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Research Article

CAUSAL RELATIONSHIP BETWEEN STOCK MARKET PERFORMANCES AND ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

This study examines the causal relationship between stock market performance and economic growth in Nigeria using quarterly data for the period of 1990-Q1 to 2010-Q4. The ADF and PP tests suggest that the series are random work processes in their level form. The work adopts a Pair-wise Granger Causality to test within multivariate co-integration and vector error correction model (VECM) framework. Three different stock exchange indicators (stock market capitalization, all-share index and value of shares traded) were used as proxy for stock market performance to test the direction of causality between the variables. Thus we have three VAR models. Findings indicate evidence of long run equilibrium relationship between stock market performance and economic growth. It further shows that there is strong bidirectional causality running from stock market performance to economic growth and from economic growth to stock market performance. The estimated co-integrated vector shows that stock market performance exerts positive impact on economic growth in Nigeria. Evidence from Vector Error Correction term reveals that the speed of adjustment is high when SMC, ASI and VST were used as proxy for stock market performance. The Impulse Response Function (IRF) shows that shocks in stock market do not deter economic growth. The ASI accounted for 67.1% of the forecast error variance while GDP accounted for 32.9%. This implies that information in the stock exchange market seem to be the driving force for economic growth. The study affirms a positive links between the stock market and economic growth, and suggests the pursuit of policies that are geared towards rapid development of the stock market.

Keywords: Stock Market, Granger Causality, Growth, Performance, Nigeria.

INTRODUCTION

Background to the Study

The relevance of stock market has assumed a developmental role in global economies following the observable benefits exerted on corporate finance and economic activity. The stock market is viewed as a complex institution imbued with inherent mechanism through which long-term funds of the major sectors of the economy comprising households, firms, and government are mobilized, harnessed and made available to various sectors of the economy (Nyong 1997). If capital resources are not provided to most economic areas especially industries where there are growing demands that are capable of increasing productivity, the rate of expansion of the economy often suffers. In this manner, Alile (1997) observes that the performance of the economy is boosted when capital is supplied to productive economic units. Furthermore, as economies continue to develop, additional funds are therefore needed to meet the rapid expansion, and the stock market serves as an appropriate tool in the mobilization and allocation of savings among competing uses which are critical to the growth and efficiency of the economy. A unique benefit of the stock market to corporate entities is the provision of long-term non-debt financial capital. Through the issuance of equity securities and provision of equity capital, the market enable companies to acquire perpetual capital for development, and avoid over reliance on debt financing, thus improving corporate debt-to-equity ratio (Sylvester and Godfrey 2011).

Prior to the introduction of the Structural Adjustment Programme (SAP) in Nigeria, the stock market was grossly underutilized and only very few Nigerians invested in the market as a result of inadequate awareness and apathy by Nigerians. But since the deregulation of the economy in 1986, the stock market has grown very significantly. For example, with a market capitalization of less than five (5) trillion in the 1990s, the stock market in Nigeria attained over thirteen (13) trillion market capitalization in 2007 before the global economic meltdown. The stock market being a major component in the financial sector of most developing economies such as Nigeria, serves a pivotal role in contributing towards economic growth in these countries. Stock markets fuel economic growth through diversification, mobilizing and pooling of savings from different investors and availing them to companies for optimal utilization. In principle, a well-developed stock market should theoretically increase saving and efficiently allocate capital to productive investments which eventually leads to an increase in the rate of economic growth. The presence of well-functioning stock markets mitigates the principal agent problem and reduces asymmetry information, thus promoting efficient resource allocation and growth (Adjasi & Biekpe 2006).

As much as the stock markets are important in facilitating privatization channels and diversification of the financial sector services, it has also been argued that stock markets may be counter-productive. For instance, more liquid stock markets may put companies at risk of counter-productive takeovers or even with the high level of integration and with the development of technological progress if left uncontrolled, a stock market can lead to economic collapse. Moreover, the effect of uncertainty on savings rate and economic growth is ambiguous as markets become more liquid (Bencivenga & Smith, 1991).

