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# Financial Market Funds and Economic Growth Nexus in Nigeria: A Cointegration Perspective with Lessons

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**ABSTRACT**
Informed by the need to evaluate the prevailing interrelationships between the structure of financial market funds and Nigeria's economic growth, this study employs secondary data sourced from the Central Bank of Nigeria, Nigerian Stock Exchange and the National Bureau of Statistics over the period 1981 to 2011 (31 yrs). The Augmented Dickey – Fuller, (ADF), Johansen's Cointegration, Error Correction Model (ECM) and Granger Causality tests were executed. The results indicate significant long-run relationship between Nigeria's GDP and the study's financial market components – Government Securities, Bonds, Equities and Bank Credits to Private sector. The Error Correction Model indicates a coefficient of determination ($R^2$) of 69.08% with an F-statistic value of 699.63 which is significant at 0.00 level. The Granger Causality results indicate bi-directional causalities between GDP and Government Securities, Equities and Bonds, as well as bonds and credit to private sector. However, Uni-directional causalities are observed between Bonds and GDP, Equity and GDP, Bonds and Government securities, Credits to Private Sector and Government Securities as well as Equity and Credits to Private Sector. For the observed unidirectional causalities, causality flows from GDP to Bonds, Bonds to Government Securities, Government Securities to Credits to Private Sector and also, from Equity to Credits to Private Sector. No significant causalities are observed between Bank Credit to Private Sector and GDP as well as between Equity and Government Securities. The study concludes that; (i) majority of the financial markets sectors largely exist to service the economy (demand following roles) in place of supply leading roles, (ii) there prevails significant level of disconnect between government and private sector programs in Nigeria as indicated by insignificant causality between equity and government securities as well as between GDP and bank credits to the private sector. Urgent policy actions to curtail the observed disconnections are recommended to enable the financial market components function coherently and play more creative roles in the economy.
**Keywords**: Bonds, Equity, Government Securities, Credit to Private Sector, Economic Growth.

## INTRODUCTION:

Financial intermediation process overtly provides fundamental basis for the assumed role of financial markets in economic growth process of nations. Garcia and Liu (1999) argue that most of the early studies on the influence of financial markets on economic growth have largely been dominated by the perceived role of banking institutions in the process of economic growth. In the same direction, Naceur and Ghazouani (2007) comment that most of these early literature largely employ bank-based measures of financial development including ratio of bank credit to the GDP, ratio of money to national income, extent of private sector-led banking etc, in order to analyse the interrelationships between financial markets and economic growth.

In recent times however, the influence of capital market as a provider of a wide range of long term funds including its trading arm-the stock market, has gained accelerated attention. As observed by Ogun and Iyoha (2005) as well as Ikoku (2010), the wide recognition of the stock market is derived from its acceptance as a leading indicator of current and future levels of economic activity in a country. In this vein, Levine and Zervos (1998) find substantive evidence to observe that stock market operations significantly serve as a reliable indicator of both current and future levels of economic growth.

Nwankwo (1985) and Ajie et al (2006) observe that Nigeria witnessed the first elements of formal financial market operations with the entry of African Banking Consortium in 1894. This institution metamorphosed into present day First Bank Nig Plc. Barclays Bank (Dominion, Colonial and Overseas) presently Union Bank Nig Plc was the second bank to enter the Nigerian market. Many other banking institutions subsequently entered the Nigerian emerging market, although with significant number of casualities. With deregulation of the economy in 1986, the financial sector expanded at an unprecedented rate. This culminated in the existence of over one hundred and sixty (160) banks in the country in the mid 1990's. The operating environment became competitively fierce with attendant high overhead costs and slim income. Many of the newly established banks crashed within a relatively short period. A lot of earlier established banks also, were not spared the agony of liquidation.

 

Soludo (2004) observes that continued deterioration in the financial and operating conditions of the Nigerian banking sector created significant number of problems. These include capital inadequacy and declining corporate governance standards. Others include falling ethics and professional misconducts especially, as they relate to un-performing credits as we as observed large scale deficiencies in reporting and disclosure requirements. In this direction, Nnamdi (2007) notes that government efforts to address these problems culminated in a reasonable number of bank reforms that were regulatorily induced. The most significant of these reforms is the 2005 Bank Recapitalization and Consolidation Programme in Nigeria. The exercise left the country with only twenty five (25) surviving banks. Many of the relatively small and weaker banks were either merged or acquired by the bigger banks. In recent times however, market-induced mergers/acquisitions are taking place in Nigeria. In this connection, three banks have on market determined basis, merged with other banks. This move has consequently, further reduced the number of operating banks in the Nigerian market in recent times.

