Symbiotic Disclosure of Real Sector and Financial Sector: Evidence in Nigerian GDP and Stock Market Capitalization

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Authors’ contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The focus of this study is to identify the disagreement if any between the real sector and the financial, and to disclose its activities alongside macroeconomic factors before the emergence of the 2016 and 2017 fair recession in Nigeria. The ending controversies of the financial sector being a host or a parasite to the real sector pave the gesture for this study. This study, therefore, evaluated the prevailing casual disclosure between the Nigeria Stock Performance and Gross Domestic Product alongside other Macroeconomic indicators, such as exchange rate, external reserves, Inflation rate, and Interest rate data sourced from Central Bank of Nigeria over the period 1985-2014. The Augmented Dickey-Fuller and Granger Causality tests were employed. The results disclose a significant symbiotic link between Stock Market Capitalization and GDP in the growth process. On the other hand interest rate tends to influence Market capitalization activities. The study concludes that GDP and Stock Market Capitalization constitute significant influential variables in the Nigerian economy as both promote each other, while the inference of interest rate follows movements in Stock Market Capitalization. The implications to these findings show that the financial sectors and the real sectors both operate within and obey the demand follow and supply leading hypotheses. The study recommends that the Central of Nigeria should collaborate with the Bank of Industry and the Agricultural Development Bank to issue out soft loans to capable entrepreneurs to uphold the symbiotic disclosure shown in this study. Finally, CBN should properly manage the macroeconomic variables to improve the Nigerian economy.

Keywords: GDP; stock market capitalization; granger causality; symbiotic disclosure; Nigeria.
1. INTRODUCTION

There is a growing and expanding financial driven technology to catch up customers’ needs from the side of the real sector through its rapid growth of sophisticated and mechanized apparatus enhancement. It is not too clear to mention which sector is controlling the other. Such has led to the recurring issue of one sector being in charge of the other. Substantially, Onwumere, Ibe, Okafor, and Uche [1] upheld the demand following hypothesis from the real sector to the financial sector through stock market capitalization. This shows that the real sector can only rely on the activities of the financial sector. The stock market no doubt plays a major role in financial intermediation in both developed and developing countries. Financial intermediation is a function that links the suppliers of funds to those users of funds. The Stock Market provides opportunities for long term investment. It thus offers investors alternative investment avenues to put their surplus funds. Most studies argue that Stock Market performance is influenced by macroeconomic variables such as interest rate, GDP, and inflation among others. In a claim by Esen and Omit [2] that stock market performance influences economic growth in Turkey. Further, Ologunde, Elumilade, and Asaolu [3] claimed that some macroeconomic determinants could hurt investors’ decision to invest in the stock market. Maku and Atanda [4] opine that monetary authorities should set a macroeconomic target every budgetary year. The Central Bank of Nigeria over these years has adopted a series of policies to stabilize the macroeconomy which affects Nigerian stock market performance. The most recent is financial inclusion strategies. Banking on these polices, Igoli, Onwumere, and Ogiri [5] pointed out that the digital financial environment has noteworthy significant impact on the Nigerian output of goods and services. The management of macroeconomic environment is aspired to aid in achieving positive output growth, price stability, exchange rate, foreign reserves, employment, etc. However, Parab and Reddy’s [6] study shows evidence of a significant impact of macroeconomic variables on stock prices. Furtherance Liu and Pan [7] stated that macroeconomic variables work better during the recession periods.

Following a series of reforms and policies on macroeconomic variables over these years, it is expected that significant impact could prevail among the set of macroeconomic variables. McQueen and Roley [8] and Jarvinen [9] stated that during the depression, a higher unexpected economic growth might indicate the end of the recession, which influences the stock market positively. Alternatively, higher than expected economic growth might bring about fears of overheating the economy, which might prompt monetary authorities to raise interest rates and thus constitute bad news in the stock market. Their results were supportive of asymmetric relationships between the stock market and macroeconomic factors. The relationship between stock market performance and macroeconomic determinants is well illustrated by Miller and Modigliani [10]. Also, Ross [11] hypothesizes the relationship between stock prices and certain macroeconomic determinants since the fundamental value of stocks equals the expected present value of the firm’s future dividends. Thus stock price (return) performance is expected to be a product of feature macroeconomic determinants. In this literature; gross domestic product, inflation, and interest rates are considered as key macroeconomic determinants that influence the performance of an emerging economy like Nigeria. This, however, calls for motivation to investigate the interrelationships between the real sector and the financial sectors together these macroeconomic variables. The emphasis is to establish the extent of support or interference among variables employed.

