Analysis of Capital Market Performance and the Growth of the Nigerian Economy: A Cointegration Approach

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***Abstract*-This study investigated the impact of the capital market performance on the growth of the Nigeria economy. To carry out this investigation, the researcher used the real gross domestic product (as a proxy for development indicator) on the market capitalization, newissues, value of shares traded and turnover ratio as capital market indicators. The cointegration approach was used for the analysis of data. The results show that there exist a longrun relationship between the growth of GDP and the capital market indicators. The gross domestic product is positively and significantly related to the one period lag of the capital market indicators. The lagged error correction term (ECTt-1) is significant and has the expected negative sign confirming the existence of longrun relationship between the dependent and explanatory variables. The causality test shows that capital market indicators namely, market capitalization and value of shares traded granger causes the growth of GDP. The researcher therefore calls for boosting of the activities of capital market through public enlightenment campaign and more relaxation of entry requirement into the Nigerian Stock Exchange. This is necessary for the continuous growth of the economy**

Keywords-Capital market, Market capitalisation, new issues, GDP, Cointegration.

I. INTRODUCTION

Prior to deregulation of Nigerian economy in 1987, the Nigerian stock market was regarded as largely underdeveloped. During this period, the debt equity ratio was very high as most firms prefer to finance their investment using bank debt (Ikhide, 1997). The preference for bank debt under this period could be ascribed to the prevalent flow in interest rate regime. Ogun and Iyoha (2005) noted that the activities in stock market within this period were generally low and the financing of long term investments with short term bank debt was rampant among firms. Available research evidences indicate that the Nigerian capital market is imperfect (Adelegan and Ariyo, 2008, Odedokun, 1995, Olowe, 1998, Oludoyi, 1999, Adelegan 2003,2006). International Finance Corporation (IFC) classify the Nigerian capital market as emerging and underdeveloped having exhibited all different forms of imperfections which include barring of foreign investors from entering into the Nigerian capital market, imposition of price caps on share price movement, regulation of proportion of negative betas, significant abnormal returns and liquidity of the market (Inanga and Emenuga 1997. Ogwumike and Omole 1997, Oludoye 1997, Inanga 1999, Adelegan 2003). Ukeje, Kama and Eluemenor (2007) noted that transactions in equities were hitherto weak due largely to low level of information dissemination and awereness which resulted in sluggish market behaviour. Adelegan and Ariyo (2008) maintained that the imperfection is revealed in microstructure elements such as high transaction costs.

Ukeje et al (2007 however observed that the analysis of the major indicators of activity in the capital market shows that the market has experienced remarkable growth since 1980. With the computerization of trading and increased transparency in delivery of corporate information, the market has become relatively more efficient. Since the 1980s, the market indicators including the number of listed companies and securities, market capitalization, new issues, value index and market turnover have recorded significant increases (Okpara,2006). The Second-tier Securities Market (SSM) in 1985; which aimed at assisting small and medium-size indigenous companies to have access to the resources of the capital market by relaxing the cost and listing requirement for them; the deregulation of interests rates in 1987, the continuous privatisation of government owned companies since 1988 and the internationalisation of the market in 1995 accentuated the interest of the private sector investment in the stock market and led to improved performance of market indicators. Ukeje, kama and Eluemunor (2007) noted that these developments have enhanced market liquidity; offered opportunities for price discovery; improved market efficiency in service delivery; and above all resulted in unprecedented growth of both the primary and secondary markets.

In July 1996 alone, about 20 companies were listed on the second tier securities market. Olugunde, Elumilado and Asaolu (2006) however, noted that this is shallow when compared with Indian stock exchange with about 4344 companies or London Stock Exchange with about 5085 listed companies and then suggested the need for accelerated development of the market. Mohammad-Tanko (2004) added that inspite of the improved performance of the market, it continued to face problems.The small size of the market with only about 195, when compared with that of Egypt which is 650 and that of South Africa which is 642, is inadequate. The market capitalization rate is without exception.

