International Journal of Business and Management Review

Vol.1 No.2, pp.43-56, June 2013

Published by European Centre for Research Training and Development UK (www.ea.journals.org)

MACROECONOMIC FACTORS THAT INFLUENCE STOCK MARKET DEVELOPMENT IN NIGERIA

Ita Joseph John, *M.Sc*
Oxford Brookes University Business School
Oxford, UK
Mobile: +44-778-868-1731

Joe Duke II, *Ph.D, MIMC (corresponding author)*
Department of Business Management
University of Calabar, Nigeria
Email: joedukeII@yahoo.com
Mobile: +234-803-710-6463

Abstract: *Stock markets provide channels for the mobilization and allocation of funds in the economy to be used by firms and others in fully exploiting their material, human and management resources for optimal output. The stock market itself can be influenced by macroeconomic factors prevalent in the economy. A co-integration and error correction model was employed on macroeconomic data from Nigeria and the results suggest that factors such as national savings rate, inflation rate, economic growth rates and financial intermediary development influenced stock market development during the period 1970-2011. Results from the Chow test suggested that there was no structural break in stock market development after the introduction of the Structural Adjustment Programme in 1986. It was recommended that stabilizing the financial and economic aggregates by the government for the overall growth of the economy will help to grow the stock market.*
JEL Classification: G20, G28, E44, O55

***Keywords*:** domestic savings, inflation, financial intermediary development, stock market development, Engle-Granger co-integration

INTRODUCTOION

Effective mobilization and allocation of investment funds to enable business and the economies harness their human, material and management resources for optimal output have long been advocated in financial literature; the stock market plays a prime role as the medium through which efficiency in capital formation and allocation is mostly promoted. This shows the prominent place which the development of the stock market can play in promoting the growth of businesses and the economies including developing country such as Nigeria. Identifying the underlying factors that influence the development of the stock market has been a subject of debate among economists and financial experts. Some studies have identified macroeconomic factors that influence stock market development (Akpan, Inya-agha and Aya, 2011; Caldron-Rossell, 1991; Demirguc-Kunt and Levine, 1966; Garcia and Liu, 1999; Naceur, Ghazouani and Omran, 2005; Yartey, 2008; Zafar, 2013) while others have concentrated on identifying both macroeconomic factors and institutional qualities (Cherif and Gazdar, 2010; Yartey, 2007, 2010).

However, stock market development is a multidimensional concept. It is usually measured by stock market size, liquidity, volatility, concentration, integration with world capital markets, or the legal rule (otherwise regulation and supervision) in the market (Garcia, 1999). Many researchers used market capitalization as a percentage of gross domestic product (GDP) to measure stock market development

because it is believed to be a better proxy and less arbitrary than other individual measures of stock market development that are often used such as number of listed companies, change in the stock market index, index of stock market size and liquidity (Yartey, 2008). The assumption behind market capitalization and gross domestic product measure is that overall market size is positively correlated with ability to mobilize and diversify risk on an economy-wide basis as captured by the GDP. Yartey also examined both macroeconomic and institutional factors influencing stock market development in 42 emerging economies including South Africa, using a panel data and adopting a generalized method of moment (GMM), and found that macroeconomic factors such as income level, gross domestic investment, banking (or financial) sector development, private capital flows, and stock market liquidity are important correlates of stock market development in emerging countries markets.

In a similar study, Garcia and Liu (1999) used pooled data from fifteen industrial and developing countries (Latin America and Asia) from 1980 to 1995 to examine the macroeconomic determinants of stock market development, in particular, market capitalization. The study used real income, savings rate, financial intermediary development, and stock market liquidity as the variables determining stock market capitalization. They found that stock market development and financial intermediary development are complements rather than substitutes. In addition, they found GDP growth, investment and financial intermediary sector development to be important factors. However, Naceur, Ghazouani, and Omran (2005) using an unbalanced panel data from twelve Middle East and North Africa (MENA) region countries in estimating a fixed and random effects specification found financial intermediary development and stock market liquidity to be significant factors.