Sensitiveness to macroeconomic variables including GDP, inflation, and interest rate contributes a valuable subject in finance and economics. Despite the increase in output of goods and services and constant management of macroeconomics variables financial sector seems to be unstable. The issue of instability with regards to Nigerian stock trading performance has been a concern to investors. There are serious concerns about the sudden turn of events in both positive and negative direction concerning the Nigerian Stock Market. The instability of the Nigeria Stock Market tends to be so sharp and it has become difficult for the Nigerian Stock market to stabilize.

In light of the above, there is an urgent need to examine the empirical extent to which these variables support or promote each other in light of recent data within the Nigerian economy. The above key issues constitute the core problem and motivation for this study. This study is therefore inspired to examine the symbiotic disclosure prevailing between the real sector and
the financial sector in nexus of gross domestic product, interest rate, exchange rate, external reserves, inflation rate, and stock market capitalization using recent Nigeria data.

The findings of this study will contribute significantly and shall be of use for scholars in resolving the existing controversy between the real sector and the financial sector together with the macroeconomic variables. And therefore, Scholars will see the findings arising from this study as a reasonable addition to the existing body of knowledge. More so, results arising from this study will be used by the general public for awareness and understanding of the functional relationship between economic growth and stock market performance. Also, public policy managers including Central Bank of Nigeria, Securities, and Exchange Commission in Nigeria will find this useful in the formulation, management, and/or reviews of Monetary and Capital Market policies. Finally, Industry Practitioners such as Bankers, investors, market/financial players, and makers will find this study significant as it will expose the risk from the macroeconomic variables. The study period is between 1985 and 2014 of the Central Bank of Nigeria data on various issues. The obvious limitation arises from the fact that Stock Exchange Factbooks, the publication started in 1985, which makes it difficult to obtain data on stock market Capitalization before this period while data on other study variables are available. In that circumstance, therefore, the results of this study would have improved a bit if the data covered earlier periods.

2. LITERATURE REVIEW

Economic theory postulates that GDP, inflation, and interest rates, as well as other macroeconomic indicators, constitute valuable determinants or predictors of stock market performance. However, several schools of thought have offered theoretical explanations for stock market performance. Prominent among the theories is the Arbitrage pricing theory. The Arbitrage Pricing Theory approach tries to explain the performance of the stock market by positing that the behavior of the stock market is influenced by some macroeconomic variables. The theory takes into account systematic factors common across all class of assets. The idea behind this theory is that stock market performances are generated by some common factors, for which different securities have different sensitivities in the market. The theory asserts that stock market performance is influenced by several independent factors. The central thesis of APT is that more than one systematic factor affects long-term average performance in the stock market. However, the problem with this is that the theory in itself does not indicate what these factors are, so they need to be empirically determined. By implication, the theory itself does not tell the investor what these factors are.

Arbitrage pricing theory directly relates the value of the security to fundamental macroeconomic factors driving it and by extension, measures the performance of the market. Existing literature suggests that a wide range of macroeconomic factors may be relevant. However, in emerging stock markets, there is an argument that not all of these macroeconomic factors are either relevant or appropriate Bilson, Brailsford, and Hoper, [12] The main empirical strength of the APT is that it permits the researcher to select whatever macroeconomic factors that provide a theoretical explanation for a particular sample at hand Groenewold and Fraser, [13]. Sharpe [14] argues that good investment managers identify important factors in the economy and market place and assess the extent to which different securities will respond to changes in those factors. There is no reason to assume or believe that a good factor for one period will be a better one for the next period. So do risk and prices which are associated with various factors as well as also the sensitivities of securities to those factors. The behavioral school of finance holds that market might fail to reflect economic fundamentals under three conditions. When all three apply, the theory predicts that pricing biases in financial markets can be both significant and persistent. The first condition is irrational behavior. It holds that investors behave irrationally when they don't correctly process all available information while forming their expectations of a company’s future performance. Second is systematic pattern behavior, which holds that even if individual investors decide to buy or sell without observing economic fundamentals, the impact on share prices would be limited.

