

implicitly and explicitly in (4) and (5), respectively as follows:

$$NSI = f(M2, GDP) \quad (2)$$

$$NSI = \beta_0 + \beta_1 GDP_t + \beta_2 M2_t + e_t \quad (3)$$

NSI is a function of the macroeconomic variables, where, *NSI* = Nigerian Stock Exchange All-share Index; *M2* = money supply and *GDP* = gross domestic product; β_0 is constant and β is coefficient of the variables, and e is expected to be greater than zero, while e is the residual error of regression representing global financial crisis and other exogenous factors that may not be readily measurable. Ordinary least squares (OLS) multiple regression (Zhang, 2009) method is adopted to compute the estimates of the regression model. All the estimations were performed in the econometrical software programme E-Views. Cointegration analysis, vector error correction and Granger-causality tests are to establish the relationships between GDP and M2, and stock prices. Augmented Dickey-Fuller test (developed by Dickey and Fuller, 1979) and Philips-Perron test procedure was adopted.

4. Results and Discussion of the Findings

4.1 Unit Root Test

The order of integration of the series is explained by the results from the unit root test results (Table 4.1).

Table 4.1: Unit Root Results

Variable	ADF Stats	Order of Integration
LNSI	-4.128790*	I(1)
GDP	-5.797371**	I(1)
M2	-4.323347*	I(1)

(*) = significant at 1%(5%) level. **Source: Output Data from E-views 3.1

The results presented in Table 4.1 shows that all the variables are integrated of the same order, I(1). Thus, there is the possibility of the existence of a long-run relationship among the variables.

4.2 Cointegration Analysis:

Table 4.2 below presents the results for cointegration tests.

Table 4.2: Cointegration Tests Results

H ₀	H ₁	Likelihood Ratio	5% Critical Value
r = 0	r > 0	31.45966*	29.68
r ≤ 1	r > 1	16.04828*	15.41
r ≤ 2	r > 2	3.446476	3.76

*= significant at 5% level. LR test indicates 2 cointegrating equations at 5% level.

Source: Output Data from E-views 3.1

The results indicated that there are two co-integrating equations at 5% level since the LR do not lead to the rejection of the null hypothesis $r \leq 2$. Based on these results, it can be said that a long-run relationship exists among LNSI, GDP, and M2 in Nigeria.

4.3 Normalized Co-integrating Vectors Test Results

Table 4.3 presents the normalized cointegrating vectors test results.

Table 4.3: Normalized Cointegrating Vectors

LNSI	GDP	M2
1.000000	-0.243857**	0.305288*
	(0.10645)	(0.15674)
	[-2.2908126]	[1.9477351]

(*) = significant at 5%(10%) level. Note: figures in () and [] are Std. errors and t-statistics respectively. **Source: Output data from E-views 3.1

One can write the above co-integrating vectors in the form of an equation as shown below;

$$LNSI = -0.243857GDP + 0.305288M2 \text{ -----} \quad (4.1)$$

The equation indicates that GDP has a negative and significant effect on the Nigeria Stock Exchange all-share index in the long-run while money supply (M2) has significant positive effect on the Nigeria Stock Exchange all-share index in the long-run.

4.4 Vector Error Correction Model (VECM)

The estimation of VECM (Table 4.4) makes it possible to separate the long-run relationship between economic variables from their short-run responses.

Table 4.4: VECM Results with Respect to LNSI.

Dependent Variable: $\Delta LNSI$

Constant	ΔGDP	$\Delta M2$	ECM(-1)
0.194033**	0.005898	0.004470	0.064991*
(0.0014)	(0.3252)	(0.2248)	(0.0556)

**(*) = significant at 1%(10%) level. $R^2 = 0.201503$, Adj $R^2 = 0.101691$, DW = 1.65,

F-Value = 2.018821, prob.(F-Value) = 0.03809. **Source: Output Data from E-views 3.1**

The results indicate that the error correction term ECM (-1) appearing in the equation is statistically significant at 10% level of significance. The coefficient of the error correction term is about 0.06 with the expected negative sign. A significant error term with the right sign indicates a strong feedback effect of deviation of LNSI from its long-run growth path. The value of the coefficient of the error term represents the speed of adjustment. The coefficient 0.06 of the error correction term shows that about 6% of the discrepancies between the actual and equilibrium value of the LNSI is corrected in each period in Nigeria.

4.5 Granger Causality Tests

The granger causality tests results show that there is unidirectional causal relationship running from NSI to GDP, and no causality between NSI and M2 in Nigeria (Table 4.5).

Table 4.5: Granger Causality Tests

Direction of Causality	F-Value	Decision
GDP → LNSI	0.09954(0.90564)*	Do not reject H ₀
LNSI → GDP	2.77022(0.08357)**	Reject H ₀

M2 → LNSI	0.61348(0.55047)*	Do not reject H ₀
LNSI → M2	0.31047(0.73626)*	Do not reject H ₀

Note: figures in () are the p-values. **(*) = significant at 10% (not significant at any level). *Source: Output Data from E-views 3.1 from E-views 3.1*

4.6 Conclusion and Recommendations

Based on the results of the unit root tests there is indication of a long-run relationship between gross domestic product and stock market prices, on one hand, and money supply and stock market prices on the other hand. The findings of co-integrating vectors indicated that gross domestic product has significant long-run negative effect on stock market prices contrary to the *a priori* expectation Money supply has long-run positive effect on stock market prices which is consistent with the *a priori* expectation. However, the results of the error correction model show that both gross domestic product and money supply have positive and insignificant effect on stock market prices in Nigeria.

Again, there is unidirectional causal effect between gross domestic product and stock market prices with direction running from stock market prices to gross domestic product, and no causal effect between money supply and stock market prices in Nigeria. The non-causal effect between macroeconomic variables and stock market prices is an indication of informational inefficiency market. The adjusted R² value of 0.101691 implies that about 10% of the variations in stock market prices are accounted by changes in macroeconomic variables (specifically, GDP and M2) in Nigeria. F-statistic value of 2.018821 with p-value of 0.038097 indicates that these variables have insignificant effect on stock market prices in Nigeria. F-statistic confirms the result of the adjusted R² that GDP and money supply account for about only 10% of the variations in stock market prices in Nigeria.

The implication is that predicting stock market prices based on macroeconomic factors will be difficult to make. Again monetary policy makers will not find it easy to plan and forecast macroeconomic variables that help to boost the stock market. Investors should not rely on the announcement of macroeconomic variables in deciding whether or not to invest or not to invest. This is because stock price changes are influenced not just by macroeconomic factors but some other intervening factors that may not be readily amenable to measurement. Firms should also focus on improving their profitability performance so as to attract more investors. By so doing they would be able to maximize the value of their firms. In future investigation should be conducted to find out the best macroeconomic variables that impact positively on stock market prices in Nigeria.

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