Adam and Tweneboah (2008) used Databank Stock Index (DSI) as a dependent variable for stock market development in Ghana, while inward foreign investments, the treasure bill rate (as a measure of interest rate), the consumer price index (as a measure of inflation), average crude oil prices, and the exchange rate served as independent variables. Using quarterly data for the above variables (from 1991:1 to 2007:4) and employing co-integration test procedures they found co-integration between macroeconomic variable and stock prices in Ghana indicating long-run relationship. Their vector error correction model showed that the lagged values of interest rate and inflation have a significant influence on the stock market. The inward foreign direct investments, the oil prices, and the exchange rate demonstrated weak influence on price changes. In terms of policy implication, they concluded that the DSI was not informational-efficient with respect to interest rate, inflation, inward FDI, exchange rate and world oil prices.

In Nigeria, most studies on stock market growth or development have focused on the relationship between stock market and economic growth (Anyanwu, 2005; Ogun and Iyoha, 2005; Nyong, 1997; Obadan, 1998; Onosode, 1998; Oyejide, 1994). The few that have concentrated on analyzing the macroeconomic factors that influence stock market development (Akpan, Inya-agha and Aya, 2011; Daferighe and Charlie, 2012) have limited themselves to the use of narrower measures of stock market development as earlier indicated in this introductory section. In addition, their adopted methodology, the ordinary least squares technique, which apart from not being able to address the possibility of a long-run equilibrium relationship, is also subject to bias of time series data used in the regression, spurious estimates as well as high standard errors of the regression (Granger and Newbold, 1974).

An examination of the empirical literature indicates that macroeconomic variables such as income level, gross domestic investment, banking and financial sector development, private capital flows, stock market liquidity, savings rate and macroeconomic stability policies (including interest, exchange and inflation rates), impact on stock market development variables (Beck and Levine, 2003; Levine and Zervos, 1998; Singh, 1997; Yartey, 2008; Wachtel, 2003). The availability of data on these variables for Nigeria

provides an opportunity to test the relevance of the variables as possible factors influencing Nigeria's stock market development.

This study therefore attempts to contribute to the gap in empirical literature on the comprehensive set of factors that determine stock market development in Nigeria. Specifically, we seek to examine the extent to which real gross domestic product, financial sector development, inflation rate, stock market liquidity, national savings rate and gross fixed capital formation influence stock market development. By doing this, we explore whether the same range of macroeconomic variables that impact stock market development in advanced economies hold for a developing country like Nigeria. Additionally, we set out to examine if the Structural Adjustment Programme (SAP) introduced in Nigeria in the mid-1980s had any structural change effects on macroeconomic variables associated with stock market development. This phenomenon has rarely been studied for Nigeria using the Chow Stability test. By employing the Engel and Granger co-integration and error correction technique, we minimize the possibility of spurious regression and biased estimates from the variables we test. The results of this study will be particularly useful for the development of the national stock market since the significant macroeconomic factors that will be identified can be given better or more appropriate attention by Nigerian economic policy makers.

METHODOLOGY

This study is a quantitative research and adopts the Engel and Granger co-integration and error correction procedure, which attempts to overcome the problems of spurious or false regression often caused by non-stationary and unstable time-series data; it also informs about the long-run relationship as well as the short-run dynamics simultaneously in the same model.