The Nigerian stock exchange is outstripped only by South African Stock exchange. It remains one of the largest equity markets in Sub-Saharan African. Roughly, 266 companies are listed on the exchange with banks accounting for more than half of total market capitalization (Muhlberger, 2010). The market witnessed an unprecedented growth in both the volume and scale of its activities which was stimulated by the consolidation of the banking sector. The recapitalization of banks to a tune of ₦25 billion which 25 banks (but presently 24 banks after Stanbic and IBTC bank merged) emerged from the previous 89 banks clearly revealed the importance of the capital market. In fact, most of the banks in Nigeria were able to raise the required capital after going to the capital market through initial public offerings. Soludo (2006) reported that about $650 million was invested in the banking sector in 2005. Alfaki (2006) puts the figure that was raised from the capital market by banks to meet the minimum capital requirement of ₦25billion as over ₦406.4 billion. The spill-over effect of the global crisis set in as investors in the market began reaping huge

inflationary income from excessive banks credits nurtured by capitalization of the banks and massive inflows of portfolio investment (Aliyu, 2009).

The recent global financial crisis which was precipitated by the United States mortgage crises, liberalization of global financial regulations, boom and burst in the housing market and its effect on other weaker countries like Nigeria necessitates the need for an empirical study of this nature. Evidence in Nigeria shows that between 2008 and 2009, the stock market collapsed by 70% point (Sanusi, 2010). This coincides with the period of global financial crisis which began in middle 2007 in United States and spread into Nigeria in 2008.

The focus on stock markets as an engine of economic growth is a new opening in financial literature. Its benefits had been largely ignored in the past, but now there is consensus concerning the positive effects brought about by stock markets. This study is thus motivated by the need to establish the causal linkage between the stock market performance and long-run economic growth in Nigeria. This is in light of the reasoning that, for a proper stock market to thrive, the prevailing economic conditions must be favourable, and again in order for the economic growth to prosper, there ought to be a vibrant and liquid stock market that ameliorates the allocation of capital and consequently enhancing the prospect for a long-term economic growth.

Research Questions:

- What is the nature of the relationship between stock market variables and economic growth in Nigeria?
- What is the direction of causality between stock market performance and economic growth in Nigeria?
- How does economic growth respond to stock market shocks in Nigeria?

Significance of the Study:

Given that stock market provides some services that ginger economic growth, the significance of this study cannot be overemphasized as it goes a long way to explore the causal relationship between stock market performance and economic growth in Nigeria. The study will be useful to the government of this nation, participants or operators in the stock market and other stakeholders as it will provide policy recommendations on the basis of its findings. This study is also very important at this level because the Nigerian stock market which witnessed a boom in the last few years is now experiencing a meltdown. Thus, it is expected that this study would complement the effort of government and policy makers in reviving the Nigerian stock market and restoring the confidence of shareholders and other participants in the market. More so, the study would further add to the existing literature on stock market performance and economic growth in Nigeria.

Scope/ Delimitation of the Study

To investigate the causal relationship between stock market performance and economic growth in Nigeria, a quarterly time series data will be employed. The study covers the period from 1990- Q_1 to 2010- Q_4. The core variables for estimation are stock market capitalization, all-share index, Value of shares traded and Gross Domestic Product. The choice is based on the availability of data.

Nigerian Stock Exchange: An Overview

The Nigerian stock exchange is made up of many markets, including a market for existing securities. There are also markets for debt securities and for equities (Anyanwu, 1993). The evolution of this market in Nigeria dates back to the pre-independence era when it was virtually dominated and controlled by foreigners. Following the favourable report of the Barback committee (set up in May 1958), the Lagos Stock Exchange was established. It was granted certificate of registration of business name on 1 March, 1959 and incorporated on 15 September, 1960 and commenced business on 5 June, 1961. In order to meet the aspirations of its services, the Lagos stock Exchange was transformed by the Federal Government on 2 December, 1997 into the Nigerian Stock Exchange (NSE) with additional branches in Kaduna and Port-Harcourt (Anyanwu, 1993). Other branches have been established in Owerri, Uyo, Ibadan and Onitsha as at 1999.