Various scholars have evaluated the existing determinants of stock prices. The relationship between macroeconomic variables and stock market performance has necessitated divergent opinions among scholars. Macroeconomic variables are relied upon to explain the price of a stock. Gan, Lee, Yong, and Zhang [15] evaluated
the relationship between New Zealand stock market performance and seven macroeconomic variables between 1990 and 2003. Johansen Multivariate Co-integration and Granger-causality test were employed. The results demonstrated a significant long term relationship between macroeconomic variables and New Zealand’s stock market performance. However, the Granger causality test results show that the stock market does not promote the macroeconomic variables. Padhan [16] investigates the relationship between economic growth and stock market performance in India between 1991 and 2005. Johansen Multivariate Co-integration and Granger Causality test were applied. The results indicate significant long run and causality relationships between the variables of the study. Ahmed [17] after employment of Granger causality test as well as Johansen’s Co-integration to study the relationship between some macroeconomic variables and a stock market in India, the results confirm the prevalence of significant long-run relationship between GDP and stock market performance.

Ozlen and Ergun [18] set out to evaluate the impacts of selected macroeconomic variables on stock market performance. Employed macroeconomic variables included inflation, exchange rate, interest rate, and the unemployment rate in the stock market of 45 organizations. ARDL (Auto Regressive Distribution Lag Bound) technique was employed on data over the period 2005 to 2012. The results indicate that interest rates and exchange rates significantly influence market performance. Besides, Zubair [19] evaluated the nature of the causal relationship between stock market performance and external trade in Nigeria using monthly data over the period 2001 to 2011; however, no significant relationships were detected.

Again, Olawale, Olusegun, and Taofik [20] utilized Error Correction Model (ECM) and Johansen's Cointegration to evaluate the nature of the long-run relationship between macroeconomic variables and stock market performance in the USA. Index of industrial production, interest rate, trade rates, consumer price index, unemployment rate, and the money supply was employed as macroeconomic aggregates. Index of industrial production and interest rate were observed to have significant influence over stock market performance. Meanwhile, Vanita and Ritika [21] evaluated the relationship between stock market performance and selected macroeconomic variables in India. Monthly information from 1997 to 2011 was secured for the macroeconomic variables. They include the exchange rate, an index for industrial production (IIP), interest rate, money supply, and oil price. The study employed ADF and PP unit root tests, Regression, ARCH model, Granger Causality, and Johansen Co-integration tests to evaluate the data. Inflation and exchange rates were found as significant variables on the performance of the stock market.

Furthermore, Mutuku and Ng'eny [22] results discovered positive relationships between the stock market and GDP, exchange rate, and treasury bills. The results provide significant evidence to assert the prevalence of significant relationships between the variables of the study. Meanwhile, Mahmoud, et al. (2016) findings show a significant relationship in Egypt between stock market performance and interest rate, while for Tunisia stock market performance has no significant relationship with the consumer price index.

Further, Lee and Brahmasrene [23] evaluated the dynamical relationship between macroeconomic variables and stock prices in Korea from 1986 to October 2016 with interest on the exchange rate, money supply, industrial production, and inflation. The Johansen co-integration and vector error correction model (VECM) initiated results indicated a long run relationships between macroeconomic variables and stock prices of Korea, while the interest rate was not significantly related to stock market prices. However, external shocks did not constitute factors that affect the market in the study.

Again, Mohamed and Ahmed [24] assessed the effects of macroeconomic variables on stock price in Jordan from 1976 to 2016. The study sourced data of 218 firms quarterly of industrial production, interest rate, money supply, inflation, gross domestic product, import prices, and stock market prices, and employs the Autoregressive Distributive Lag (ARDL) model. The results indicate that industrial production, money supply significantly related to stock prices, while import price has negative relationships with stock market prices.

Conversely, Aldukhail [25] measured the effect of macroeconomic variables on the Saudi stock market between 1997 and 2017 with the employment of GDP, interest rate, and inflation
rate as macroeconomic variables on Saudi stock market price, shares value and traded shares. The analysis was carried out using the ARDL model and the results show no significant impact in the short run but statistically influence during the long run.