Following financial liberalization and the relaxation of rule for bank establishment in 1987, there was a rapid increase in the number of banks from 41 in 1986 to about 120 in 1992. The banks were buying foreign currency at low official

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prices and reselling in burreaux de change or parallel market to make substantial returns.

However, evidence prevailed that though the banks predominantly engaged in short term arbitrage activities, many of them had poor balance sheets and made limited lending to the private sector. Weak regulation of financial institution led to wide spread concern about the rising systematic risk in the Nigerian banking sector in the 1990s. In 1988 alone, a total of 26 banks including listed ones were put to liquidation and by 1993, it was estimated that about half of the licensed banks were distressed (Okpara, 2006, Okogo and Osafo-Kwaako, 2006). This situation led to banks recapitalization exercise in 2004. This development made many private enterprises/investors to patronize the equity market to source funds, as bank lending became relatively expensive. This resulted to very high tempo of activities in the new issues market in 2005 and 2006 as many banks and insurance companies sourced additional funds from the stock market. The exchange considered and approved 62 applications for new issues, valued at N1.4 trillion in 2006, compared with 52 applications valued at N730.5 billion in 2005. The non-bank corporate issues accounted for 48 per cent of the new issues approved in 2006, with 40 applications valued at N678.54 billion, while the banking sector accounted for 41 per cent with 21 application valued at N577 billion (Ukeje, Kama, Eluemunor, 2007).

From 91 in 1980, the number of companies listed on the exchange (equities) rose from 131 in 1990 to 214 in 2005, but declined to 202 in 2006 as some quoted banks were involved in merger/acquisitions as a result of not meeting up with the policy induced recapitalization exercise in the banking sector, while those that were totally unsuccessful were de-listed from the exchange. Similarly, the number of total securities listed increased from 188 in 1980 to peak at 295 in 1990, before it fluctuated downwards in 2006 to 288 securities made up of 36 government stock, 50 industrial loans (debenfure/preference) stocks and 202 equity/ ordinary shares (including SSM) of companies: with a total market capitalization of N5.12 trillions. The deregulation of the capital market in 1993 and the follow-up internationalisation of the market in 1995 with the abolition of laws that constrained foreign participation necessitated positive changes to the extent that the stock exchange witnessed transactions in foreign portfolios in excess of N10.0 billion excluding strategic foreign investment in banks under recapitalization programme in 2005. The volume of transactions rose by 40.0 per cent to 26.7 billion shares in 2005 from 19.2 billion shares in 2004, while the value stood at N262.9 billion, up by 16.4 per cent from N225.8 billion in 2004. In 2006, the total turnover was 36.7 billion shares, indicating an increase of 37.5 per cent over the preceding year's level. The year closed with a market turnover value of N470.3 billion or an increase of 78.8 per cent over the preceding year. The market capitalisation skyrocketed from N2900bn in 2005 to N13294.50bn in 2007.while new issues rose from N552.78bn to N2400bn. This phenomenal growth notwithstanding, the market capitalisation represents only 28 percent of the GDP, compared with 167.1 per cent for South Africa, 50.7 percent for Zimbabwe and 130 percent for Malaysia. This indicates that the potentials for growth in the Nigerian market is still very enormous. (Ukeje, Kama, Eluemunor, 2007).

The Nigerian capital market responded negatively to " economic meltdown" in global economy with a "crash". The global financial crisis began in the United States of America and the United Kingdom when the global credit market came to a standstill in July 2007 (Avgouleas, 2008). The crisis which led to a fall in the world stock market and numerous financial institutions, started to show its effects in Nigeria in the middle of 2008 that the Nigerian government just like the governments of even the wealthiest nations, came up with rescue packages to bail out their financial systems (see Adamu, 2008). Several anti market initiatives by the regulatory authorities like the one percent minimum fix on downward movement of share prices helped deplete investor confidence in the capital market and accentuate the fall. However, with so much selling pressure on the market and little or no demand from any source, it was not surprising that the Nigerian stock market plunged 67 percent in 2008 to become one of the worst performing markets in the world.