Model Specification

The specification of the empirical model is guided by the empirical literature. It was observed that not all the reviewed macroeconomic variables could enter one model because of problem of insufficient number of years of the time series data (i.e. problem of limited sample size which might cause a challenge for sufficiency of degree of freedom) in specifying the co-integration model. Therefore, the following indicators were considered for the empirical model based on the availability of data for Nigeria:

$MKTCAP = \beta_0 + \beta_1 GDP + \beta_2 FINDEV + \beta_3 LIQ + \beta_4 INF + \beta_5 SAVR + \beta_6 INV + \mu_t$ -------- (1)

Where:

MKTCAP = Market capitalization–GDP ratio (as a measure of stock market development)

GDP = Gross domestic product (a measure of economic growth, $\beta_1 > 0$)

FINDEV = Financial sector development, i.e., M_2/GDP, $\beta_2 > 0$)

LIQ = Stock Market liquidity (i.e. value of equities/GDP, $\beta_3 > 0$)

INF = Inflation rate ($\beta_4 < 0$)

SAVR = Domestic savings rate (i.e. saving–GDP ratio, $\beta_5 > 0$)

INV = Investment (i.e. gross fixed capital formation, $\beta_6 > 0$)

μ_t = Stochastic error term often assumed to be independently and normally-distributed with zero mean and constant variance

Estimation Techniques

The study adopted the Engle and Granger (1987) two-step procedure in co-integration modeling. 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 (Engle and Granger, 1987; Adam cited in Nkang, Abang, Akpan and Offem,

2007). The first process is the "stationarity test" (or 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 procedure.

Econometric analyses have shown that most time-series data sets are non-stationary in nature, meaning that they have a tendency to increase or decrease over time; therefore, an error correction mechanism becomes imminent in most time series analyses to correct for this instability in time series data. The consequence of non-stationary data is that the asymptotic convergence theory (such as weak law of large numbers) that is found in statistical estimation theories are violated and such data should not be used in regression analyses, because such regression will yield false estimates (Granger and Newbold, 1974; Philips cited in Nkang, Abang, Akpan and Offem, 2007).

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:

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \sum_{t=1}^{i} Y \Delta Y_{t-j} + \mu_t$$

…… (2)

Here, the lag length j chosen for ADF ensures that μ_t is empirical white noise; the significance of β is tested against the null that $\beta = 0$, based on t-statistics on β 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. Consequently one will then go ahead to conduct a co-integration test.

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 (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 only co-integrated series. When variables are co-integrated, there exists a valid error correction mechanism describing their relationship, with the implication that co-integration between variables involved is a precondition for the error correction mechanism (Engle and Granger, 1987).

This study used the augmented Dickey-Fuller test 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 number of bivariate co-integrating regressions were run between the dependent variable 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 ordinary least squares method. 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)

α_0 = the vector of parameters.

The secondary data were sourced from the Central Bank of Nigeria Statistical Bulletin, volume 18, 2007 and 2011.

RESULTS AND DISCUSSION

Test of Stationarity

This result is presented in Table 1 below. The null hypothesis of the presence of a unit root (non-stationarity) was tested against the alternative hypothesis of the absence of unit root (stationarity). It was not all the variables that were stationary at levels but after the first difference, they all became stationary. It could be seen from the test result (which adopted the augmented Dicker-Fuller (ADF) test that the variables were integrated of order one, i.e. I (1). One then proceeded to discuss the results of Engle-Granger (EGC) co-integration of the bivariate models.

Table 1: Results of unit root: (sample 1970-2011): dependent variable: Stock Market Development (LMKTGDP)

Variable	Variable levels	ADF 5%	Variable First difference	ADF 5%	Variable second difference	ADF 5%	Order of integration
L(MKTGDP	-0.7547	-3.5366	-4.0822	-3.5403	-7.3112	-3.544	I(1)
L(GDP)	-1.5394	-3.5366	-6.2326	-3.5403	-4.8713	-2.7571	I(1)
L(FINDEV)	-1.2341	-3.5366	-5.6317	-2.9458	-4.6689	-2.9571	I(1)
L(LIQ)	0.1838	-2.9434	-6.5680	-2.9458	-6.0615	-2.9540	I(1)
L(INF)	-3.5008	-2.9434	-6.6525	-2.9484	-6.2990	-2.9571	I(1)
L(SAVR)	-1.1938	-3.5366	-5.8512	-2.9458	-3.1409	-2.9678	I(1)
L(INV)	-1.9873	-2.9434	-9.1000	-2.9458	-5.6042	-2.9540	I(1)