Thrust, Aryasta, and Artini [26] account for the effects of macroeconomic indicators and global stock index on the composite stock market price in Indonesia with the application of the gross domestic product, exchange rate, inflation, interest rate, Dow Jones index, BSE Sensex index and Shanghai index on the composite stock index from the period January 2010 to December 2018. The multiple linear regression analysis technique application results indicated GDP, exchange rate, Shanghai index significantly, and positive affect stock market price, whereas, inflation and interest rate negatively affected stock prices in Indonesia.

Impressively, Bassar [27] analyses the effect of Sharia stock trading activity factors and macroeconomic variables performance in the Indonesia capital market. The study uses the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT). Variables employ includes the interest rate, inflation rate, exchange rate, market capitalization, and trade volume between January 2014 and December 2018, and the results reveal the existence of relationships between interest rate, exchange rate, and the stock market.

However, the above literature needs caution as the majority of these studies has indicated just a little departure and mixture which this study tends to solve that will contribute to the existing body of knowledge. However, this interpretation from interrelationships between the real sector and the financial sector can be explained by stock market performance and GDP growth as well as selected macroeconomic variables. Hence, the above studies fail to disclose the extent of symbiotic of how much GDP and market capitalization promotes each other in the light of real and financial sector hypotheses.

3. METHODOLOGY

The study adopted the ex-post facto research design. The study employed secondary data to measure the symbiotic disclosure between selected macroeconomic variables and stock market capitalization in the context of real and financial sector nexus in the Nigerian economy. The macroeconomic variables included exchange rate, external reserves, inflation, interest rate, and the gross domestic product that represent the real sector.

The data is sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin (various issues) over the period 1985 to 2014. The novelty behind this period is properly accounted for and disclosed the symbiotic between the real sectors and financial sector before the Nigerian fair recession around 2016 and 2017.

The estimation process for this study follows Pairwise Granger Causality, Test of Hypothesis, and Diagnostic/Reliability Tests considerations. These sets of tests are designed to validate the goodness stationary of variables the data sets of Unit Root.

3.1 Granger Causality Representation

From the broad objective of the study, the Granger causality test becomes imperative to analyze how the independent variables promote/support the dependent variable or how both reinforce themselves in the growth process. According to Koop [28], Granger causality tests are evaluated to measure variable X granger causes Y if past values of X can help explain Y. The model below implies that the last period's value of X has an explanatory influence on the current value of Y. Given the objective of measuring the impact of digital finance on the set of variables, the functional models are therefore stated as follows:

\[ MACP = f(\text{macroeconomic environments}) \] (1)

After establishing a possible causal relationship through the granger causality model will be used to test the level of support emanating from the macroeconomic variables. This will follow the form specified mathematically below:

\[ y_t = \beta + \Phi_1 X_{t-1} + \gamma_1 X_{1,t-1} + \gamma_2 X_{2,t-1} + \gamma_3 X_{3,t-1} + \gamma_4 X_{4,t-1} + \gamma_5 X_{5,t-1} + \epsilon_t \] (2)

All the variables are discussed above with combined modeling of the casual coefficients in the granger causality framework. Taking MCAP to be stock market capitalization of the financial sector indicator and macroeconomic variables predictors such as exchange rate, external reserves, gross domestic product, inflation, and interest rates the study empirically estimate functional relationships as follows:
Where

$\gamma$ is a measure of the influence of $X_{t-1}$ on $Y_t$.

If $\gamma_1, \gamma_2, \gamma_3, \gamma_4, and \gamma_5$ are greater than 0.05 respectively, then past values of $X$ do not affect $Y$ and there is no way that $X$ could Granger cause $Y$.

Restating the above eq. in the econometric form below and results will be extracted from E-view software.

From the theoretical standpoint, the study is designed to prove the reality or otherwise of the APT using variables from Nigeria. Therefore eq. 1 and 2 can be rewritten as follows:

$$MCAP_t = \gamma_0 + \gamma_1 EXCH_t + \gamma_2 EXTR_t + \gamma_3 GDP_t + \gamma_4 INFLR_t + \gamma_5 INTR_t + \varepsilon_t$$

$$\text{where all the variables are as stated above and } \gamma_0 \text{ is the constant (the value of the dependent variable when all the repressors are at zero); } \gamma_1 - \gamma_5 \text{ are coefficient of the independent variables and } \varepsilon_t \text{ is the noise or error term.}$$

The model's variable of this study is stock market capitalization as a broad dependent variable that is being symbiotically disclosed in macroeconomic variables and the real sector of the exchange rate, external reserves, GDP, inflation, and interest rates as independent variables. They serve as the explanatory variables for the financial sector; stock market capitalization.