When the NSE began operations in 1961, the market was dominated by government long-term bonds (securities) both in the volume of offerings and in the naira value of the securities. Equities, preference shares and debentures put together lagged behind in related to government securities. The capital market was primarily a market for raising capital for new companies or companies expanding their businesses and for trading in second hand securities of the private sector (Onoh, 2002).

Until 1991 that private sector securities for the first time led government securities at the market, government stocks had dominated the market since its inception in 1961. It took a number of macroeconomic policy changes, which stimulated the market into greater activity and created greater awareness among the investing Nigerian public on the usefulness of the capital market. This was done through the indigenization policy of the federal government of the 1970s (Onoh, 2002). Two other policies were the deregulation of the economic in the last quarter of 1986 and the privatization and commercialization of the public sector enterprises which began in 1988. These major policy changes created positive cumulative impacts on the Nigerian capital market in general and the stock market in particular.

Market capitalization of NSE rose from a mere ₦10.02 billion in 1988 to ₦472.9 billion in 2002 while the All Share Index frog leaped from 233.6 in 1988 to 6992 in 1996 and declined slightly to 5266.4 in 1999.

The growth in Nigerian stock exchange continued as indicated by various performance measures. The market recorded a turnover of 12.6 billion shares valued at ₦108.31 billion in 206182 deals in April 2010 against a total of 10.73 billion shares valued at N91 billion during March in 185643 deals. The NSE-ASI rose to 26453.2 in April 2010 from 25966.25 in March of the same year, representing 2.1% increase within one year.

The Model

The Vector Autoregressive (VAR) model shall be employed. The model in its general form is:

$$y_t = \alpha_i + \beta_i \sum_{J=1}^{K} y_{t-1} + \partial_i \sum_{J=1}^{K} X_{t-1} + V_J \ldots \quad (1)$$

Where:

y_t = 4 x 1 vector of endogenous variables (ie. y_t = GDP_t, ASI_t, SMC_t, and VST_t)

α_i = 4 x 1 vector of constant terms

β_i = 4x4 coefficient matrix of the autoregressive terms

∂_i = 4x4 coefficients matrix of the explanatory variables (vector of coefficients)

V_j = vector of innovations.

Definition of Model Variables

The All share Index (ASI), Stock Market Capitalization (SMC) and Value of Shares (VST) Traded as the indicators of the Nigeria Stock Exchange Market shall be used as a proxy for Stock Market Performance (SMP), while the real gross domestic product (GDP) of the Nigerian economy will be a proxy for economic growth.

Equation (1) can be re-written thus:

$$GDP_T = \alpha_0 + \alpha_{11}\sum_{J=1} GDP_{T-1} + \alpha_{12}\sum_{J=1} SMC_{T-1} + \alpha_{13}\sum_{J=1} ASI_{T-1} + \alpha_{14}\sum_{J=1} VST_{T-1} + \varepsilon_{1T} \ldots \quad (2)$$

$$SMC_T = \beta_0 + \alpha_{21}\sum_{J=1}^{K} SMC_{T-1} + \alpha_{22}\sum_{J=1}^{K} GDP_{T-1} + \alpha_{23}\sum_{J=1}^{K} ASI_{T-1} + \alpha_{24}\sum_{J=1}^{K} VST_{T-1} + \varepsilon_{2T} \ldots \quad (3)$$

$$ASI_T = \gamma_0 + \alpha_{31}\sum_{J=1}^{K} ASI_{T-1} + \alpha_{32}\sum_{J=1}^{K} GDP_{T-1} + \alpha_{33}\sum_{J=1}^{K} SMC_{T-1} + \alpha_{34}\sum_{J=1}^{K} VST_{T-1} + \varepsilon_{3T} \ldots \quad (4)$$

$$VST_T = \phi_0 + \alpha_{41}\sum_{J=1}^{K} VST_{T-1} + \propto_{42}\sum_{J=1}^{K} SMC_{T-1} + \propto_{43}\sum_{J=1}^{K} GDP_{T-1} + \propto_{44}\sum_{J=1}^{K} ASI_{T-1} + \varepsilon_{4T} \ldots \quad (5)$$