In the words of Osai-Brown (2009), sadly, "I cannot disagree with the contrasting description of what happened globally and what happened locally which resulted in the Nigerian capital market earning the unenviable accolade as one of "the world's worst performing stock market in 2008, after losing N5.2 trn in market capitalization and 54 percent in the All Share Index" just a year after it had emerged as the world's best performing stock market in 2007 with a return of 74.9 percent (http://www.articlesbase.com/investing-articles/global-economic-meltdown-crude-oil-and-the-nigerian-capital-market-1083294.html). Sarki-Sule (2009) blamed the downturn in the market on banks, which put the shares pledged as collateral on offer to realize their money, as well as the activities of speculators (constituting about 70 per cent of players in the market), whose swoop resulted in a significant fall in the value of stocks. As a result of this and the flight of foreign portfolio investors, the value of the Nigerian Stock Exchange market capitalization fell by over N3.5 trillion by the end of 2008. At the end of January, for example, the NSE All-Share-Index dropped by over 30 per cent, a situation, which made Renaissance Capital in January end report considered it "the world's worst-performing equity gauge in dollar terms so far in 2008 (Ighomwenghian,2009). This cocktail of crisis was further compounded by the sudden steep drop in crude oil prices from a high of about $145 pb to an average of $35 pb. The repercussion effect of this in a monocultural oil dominated economy was that the liquidity position of the economy as a whole was compounded. In view of this, most of the banks were forced to further cut down their activities with the capital market in a bid to boost their liquidity position and remain in business.

The dwindling fortunes in the market continued into early part of 2009 but in May 2009, the market rebounded strongly coinciding with the restoration of a level of confidence in the global financial system which saw a resurgence in crude oil prices in the international markets from an average of between $35 to $40 to about $69 before slipping to its current average of $60.

The Nigerian Stock market made a strong 38.3 percent gain in May owing probably to the fact that the crude oil prices reached a new high of $70 in the international markets. This suggests a strong relationship between crude oil prices and the performance of the Nigerian stock market.

II. METHODOLOGICAL FRAMEWORK

This section is divided into two namely, specification of the model and method of data analysis.

A. Specification of the Model

A discussion on issue like economic growth in relation to capital market performance could be based on economic variables such as Gross Domestic Proudct (GDP) and capital market activities. This is because, economic growth has been defined (Nnanna, Englama and Odoko,2004) as the ability of the economy to increase production of goods and services with the stock of capital and other factors of production within the economy. The GDP being the market value of goods and services produced in the economy over a period of one year should therefore have a link to the capital market activities. Significant changes in the capital market will invariably affect its growth. Thus, increase in market capitalisation (Mktcap), new issues (Newiss), turnover ratio (TOR) and value of shares traded (Vshat) are expected to have a positive impact on the GDP. In the light of this, the macro-economic model for the determination of long-run impact of capital market Performance on the growth of Nigerian economy will be stated as follows.GDP = F(Mktcap, Newiss, TOR, Vshat) A critical evaluation of this equation will help us to draw conclusoin on the longrun impact of capital market performance on economic growth of Nigeria.

III. METHOD OF DATA ANALYSIS

In verifying the long-run relationship between the capital market development and economic growth, the study uses annual series from 1970 to 2007. The first stage in the empirical investigation is to analyze the time series properties of the data using the unit root (Augmented Dickey Fuller) test to determine the order and level of difference stationarity of the variables on the first order autoregressive process AR(1).