The traditional Augmented Dickey and Fuller (ADF) [29] test is adopted to show the unit root properties of the series following equation specified:

$$\Delta y_t = \beta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 + \delta y_{t-1} + \sum_{i=1}^{n} \delta y_{t-1} + \varepsilon_t$$

$$\text{From the above equation, it assumed that } X \text{ and } Y \text{ will be stationary.}$$

$$\text{Where the test is for } H_0 = \delta = 0 \text{ and } H_1 = \delta < 0.$$  

From the theoretical point of view, the study is constructed to prove the reality or otherwise of the interface between the real sector and the financial sectors using variables from the Nigerian economy.

The prior expectations from the model's tests of the hypotheses are given as follows:

**Hypothesis One**

$H_0$: There are no significant causal and symbiotic disclosure between stock market capitalization, and macroeconomic variables of the exchange rate, external reserves, gross domestic product, inflation, and interest rates in Nigeria.

Controlling for the exchange rate, external reserves, gross domestic product, inflation, and interest rates as the explanatory variables of interest, the model for the hypothesis is presented thus:

$$MCAP_t = \gamma_0 + \gamma_1 EXCH_t + \gamma_2 EXTR_t + \gamma_3 GDP_t + \gamma_4 INFLR_t + \gamma_5 INTR_t + \varepsilon_t$$

(5)

Therefore the prior expectation with regards to this will be greater than zero; i.e. $\gamma_2, \gamma_3, \gamma_5 > 0$, and $\gamma_1, \gamma_4 < 0$

4. RESULTS PRESENTATION AND DISCUSSION OF FINDINGS

The base data for this study are presented in Table 1.

4.1 Data Analysis

ADF Unit Root Test Results

The results of the Unit root test are presented in Table 2.

Test of Hypotheses

Test of hypothesis one

$H_0$: There is no significant unit root between market capitalization and each of the macroeconomic variables of the exchange rate, external reserves, gross domestic product, inflation, and interest rates in Nigeria.

$H_a$: There is a significant unit root between market capitalization and each of the macroeconomic variables of the exchange rate, external reserves, gross domestic product, inflation, and interest rates in Nigeria.

In the Table 2 above, the ADF test statistic of MCAP ($-6.009562$), EXCHR ($-5.090450$), EXTRR ($-5.606112$), INFLR ($-4.850510$), INTR ($-6.5645842$) and GDPR ($-7.809319$) are greater than the test critical level-2.976263, -2.671853, -2.981038, -3.012363, -2.971853 at 0.05 significance level respectively. Besides, the
probability values of 0.0000, 0.0003, 0.0001, 0.0010, 0.0000 and 0.000 are all less than 0.05 significance levels. Hence, the null hypothesis that the variables have a unit root and non-stationary is rejected at the 0.05 level of significance. This is for the fact that the Augmented Dickey-Fuller test statistics are greater than its critical, and its probability values are less the 0.05 level of significance as stated above. Thus, we can say that there exists no unit root among the variables in their first difference.

Table 1. Data on Market Capitalization (MCAPr), Exchange Rate (EXCHR), External Reserves (EXTRr), Gross Domestic Product (GDPr), Inflation Rate (INFLr) and Interest Rate (INTR) for the period 1985 to 2014