Where

j is the lag length, K is the maximum distributed lag length, α_0, β_0, γ_0, ϕ_0 are the constant terms, ε_T is independent and identically distributed error term.

In matrix form, the above can be compactly specified as in equation (6)

$$\begin{bmatrix} GDP_T \\ SMC_T \\ ASI_T \\ VST_T \end{bmatrix} = \begin{bmatrix} \alpha_0 \\ \beta_0 \\ \gamma_0 \\ \phi_0 \end{bmatrix} + \begin{bmatrix} \alpha_{11} & \alpha_{12} & \alpha_{13} & \alpha_{14} \\ \alpha_{21} & \alpha_{22} & \alpha_{23} & \alpha_{24} \\ \alpha_{31} & \alpha_{32} & \alpha_{33} & \alpha_{34} \\ \alpha_{41} & \alpha_{42} & \alpha_{43} & \alpha_{44} \end{bmatrix} \begin{bmatrix} GDP_{T-1} \\ SMC_{T-1} \\ ASI_{T-1} \\ VST_{T-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1T} \\ \varepsilon_{2T} \\ \varepsilon_{3T} \\ \varepsilon_{4T} \end{bmatrix} \quad \ldots(6)$$

Transforming the VAR equations into VECM specifications correspond to:

$$\Delta GDP_T = \alpha_0 + \alpha_{11}\sum_{J=1}^{K} \Delta GDP_{T-1} + \alpha_{12}\sum_{J=1}^{K} \Delta SMC_{T-1} + \alpha_{13}\sum_{J=1}^{K} \Delta ASI_{T-1} + \alpha_{14}\sum_{J=1}^{K} \Delta VST_{T-1} + \delta ECM_{T-1} + \varepsilon_{1T} \ldots \quad (7)$$

$$\Delta SMC_T = \beta_0 + \alpha_{21}\sum_{J=1}^{k} \Delta GDP_{T-1} + \alpha_{22}\sum_{J=1}^{k} \Delta SMC_{T-1} + \alpha_{23}\sum_{J=1}^{k} \Delta ASI_{T-1} + \alpha_{24}\sum_{J=1}^{k} VST_{T-1} + \Pi ECM_{T-1} + \varepsilon_{2T} \ldots \quad (8)$$

$$\Delta ASI_T = \gamma_0 + \alpha_{31}\sum_{J=1}^{k} \Delta ASI_{T-1} + \alpha_{32}\sum_{J=1}^{k} \Delta GDP_{T-1} + \alpha_{33}\sum_{J=1}^{k} \Delta SMC_{T-1} + \alpha_{34}\sum_{J=1}^{k} \Delta VST_{T-1} + \lambda ECM_{T-1} + \varepsilon_{3T} \ldots \quad (9)$$

$$\Delta VST_T = \phi_0 + \alpha_{41}\sum_{J=1}^{k} \Delta VST_{T-1} + \alpha_{42}\sum_{J=1}^{k} \Delta ASI_{T-1} + \alpha_{43}\sum_{J=1}^{k} \Delta GDP_{T-1} + \alpha_{44}\sum_{J=1}^{k} \Delta SMC_{T-1} + \psi ECM_{T-1} + \varepsilon_{4T} \ldots \quad (10)$$