Note: *Critical values of ADF test were based on Mackinnon (1996) one-side p-values. Lag length selection was automatic based on Eviews (5.1) Schwarz information criteria.*

Engle and Granger Co-integration Test

The result of the Engle and Granger co-integration bivariate regression and test statistics for the macroeconomic factors that influence stock market development are shown in Table 2 below:

Table 2: Results of ADF test on residuals of co-integration bivariate regressions

		Residual level	
	Long-run coefficients (t-statistics)	**ADF statistics**	**Critical value 10%**
L(MKTGDP) on (FINDEV)	1.1859(16.6596)	-2.2936	-2.6103
L(MKTGDP) on L(INF)	-0.3690(-0.8931)	1.5184	-2.6103
L(MKTGDP) on L(SAVR)	1.2216(15.0246)	-2.6637	-2.6103
L(MKTGDP) on L(INV)	0.3810(4.0107)	-0.4865	-2.6103
L(MKTGDP) on (SAVR) and L(INF)	See coefficients in Table 3	-3.0299	-2.6103

Note: *Critical values of ADF tests are based on Mackinnon (1996) one-sided p-values. Lag length selection is automatic based on Eviews Schwarz information criterion.*

The calculated ADF statistic for financial sector development (LFINDEV), inflation (LINF), and investment (LINV) were found to be insignificant or non-stationary in residuals, when comparing their respective residual values of ADF Statistic with the critical values at 10% (critical value being 2.6103, in absolute value). Savings rate (LSAVR) was stationary in residual when comparing its ADF t-statistic value (-2.2.6637) with its critical value (-2.6103, here the absolute value is always considered). However combining the stationary saving rate (LSAVR) variable with a non-stationary inflation variable (LINF) resulted in a stationary model of the residual at the 10% level and their long-run co-integrating multivariate regression is shown in Table 3 below: it could be noted that income or output (LGDP) and stock market liquidity (LLIQ) variables were not included in the long-run co-integrating regression because they are exogenous to the system (Calderon-Rossell, 1991). The stationarity of the residual here indicates the existence of a long-run (static) co-integrating relationship between stock market development (LMKTGDP) savings rate (LSAVR) and inflation (LINF). Thus, one can say that the residuals are integrated of order zero, i.e. I (0). Hence, one can go ahead to specify an error correction mechanism (ECM) for stock market development, which includes the residuals from the static co-integration multivariate regression between the dependent variable (LMKTGDP) and the two long-run equilibrium variables (i.e. LSAVR and LINF), as an explanatory variable, called the error correction term.

Table 3: Estimates of long-run Co-integrating Multivariate Regression and diagnostics (sample: 1970-2011; dependent variable: L(MKTGDP)

Variable	**Coefficient**	**Std. Error**	**t-statistic**	**Probability**
C	1.1062	0.4392	2.5184	0.0165**
L(SAVR)	1.2150	0.0793	15.3146	0.0000***
L(INF)	-0.2572	0.1512	-1.7011	0.0978*
R^2 = 0.873	R^2(Adj) = 0.8657	Ser = 0.7041	F-stat.=	AIC = 2.2117
SC = 2.341	DW = 0.3855		120.25[0.0000]	

** Significant at 10% level, ** significant at 5% level, ***significant at 1% level.*

Over-parametized error correction model (ECM)

The estimates of the over-parametized error correction mechanism for stock market development (LMKTGDP) are reported in Table 4 below:

Table 4: Estimates of over-parametized error correction model (sample: 1970-2011); dependent variable: L(MKTGDP)