Capital market operations in Nigeria have also, undergone significant number of reforms. Osaze (2007) as well as Central Bank of Nigeria (2007) largely observe that capital market reforms have continued to reshape and transform investment and security trading in Nigeria as well as the vital issues of market operating efficiency and transaction costs. Of major interest is the fact that the financial market structurally, embodies the long and short term funding arms. Given this dimension, the need to understand the empirical nature of simultaneous interrelationships among these funding ends as well as their interactions with the Nigerian economy becomes expedient especially, in the light of recent data. The above issues therefore, constitute the problem of this study.

While generally aimed at evaluating the nature of interrelationships prevailing among the various financial market funding elements and Nigeria's economy, specifically, this study will evaluate the nature of long run relationship that prevails between Nigeria's Gross Domestic Product (GDP) and each of the financial market fund components (Government Securities, Bonds, Equities and Bank Credits to the Private Sector). Further, this study will also, examine the nature and directions of prevailing causal interrelationships among the above study variables. Given the growing interest in this area, it is hoped that the financial market operators, regulators and policy makers will benefit from the results of this study. To this extent, it is envisaged that the results will provide basis for new policy actions. In the same direction, the results are hoped to provide useful information for review and/or modification of existing financial market policies for improved performance of both the Nigerian economy and the financial markets.

Having provided an overview, the rest of this study is divided into four (4) sections. Section two deals with the theoretical framework and literature review, while section three discusses the materials and methods. The fourth section presents the results and analyses of same, while the fifth and last section provides the discussions, conclusions and policy recommendation.

## THEORETICAL FRAMEWORK AND LITERATURE REVIEW:

For purpose of clarity, this section is discussed under the following sub-sections:

### 2.1 Theoretical Link between Financial Markets and the Economy:

Financial markets fundamentally function to facilitate the intermediation process in order to guarantee efficient financial resource mobilization and allocation in the economy. This position finds significant support in the studies of Garcia and Liu (1999) as well as Ikoku (2010). Further incorporated in these studies as well as those of Adenuga (2010) and Ighodaro and Oriakhi (2011), are other beneficial roles of financial markets. These include provision of improved liquidity for investments in long-term financial securities, efficiency of information flows and minimization of transaction costs. A contrary position would obviously, pave way for information asymmetry, inefficient resource allocation and escalation of transaction costs.

Financial market institutions are basically net liability takers resulting from their intermediation roles. Ajie et al (2006) relate financial intermediation to the process of cost effective savings mobilization and allocation in the economy at market determined rates by the formal financial sector. In the same direction, the works of Goldsmith (1969) and Shaw (1976) demonstrate that optimal management of interest rate would overtly, stimulate savings. Resultantly, it will enhance the quantum of investible funds and ultimately, improve economic growth. A contrary situation will provide for a retardation of the economic growth process. The above theory rests on the supply-leading role of financial markets. Further, Patrick (1976) advocates a dual-capacity role for

 

financial markets in the economic development process whereby, they function to play both supply- leading and demand – following roles.

The banking industry has attracted significant level of attention in financial literature. This basically, derives from its capacity to provide significant financial leverage for entrepreneurship. Bhole (2006) observes that while exercising their lending functions, banks are significantly, guided by safety, liquidity and profitability considerations. While there prevails a significant level of disagreement between theory and empirical studies on the exact influence of banking institutions' operations on economic growth of nations, the path-braking study of Schumpeter (1934) concludes that where enterprise leads finance follows. Other studies including Robinson (1952) view the banking sector as typical handmaids to domestic enterprise. Consequently, financial institutions including banks, have in earlier literature, been largely observed to function in a demand following manner, and consequently, operate to depend and/or service enterprise.

Stock markets and their operations have gained increasing relevance in recent times. In this direction, Levine and Zervous (1998) as well as Atjie and Jovanovic (1993) find compelling evidence to conclude that stock market operations including its liquidity significantly relate to economic growth. While Okpara (2007) and Nurudeen (2009) find associated evidences in Nigeria, Bhole (2006) further asserts that internationalization of stock market operations in recent times facilitates; (i) global linkage of economies inclusive of periodic shocks, (ii) homogeneity in investors' expectations from securities and portfolios and (iii) enhanced movement of investible resources across the globe occasioned by increased arbitrage operations.

### 2.2 Review of Related Literature:

Financial market constitutes capital and money market ends. To this extent, a review of studies that evaluate the prevailing influences and empirical relationships between capital and money market institutions as well as their operations on economic growth becomes very relevant. In a broad study involving a valuable sample of developing economies, Eatzaz and Malik (2009) examine the empirical relationships between financial and economic development. The study finds valuable evidence to conclude that bank credits to the private sector significantly influence both productivity of workers and economic growth. Ahmed (2008) evaluates the relationship between bank credits and economic growth in Sub-Sahara Africa countries through application of OLS regression technique and finds a significant relationship between bank credits and economic growth in the region. Employing the Granger causality technique, Prakash (2009) finds a significant bi-directional causality between financial development and economic growth in India. Within the same period, Kiran et al (2009) employ ratio of bank credit to the GDP as a relevant bank-based measure and find valuable evidence to conclude that a positive and significant long run relationship prevails between financial development and economic growth in a sample of emerging economies.