Where α^s are parameters to be estimated, Δ is the difference operator, ε_T, k are as defined above. The parameter estimates of δ, Π, λ and ψ should be negative (<0). Equation 7, 8, 9 and 10 can be summarized thus;

$$\Delta y_T = \alpha_i + \beta_i \sum_{J=1}^{K} \Delta y\gamma_{T-1} + \partial_i \sum_{J=1}^{K} \Delta X_{T-1} + \phi ECM_{T-1} + \varepsilon_T \quad \textbf{(11)}$$

Justification of the Model

The choice of a VAR model to be transformed into a vector error correction mechanism (VECM) is made because it is one of the models that are superior to the ones that are vulnerable to simultaneity bias. It offers an easy solution in explaining, predicting and forecasting the values of a set of economic variables at any point in time. It has the ability to test for weak exogeneity and parameter restrictions. It also assumes there is no priory direction of causality among variables. It is a-theoretical and does not require any explicit economic theory to estimate the model (Gujarati, 2003). A good attribute of the VAR model is that it obviates a decision as to what contemporaneous variables are exogenous with only lagged variables on the right-hand side, all variables are endogenous.

Data Analysis and Presentation of the Results

Unit Roots Test Result

The Augmented Dickey Fuller (ADF) and Phillip Perron (PP) unit roots tests were employed to test for the time series properties of model variables. The null hypothesis is that the variable under investigation has a unit root against the alternative that it does not. The choice of lag length was based on Akaike and Schwartz-Bayesian information criteria. Thus, the optimum lag length for ADF and PP were 2 and 3 respectively. The decision rule is to reject the null hypothesis if the ADF and PP statistic value exceeds the critical value at a chosen level of significance (in absolute term). These results are presented in table I below.

Table 1: Unit Roots Test Result

Variable	ADF statistics Level	1st different	Critical values	PP statistics Level	1st different	Critical values
GDP	-1.6	-6.15	1% - 3.51 5% - 2.10 10% - 2.59	-1.68	-8.62	1% - 3.51 5% - 2.10 10% - 2.59
ASI	-1.38	-7.28	1% - 3.51 5% - 2.10 10% - 2.59	-1.84	-14.57	1% - 3.51 5% - 2.10 10% - 2.59
SMC	-0.64	-7.72	1% - 3.51 5% - 2.10 10% - 2.59	-0.97	-12.14	1% - 3.51 5% - 2.10 10% - 2.59
VST	-1.41	-7.51	1% - 3.51 5% - 2.10 10% - 2.59	-1.93	-14.06	1% - 3.51 5% - 2.10 10% - 2.59

The results of table 4.1 above show that all the variables are non-stationary in level form since their ADF and PP values are less than the critical values at 1%, 5% and 10%, the null hypothesis of no unit root was accepted for all the variables but was rejected in 1st difference. Thus, we conclude that the variables under investigation are integrated of order one (I(1)). Since the variable are integrated of the same order. We therefore, examine their co-integrating relationship using Johansen's full information maximum likelihood.

Co-integration Test Result

A necessary but insufficient condition for co-integrating test is that each of the variables be integrated of the same order (Granger, 1986). Following objective one of this study, we examined the long-run relationship between Stock Market Performance (using three different stock exchange market indicators namely: All Share Index (ASI), Stock Market Capitalization (SMC) and Value of Shares Traded (VST)) and Economic Growth. The Johansen co-integration test utilizes two statistics test namely: the trace test and the maximal Eigen value test. The first row in each of the table test the hypotheses of no co-integrating relation, the second row test the hypothesis of one co-integrating relation, against the alternative of full rank of co-integration. The results are presented in table 2 to 5 below.