<table>
<thead>
<tr>
<th>Year</th>
<th>MCAPr</th>
<th>EXCHR</th>
<th>EXTRr</th>
<th>GDPr</th>
<th>INFLr</th>
<th>INTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>0.17</td>
<td>0.89</td>
<td>0.25</td>
<td>11.33</td>
<td>1.0</td>
<td>8.50</td>
</tr>
<tr>
<td>1986</td>
<td>0.03</td>
<td>2.02</td>
<td>0.56</td>
<td>1.89</td>
<td>13.7</td>
<td>8.50</td>
</tr>
<tr>
<td>1987</td>
<td>0.17</td>
<td>4.02</td>
<td>0.22</td>
<td>-0.69</td>
<td>9.7</td>
<td>11.75</td>
</tr>
<tr>
<td>1988</td>
<td>0.18</td>
<td>4.54</td>
<td>-0.39</td>
<td>7.58</td>
<td>61.2</td>
<td>11.75</td>
</tr>
<tr>
<td>1989</td>
<td>0.22</td>
<td>7.39</td>
<td>0.75</td>
<td>7.15</td>
<td>44.7</td>
<td>17.50</td>
</tr>
<tr>
<td>1990</td>
<td>9.21</td>
<td>8.04</td>
<td>0.62</td>
<td>11.36</td>
<td>3.6</td>
<td>17.50</td>
</tr>
<tr>
<td>1991</td>
<td>0.29</td>
<td>9.91</td>
<td>0.21</td>
<td>0.01</td>
<td>23.0</td>
<td>15.00</td>
</tr>
<tr>
<td>1992</td>
<td>0.26</td>
<td>17.30</td>
<td>-0.02</td>
<td>2.63</td>
<td>48.8</td>
<td>21.00</td>
</tr>
<tr>
<td>1993</td>
<td>0.34</td>
<td>22.05</td>
<td>-0.35</td>
<td>1.56</td>
<td>61.3</td>
<td>26.90</td>
</tr>
<tr>
<td>1994</td>
<td>0.28</td>
<td>21.89</td>
<td>0.05</td>
<td>0.78</td>
<td>76.8</td>
<td>12.50</td>
</tr>
<tr>
<td>1995</td>
<td>0.63</td>
<td>21.89</td>
<td>0.20</td>
<td>2.15</td>
<td>51.6</td>
<td>12.50</td>
</tr>
<tr>
<td>1996</td>
<td>0.37</td>
<td>21.89</td>
<td>0.77</td>
<td>4.13</td>
<td>14.3</td>
<td>12.25</td>
</tr>
<tr>
<td>1997</td>
<td>-0.01</td>
<td>21.89</td>
<td>-0.01</td>
<td>2.89</td>
<td>10.2</td>
<td>12.00</td>
</tr>
<tr>
<td>1998</td>
<td>-0.07</td>
<td>21.89</td>
<td>-0.11</td>
<td>2.82</td>
<td>11.9</td>
<td>12.95</td>
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<tr>
<td>1999</td>
<td>0.12</td>
<td>92.69</td>
<td>0.68</td>
<td>1.19</td>
<td>0.2</td>
<td>17.00</td>
</tr>
<tr>
<td>2000</td>
<td>0.36</td>
<td>102.11</td>
<td>0.34</td>
<td>4.89</td>
<td>14.5</td>
<td>12.00</td>
</tr>
<tr>
<td>2001</td>
<td>0.29</td>
<td>111.94</td>
<td>0.34</td>
<td>4.72</td>
<td>16.5</td>
<td>12.95</td>
</tr>
<tr>
<td>2002</td>
<td>0.13</td>
<td>120.97</td>
<td>-0.17</td>
<td>4.63</td>
<td>12.2</td>
<td>18.88</td>
</tr>
<tr>
<td>2003</td>
<td>0.44</td>
<td>129.36</td>
<td>0.05</td>
<td>9.57</td>
<td>23.8</td>
<td>15.02</td>
</tr>
<tr>
<td>2004</td>
<td>0.36</td>
<td>133.50</td>
<td>0.57</td>
<td>6.58</td>
<td>10.0</td>
<td>14.21</td>
</tr>
<tr>
<td>2005</td>
<td>0.27</td>
<td>132.15</td>
<td>0.57</td>
<td>6.51</td>
<td>11.6</td>
<td>7.00</td>
</tr>
<tr>
<td>2006</td>
<td>0.43</td>
<td>128.65</td>
<td>0.33</td>
<td>6.03</td>
<td>8.5</td>
<td>8.80</td>
</tr>
<tr>
<td>2007</td>
<td>0.61</td>
<td>125.83</td>
<td>0.34</td>
<td>6.45</td>
<td>6.6</td>
<td>6.91</td>
</tr>
<tr>
<td>2008</td>
<td>-0.38</td>
<td>118.57</td>
<td>0.15</td>
<td>5.98</td>
<td>15.1</td>
<td>7.03</td>
</tr>
<tr>
<td>2009</td>
<td>-0.36</td>
<td>148.88</td>
<td>0.11</td>
<td>6.96</td>
<td>13.9</td>
<td>3.72</td>
</tr>
<tr>
<td>2010</td>
<td>0.29</td>
<td>150.30</td>
<td>-0.12</td>
<td>7.98</td>
<td>11.8</td>
<td>5.60</td>
</tr>
<tr>
<td>2011</td>
<td>0.03</td>
<td>153.86</td>
<td>0.07</td>
<td>7.43</td>
<td>10.3</td>
<td>11.16</td>
</tr>
<tr>
<td>2012</td>
<td>0.31</td>
<td>157.50</td>
<td>0.21</td>
<td>6.58</td>
<td>12.0</td>
<td>11.70</td>
</tr>
<tr>
<td>2013</td>
<td>0.22</td>
<td>157.31</td>
<td>0.17</td>
<td>6.89</td>
<td>8.0</td>
<td>10.75</td>
</tr>
<tr>
<td>2014</td>
<td>0.22</td>
<td>158.55</td>
<td>-0.10</td>
<td>6.89</td>
<td>8.0</td>
<td>10.70</td>
</tr>
</tbody>
</table>