Murty et al (2012) employ the Johansen cointegration technique and confirm prevalence of significant long run relationship between private sector bank credits and Ethiopia's economic growth. In the light of this result, the study calls for establishment of more banking institutions and branch network in Ethiopia. In the same direction, Akpansung and Babalola (2011) through the employment of Johansen's Cointegration and Granger Causality techniques, find significant long run relationship, as well as valuable Uni-directional causality between bank credits to the private sector and economic growth in Nigeria. The observed causality runs from GDP to bank credits to the private sector of the Nigerian economy.

Evaluating the relevance and potency of bank credits to the private sector and economic growth in Nigeria, Nwakanma, Nnamdi and Omojefe (2014a) find through the employment of Autoregressive Distributed Lag Bound and Granger Causality techniques, evidence of significant long run relationship between bank credits to the private sector and economic growth in Nigeria. However, the results show no evidence of significant causality in any of the directions. The study thus concludes that Schumpeterian independent hypothesis still prevails in Nigeria whereby; the financial sector and the Nigerian economy largely operate independently without promoting each other. In another study, Nwakanma, Nnamdi and Omojefe (2014b) examine the empirical relationships that prevail in Nigeria between micro credit operations and the nation's economic growth. The results of the Augmented Dickey-Fuller, Autoregressive Distributed Lag Bound and Granger Causality techniques on data covering the period 1982 to 2011, indicate significant long run relationship between micro credit institutions' operations and Nigeria's economic growth. The causality results however, indicate the prevalence of unidirectional causality with causality flowing from Nigeria's GDP to micro credits. The study concludes that Nigeria's micro credit institutions are presently, playing demand-following roles and recommends

 

intensified micro credit products development and marketing as well as enforcement of credit contracts for enhanced growth of microcredit operations in Nigeria.

Irrespective of the fact that significant volume of literature find bank credits very relevant for economic growth process, in a recent study, Acrad et al (2012) find substantial evidence to suggest that rapid expansion in bank credits may retard economic growth, especially for economies whose ratios of private sector bank credit to the GDP has attained 80 – 100% range. The study attributes this observation to the overall tendency of excessive credit growth to inhibit savings, induce economic volatility, raise the possibility of financial crises and ultimately, create room for resource misallocation within the economy.

Garcia and Liu (1999) equally observe that the growing importance attached to capital market operations partly derives from current expansion in the internationalization of stock market operations. Okafor (1985) and Osaze (2007) observe that a country's economic growth is largely related to the level and sophistication of its capital and attendant stock markets. In this direction, the studies of Ogun and Iyoha (2005), Okpara (2007), Adenuga (2010) and Ikoku (2010) provide evidence to confirm prevalence of a significant long run relationship between stock market operations and economic growth in Nigeria. Examining stock returns against possible fisher effects (inflation), Ezirim et al (2009), find sufficient evidence to conclude that stock market operations and attendant stock returns provide sufficient hedge against possible erosion of investors' wealth by inflationary trends in most of the classified sectors of Nigeria's stock market operations. In this direction, Omotor (2010) finds also, through employment of cointegration and Granger Causality tests that stock returns in Nigeria provide valuable cushion against inflation. Riman et al (2008) examine the empirical relationship between stock market performance and economic growth in Nigeria. The results indicate significant longrun relationship between stock market performance indicators and Nigeria's economic growth. The causality results confirm prevalence of unidirectional causality which runs from stock market capitalization to GDP. Consequently, the study finds compelling evidence to conclude that Nigeria's stock market operations promote economic growth. At the level to regional economic organization, Naceur et al (2008) investigate whether economic growth in any reasonable measure, is spurred by stock market liberalization. An investigation of the South and East Mediterranean region provides evidence that liberalization of stock market operations does not significantly influence investment opportunities as well as economic growth in that region.

Some related studies have examined the simultaneous effects of financial market operations on economic growth. In this vein, Naceur et al (2007) examine the prevailing simultaneous interrelationships between bank, stock market operations and economic growth within the Mediterranean and North African (MENA) Region. The GMM dynamic panel data estimator technique results provide evidence of insignificant longrun relationship between the simultaneous operations of these financial market ends and economic growth in the region. Ayadi et al (2013), evaluate the interrelationships between financial development, bank efficiency and economic growth across the Mediterranean Region over a study period of twenty five (25) years. The study employs bank deposits, credit to the private sector, stock market capitalization, financial openness index and GDP among others. The results show that bank credit to the private sector relates negatively to the GDP. The employed stock market performance indicators (market capitalization, market size and market liquidity) relate positively and significantly to the GDP. In all, the study's stock market performance indicators are found to promote economic growth.