Two basic types of time series model exist; these are autoregressive and moving average models. The basic autoregressive model for a series X expresses that series as a function of past values of itself and an error component.

$$Xt = \square(L)Xt\text{-}1 + \square t$$

Where $\square t$ = a white noise error process and

$$\square (L)Xt\text{-}1 = \square 1Xt\text{-}1 + \square t\text{-}2 +\ldots\ldots\ldots\ldots\ldots\ldots + \square nXt\text{-}n$$

Alternatively, this can be stated as follows

$$X_t = C + \sum_{i=1}^{n} \Psi_i X_{t-i} + \varepsilon_t$$

Where $\Psi 1\ldots\ldots\ldots\ldots\Psi n$ are the parameters of the model, C is a constant and εt is an error term. The constant term is omitted by many authors for simplicity. This would be referred to asthe nth order autoregressive process, or AR(n). The basic moving average model represents X as a function of current and lagged values of a white noise process;

$$X_t = \xi (L)\mu_t$$

Where μ_t is a white noise error process and

$$\xi (L)\mu_t = \mu_t + \xi_1\mu_{t-1} +\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots+\xi_q\mu_{t-q}.$$

this can also be written as

$$X_t = \mu_t = \sum_{i=1}^{n} \xi_1\mu_{t-i}$$

Where ξi are the parameters of the models and μts are the error term. This equation would be referred to as a qth order moving average process, or MA(q). A mixture of these two types of model would be referred to as an autoregressive moving average model (ARMA)n,q, where n is the order to the autoregressive part and q is the order of the moving average term.

Where the series is differenced to achieve stationarity, the process becomes an autoregressive integrated moving average ARIMA(p,n,q) process with p as the order of the AR component, d the number of times the series is differenced, where q is the order of the MA process. A non-stationary series could be made stationary by differencing once or twice. This is called an integrated series. It could be integrated of order 1 which is often denoted as I(1) or order 2 represented by I(2). The stationary linear combination of the variables under consideration is called cointegration equation (Engle and Granger, 1991).

The formulated model will be tested for stationarity using the Augmented Dickey Fuller Unit root test to be sure that one is not analyzing inconsistent and spurious relationship. A series that exhibits a stochastic trend, or even simply wanders around at random will not be stationary and cannot be forecasted far in the future. A stationary series will constantly return to a given value and no matter the starting point, in the long-run, it is expected to attain that value (Hall, 1994). To illustrate the use of Dickey Fuller test, one can state the autoregressive AR(1) process. Thus,

$$Y_t = \mu + \rho Y_{t-1} + \varepsilon_t$$

Where μ and ρ are parameters and ε_t is the white noise assumption. Y is a stationary series if $-1 < \rho < 1$. If $\rho = 1$, Y is a non-stationary series (a random walk with drift). The hypothesis of a stationary series can therefore be evaluated by testing whether the absolute value of ρ is strictly less than one (Dickey and Fuller, 1981). Thus, H_0: $\rho = 0$ and H_1: $\rho < 1$. If the series is correlated at higher order lags, the assumption of white noise disturbance is violated and the ADF test makes a parametric correction by assuming that the series follows an AR(ρ) process. The test methodology is then adjusted by adding lagged difference terms of the dependent variable Y to the right hand side of the regression. Thus,

$$\Delta Y_T = \mu + \gamma Y_{t-1} + \delta_1 \Delta Y_{t-1} + \delta_2 \Delta Y_{t-2} + \ldots\ldots\ldots + \delta p\text{-}_1 \Delta Y_{t-p+1} + \varepsilon_t$$

The hypothesis for the augmented specification is tested thus;

H_0: $\gamma = 0$ and H_1: $\gamma < 0$ where $\gamma = p - 1$.

That variables are cointegrated, implies that they share a long-run relationship and will move closely together over time; meaning that the difference between such variables are stable over time and there is some degree of convergence in the long-run.