Source: Central Bank of Nigeria: Statistical Bulletin (Various Issues)

Table 2. ADF unit root test

<table>
<thead>
<tr>
<th>Difference variable</th>
<th>ADF-Test Statistic</th>
<th>Test of critical level</th>
<th>Order of Integration</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>D(MCAPr)</td>
<td>-6.009562</td>
<td>-3.699871</td>
<td>-2.976263</td>
<td>2.627420</td>
</tr>
<tr>
<td>D(EXCHR)</td>
<td>-5.606112</td>
<td>-3.711457</td>
<td>-2.981038</td>
<td>-2.629906</td>
</tr>
<tr>
<td>D(INFLR)</td>
<td>-4.850510</td>
<td>-3.788030</td>
<td>-3.012363</td>
<td>-2.646119</td>
</tr>
<tr>
<td>D(INTR)</td>
<td>-6.5645842</td>
<td>-3.788030</td>
<td>-3.012363</td>
<td>-2.616119</td>
</tr>
<tr>
<td>D(GDPR)</td>
<td>-5.090450</td>
<td>-3.689194</td>
<td>-2.671853</td>
<td>-2.625121</td>
</tr>
<tr>
<td>D(EXCHR)</td>
<td>-7.809319</td>
<td>-3.689194</td>
<td>-2.971853</td>
<td>-2.625121</td>
</tr>
</tbody>
</table>

Note: D(EXCHR), D(EXTRr), D(INFLR), D(INTR), D(MCAPr) and D(GDPR) represent the differenced values of the Exchange rate (EXCHR), External reserves (EXTRr), Inflation rate (INFLr), Interest rate (INTR), Market capitalization (MCAPr), GDP (GDPr) respectively.
4.2 Granger Causality Test Results

The results of the Granger Causality Test are shown in Table 3.

Generally, the Granger Causality results shown in Table 3 indicate that there is bi-directional causality between market capitalization and GDP. As claimed by Koop (2013); if the P-value for the F-statistic is than 0.05, it can be concluded that \( R^2 \neq 0 \). And if the P-value for the F-statistic is greater than 0.05, it can be concluded that \( R^2 = 0 \). Recall if \( R^2 = 0 \) then X does not have any explanatory impact for Y. Therefore the test of hypothesis \( R^2 = 0 \) aims to interpret if the results expose any influence at all.

As its probability values are less than 0.05 significance levels, 0.0164 and 0.0019 respectively. Also, a two-way movement exited between inflation and market capitalization with probability values less than 0.05 significance levels, 3.E-06 and 0.0055 respectively. However, significant uni-directional Causality prevails between stock market capitalization and interest rate with Causality flowing from market capitalization to interest rate at a probability value of 00239 at 0.05 significance levels. On the whole, no significant Causality prevails between market capitalization and exchange rate as well as between market capitalization and external reserves.