Further Beck and Levine (2004) examine the simultaneous effects of stock markets and bank operations on economic growth and observe that both bank operations and stock market activities significantly promote economic growth. In this direction, Hondroyiannis et al (2005) evaluate the simultaneous interrelationships between stock market development, banking system's operational performance and economic growth in Greece over the period 1986 – 1999. The results provide evidence to conclude that both stock market and banking operations promote long run economic growth in Greece, although the contribution of the banking sector remains higher in magnitude compared to the stock market in Greece.

## 3. MATERIALS AND METHODS:

For clarity of purpose, this section is further divided into subsections as presented below:

### 3.1 Data and Variable Description:

The data for this study consist of end of year values of gross domestic product (GDP) at current market prices, outstanding government securities, bonds, equities and bank credits to the private sector of Nigeria's economy.

 

Basically secondary in nature, the data were sourced from: (i) Statistical Bulletin of Central Bank of Nigeria, (ii) Fact Book of the Nigerian Stock Exchange and (iii), The Annual Abstract of Statistics of the National Bureau of Statistics. They cover the period 1981 to 2011 (31 years). The data set is presented in table 1 below:

**TABLE 1**: **Gross Domestic Product (At Current Market Prices), Outstanding Government Securities, Bonds, Equities And Bank Credits To The Private Sector In Nigeria, 1981 – 2011 (₦'b)**

| Year | GDP | Outstanding Govt. Securities | Outstanding Bonds | Equities | Bank Credit to the Private Sector |
|---|---|---|---|---|---|
| 1981 | 102.69 | 3.10 | 0.20 | 1.90 | 9.295 |
| 1982 | 110.03 | 3.00 | 1.00 | 1.00 | 11.302 |
| 1983 | 119.12 | 3.50 | 1.00 | 2.20 | 12.280 |
| 1984 | 125.07 | 2.90 | 0.20 | 2.40 | 13.190 |
| 1985 | 144.72 | 3.50 | 0.40 | 2.70 | 13.973 |
| 1986 | 143.63 | 2.70 | 0.20 | 3.70 | 18.473 |
| 1987 | 203.04 | 4.20 | 0.40 | 4.00 | 21.698 |
| 1988 | 275.20 | 4.50 | 0.40 | 5.10 | 23.851 |
| 1989 | 403.76 | 4.20 | 0.60 | 8.00 | 27.676 |
| 1990 | 497.35 | 3.40 | 0.80 | 12.10 | 33.367 |
| 1991 | 574.28 | 3.30 | 1.40 | 18.40 | 40.954 |
| 1992 | 909.75 | 3.20 | 1.80 | 26.20 | 54.07 |
| 1993 | 1132.20 | 3.60 | 2.10 | 41.80 | 106.96 |
| 1994 | 1457.13 | 3.20 | 2.10 | 61.00 | 128.70 |
| 1995 | 2991.94 | 3.20 | 2.10 | 175.10 | 146.63 |
| 1996 | 4135.81 | 3.00 | 3.0 | 279.80 | 211.98 |
| 1997 | 4300.21 | 2.80 | 2.80 | 276.30 | 444.37 |
| 1998 | 4101.03 | 2.70 | 3.10 | 256.80 | 326.50 |
| 1999 | 4799.97 | 2.40 | 3.10 | 294.50 | 394.03 |
| 2000 | 6850.23 | 2.10 | 4.10 | 466.10 | 580.30 |
| 2001 | 7055.30 | 8.30 | 5.80 | 648.40 | 797.50 |
| 2002 | 7984.4 | 12.70 | 3.50 | 748.70 | 958.94 |
| 2003 | 10,136.40 | 25.20 | 8.40 | 1325.70 | 1219.99 |
| 2004 | 11673.60 | 178.10 | 7.90 | 1926.70 | 1530.60 |
| 2005 | 14735.32 | 365.50 | 11.10 | 2523.50 | 2005.22 |
| 2006 | 18709.80 | 888.90 | 3.50 | 4228.60 | 2540.75 |
| 2007 | 20940.91 | 2976.60 | 17.00 | 10,301.00 | 4836.34 |
| 2008 | 24665.24 | 2529.96 | 45.52 | 6987.51 | 7842.15 |
| 2009 | 25225.14 | 1930.26 | 108.50 | 4992.00 | 8970.40 |
| 2010 | 29498.16 | 1227.10 | 220.00 | 7913.80 | 7759.30 |
| 2011 | 30872.70 | 1239.26 | 242.00 | 8214.21 | 9101.30 |

**Sources:**
(1) Central Bank of Nigeria, Statistical Bulletin (Various Issues).
(2) The Nigerian Stock Exchange, FACT Book (Various Issues).
(3) National Bureau of Statistics, Annual Abstract of Statistics (Various Issues).
Gross domestic product serves as a reliable indicator of economic growth and is carried at current market prices. Central Bank of Nigeria (2005) defines GDP at current market prices as the value of GDP that approximates the prices that consumers and purchasers pay for the goods and services consumed at particular points in time. Typically, it reflects the historical prices of goods and services consumed. The key funding elements in the Nigerian capital market constitute government securities, bonds and equities. Their outstanding values are also, captured on historical basis.

