that economic growth means more output, while economic development implies both more output and changes in the technical and institutional arrangements by which the output is produced and distributed. Succinctly put they argued;

"Growth and development are sometimes used synonymously in economic discussions. Occasionally, the usage is entirely acceptable. But where two terms exist, separating their meaning has merit. Implicit in general usage and explicit in what follows, economic growth means more output, while economic development implies both more output and changes in technical and institutional arrangements by which it is produced and distributed. Growth may well involve not only more output derived from greater efficiency, that is, an increase in output per unit of input. Development goes beyond this to imply changes in the composition of output and in the allocation of inputs by sectors. As with humans, to stress "growth" involve focusing on height or weight (or GNP), while to emphasize development draw attention to changes in functional capacity (or the ability of the economy to adapt). Given the above assertion, economic growth can be proxied by quantifiable economic indices like gross national product among others.

In the light of the above controversies, this study seeks to contribute to the on-going debate by examining empirically whether there is any functional long-run relationship between stock market and economic growth in Nigeria and to explore the direction of causality between the stock market indicators and economic growth in the Nigerian context.

Objectives of the Study
The objectives of this study are as follows:
1. To explore the direction of causality between the stock market indicators and economic growth in Nigeria.
2. To determine empirically whether there is any functional long-run relationship between stock market and economic growth in Nigeria.

Research Hypothesis
Ho$_1$:   Stock market activities do not Granger-cause economic growth.

Scope of the study
This study covers the period between 1980 and 2010

Organization of the study
This research work is divided into five sections. Section 1 deals with introduction, , objectives of the study, research hypothesis as well as the scope of the study. Section II examines the literature review while section III deals with research methodology, Section four deals with discussion of results while section five which is the last section deals with concluding remarks.

II. Literature Review
There have been growing concerns and controversies on the role of the stock market development and economic growth. Alile (1984), Atje and Jovanovic, 1993). Levine and Zervos (1996), Levine (1997), Nyong (1997), Dernirguc-Kunt and Maksirnoric (1998), Nervos (1998), Luintel and Khan (1999), Kar and Pentecost (2000), Osinubi (2002), Ngerebo (2002), Unalmis (2002), Coporale, Hovells and Soliman (2004), Wagabaca (2004), Osei (2005), Capasso (2006), Surva & Neupane (2006), Nzue (2006), Guryal et. al (2007), Yartey and Adjasi (2007), Ahmed, Shahbaz & Au (2008), Ewah etal (2009), Ogbulu (2009).

There have been mixed results; while some are in - support of a positive link, some negative link and others do not find any empirical evidence to support such conclusion.

Ogbulu (2009) in his study, Capital Market Development and Economic Growth in Nigeria, where he used co-integration and causality tests to determine a long-run relationship between the market indicators and economic growth. The study employed a time series data from 1970 to 2008 and Engle-Granger and Johansen-Joselius method of co-integration in a VECM setting. The results show that the value of new issues (VN) and foreign exchange rate of the Naira (FXR) are positively and significantly related to GDP while the degree of openness of the economy (EMR) and Degree of Government Regulation (DGR) impact negatively and significantly on GDP.

Ewah et al (2009) appraised the impact of the capital market efficiency on the economic growth of Nigeria using time series data from 1961 to 2004. They show a two-way causality between financial development and economic growth in Nigeria.

III. Methodology

Time series analysis was adopted for the study. This study covers a period of thirty-one years that is, between 1980 and 2010.

Sources of Data

Secondary data was used for the study and the data were collected from the Nigerian Stock Exchange Fact Book and the Central Bank of Nigeria.

Method of Data Analysis

This study employs ordinary least square regression method and Granger causality test to determine whether there is a long-run relationship between the capital market and economic growth. The direction of influence was also established among the variables under consideration. The Gross Domestic Product (GDP) was used to represent economic growth. The GDP is the dependent variable while market capitalization, the volume of shares traded, market turnover, and number of listed securities are the independent variables.

Model specification

The model specified for the study is shown below:

(1) $\quad LGDP = \beta + \beta_2 LMC + \mu_1$ .... (i)

(2) $\quad LGDP = \beta + \beta_2 LVT + \mu_1$ .... (ii)

(3) $\quad LGDP = \beta + \beta_2 + LTOR + \mu_1$ .... (iii)

$\quad LGDP = $ Logarithm of Gross Domestic Product

$\quad \beta = \quad\quad\quad$ Elasticity

$\quad LMG = $ Logarithm of Market Capitalization

$\quad LVT = $ Logarithm of Volume of Shares Traded

$\quad LTOR = $ Logarithm of Market Turnover

$\quad \mu_t = \quad\quad\quad$ Error Term

(4) $\quad GDP = \beta_0 + \beta_1 MC + \beta_2 VT + \beta_3 LTOR + \mu_t$ .... (iv)