To test for cointegration, Johansen's (1991) tests the restrictions imposed by cointegration on the unrestricted vector autoregresions (VAR) involving the series. If the VAR is of order P, the starting equation can be stated as

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots\ldots\ldots\ldots + A_p Y_{t-p} + BX_t + \varepsilon_t$$

Where Y_t is a k – vector of non-stationary I(1) variables, X_t is a d vector of deterministic variables and ε_t is a vector of innovations. The VAR can be re-written as:

$$\Delta Y_t = \prod Y_{t-1} + \sum_{i=1} \Gamma_i \Delta Y_{t-i} + BX_t + \varepsilon_t$$

where

$$\prod = \sum_{i=1}^{p} A_i - I, \quad \Gamma_i = -\sum_{j=i+1}^{p} A_j$$

Cointegration was developed to make the concept of long-run equilibrium operational and the presence of cointegration forms the basis for error correction model specification. The dynamics of capital market performance is then specified in an error correction model (ECM_t), incorporating the one period lagged residual from the static regression. The error correction model is designed to capture the short-run deviations that might have occurred in estimating the long-run co-integrating equation (Engle and Granger,1987). Thus, the capital market model will be re-specified as follows to include an error correction term (ECM_t)

$$GDP = \phi_0 + \phi_1 Mktcap + \phi_2 Newiss + \phi_3 TOR + \phi_4 Vshat + \phi_5 ECT_{t-1} + u_t$$

The researcher also employed the Granger causality test, as correlation does not necessarily imply causation in any meaningful sense of the word. The basic principle of Granger causality analysis is to test whether past values help to explain current values. Maddala (1998) indicates that if two variables are cointegrated, there must be at least one direction of causality between investigated variables. Thus, the Granger test is predicated on the following regression analysis:

$$Y_t = \beta 0 + \sum \beta i Y_{t-i} + \sum \beta u X_{t-i} \mu t$$

$$X_t = \alpha_0 + \sum \alpha i X_{t-i} + \sum \alpha i Y_{t-i} + v_t$$

Where Yt and Xit are the GDP and the capital market variables (respectively) to be tested and μ and vt are the idiosyncratic terms that capture all variations in Yt and Xt not in the lagged values.

IV. RESULTS AND DISCUSSION

The results from the Augmented Dickey-Fuller set of unit root tests of the series (presented in table 1) show that all the variables are integrated of order one, I(1) at 5 percent level of significance. Thus, the economic growth indicator GDP, follows an integrating I(1) process so that the stock market variables are a stationary process.

The result of the test of non-stationarity of the residuals (RES) from the static regression in the economic growth equation presented in table 2 in the appendix, proves significant at 1% and 5% level of significance, at lags 1 to 3. I therefore reject the null hypothesis of no cointegration and conclude that the variables are cointegrated.

Table 3 in the appendix shows the cointegrating vectors that span the explanatory variables in this macroeconomic growth model using the Soren Johanson (1991) cointegration tests.

The results show that the Johanson (1991) cointegration test for the GDP series indicate 3 cointegrating equations at 5 percent level of significance implying that there are 3 significant vectors, or only 3 different linear combinations of the variables that can be stationary and can therefore drift together roughly at the same time with the GDP.

The regression estimates for the reparameterised error correction term (ECT_t) is presented in table 4 of the appendix . The parsimonious model shows that the past values of real GDP, value of shares traded, market capitalisation and turnover ratios are positively and significantly impacting on the current value of growth of the real GDP. However the past values of the differences (changes) in these variables with the exception of value of share traded are significant but could not meet the a priori expectation. The coefficient of determination is highly significant and the overall regression is also significant. The error correction coefficient is expectedly negative and highly significant at both 1% and 5% levels. The Granger causality results at lag 2 (presented in table 5) show that market capitalisation and value of shares traded granger causes real GDP with no reverse or feed back effect. This result is presented in table 5 in the appendix.

V. CONCLUSION

This study invsetigated the impact of the capital market performance on the growth of Nigerian economy.

The result shows that there exist a long run relationship between the growth of the economy proxied by gross domestic product and the capital market indicators. There exists three significant vectors or three different linear combinations of the capital market indicators that can drift together roughly at the same time with the GDP. The one period lag of the market capitalisation, new issues, value of shares traded and turn over

ratio, all impact significantly on the growth of the GDP.