Bank credits to the private sector serves as an indicator of both the quantity and quality of banking sector's credit to the economy. It excludes all credits to the public (government) sector. As argued by Demetriades and Hussien (1996), as well as Levine and Zervous (1998), private sector bank credits are provided under more stringent conditions. They largely obviate the problem of inefficiency in credit resource allocation and thus, enhance the

 

chances of generating better results while minimizing the chances for moral hazard to prevail. Their historical values are also maintained for consistency purposes.

### 3.2 Specification of Analytical Tools and Tests:

The key objectives of this study are to evaluate the nature of long run relationships prevailing between the financial market components and economic growth in Nigeria. They also, seek to examine the extent and directions of causal relationships that pertain thereto, in order to ascertain the extent to which these financial market ends do promote, support and/or reinforce themselves and Nigeria's economic growth. For better appreciation, This subsection is further subdivided as follows:

#### 3.2.1 Stationarity Tests:

Time series data are often associated with trend properties. These properties pave way for spurious estimates on employment of the time series data for econometric estimates. To avert this problem, it becomes necessary to ascertain the unit root or stationarity properties of the time-series data by employment of the Augmented Dickey-Fuller (ADF) test. Maddala (2007) as well as Gujarati and Porter (2009) specify the modeling procedure for a time series variable of choice $Y_t$, as follows:

$$\Delta Y_t = \propto_o + \propto_i Y_{t-1} + \sum_{i=1}^{\rho} \delta_i \Delta Y_{t-1} + \in_i \quad ---------(1)$$

Where;

Y = Variable of choice
$\propto_o$ = Intercept
$\Delta$ = First difference operator
$\propto_i$ = (for i = 1and 2) and $\delta_i$ (for i = 1, 2 –$\rho$) are constant parameters
$\sum_i$ = Stationary stochastic process
$\rho$ = Number of lagged terms chosen by Akaike Information Criterion (AIC) to ensure that $\sum_i$ is white noise.

Deriving from equation (1) above, the resulting hypotheses for testing would consist of the following;

$H_{O1}$: $\propto_i = 0$; i.e. there exists a unit root, - time series is non-stationary.
$H_{A1}$: $\propto_i \neq 0$; i.e. there is no unit root, - time series is non-stationary.

For decision purposes, the null hypothesis, $H_o$, will be rejected if the value of the Calculated Augmented Dickey-Fuller statistic is higher on absolute basis than all the McKinnon's critical values at 1%, 5% and 10% levels respectively. This condition would imply the non-existence of unit root properties and suitability of the time series data for employment in econometric estimates. The converse would imply the acceptance of the null hypothesis, existence of a unit root and/or non-stationarity of the time series data. However, failure to reject the null-hypothesis would as a matter of methodology, lead to a further conduct of the stationarity test on further differenced variants of the time series data. This is effectively achieved through a modification of equation (1) above to incorporate the second differences on the lagged first, inclusive of the k lags of the second differences as shown in equation (2) below:

$$\Delta^2 Y_t = \Psi \Delta Y_{t-1} + \sum_{i=1}^{\rho} \phi \Delta^2 Y_{t-1} + \in_i \quad ---------(2)$$

In the light of this further differenced variant shown in equation (2), the resulting hypotheses for testing would constitute;

Ho: $\Psi = 0$, i.e. there exists a unit root, implying that time series is non-stationary.
Ho: $\Psi \neq 0$, i.e. there exists no unit root, implying that time series is stationary.

#### 3.2.2 Johansen's CoIntegration Tests:

Johansen's Cointegration test is relevant for detection of prevailing long run relationship among variables in a multivariate framework. Maddala (2009) observes generally that if a dependant variable Y and a set of explanatory variables $x_1$, $x_2$ ---$x_n$ are integrated of order 1 (1), then there exists a linear combination of these time series such that Y, $X_1$ -- - $X_n$ are said to be cointegrated. The extent to which the time series variables are Cointegrated is validated by the level of significance of the Cointegrating equation in order to accept or reject the null hypothesis of no co-integration.