Table 2: Co-integrating Test Result between ASI and GDP

Eigen value	Likelihood Ratio	5% critical value	1% critical value	Hypothesized No of CE(s)
0.440391	48.89435	15.41	20.04	None**
0.030198	2.453059	3.76	6.65	At most 1

***(**) denotes rejection of the hypothesis at 5% (1%) significance level. L.R. test indicates 1 co-integrating equation(s) at 5% level of significance**

Table 3: Co-integrating Test Result between SMC and GDP

Eigen value	Likelihood ratio	5% critical value	1% critical value	Hypothesized No of (E(s)
0.408290	44.28022	15.41	20.04	None**
0.028354	2.301117	3.76	6.65	At most 1

***(**) denotes rejects of the hypothesis at 5% (1%) significance level**

L.R test indicates 1 co-integrating equation(s) at 5% significance level.

Table 4: Co-integrating Test Result between VST and GDP

Eigen value	Likely hood ratio	5% critical value	1% critical value	Hypothesized No of (E(s)
0.421748	46.40957	15.41	20.04	None**
0.031856	2.589927	3.76	6.65	At most 1

***(**) denotes rejection of the hypothesis at 5% (1%) significance level. L.R indicates 1 co-integrating equation(s) at 5% significance level.**

Interpretation of co-integrating results

In table 2 to 4 above, the likelihood and maximal Eigen value statistics indicate the presence of one co-integrating equation at 5% significance level which implies that stock market indicators (ASI, SMC and VST) used as proxies for stock market performance (SMP) and GDP used as proxy for economic growth are co-integrated. These show rejection of null hypothesis of no co-integration and acceptance of the alternative of co-integration. Thus, the results suggest existence of a stable long run relationship between stock market performance (SMP) and economic growth.

Vector Error Correction Model (VECM) Result

Since there is co-integration, the vector error correction model is estimated. The results are presented in Table 5 below.

Table 5a: Variables included in the VECM: ASI and GDP

Variable	α's	ECM
ASI	1.000000	-1.010995 (-2.49958)
GDP	-0.00719 (22.5370)	131.8635 (5.05415)
C	712.4544	

Table 5b: Variables included in the VECM: SMC and GDP

Variable	β's	ECM
SMC	1.000000	-1.046575
		(-4.17944)
GDP	-0.001130	-66.26774
	(-9.84779)	(-3.55917)
C	241.8753	

Table 5c: Variables included in the VECM: VST and GDP

Variable	β's	ECM
VST	1.000000	-1.356345
		(-5.02972)
GDP	-0.150454	0.662191
	(-7.54205)	(1.07732)
C	43724.49	

Note: The t-statistics are in Parentheses

Interpretation of VECM Results

From tables 5a, 5b and 5c respectively, we can formally state the normalized long-run co-integrating equation between stock market performance and economic growth.

ASI = 712.4544 – 0.00719GDP---------- (1)

SMC = -241.8753 – 0.001130GDP---------- (2)

VST = 43724.49 – 0.150454GDP ------- (3)

From equation (1) as in table 5(a), the VECM result shows that there is a significant long-run relationship between stock market performance proxied by ASI, SMC and VST, and economic growth proxied by real GDP, suggesting that stock market performance exert significant impact on economic growth.

Interpretation of Vector error correction term

The vector error correction term for ASI is -1.01. This speed of adjustment suggests that about 1.1% of the previous period's disequilibrium in stock exchange market is corrected every quarter. The implication is that it will take more than two quarters for any disequilibrium to be corrected. The vector error correction term for GDP is 131.9. This implies that about 131.9% of the previous period's imbalance is corrected every quarter.

For SMC, the vector error correction is -1.05 implying that about 1.5% of the disequilibrium in stock exchange markets is corrected quarterly while that of GDP is – 66.3. This implies that about 66.3% of the previous period`s imbalance is corrected every quarter.

For VST, the speed of adjustment is -1.36, implying that about 1.36% of the previous period disequilibrium is corrected quarterly. While that of GDP is 0.66, which implies that about 66% of the previous period`s imbalance is corrected every quarter. These error correction terms suggest high speed of adjustment. This implies that stock market performance and economic growth adjust to their stable long run equilibrium relationship.

The optimum lag length of 8 was selected based on AIC and SBC information criteria. This means that the convergence between the variables is not instantaneous.