In addition, the results from causality test show that market capitalisation and value of shares traded, each drives real GDP with no reverse or feed back effect. Thus, the granger causality test supports the evidence of unidirectional causal link from capital market to gross domestic product. The economic implication of the finding suggests a need for more focus on the enhancement of the capital market so as to engender greater growth of the economy. This could be

achieved through enlightment campaign on the importance of the capital market to the industrialists/small scale investors and more relaxation of the stringment entry requirements of the companies into the Nigerian Stock Exchange.

APPENDIX

Table 1: Stationarity Test

Variable	Augmented dickey fuller test statistic	Max lag	Order of integration
D(GDP)	3.247794	2	1
D(Mktcap)	5.841285	2	1
D(Newiss)	17.19447	2	1
D(TOR)	-5.183995	2	1
D(Vshat)	23.58533	2	1

Critical value 1% = -3.6353, 5% = -2.9499, 10% = -2.6133

Table 2: Augmented Dickey-Fuller Unit Root Test on Residual RES for GDP equation.

Lag No.	RES	Critical value 1%	Critical value 5%
1	-4.97238	-2.6486	-1.9535
2	-3.359997	-2.6649	-1.9559
3	-10.01678	-2.7411	-1.9658

Table 3. Johanson Cointegration tes

Sample: 1970 – 2007
Included observations: 35
Test assumption: Linear deterministic trend in the data
Series: RGDP MKTCAP NEWISS TOR VSHAT
Lags interval: 1 to 2

Eigenvalue	Likelihood Ratio	5 percent Critical value	1 percent Critical value	hypothesized No. of CE(s)
0.978222	242.7481	68.52	76.07	None**
895428	108.8036	47.21	54.46	At Most 1**
460655	79.78277	29.68	35.65	At Most 1**
188301	8.173747	15.41	20.04	At Most 1**
0.027000	0.957990	3.76	6.65	At Most 1**

*(**) denotes rejection of the hypothesis at 5% (1%) significance level
L.R. test indicates 3 cointegrating equation(s) at 5% significant level

The Pasimonious
Error Correction Model of Real GDP Growth

Variable	Coefficient	Standard error	T statistic
C	-284.893	194.61	-1.46
RGDP(-1)	100.266	40.105	2.50
D(RGDP(-1)	-101.027	42.626	2.37
D(RGDP(-2)	-71.762	35.470	-2.02
VSHAT(-1)	29.985	11.785	2.544
D(VSHAT(-1)	425.133	181.04	2.35
D(VSHAT)(-2)	303.95	151.58	2.01
	29.515	11.809	2.499
MKTCAP(-1)	-29.656	12.454	-2.381
D(MKTCAP(-1)	-21.096	10.464	-2.061
D(MKTCAP(-2)	20655.14	8290.37	2.491
TOR(-1)	150005.61	7427.08	2.02
D(TOR(-2)	-21096.659	8930.147	-2.36
D(TOR(-1)	-15005.61	7427.08	-2.02
D(TOR(-2)	-1.431	0.131	-10.913
ECT(-1)			

$R^2 = 0.62$, $F(27,5) = 2.66$

Table 5. Pairwise Granger Causality Tests (Lag 2)

Null Hypothesis	Obs	F-Statistic	Probability
RGDP does not Granger Cause MKTCAP	36	1.54831	0.22860
MKTCAP doest not Granger Cause RGDP		6.06058	0.00600
VSHAT does not Granger Cause RGDP	36	4.44158	0.02013
RGDP doest not Granger Cause VSHAT		1.11030	0.34221
RGDP does not Granger Cause NEWISS	36	0.87980	0.42497
NEWISS doest not Granger Cause RGDP		0.85287	0.43595
TOR does not Granger Cause RGDP	36	0.22067	0.80323
RGDP doest not Granger Cause TOR		0.81085	0.45368

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