 

Brooks (2009) asserts that if a dynamic linear model with stationary disturbances prevails and the time series data are integrated of order 1 (1), then the variables would by implication, be integrated of order 1 (1). Further, for employment of Johansen's cointegration, the study observes that if there is a set of g variables (where g ≥ 2), which are of order 1 (1) and are thought to be cointegrated, then a Vector Autoregression (VAR) model needs to be set up. The VAR would contain g variables in their first differenced forms and k – 1 lags of the dependent variables with a T coefficient matrix. Further, in a generalized form, the Johansen's co-integration model for g number of variables is expressed in equation 3 with specifications already stated above;

$$\Delta y_t = \pi y_{t-k} + T_i \Delta y_{t-1} + T_2 \Delta y_{1-2} \pm - - \mp T_{k-1} \Delta y_t - (k-1) + \upsilon_t — (3)$$

Where;

$$\pi = \left( \sum_{i=1}^{k} \beta_i \right) - 1_g \; and \; T_i = \left( \sum_{j=1}^{i} \beta_j \right) - 1_g$$

3.2.3 **Error Correction Estimation:**

An error correction estimation model is often employed to modify for the deviations from estimated relationships due to possible shocks in any one or more of the times series variables employed in the short run. To this extent, studies including Nwakanma and Mgbataogu (2013) observe that such short-run interactions and subsequent adjustments to eventual long-run equilibrium conditions are vital because they have obvious theoretical and policy implications. In this sense, the Error (Equilibrium) Correction Model (ECM), becomes very relevant in order to analyse the nature and extent of such short-run dynamics.

Rejection of null hypothesis of non-stationarity implies that the residual is stationary and that the series $y_t$ and $x_t$ must be cointegrated. Econometric models are faced with the problem of possible convergence of the series variables in the long run. Such a convergence would imply that the model would have nothing to say about an equilibrium relationship between the series y and x. Brooks (2009) asserts that the Error Correction Model (ECM) overcomes this difficulty through the employment of combinations of first differenced and lagged levels of cointegrated variables as demonstrated in equation (4) below

$$\Delta y_t = \beta \Delta x_t + \beta_2 (y_{t-1} - \emptyset x_{t-1}) + \mu_t — - - - - - (4)$$

Here, $y_{t-1} - \emptyset x_{t-1}$ denotes the error correction model. Provided that $y_t$ and $x_t$ are cointegrated with coefficient Ø, then it would imply that $(y_{t-1} - \emptyset x_{t-1})$ will be integrated of order, 1(0) irrespective of the fact that the constituents are integrated of order 1(1). Further, in the above equation, Ø denotes the long run relationship between x and y, $\beta_i$ represents the short run relationship between changes in x and y, while $\beta_i$ denotes the speed of adjustment of the series variables back to equilibrium.

3.2.4 **The Granger Causality Tests:**

The Standard Granger Causality test seeks to ascertain the extent of variation in present Y that is attributable to variations in values of X and also, determining whether addition of lagged values of X can enhance the explanation. Generally, Y is said to be Granger Caused by X if X assists in explaining Y and also, if the coefficients of lagged X are found statistically significant and vice versa. The Granger Causality test is predicated on the following regression equations;

$$Y_t = \beta_o + \sum_{i=1}^{n} \beta_i \, Y_{t-i} + \sum_{i=1}^{n} \beta_u \, X_{t-i} + \mu_t - - - - - - - - - - - \quad (5)$$

$$X_t = \propto_o + \sum_{i=1}^{n} \propto_i \, X_{t-i} + \sum_{i=1}^{n} \propto_i \, Y_{t-i} + V_t - - - - - - - - - - - \quad (6)$$

Where;

$Y_t$ and $X_t$ are the time series variables under test, while $U_t$ and $V_t$ are the idiosyncratic terms (white noise errors) that incorporate all variations in the time series variables $Y_t$ and $X_t$ not included in the lagged values. A Maximum lag length of 2 was specified.

## 4. PRESENTATION OF RESULTS:

### 4.1 Presentation of Stationarity (Unit Root) Tests:

The results of the stationarity tests for all the study variables are presented in table 2 below.

Table 2: **Results of Stationarity (Unit Root) Tests:**

 

| Differenced Variables | ADF Statistic | McKinnon's Critical Values | | | Order of integration | Prob. |
|---|---|---|---|---|---|---|
| | | 1% | 5% | 10% | | |
| D(GDP) | -10.91200 | -3.737853 | -2.991878 | -2.635542 | 1(1) | 0.0000 |
| D(GSEC) | -4.417335 | -3.679322 | -2.967767 | -2.622989 | 1(1) | 0.0016 |
| D(BOND) | -4.192420 | -3.699871 | -2.976263 | -2.627420 | 1(1) | 0.0031 |
| D(EQTY) | -5.990356 | -3.689194 | -2.971853 | -2.625121 | 1(1) | 0.0000 |
| D(CPS) | -3.786739 | -3.679322 | -2.967767 | -2.622989 | 1(1) | 0.0312 |

Notes:
D(GDP), D(GSEC), D(BOND) D(EQTY) AND D(CPS) represent the differenced values of gross domestic product, government securities, bonds, equity and credit to private sector respectively.