Where:

$GDP = $ Gross Domestic Product

$MC = \quad\quad$ Market Capitalization

$VT = \quad\quad$ Volume of Shares Traded

$TOR = $ Market Turnover

$\mu_t = \quad\quad$ Error Term

(5) $\quad MC = \sum_{i=1t-1}^{n} x1\, GDP + \sum_{J=1 t-j}^{N} Bjmc + \mu t$

(6) $\quad VT = \sum_{i=I}^{n} x1\, GDP_{t-1} + \sum \beta 1\, VT_{t=j} + \mu t$

(7)　　$$TUR = \sum_{i=1}^{n} x1\, GDP_{t-j} + \sum_{t=1}^{n} \beta1\, TOR + \mu t$$

IV.　Discussion of Findings

Table 1.1　Correlation matrix

	LOG(GDP)	LOG(MCAP)	LOG (MKTUR)	LOG (VOLT)
LOG (GDP)	1.000000	0.988417	0.999591	0.945755
LOG (MCAP)	0.988417	1.000000	0.990899	0.968616
LOG (MKTUR)	0.999591	0.990899	1.000000	0.953097
LOG (VOLT)	0.945755	0.968616	0.953097	1.000000

Source: Author's computation

Table 1.1 above shows the log values of gross domestic product, market capitalization, market turnover and volume of transactions between 1980 and 2010.

Table 1.2　Logarithm of GDP, MCAP, MKT TURN & VOLT

Sample: 1980-2010

	LOG(GDP)	LOG(MCAP)	LOG (MKTUR)	LOG (VOLT)
Mean	13.92675	4.889646	14.04492	11.56620
Median	14.47469	5.195177	14.50111	10.81003
Maximum	17.34142	9.495106	17.25411	15.07840
Minimum	10.77100	1.568616	10.98123	8.873188
Std. Dev.	2.269115	2.713015	2.196107	1.87812
Skewness	-0.065009	0.251823	-0.029081	0.473246
Kurtosis	1.558498	1.675721	1.560664	1.875060
Jarque-Bera	2.705826	2.592857	2.680299	2.791728
Probability	0.258486	0.273507	0.261806	0.247619
Observations	31	31	31	31

Source: Author's computation

Table 1.2 above shows the mean values of the log of Gross Domestic Product to be 13.92%, that of market capitalization, 4.88%, market turnover, 14.04% and volume of transactions, 11.56%. The table also shows the minimum and maximum values of gross domestic product, market capitalisation, market turnover, volume of transactions among others.

Pairwise Causality Test

Pairwise Granger Causality tests were run on the model with an optimal lag of 2. The result is presented in table 1.3 below

Table 1.3　Pairwise Granger Causality Test Result

Pairwise Granger Causality Tests
Sample: 1980-2010
Lag: 2

Null Hypothesis:	Obs	F-Statistic	Probability
LOG (MCAP) does not Granger Cause LOG (GDP)	29	1.36962	0.27337
LOG (GDP) does not Granger Cause LOG (MCAP)		4.42151	0.02319
LOG (MKTURN) does not Granger Cause LOG (GDP)	29	0.86980	0.43183
LOG (GDP) does not Granger Cause LOG (MKTURN)	29	1.16238	0.32973
LOG (VOLT) does not Granger Cause LOG (GDP)	29	1.20670	0.31670
LOG (GDP) does not Granger Cause LOG (VOLT)		2.03562	0.15254

Source: Author's computation.

The results show that the F-statistic from the null hypothesis of the causality test running from log MCAP to log GDP is 1.36962 with a probably value 0.27337 and from log GDP to log MCAP, the F. Statistic is 4.42151 and probability value of 0.02319 indicating a uni-directional causality from log GDP to log MCAP at 5% level of significance.

The other results show that F-Statistic from the null hypothesis are not unidirectional that is from log MKTTURN to log GDP, from log GDP to log MKT TURN and log VOLT to log GDP and log GDP to log VOLT are not unidirectional.

The results from this study finds robust support from the earlier works of Levine and Zervous et al (2004), Abu-Qarn (2005), Capasso (2006), Ogbulu (2009) among others.

The results of the Granger causality test above agree with the findings of Kar and Pentecost (2000), Unalonisis (2002), Yartey and Adjas (2007) and Ogbulu (2009) which show that causality tests are mixed and inconclusive.

V.   Concluding Remarks

This study makes an attempt to add to the growing body of literature on the issue of stock market in context of the Nigerian capital market. Using ordinary least square regression method, the empirical evidence suggests that there is a long-run relationship between market capitalization, volume of transactions and market turnover. The Granger Causality test on the other hand shows that there is a uni-directional relationship between gross domestic product and market capitalization while there is no directional relationship between gross domestic product and market turnover as well as that of gross domestic product to volume of transactions.

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