Following objective two, the direction of causality between stock market performance and economic growth were tested using pair-wise Granger causality test. The results are presented in table 6 below. The null hypothesis of no direction of causality was tested against the alternative that there exists a direction of causality amongst the variables.

In our case there are four possibilities namely:

Unidirectional causality from economic growth (GDP) to stock market performance

(SMP) when the coefficient of GDP is statistically significant.

Unidirectional causality from SMP to GDP when the coefficient of SMP is statistically significant.

Feedback or bidirectional causality when the sets of SMP and GDP coefficients are statistically significant.

Finally, mutual independence, when SMP and GDP coefficient are statistically insignificant.

Table 6: Pairwise Granger Causality Test Results

Null hypothesis	F-statistical	P-value	Conclusion
GDP does not granger cause ASI	5.60765	2.7E-05	Reject Ho
ASI does not granger cause GDP	14.2231	2.7E-11	Reject Ho
GDP does not granger cause SMC	12.9525	1.5E-10	Reject Ho
SMC does not granger cause GDP	5.77622	1.9E-05	Reject Ho
GDP does not granger cause VST	10.6924	3.8E-09	Reject Ho
VST does not granger cause GDP	13.3185	8.9E-11	Reject Ho

Interpretation of Pair-wise Granger Causality Test Result

From Table 6, the causality test revealed that stock market performance proxied by ASI, SMC and VST granger cause economic growth proxied by real GDP with a feedback. This indicates a strong bidirectional causality running from stock market performance (SMP) to economic growth and from economic growth to stock market performance. The conclusion was arrived based on the fact that their F-statistics were statistically significant at 5% as indicated by their p- values. These results corroborate the findings of Luintel and Khan (1999), Ahmed et al (2008) and Dawson(2008).

Impulse Response Function

Following objective three, Impulse Response Function (IRF) and Forecast Error Variance Decomposition was used to trace the effect of shocks and transmission of periodic shocks between stock market performance and economic growth for over 10 quarters. The impulse response graph (see appendix VII) represents various response of stock market performance proxied by ASI to a one standard deviation (0.25 percentage point) shocks in the economic growth (GDP). The positive response of GDP to ASI implies that an increase in stock market performance improves economic growth. Also, the positive response of ASI to GDP suggests that an increase in economic growth increase stock market performance.

The forecast error variance between stock market performance and economic growth was examined using Cholesky Forecast Error Variances Decomposition (FEVD) for a period of 10 quarters (see appendix VI). This is computed by orthogonalizing the innovations with Cholesky decomposition. For ASI, after ten periods, the GDP accounted for 0.9% of the forecast error in stock exchange market, while ASI accounted for 99.1%. This implies that information in the stock exchange market seem to be the driving force behind the stock exchange market variance.

For GDP, All Share Index accounted for about 67.1% of the forecast error variance in economic growth after ten periods, while GDP accounted for 32.9%. This suggests that information in the stock exchange markets and GDP seem to be the driving force behind economic growth variance.

Descriptive Statistics

The characteristics of the distribution of the variables are presented in Table 7 below.

Table 7: summary of the descriptive statistics of the variables

	ASI	SMC	VST	GDP
Mean	13982.61	1989.711	248260.2	1862421
Median	7755.425	534.4625	39227.11	800328.6
Maximum	57990.2	10301	1679144	6745561
Minimum	513.8	12.1	225.4	66260.6
Std. Dev.	13568.58	2789535	408589	2016650
Skewness	1.303429	1.55618	1.94484	1.095754
Kurtosis	4.141635	4.24906	5.879802	2.806922
Jarque-Bera	28.34665	39.36429	81.98004	16.93994
Probability	0.000001	0	0	0.00021
Observations	84	84	84	84

Jarque-Bera is a statistical test that determines whether the series is normally distributed. This statistic measures the difference of the skewness and the kurtosis of the series with those from the normal distribution. The null hypothesis is that the series is normally distributed against the alternative that it is not. Evidently, the Jarque-Bera statistic rejects the null hypothesis of normal distribution for all the variables since their probability value is less than 0.05. This implies that all the variables are not normally distributed.