Source: Author's Computations using E-VIEWS 7.1

The results of stationarity (unit root) tests shown in table 2 above indicate that the Computed Augmented Dickey-Fuller test statistics for all the series variables are in absolute terms, generally higher than their corresponding McKinnon's critical values at all levels of significance respectively. Accordingly, all the study variables are confirmed stationary and fit for employment in subsequent econometric estimates. Further, since all the variables are found stationary at first difference, they are said to be integrated of order 1(1).

### 4.2 Presentation of Johansen's Co-integration Tests Results:

The results of Johansen's cointegration tests for all the time series variables of this study are presented in table 3 below;

Table 3: **Results of Johansen's Unrestricted Cointegration Rank Test (Maximum Eigen Value):**

| Obs | Series | Hypothesized No of C E (s) | Eigen value | Maxi-Eigen Statistic | P0.05 Critical Value | Prob.** |
|---|---|---|---|---|---|---|
| 29 | D(GDP), D(GSEC), D(BOND), D(EQTY), D(CPS) | None* | 0.997296 | 171.4761 | 33.87687 | 0.0001 |
| | | At Most 1* | 0.970019 | 101.7089 | 27.58434 | 0.0000 |
| | | At Most 2* | 0.686982 | 33.68337 | 21.13162 | 0.0005 |
| | | At Most 3 | 0.191874 | 6.178090 | 14.26460 | 0.5905 |
| | | At Most 4 | 0.024006 | 0.704671 | 3.841466 | 0.4012 |

Max-eigen value test indicates 3 cointegrating equations at 0.05 level.
*denotes rejection of null hypothesis at 0.05 level
** MacKinnon – Haug – Michelis (1999) p-values

Source: Author's Computations using E-VIEWS 7.1

The results of Johansen's maximum likelihood cointegration tests reported in table 3 above do not indicate any full-rank trend. To this extent, the results provide good evidence of absence of multicollinearity among the time series variables. Further, the results are indicative evidence of rejection of the null hypothesis of no cointegration. For all intents and purposes, the cointegration test statistics thus, embody evidence that there is significant cointegrating relationship between Nigeria's GDP and the explanatory variables (government securities, bond, equity and credits to the private sector.). Accordingly, the results provide compelling evidence to conclude that a significant long run relationship prevails between Nigeria's economic growth and the study's financial market elements.

### 4.3 Presentation of Error Correction Model Estimates:

The results of the Error Correction Model (ECM) estimates are presented in table 4 below;

Table 4: **Error Correction Model Estimates:**

Dependent Variables: GDP
Method: Least Squares

 

Sample adjusted: 1982 – 2011
Included observations: 30, after adjustments.

| Variable | Coefficient | Std Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(GSEC) | -11.76912 | 1.958119 | -6.010420 | 0.2877 |
| D(BOND) | -79.34048 | 19.26317 | -4.118765 | 0.0558 |
| D(EQTY) | 3.316312 | 0.511965 | 6.477610 | 0.0048 |
| D(CPS) | 3.756013 | 0.516129 | 7.277272 | 0.0036 |
| ECM (-1) | -0.480117 | 0.192704 | -2.491473 | 0.01970 |

R-Square ($R^2$) = 0.690795 Mean Dependent Var = 7576.585
Adjusted R-square= 0.689379 S.D. dependent var = 9631.848
S.E. of regression = 992.6558 Akaike info Criterion = 16.78534
Sum Squared resid = 25619505 Schwarz Criterion = 17.01662
Log likelihood = -255.1727 Hannan-Quinn Criterion = 16.86073
F-Statistic = 699.6274 Durbin-Watson = 1.579909
Prob. (F-Statistic) = 0.000000

Source: Author's Computations Using E-VIEWS 7.1

The results of the Error Correction Model reported in table 4 above show that all the explanatory (predictor) variables jointly explain 69.08 percent of the variations in Nigeria's GDP. The ECM has expected negative sign and its associated F-Statistc value of 699.6274 is significant at 0.00 level, which confirms a good line of fit. Further, the Durbin-Watson statistic of 1.579909 is within acceptable range. The absolute value of the ECM is 48.01 percent. This implies that about 48.01 percent of the disequilibrium in Nigeria's GDP is offset by short-run adjustments in the explanatory (predictor) variables yearly. The ECM value of 48.01 percent is also, associated with a probability value of 0.01970, which is statistically significant at 0.05 level.