Test of hypothesis two

\( H_0 \): There is no significant Casual and symbiotic disclosure between Stocks Market Capitalization and each exchange rate, external reserves, gross domestic product, inflation rate, and interest rate in Nigeria.

\( H_A \): There is significant Casual and symbiotic disclosure between Stocks Market Capitalization and each exchange rate, external reserves, gross domestic product, inflation rate, and interest rate in Nigeria.

From Table 3 and findings indicate a significant Casual and symbiotic disclosure between stock market capitalization and GDP. There is also inflation rate and market capitalization. The null hypothesis is, therefore, rejected concerning them while the alternate is accepted. For the exchange rate, external reserves, and interest rates, the null hypothesis is accepted, while the alternate is rejected.

The Granger Causality results above indicate that GDP and Stock Market Capitalization do reinforce each other in the growth process. And there are revolving movements in inflation and market capitalization. Hence, the real sectors and the financial sectors through the evidence of GDP and Stock market capitalization disclosed a symbiotic relationship in Nigeria during the periods of the boom. This evidence precludes that an increase in the real sector brings about more money in circulation through job creation. No wonder before the time of recession Nigerians starts by experiencing a glut in GDP as a result of foreign investors withdrawing their investment portfolios as a result of war threat of post-elections matters towards the 2015 presidential elections. More so, the interest rate is shown to responding and adjusting to trends in Stock Market Capitalization while market

<table>
<thead>
<tr>
<th>Table 3. Results of the Pairwise Granger Causality Test</th>
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<tbody>
<tr>
<td>Null Hypothesis:</td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
</tr>
<tr>
<td>MCA PR does not Granger Cause EXCHR</td>
</tr>
<tr>
<td>EXCHR does not Granger Cause MCA PR</td>
</tr>
<tr>
<td>MCA PR does not Granger Cause EXTRR</td>
</tr>
<tr>
<td>EXTRR does not Granger Cause MCA PR</td>
</tr>
<tr>
<td>MCA PR does not Granger Cause INFLR</td>
</tr>
<tr>
<td>INFLR does not Granger Cause MCA PR</td>
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<tr>
<td>MCA PR does not Granger Cause INTR</td>
</tr>
<tr>
<td>INTR does not Granger Cause MCA PR</td>
</tr>
<tr>
<td>GDPR does not Granger Cause MCA PR</td>
</tr>
<tr>
<td>MCA PR does not Granger Cause RGDP</td>
</tr>
</tbody>
</table>

Source: Extracted from E-views 9
capitalization, exchange rate, and external reserves are operating independently of each other. These results could be as a result that the monetary authorities are mismatching the management of inflation rate and interest rate policies. It could also be a result of panic buying or public treasury loot.

5. CONCLUSION

The challenges of Nigerians have made the financial sector to be on its toes by solving high demand customers' services from the overwhelming proceeds of the real sectors. In the process of doing this, a disagreement has always been on the front burners of Nigerians. The notion or dispute to which sector of either the financial sector or the real sector has now been settled in this study. The evidence has shown clearly on GDP and stock market capitalization of a symbiotic disclosure between the real sector and the financial sector. From the above findings, it is concluded that the gross domestic product and inflation rate constituted the significant policy variables of interest to promote and manage the desired performance of the Nigerian stock market. So, this appears that the real sector and the financial sector are moving neck to neck in a positive direction. This reveals that equal additions opportunities to the real and financial sector and proper macroeconomic variables management may transform the Nigerian economy positively. The implication to findings indicates that neither the real nor the financial sector function in isolation. At the same time, the interest rate is depicted as purely promoted by stock market performance and constitutes a derived effect. Finally, stock market performance in Nigeria appears to be independent of the exchange rate and external reserves performance and as such, cannot be influenced by each other.

6. RECOMMENDATION(S)

In light of the above findings, the following recommendations are made:

i. Stock market investment should be adopted as one of the variables in managing Nigeria's Interest rate policy.

ii. The Nigerian Federal Ministry of Finance and Central Bank should step up its fiscal and monetary policies to achieve a stable economy.

iii. The Central of Nigeria should collaborate with the Bank of Industry as well as Agricultural Development Bank to issue out soft loans to capable and interested entrepreneurs to uphold the symbiotic disclosure shown in this study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES


