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# DETERMINANTS OF STOCK MARKET DEVELOPMENT IN NIGERIA USING ERROR CORRECTION MODEL APPROACH

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**ABSTRACT**

Harnessing economic resources for national development is a major goal of governments; the stock market provides the medium through which funds could be mobilized and allocated for investments for development. This study sought to examine empirically whether stock market liquidity, savings rate, investment ratio, and foreign direct investment (FDI) were determinants of stock market development in Nigeria from 1970-2007. Using secondary data from the Central Bank of Nigeria Statistical Bulletin, 2007, and adopting co-integration and error correction mechanism (ECM), we found that stock market liquidity, savings rate, and one-period lagged stock market development were significant predictors of stock market development in Nigeria. It implies that improving liquidity of the market would impact the stock market; more domestic firms should be encouraged to enlist in the market and Nigerian businessmen abroad should enlist their companies in their home stock market to increase liquidity in the market.

**KEY WORDS**: Macroeconomic Determinants, Stock Market Development, Error Correction Mechanism, Nigeria.

## INTRODUCTION

Harnessing economic resources for national growth and development is one of the major macroeconomic goals of a nation. To achieve this objective, nations must save and invest in profitable ventures. For sustainable growth and development, funds must be effectively mobilized and allocated to enable business and the economies harness their human, material and management resources for optimal output. The stock market therefore becomes an economic mechanism, which is often used to promote efficiency in capital formation and allocation. It enables the governments and industries to raise long-term capital for financing new projects; and expanding and modernizing industrial and commercial concerns.

Many studies have linked stock market development with economic growth only. The pioneering works in this area include the articles from Gurley and Shaw (1955, 1960, 1967), Mckinnon (1973), and Shaw (1973). Recent studies on the subject include works of Yartey (2008), and Beck and Levine (2003). In Nigeria, studies on the subject include Ogun and Iyoha (2005), and Anyanwu (2005). Both pioneering and new researches provide evidence to the fact that a well functioning financial system is crucial to economic growth. As part of the financial system, the stock market plays important role in economic growth trend. Then, the question of what determines stock market development becomes a pertinent research question. However and surprisingly, most works in Nigeria only studied the link between economic growth and stock market development. Therefore, this present work became an important contribution in examining empirically other determinants of stock market development in Nigeria. The specific objectives include to estimate the short-run and long-run effects of stock market liquidity (equity/GDP), investment ratio (i.e. gross fixed capital formation over GDP ratio), national savings rate (i.e. domestic savings over GDP ratio) and foreign direct investment(FDI) on stock market development variable (i.e. market capitalization over GDP ratio). The study becomes important because finding the specific macroeconomic factors that determine stock market development for Nigeria can help inform policy makers to use such determinants as specific policy variables in policy formulation and implementation for the development of Nigeria's stock market.

Stock market liquidity is the ease and speed to which an investor can off-load his investment for cash. This is one of the most important functions of the stock market. Liquid stock markets allow investors to alter their portfolios quickly and cheaply; it makes investment less risky and facilitates longer-term, more profitable investments. Consequently, the more liquid the market, the larger the amount of savings and investments are channeled through the stock markets. Therefore, one expects a more liquid market to lead to a higher stock market development.

Also, foreign investors have emerged as major participants in emerging stock markets. It is argued that the long-term impact of foreign capital inflows on the development of the stock market is broader than the benefits from initial flows and increases investor participation. And because FDI is associated with institutional and regulatory reforms, adequate disclosure and listing requirements and fair-trading practice; this increase in information and operational efficiency is often expected to inspire greater confidence in domestic market and development (Miller, 1991).

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**Literature Review**

The most current empirical work on the determinants of stock market development is the work of Yartey (2008). It examines both the macroeconomic and institutional determinants of stock market development using a panel data of 42 emerging economies for the period 1990 to 2004. The study finds that macroeconomic factors, such as income level, gross domestic investment, savings, bank sector development, private capital flows, and stock market liquidity are important determinants for stock market development in emerging market countries. The results also show that institutional qualities such as the political risk, law and order, and bureaucratic quality are important determinants of stock market development because they enhance the viability of external finance. It concludes that the results for emerging markets also hold for South Africa.

However, stock market development is a multi-dimensional concept. It is usually measured by stock market size, liquidity, volatility, concentration, integration with world capital markets, and the legal rule (regulation and supervision) in the market (Garcia, 1999). Yartey (2008) uses market capitalization as a percentage of GDP to measure stock market development because it is believed to be a good proxy and less arbitrary than other individual measures of stock market development, which include: number of listed companies, change in the stock market index, and an index of stock market size and liquidity.

Earlier, Yartey (2007) finds that a percentage point increase in financial intermediary sector development tends to increase stock market development in Africa by 0.6 point, controlling for macroeconomic stability, economic development, and the quantity of legal and political institutions. El-Wassal (2005) investigates the relationship between stock market growth and economic growth, financial liberalization, and foreign portfolio investment in 40 emerging markets between 1980 and 2000. The result shows that economic growth, financial liberalization polices, and foreign portfolio investments were the leading factors of the emerging sock markets growth.

It is known that both macroeconomic and institutional factors are important in stock market development. Pagano (1993) shows that regulatory and institutional factors may influence the functioning of stock markets. For example, mandatory disclosures of reliable information about firms may enhance investor participation, and regulations that instill investor's confidence in brokers should encourage investment and trading in the stock markets.

However, this present work concentrates on the macroeconomic factors because accurate information on institutional variables is limited in a developing country like Nigeria. Also, institutional factors are directly reflected in macroeconomic factors. It has been shown that some institutional measures such as legal role are highly correlated with stock market liquidity, while stock liquidity is one of the macroeconomic determinants examined in this study (Demirguc-kunt and Levine 1996, and Garcia and Liu, 1999). Specifically, the macroeconomic factors investigated in this study are:

**Stock Market Development**:

Various studies used stock market development as dependent variable. They measure stock market development using market capitalization as a proportion of GDP. This measure equals the money value of listed shares divided by GDP. The underlying assumption behind this measure is that overall market size is positively correlated with the ability to mobilize capital and diversify risk on an economy-wide basis (Yartey, 2008). Variables often used as independent variables include income level; real income was found to be highly correlated with the size of the stock market. Its cyclical component should impact the size of the stock market and its price index. In addition, because higher income usually goes hand in hand with better-defined property rights, better education, and a better general environment for business, one expects it to have a positive effect on the stock market size. Another variable includes banking sector development most studies use $M_2$ relative to GDP as a measure of financial depth. However, according to King and Levine (1993), this measure does not tell whether the liabilities are those of the central bank, commercial banks or other depository institutions. As a result, some studies use the value of domestic credit provided by the banking system to the private sector relative to GDP as a measure of banking sector development. Private credit is the most comprehensive indicator of the activity of commercial banks. It captures the amount of external resources channeled through the banking sector to private firms. This measure also isolates credit issued to the private sector as opposed to credit issued to the governments and public corporations. One expects credit to the private sector to be positively correlated with stock market capitalization. However, very high levels of banking sector development can lead to substitutability between debt and equity making the coefficient of the bank credit negative.

**Stock Market Liquidity**:

Stock markets, like financial intermediaries, channel savings to investment projects. Usually, the larger the savings, the higher the amount of capital flows through the stock market. Thus, one expects savings and investment to be important determinants of stock market development. Some studies use gross domestic savings as percentage of GDP and gross fixed domestic investment as a percentage of GDP. Another independent variable is stock market liquidity. This is the ease and speed to which an investor can off-load his investment for cash; and it is one of the most important functions of the stock market (Miller, 1991 in Garcia and Liu 1999). Liquid stock markets allow investors to alter their Portfolios quickly and cheaply, it makes investment less risky and facilitates longer-term, more profitable investments (Levine, 1991, and Bencivenga, Smith and Starr, 1996 in Garcia and Liu, 1999). Consequently, the more liquid the market, the larger the amount of savings are channeled through the stock markets. Therefore,

one expects a more liquid market to lead to a higher market capitalization. Some studies measure stock market liquidity using value of equity transactions relative to GDP. This measure is said to not directly measure how easily investors can buy or sell shares at posted prices. However, it does measure the degree of trading relative to the size of the economy. It therefore, reflects stock market liquidity on an economy-wide basis as stated by Levine and Zervos (1998) in Garcia and Liu (1999).

**Private capital flows (FDI):**

Foreign investors have emerged as major participants in emerging stock markets, in the past two decades. Errunza (1982) in Garcia and Liu (1999) argue that the long-term impact of foreign capital inflows on the development of the stock market is broader than the benefits from initial flows and increases investor participation. FDI is associated with institutional and regulatory reform, adequate disclosure and listing requirement and fair-trading practices. The increase in information and operational efficiency is expected to inspire greater confidence in domestic markets. This increases the investor's base and participation and leads to more capital flows. A capital flow is measured in most works using FDI as percentage of GDP.

**Macroeconomic stability:**

General macroeconomic stability may well be an important factor for the development of the stock market. It is expected that the higher the volatility of the underlying economic situation, the less incentive firms and savers would have to participate in the market. With the high instability observed in Nigeria, this is believed to negatively affect the sock market. The profitability of firms can experience sharp movements due to unexpected changes in economic policies such as monetary policy, fiscal policy, exchange rate policy, and trade policy. Hence, one expects that stock market in Nigeria with volatile macroeconomic conditions would also have volatile price indexes and market capitalization. To determine the impact of macroeconomic stability on market capitalization, one can use three measures such as interest rate, current inflation and exchange rate (dollar-naira rate) following their importance in previous works is stated by Yartey (2008). Inflation, in particular, is often hedged by stock purchases, and the nominal equity returns should be positively related to inflation (the Fisherian hypothesis). McCarthy *et al* (1990), however, suggest a negative relationship between stock returns and inflation.

To summarize the empirical literature; scholars seem to agree that macroeconomic variables such as income level, gross domestic investment, banking sector development, private capital flows, stock market liquidity, savings rate, and macroeconomic stability policies (including interest rate, inflation, and exchange rate) impact on stock market development. The availability of data on these variables for Nigeria provides an opportunity to test the validity of this assertion.

**METHODOLOGY**

(a) **Analytical framework**: This study adopts the co-integration and error correction methodology, which overcomes the problems of spurious or false regression, caused by non-stationary time-series data and also informs of the long run relationship as well as short-run dynamics in the same model.

(b) **The Data:** The data used for the study were basically secondary data extracted from the Central Bank of Nigeria Statistical Bulletin, volume 18, 2007.

(c) **Model Specification**: The specification of the empirical models was guided by the theoretical and empirical literatures. Following the stated specific objectives of the study, the empirical model is expressed as:

$MKTCGDP=\alpha_0 + \alpha_1 STMKTLIQ + \alpha_2 SAVGDPR + \alpha_3 FDI + \alpha_4 INVRATIO + \mu_t$ …….. (1)

Where:

| | | |
|---|---|---|
| MKTCGDP | = | market capitalization - GDP ratio. (a measure of stock market development). |
| STMKTLIQ | = | stock market liquidity ratio ($\alpha_1 > 0$) |
| SAVGDPR | = | savings-GDP ratio ($\alpha_2 > 0$) |
| INVRATIO | = | investment -GDP ratio ($\alpha_4 > 0$) |
| FDI | = | Foreign direct investment ($\alpha_3 > 0$) |
| $\mu_t$ | = | Stochastic error term assumed to be independently and normallydistributed with zero mean and constant variance. |

(d) **Estimation Techniques:**

The study adopted the Engle and Granger (1987) two steps procedure in co-integration. Firstly, an analysis was made to find the order of integration of the data sets. Secondly, the ordinary least squares (OLS) regression was done to estimate the equation for those macroeconomic variables where co-integration could be found ( Nkang, Abang, Akpan and Offem, 2007). The first process is the stationarity test (unit root test) and the second process is the co-integration test. In the co-integration test, the residuals obtained in the long-run co-integration regression were used as explanatory variables to specify a dynamic error correction model (ECM), which is estimated via OLS regression.

Econometric analyses have shown that most time-series data sets are non-stationary, meaning that they have a tendency to increase or decrease over time; therefore, an error correction mechanism becomes imminent in most time series analyses. The consequence of non stationary data is that the asymptotic convergence theories (such as weak law of large numbers) that is found in statistical estimation theory are violated and such data should not be used

in regression analyses, because such regression would yield false estimates as stated by Nkang, Abang, Akpan and Offem (2007).

(e) **Test for Stationarity (unit root tests):**
The Augmented Dickey Fuller (ADF) test was used for this purpose. The ADF includes the first difference in lags in such a way that the error term is distributed as white noise, the ADF test adopts the formula:

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \sum_{t=1}^{i} Y \Delta Y_{t-j} + \mu \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Here, the lag length j chosen for ADF ensures that $\mu_t$ is empirical white noise; the significance of P is tested against the null that P = 0, based on t- statistics on P obtained from the OLS estimates of equation (2). Thus, if the null hypothesis of non-stationary cannot be rejected, the individual variables are differenced accordingly until they become stationary that is until the existence of a unit root is rejected. One then goes ahead to conduct a co-integration test.

(f) **Test for Co-integration:**
Co-integration is said to exist between non-stationary variables if their linear combination, namely the residuals of the co-integrating regression are stationary (Engle and Granger, 1987; Hendry; 1986). Thus, falseness can only be avoided if a stationary co-integrating relationship is established between the variables. The error correction form requires modeling co-integrated series. When variables are co-integrated, there exists a valid ECM describing their relationship, with the implication that co-integration between variables involved is a precondition for the ECM (Engle and Granger, 1987).

The study used the ADF and applied them to the residuals of the co-integrating regression. If the residuals of the bivariate co-integrating regression are found to be stationary, implying co-integration, one will be guided towards specifying an error correction mechanism, which is the second step of the Engle-Granger two-step process. According to Engle and Granger (1987), the co integration regression can be specified as:

$Y_t = \alpha_0 + \beta X_t + \mu_t$ …….. (3)

Equation (2) can be re-written without the inclusion of adjustment lags as follows:

$Y_t = \alpha + \beta X_t - ECM (Y_{t-1} - \alpha - \beta X_{t-1}) + \mu_t$ …….. (4)

The residuals of the equation, $\mu_t = (Y - \alpha_0 - \beta X_t)$ are simply a linear difference of the non-stationary series (i.e. $Y_t - X_t$) then, a linear difference of the non stationary series (i.e. Yt - Xt) then, a number of bivariate co-integrating regressions were run between the regressand and each of the independent variables.

Lastly, the residuals of the valid co-integrating regressions were included in the model as independent variables, before estimating the model using OLS. From equation (3), the error correction model is thus:

$\Delta Y_t = \alpha_0 + \beta \Delta X_t - \Psi(Y_t - \alpha - \beta_{Xt})_{t-1} + \mu_t$ …….. (5)

Where $X_t$ = the vector of explanatory variables
Y and $X_t$ = the co-integration variables
Ψ = the error correction mechanism (ECM)
$\alpha_0$ = the vector of parameters.

**RESULTS AND DISCUSSION**
(a) **Tests for Stationary:** The result is presented in Table 4.1 below. The null hypothesis of the presence of a unit root (non-stationary) was tested against the alternative hypothesis of the absence of unit root (stationarity). All the variables were not stationary at levels or at first difference and then they were differenced twice before becoming stationary. From the results, it shows that the variables were integrated of order 2, i.e. I(2). One then proceeded to discuss the results of co integration between the dependent and each of the independent variables.

**Table 4.1: Results of Unit Roots, Some With and Without Trend: Sample: 1970-2007. Dependent Variable: Stock Market Development**

| Variable | Levels | Critical values | Variable 1st difference | 5% level | Variable 2nd difference | Lag length | Order of integration |
|---|---|---|---|---|---|---|---|
| ΔMKTCGDP | -1.1681 | -2.9458 | -0.7203 | -2.9484 | -16.0490 | 0 | 1 (2) |
| ΔSTMKTLIQ | 8.9934 | -2.9458 | 9.7568 | -2.9484 | -8.0616 | 1 | 1 (2) |
| ΔSAVGDPR | -3.8626 | -2.9434 | -8.8688 | -2.9458 | -8.0616 | 1 | 1 (2) |
| ΔINVRATIO | -5.8925 | -3.5366 | -6.6556 | -3.5443 | -8.6345 | 1 | 1 (2) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ΔFDI | -2.5491 | -3.5485 | -2.3683 | -3.5443 | -7.3110 | 1 | 1 (2) |

**Note:** Critical values of ADF test were based on Mackinnon (1996) one-side ρ-values. Lag length selection was automatic based on Eviews (4.1) Schwarz information criteria.

(b) **Engle and Granger co-integration Test:** was conducted to determine whether there exists a co-integrating relationship (or static equilibrium) among the variables. The result is shown in Table 4.2 below. The test was applied to the long-run regression of the variables taken together, the residuals were stationary indicating that there exists a long-run co-integrating relationship between the dependent variables (MKTCGDP) and all the independent variables, namely: STMKTLIQ, SAVGDPR, FDI, INRATIO, and MTKCGDP(-1). Thus, one could say that the residuals are integrated of order zero, i.e., I(0). Hence, ECM is specified for stock market development, which includes the residuals from the static, co-integration regression between stock market and the five independent variables, as an explanatory variable, called the error correction term.

**Table 4.2: Estimates of Long-run Co-integrating Regression and Diagnostics (Sample: 1970-2007: Dependent Variable: LMKTCGDP)**

| Variable | Coefficient | Standard error | t-statistic | Probability |
|---|---|---|---|---|
| Constant | 0.367 | 0.118 | 3.098 | 0.0101* |
| LSTMKTLIQ | 0.0154 | 0.0078 | 1.9587 | 0.0760*** |
| LSAVGDPR | -3.90E-06 | 1.66E-06 | -2.3434 | 0.0389**** |
| LINVRATIO | 4.46E-06 | 1.92E-06 | 2.3284 | 0.0400** |
| LFDI | 0.0011 | 0.0020 | 0.5563 | 0.5891 |
| LMKTCGDP(-1) | 0.7851 | 0.2728 | 2.8779 | 0.0073* |

$R^2$= 0.6122 $R^2$ (Adj.) = 0.6019 SER = 0.0795 F=2.481 DW = 1.3499
AIC = -1.928 Schwarz Criteria = -1.5308
Significant at 10% level, ** significant at 5% level, *significant at 1% level.

(c) **Over parametised error correction model:** the statistics of the over-parametised ECM is presented in Table 4.3. Using the adjusted $R^2$, F-ratio, standard error of regression, DW statistics and other diagnostics, it could be observed that the model was robust. The essence of the over parametised model was to capture the main dynamic process in the model. The lag length was one, which was chosen bearing in mind the possible problems of low degree of freedom likely to occur with higher long length. The over-parametised model was then reduced to achieve a parsimonious model, which is data admissible.

**Table 4.3: Estimate of Over-parametised Error Correction Model (Sample: 1970-2007: Dependent Variable: (DMKTCGDP)**

| Variable | Coefficient | Standard error | t-statistic | Probability |
|---|---|---|---|---|
| C | -0.00098 | 0.002 | -0.399 | 0.6940 |
| D(SAVGDPR) | -0.0021 | 0.00127 | -1.673 | 0.1092*** |
| D(SAVGDPR(-1)) | 0.000243 | 0.001265 | 0.19198 | 0.8496 |
| D(INVRATIO) | 0.011424 | 0.008238 | 1.38678 | 0.1801 |
| D(INVRATIO(-1)) | 0.005758 | 0.004709 | 1.222829 | 0.2349 |
| DSTMKTLIQ | 5.396584 | 0.992846 | 5.43847 | 0.0000* |
| DSTMKTLIQ (-1) | 0.360178 | 0.908412 | 0.396491 | 0.6957 |
| D(FDI) | 1.31E-07 | 1.41E-07 | 0.934183 | 0.3608 |
| D(FDI(-1) | 7.15E-08 | 1.40E-07 | 0.5106 | 0.6165 |
| RESIDO 2(-1) | -0.007112 | 0.004022 | -1.76826 | 0.0915*** |
| D(MKTCGDP(-1)) | 0.246289 | 0.100845 | 2.442251 | 0.0235** |

$R^2$ = 0.8465 $R^2$(Adj) = 0.7734 Ser = 0.0089 F-statistic = 11.5782
Dw = 2.0329 Akaike Info.Criteria (AIC) = -6.3307 Schwarz criterion (SC) = -5.8269
***significant at 10% level, ** significant at 5% level, *significant at better than 5% level.

(d) **Parsimonious error correction model:** Table 4.4 is used to present the results of the parsimonious error correction model (ECM) for stock market development. From the results, it could be observed that the parsimonious model has a better goodness of fit compared to the over-parametised model.

**Table 4.4: Estimates of Parsimonious Error Correction Model (Sample: 1970-2007: Dependent Variable: D(MKTCGDP).**

| Variable | Coefficient | Standard error | t-statistic | Probability |
|---|---|---|---|---|
| C | 0.00021 | 0.001661 | 0.1246 | 0.9018 |
| D(STMKTLIQ) | 5.05286 | 0.908414 | 5.562288 | 0.0000* |
| D(MKTCGDP(-1) | 0.295748 | 0.088451 | 3.343622 | 0.0025* |
| D(SAVGDPR) | -0.001961 | 0.001129 | -1.73725 | 0.0942*** |
| D(INVRATIO) | 0.005275 | 0.004775 | 1.104579 | 0.2795 |
| RESIDO 2(-1) | -0.005905 | 0.003359 | -1.75787 | 0.0905*** |

$R^2$ = 0.8232 $R^2$(Adj.) = 0.7892 SER = 0.00862 F-statistic = 24.2047
DW = 2.11298 Akaike Info.criterion = -6.502 Schwarz criterion = -6.277
Significant at 10% level, *significant at 1% level.

The parsimonious model had a better F-statistic (24.2049) compared to 11.5782 in the over-parametised model. F-statistic measures the overall goodness of fit of the model. This significant F-statistic confirmed that the high coefficient of multiple determination (adjusted R-squared) did not occur by chance. Related evidence is given by the values of standard error of regression, and other information criteria, such as the Akaike and the Schwarz criteria. The DW statistic also confirmed the absence of serial correlation of residuals. The fitness of the model lends credence to the fact that one would expect the residuals to be distributed as white noise, and that the coefficient estimates are valid for economic forecasting and policy discussions.

One also considers the estimates of the short and long-run elasticities as well as the error correction mechanism. Estimates show that the coefficient of the error correction term RESIDO 2(-1) carried the expected negative a *priori* sign and is significant at 10% level. Its statistical significance supports co-integration and suggests the existence of a long-run equilibrium between stock market development and stock market liquidity, savings rate, and one-year lagged stock market development.

Specifically, the error correction mechanism indicates a feedback of about 1% of the previous year's disequilibrium from long-run elasticity of stock market liquidity, savings rate and one-year lagged stock market development. It measures the speed at which stock market liquidity, savings rate and savings rate to achieve long-run static equilibrium. As could be observed, the speed of adjustment is extremely low.

The short-run elasticity of stock market liquidity (STMKTLIQ) entered the parsimonious model with the right sign (positive) and is significant at 1% level. By the same token, the long-run elasticity is positive and significant at 10% level. These results indicated that in the short-run, a 10% increase in stock market liquidity (STMKTLIQ) will boost stock market development by 50.5% and vice versa. While in the long-run, a 10% increase in stock market liquidity (STMKTLIQ) will increase market development by a mere 0.15%. Stock market liquidity is one of the most vital functions of the stock market. It is the ease and speed to which an investor can off-load his investment for cash. By this ease, investors could alter their portfolios quickly and cheaply; thus, making investment less risky and facilitating long-term, more profitable investments. The significance of stock market liquidity variable supports the works of Levine (1991), Bencivenga, Smith and Starr (1996) who found a significant link between the two variables.

The short-run elasticity of savings ratio was negative and significant at 10%. By interpretation, a 10% increase in savings ratio will depress market development by 0.019% and vice versa. By the same token, the long-run elasticity was negative and significant at 5% level. Therefore, in the long-run, a 10% increase in savings ratio (SAVGDPR) will depress the market also, but very negligibly.

The short-run elasticity of one-period lag of stock market development (MKTCGDP(-1)) entered the model positively and is significant at 1% level. By the same token, the long-run elasticity was significant at 10% level.

## SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

The study examined the macroeconomic determinants of stock market development in Nigeria from 1970 to 2007 using co-integration and error correction (ECM) methodology. The specific objectives were to estimate short-run and long-run effects of stock market liquidity (equity/GDP), investment ratio (i.e. gross fixed capital over GDP ratio), national savings rate (i.e. domestic savings over GDP ratio) and foreign direct investment on stock market development variable (i.e. market capitalization over GDP ratio).

It became very clear that stock market liquidity had significant and positive short-run and long-run effects on stock market development, given the historical data set. Market liquidity is one of the most important functions of the stock market. This is the ease and speed at which an investor can off-load his investment for cash. It also became clear that Nigeria's national savings rate does not support or favour stock market development. Trend shows that Nigeria's savings rate has been relatively low.

Also, it became clear that there is a co-integrating relationship among the variables thus suggesting the existence of a long-run equilibrium between stock market development, stock market liquidity, savings rate and one-period lagged stock market development. However, the speed of adjustment of the previous year's disequilibrium from long-run elasticity of the variables is rather low (about 1%).

The findings of this paper have important policy implications for Nigeria's stock market and the economy. First, normally domestic investment plays an important role in stock market development but not so for Nigeria, this may be so because of her relatively low investment profile over the years. It is important to initiate policies to foster domestic investment growth as Nigeria liberalizes her financial systems, and should also encourage foreign capital inflow, as her savings rate had been low over the years, thus showing a depressing effect on market development. Second, stock market liquidity has a positive effect on stock market development. Improving market liquidity can be another way of promoting stock market development. This can be done through encouraging more domestic firms to enlist in the stock market; also, Nigerian businessmen abroad should be encouraged to enlist their companies in the Nigeria stock market.

In conclusion, the solutions to stock market development in Nigeria lie in the application of a combination of economic and financial policies that have short run and long run impacts on the economy in general and the stock market in particular.

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**Appendix 1: Nigeria's macroeconomic & financial data (1970-2007)**

| YEAR | GDP | MKTCAP | MKTCGDP | EQUITY | STMKTLIQ | SAVINGS | SavGDPR | GFC | IRATIO | FDI |
|---|---|---|---|---|---|---|---|---|---|---|
| 1970 | 5,203.7 | 1608.5 | 0.3091 | 16.6 | 0.0032 | 341.6 | 6.56 | 131.5 | 0.03 | 1,003.20 |
| 1971 | 6,570.7 | 1608.2 | 0.2448 | 36.2 | 0.0055 | 376.3 | 5.73 | 83.0 | 0.01 | 1,322.80 |
| 1972 | 7,208.3 | 1608.7 | 0.2232 | 27.2 | 0.0038 | 461.2 | 6.40 | 29.6 | 0.00 | 1,571.10 |
| 1973 | 10,990.7 | 1607.7 | 0.1463 | 92.4 | 0.0084 | 586.8 | 5.34 | 65.7 | 0.01 | 1,763.70 |
| 1974 | 18,298.3 | 1609.7 | 0.0880 | 50.7 | 0.0028 | 1,137.1 | 6.21 | 12.6 | 0.00 | 1,812.10 |
| 1975 | 21,558.8 | 1605.6 | 0.0745 | 63.7 | 0.0030 | 1,815.2 | 9.42 | 50,198.0 | 2.33 | 2,287.50 |
| 1976 | 27,297.5 | 1613.8 | 0.0591 | 111.9 | 0.0041 | 2,255.3 | 8.26 | 8,107.3 | 0.30 | 2,339.00 |
| 1977 | 32,747.3 | 1596.9 | 0.0488 | 180 | 0.0055 | 2,592.8 | 7.92 | 9,094.5 | 0.29 | 2,531.40 |
| 1978 | 36,083.6 | 1630.7 | 0.0452 | 189.7 | 0.0053 | 3,009.7 | 8.34 | 9,386.3 | 0.26 | 2,863.20 |
| 1979 | 43,150.8 | 1,563.2 | 0.0362 | 254.4 | 0.0059 | 4,161.8 | 9.64 | 9,094.5 | 0.21 | 3,153.10 |
| 1980 | 50,848.6 | 1,698.1 | 0.0334 | 388.7 | 0.0076 | 5,769.9 | 11.35 | 10,841.0 | 0.21 | 3,620.10 |
| 1981 | 102,686.8 | 1,916.9 | 0.0187 | 304.8 | 0.0030 | 6,562.6 | 6.39 | 12,215.0 | 0.12 | 3,757.90 |
| 1982 | 110,029.8 | 976.8 | 0.0089 | 215 | 0.0020 | 7,514.4 | 6.83 | 10,922.0 | 0.10 | 5,382.80 |
| 1983 | 119,117.1 | 2,222.8 | 0.0187 | 397.9 | 0.0033 | 9,443.9 | 7.93 | 8,115.0 | 0.07 | 5,949.50 |
| 1984 | 125,074.8 | 5,500.0 | 0.0440 | 256.5 | 0.0021 | 10,988.1 | 8.79 | 5,417.0 | 0.04 | 6,418.30 |
| 1985 | 144,724.1 | 6,400.0 | 0.0442 | 316.6 | 0.0022 | 12,521.8 | 8.65 | 5,573.0 | 0.04 | 6,804.00 |
| 1986 | 143,623.9 | 7,700.0 | 0.0536 | 497.9 | 0.0035 | 13,934.1 | 9.70 | 7,323.0 | 0.05 | 9,313.60 |
| 1987 | 203,037.1 | 8,900.0 | 0.0438 | 382.4 | 0.0019 | 18,676.3 | 9.20 | 10,661.1 | 0.05 | 9,993.60 |
| 1988 | 275,198.2 | 9,700.0 | 0.0352 | 624.8 | 0.0023 | 23,249.0 | 8.45 | 12,283.0 | 0.04 | 11,339.20 |
| 1989 | 403,762.9 | 12,000.0 | 0.0297 | 27.9 | 0.0001 | 23,801.3 | 5.89 | 18,414.1 | 0.05 | 10,899.60 |
| 1990 | 497,351.3 | 15,900.0 | 0.0320 | 66.9 | 0.001 | 29,651.20 | 5.96 | 30,625.8 | 0.06 | 10,436.10 |
| 1991 | 574,282.1 | 22,600.0 | 0.0394 | 143.3 | 0.0002 | 37,738.2 | 6.57 | 35,423.9 | 0.06 | 12,243.50 |
| 1992 | 909,754.2 | 32,500.0 | 0.0357 | 400.0 | 0.0004 | 55,116.8 | 6.06 | 58,640.3 | 0.06 | 20,512.70 |
| 1993 | 1,132,181.2 | 46,900.0 | 0.0414 | 456.2 | 0.0004 | 85,027.9 | 7.51 | 80,748.1 | 0.07 | 66,787.00 |
| 1994 | 1,457,129.7 | 65,500.0 | 0.0450 | 793.6 | 0.0005 | 108,460.5 | 7.44 | 85,021.1 | 0.06 | 70,714.60 |
| 1995 | 2,991,941.7 | 171,100.0 | 0.0572 | 1,788.0 | 0.0006 | 108,490.3 | 3.63 | 114,390.0 | 0.04 | 119,391.60 |
| 1996 | 4,135,813.6 | 285,100.0 | 0.0689 | 6,916.8 | 0.0017 | 134,503.2 | 3.25 | 172,100.0 | 0.04 | 122,600.90 |
| 1997 | 4,300,209.0 | 292,000.0 | 0.0679 | 10,222.6 | 0.0024 | 177,648.7 | 4.13 | 205,550.0 | 0.05 | 128,331.08 |
| 1998 | 4,101,028.3 | 263,300.0 | 0.0642 | 13,555.3 | 0.0033 | 200,065.1 | 4.88 | 192,990.0 | 0.05 | 152,409.60 |
| 1999 | 4,799,966.0 | 299,900.0 | 0.0625 | 14,071.2 | 0.0029 | 277,667.5 | 5.78 | 177,450.0 | 0.04 | 154,188.60 |
| 2000 | 6,850,228.8 | 472,900.0 | 0.0690 | 28,145.0 | 0.0041 | 385,190.9 | 5.62 | 268,895.0 | 0.04 | 157,535.40 |
| 2001 | 7,055,331.0 | 641,200.0 | 0.0909 | 57,648.2 | 0.0082 | 488,045.4 | 6.92 | 392,249.0 | 0.06 | 162,343.40 |
| 2002 | 7,984,385.3 | 763,900.0 | 0.0957 | 59,404.1 | 0.0084 | 592,094.0 | 7.42 | 438,114.9 | 0.05 | 166,631.60 |
| 2003 | 10,136,364.0 | 1,359,000.0 | 0.1341 | 113,882.5 | 0.0112 | 655,739.7 | 6.47 | 429,230.0 | 0.04 | 178,478.00 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2004 | 11,673,602.2 | 2,122,000.0 | 0.1818 | 223,772.5 | 0.0192 | 797,517.2 | 6.83 | 456,970.0 | 0.04 | 249,200.60 |
| 2005 | 10,904.983.1 | 2,261,060.0 | 0..2073 | 254,683.1 | 0.0234 | 1,078,330.1 | 9.89 | 443,100.0 | 0.04 | 269,844.70 |
| 2006 | 5,165,742.0 | 5,121,000.0 | 0..9913 | 468,588.4 | 0.0907 | 1,739,636.9 | 0.34 | 450,035.0 | 0.09 | 302,843.30 |
| 2007 | 22,586,710.0 | 13,294,500.0 | 0..5886 | 1,074,883.9 | 0.0476 | 2,693,554.3 | 0.12 | 446,567.5 | 0.02 | 364,008.50 |

Source: Central Bank of Nigeria Statistical Bulletin, volume 18, 2007.
Where:
GDP = Nominal gross domestic product or income in N'million
MKTCAP = Market capitalization in N'million
MKTCGDP= Market capitalization to GDP ratio
EQUITY = Value of equity in stock market in N'million
STMKTLIQ= Stock market liquidity ratio
SAVINGS = National savings in N'million
SavGDPR = National savings to GDP ratio
GFC = Gross fixed capital investment in N'million
IRATIO = Gross fixed capital investment to GDP ratio
FDI = Volume of foreign direct investment in N'million