### 4.4 Presentation of Granger Causality Test Results:

The results of the Pair-wise Granger Causality tests are presented in table 5 below:

Table 5: **Results of Pair-Wise Granger Causality Tests:**

| Null Hypothesis | Lags | Obs | F-Statistic | Prob. |
|---|---|---|---|---|
| D(GSEC) does not Granger cause D(GDP) | 2 | 28 | 3.44213 | 0.0500 |
| D(GDP) does not Granger cause D(GSEC) | 2 | 28 | 6.57981 | 0.0058 |
| D(BOND) does not Granger cause D(GDP) | 2 | 28 | 0.12056 | 0.8870 |
| D(GDP) does not Granger cause D(BOND) | 2 | 28 | 4.38878 | 0.0249 |
| D(EQTY) does not Granger cause D(GDP) | 2 | 28 | 2.73561 | 0.0869 |
| D(GDP) does not Granger cause D(EQTY) | 2 | 28 | 3.86567 | 0.0364 |
| D(CPS) does not Granger cause D(GDP) | 2 | 28 | 0.91249 | 0.4162 |
| D(GDP) does not Granger cause D(CPS) | 2 | 28 | 3.27879 | 0.0567 |
| D(BOND) does not Granger cause D(GSEC) | 2 | 28 | 16.7679 | 3E-05 |
| D(GSEC) does not Granger cause D(BOND) | 2 | 28 | 2.52385 | 0.1021 |
| D(EQTY) does not Granger cause D(GSEC) | 2 | 28 | 1.53026 | 0.2377 |
| D(GSEC) does not Granger cause D(EQTY | 2 | 28 | 0.02054 | 0.9797 |
| D(CPS) does not Granger cause D(GSEC) | 2 | 28 | 2.66975 | 0.0906 |
| D(GSEC) does not Granger cause D(CPS) | 2 | 28 | 62.9864 | 5E-10 |
| D(EQTY) does not Granger cause D(BOND) | 2 | 28 | 5.71220 | 0.0097 |
| D(BOND) does not Granger cause D(EQTY) | 2 | 28 | 4.12899 | 0.0294 |
| D(CPS) does not Granger cause D(BOND) | 2 | 28 | 117.906 | 8E-13 |
| D(BOND) does not Granger cause D(CPS) | 2 | 28 | 14.1101 | 0.0001 |
| D(CPS) does not Granger cause D(EQTY) | 2 | 28 | 0.27778 | 0.7600 |
| D(EQTY) does not Granger cause D(CPS) | 2 | 28 | 90.1158 | 1.E-11 |

Source: Author's computations using E-VIEWS 7.1.

The results of Pair-wise Granger Causality tests presented in table 5 above indicate that; (i) bi-directional causalities prevail between Nigeria's GDP and outstanding government securities, corporate equities and bonds as well as between bank credit to the private sector and bonds, (ii) Uni-directional causalities are observed

 

between bonds and GDP, equity and GDP, bond and outstanding government securities, bank credit to the private sector and outstanding government securities as well as between bank credits to the private sector and equity. In the above instances, causalities flow from GDP to bond, GDP to equity, bond to outstanding government securities, outstanding government securities to bank credit to private sector and also, from equity to bank credits to the private sector respectively. On the whole, no causalities are observed between bank credit to the private sector and GDP as well as between equity and outstanding government securities.

## 5. DISCUSSIONS, CONCLUSIONS AND POLICY RECOMMENDATIONS:

The results of Cointegration tests in this study confirm the existence of a significant long run relationship between Nigeria's GDP and the study's set of financial market elements (outstanding government securities, bonds, equity and bank credit to the private sector of the economy. The results of the pair-wise Granger Causality analysis throw up the following implications;

(i) The bond and equity markets (capital market major finances) are driven by growth in Nigeria's GDP, implying a demand-following function on the part of these financial market elements.

(ii) Failure of bank credits to the private sector and GDP to Granger Cause each other in any direction highlights a serious disconnect between the economy and operations of the banking sector in Nigeria. It provides a compelling evidence of the prevalence of Schumpeterian independent hypothesis whereby, the Nigerian economy and the banking sector are significantly operating independent of each other.

(iii) The equity market promotes or Granger Causes bank credits to the private sector of Nigeria's economy by the operating banks. This might have resulted from the fact that improved capital market performance results in a boost in public confidence inclusive of the banking sector, which responds by financing increased working capital requirements of quoted companies. In effect, this trend provides a significant evidence of demand-following role played by Nigerian banking institutions.

(iv) The bi-directional causality prevailing between corporate bonds and bank credits to the private sector of Nigeria's economy might have resulted from the periodic long and short term funding requirements of the corporate sector to enhance corporate operational activities. These two financial ends therefore, mutually and/or contemporaneously, promote and reinforce each other in the interest of the corporate (private sector) business environment.

(v) The Schumpeterian independent hypothesis (no causality in either direction) prevailing between outstanding government securities and corporate equity indicates a complete disconnect between government (public) and private sector economic and/or development activities in Nigeria. Periodic policy conflicts and inconsistencies as well as erratic changes in government policies and programmes might have created room for this observation. In all, it is probably a pointer to observed divergence between public and private sector policies and economic programmes in Nigeria.

In the light of the above results, implications and/or conclusions, it is recommended that;

(a) Harmonization of government and private sector economic and financial programmes should be urgently addressed for accelerated economic growth in Nigeria.

(b) Further reforms should be implemented in the operations of money and capital market institutions in Nigeria to enhance their capacity to play more of supply-leading roles.

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