Variable	Coefficient	Std. Error	t-statistic	Probability
L(MKTGDP(-1)	1.2457	0.2629	4.7388	0.0001***
L(MKTGDP(-2)	-0.5955	0.3232	-1.8423	0.0811*
L(MKTGDP(-3)	0.4532	0.2341	1.9357	0.0679*
L(SAVR)	0.6070	0.3746	1.6204	0.1216
L(SAVR(-1)	-0.7834	0.2512	-3.1182	0.0057***
L(SAVR(-2)	0.3125	0.2005	1.5586	0.1356
L(SAVR(-3)	-0.1330	0.1569	-0.8474	0.4073
L(INF)	0.0961	0.0789	1.2189	0.2378
L(INF(-1)	0.0192	0.0867	0.2212	0.8273
L(INF(-2)	0.1629	0.0765	2.1313	0.0463**
L(INF(-3)	0.0032	0.0649	0.0489	0.9615
ECM_{t-1}	-0.2796	0.1502	-1.8612	0.0783*
C	-2.5338	1.3660	-1.8548	0.0792*
L(GDP)	0.2026	0.0889	2.2790	0.0344**
L(FINDEV)	-0.0143	0.3755	-0.0381	0.9700
L(INV)	-0.0436	0.0386	-1.1281	0.2733

R^2 = 0.9948 R^2 (Adj.) = 0.9906 Ser = 0.1939 F-stat. = 240.707[0.0000] DW = 2.532 Akaike info. Criterion (AIC) = 0.1396 Schwarz Criterion (SC) = -0.5714

** Significant at 10% level, ** significant at 5% level, *** significant at 1% level.*

The over-parametized specification captures the main dynamic processes in the model. The lag length was set at three bearing in mind that higher lag length may create degree of freedom problem. The model suggests that it is well estimated, looking at the coefficient of multiple determination, i.e., the adjusted R-squared, as well as the standard error of regression, Durbin-Watson statistic and the F-statistic. The highly significant F-statistic confirms that the high adjusted R-squared is better than it would have occurred by chance. The over-parametized model was then reduced to achieve a short-run parsimonious model specification and is presented in the next sub-section.

3.4 Parsimonious error correction model

The parsimonious error correction model for macroeconomic factors that influence stock market development in Nigeria is presented in Table 5 below:

Table 5: Estimates of parsimonious error correction model (sample: 1970-2011) Dependent variable: L(MKTGDP)

Variable	Coefficient	Std. Error	t-statistic	Probability
L(MKTGDP(-1)	1.3630	0.2147	6.3493	0.0000***
L(MKTGDP(-2)	-0.5515	0.2696	-2.0456	0.0515**
L(MKTGDP(-3)	0.2942	0.1774	1.6586	0.1097
L(SAVR(-1)	-0.6682	0.2142	-3.1197	0.0045***
L(INF(-2)	0.0928	0.0545	1.7037	0.1008*
ECM_{t-1}	0.2927	0.1212	-2.4158	0.0233**

C	-3.2617	0.8954	-3.6326	0.0012***
L(GDP)	0.2270	0.0680	3.3368	0.0027***
L(FINDEV)	0.5389	0.1371	3.9295	0.0006***
L(INV)	-0.0186	0.0343	-0.5406	0.5935

R^2 = 0.9934 R^2 (Adj.) = 0.99010 Ser = 0.1905 F-stat. = 415.2487[0.0000] DW = 1.9882
Akaike info. Criterion (AIC) = 0.2439 Schwarz Criterion (SC) = 0.2005

** Significant at 10% level, ** significant at 5% level, *** significant at 1% level.*

The parsimonious model exhibits a better fit compared to the over-parametized model, taking a look at its adjusted R-squared [i.e. comparing 0.9906 with 0.9910]. The F-statistic is also better [240.7 for the over-parametized and 415.25 for the parsimonious model]. The highly significant F-statistic is the measure of the overall significance of the parsimonious model. It does suggest that the parsimonious model's high R-squared did not arise by chance. The structural variables of the parsimonious model explain the change in stock market development better than those in the over-parametized specification. A high adjusted R-squared means that the model fits the data well. Related evidence is given by the values of the standard error of regression (ser), which are low suggesting that there is low level of bias in the specification; Durbin-Watson statistic, the Akaike and Schwarz information criteria.
In specific terms the lower the standard error of the regression; the better a model is in relation to a parallel model. This rule also applies to the values of the Schwarz and Akaike information criteria.