Kurtosis measures the peakedness or flatness of the distribution of the series. The statistic for Kurtosis shows that all the variables are Leptokurtic since their distributions are peaked (approximately greater than 3) relative to the normal. Lastly, skewness is a measure of asymmetry of the distribution of the series around its mean. The statistic for skewness shows that all the variables are positively skewed implying that these distributions have long right tails.

Discussion of Findings

According to the results, the stationary test indicates that all the variables are stationary at the first difference. The co-integration test illustrate that the variables are co-integrated and implying that a long run relationship exists between them. The result from FEVD shows that for stock market, after 10 quarters, ASI accounted for 99.1% of the forecast error to itself while the GDP accounts for 0.9% of the forecast error variance. This suggests that information in the stock exchange market seem to be the driving force behind stock exchange market variance. For economic growth, ASI accounts for 67.1% of the forecast error variance while GDP accounts for 32.9%. This implies that information in the stock exchange market seem to be the driving force for economic growth. Given that correlation does not imply causation in any way, the study carried out a Granger causality test within VECM framework to determine the direction of causality between stock market performance and economic growth. The result shows that there is bidirectional causality running from stock market performance to economic growth and from economic growth to stock market performance.

Considering the implications of the findings, it can be stated that since there is a positive and significant relationship between stock market performance and economic growth in Nigeria, it suggests that to enhance economic growth, policy makers and market regulators need to sustain the level of reforms, also the market efficiency and deepening needed to sustain the stock market, for it to have a long run impact on economic growth.

Summary of Findings

The variables are non stationary, therefore, random walk series. When the first

differences of the series were taken, the ADF and PP test statistics became significant.

Therefore, the series are I (0) processes and they are integrated of order one.

The Johansen Co-integration Test result showed a one co-integrating vector between

stock market performance and economic growth. This means that there exists a stable long-run equilibrium relationship between stock market performance and economic growth.

The estimated co-integrated vector within the VECM framework reveals that stock market variables exert a positive impact on economic growth. The magnitudes of the estimated coefficients shows that stock market performance have significant positive impact on the magnitude of economic growth.

Evidence from the VECM suggests high speed of adjustment. This implies that stock market performance and economic growth adjust to their stable long run equilibrium relationship.

In order to consider the parsimony principle and residual's white-noise property, lag interval of 8 was selected based on MAIC and MSBC information criteria. The lag length of 8 suggests that the adjustment of stock market and economic growth to their long run equilibrium relationship is not instantaneous. Specifically, it will take about 8 quarters (2 years) for any disequilibrium in the stock market to spread to the economy.

The results show that shocks in the stock exchange market do not deter economic growth.

Conclusion

The present study makes a modest attempt to explore the causal relationship between stock market development and economic growth in the Nigerian economy for the period 1990Q1 – 2010Q4. The study primarily revolved around two major questions: *firstly,* whether at all any relationship exists between stock market performance and economic growth. *Secondly*, what could be the nature and direction of the causal relationship, if any i.e. does performance of stock market promote economic growth or vice versa? To test these hypotheses, we employ the methodology of Vector Autoregressive (VAR) model. The three important indicators for stock market development variables included in the study are stock market capitalization, all-share index and value of shares traded. Real GDP was used as a proxy for economic growth. The results show bidirectional causality between Stock market performance and economic growth.

Further work may also be done to establish whether other aspects of the stock market such as size, volatility, and depth in terms of instruments on offer exhibits different results from the ones reached in the conclusion of this study. While much work remains to be done to better understand the relationship between stock market performance indicators and economic growth, a growing body of evidence suggests that stock markets provide services to the economy, which are crucial for long-term economic growth.

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