The DW-statistic also suggests a better model specification. The value of 1.9882 confirms the absence of serial correlation of the residuals of the parsimonious model. The residual graph as shown in Figure 1 below indicates that the fitted observations are as close as possible to their corresponding observed values, which is what the ordinary least squares (OLS) estimator seeks to maximize. Having discussed the diagnostics, one now turns to discussing the estimates of the short and long-run elasticity (i.e. the coefficients are elasticity, given that the variables are in logs) as well as the error correction mechanism.

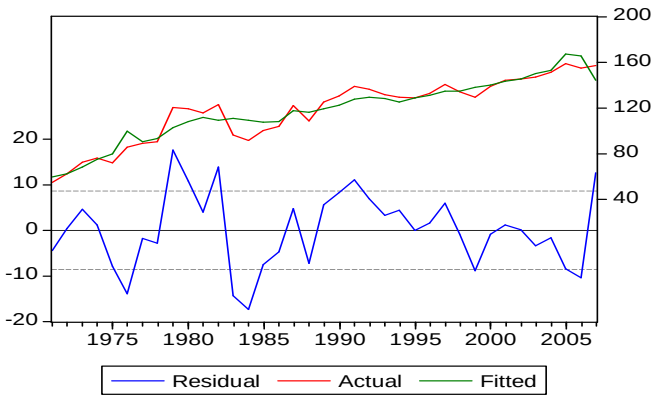

Fig. 1: Residual graph of the parsimonious model

The estimates suggest that the coefficient of the error correction term, ECM_{t-1} carries the expected *a priori* negative sign and it is significant at 5% level. This means that there is a long-run (static) equilibrium between stock market development (LMKTGDP), savings rate (SAVR), and inflation rate (INF). Specifically, the error correction mechanism indicates a feedback of about 29% of the previous year's discrepancies from long-run elasticity of savings rate and inflation. It measures the speed at which

stock market development (LMKTGDP) adjusts to changes in savings rate (LSAVR) and inflation (LINF) to achieve long-run static equilibrium. However the speed of adjustment is low (at 29%).

The short-run elasticity of one-period lag of savings rate entered the parsimonious model with a negative sign and it is significant at the 1% level. But the long-run elasticity was rather positive and significant at 1% level (see Table 3). These results indicate that in the short-run, a 10% increase (or decrease) in savings rate, may decrease (or increase) stock market development by 6.68% while in the long-run, a 10% increase (or decrease) in savings rate, may increase (or decrease) stock market development by 12.15%, *ceteris paribus*. Inflation rate carries a positive sign and is significant at 10% level. In the long-run, the coefficient is negative but significant at the 10% level. This means that in the long-run, a 10% increase (or decrease) in inflation decreases (or increases) stock market development by 25.7%. This is stock market development is relatively elastic to small changes in inflation.

The coefficients of the one-period and two-period lagged endogenous variable were positive and negative, respectively; and were significant at 1% and 5% levels, respectively (see Table 5). The value of the coefficient of the one-period lag of stock market development suggests that if previous year's stock market development increases (or decreases) by 10%, the current year's market development will increase (or decrease) by a higher margin, 13.63%. National income as measured by the real gross domestic product (LGDP), which was taken as a proxy for real economic growth was significant at 1% level. Financial sector development (LFINDEV) was also significant at 1% level, whereas national investment measure as captured by the gross fixed capital formation failed the test of statistical significance.

3.5 Test for model stability

The result of the test for model stability using the Chow break point test for 1986 has an F-statistic of 1.186 and a probability value of 0.3707 as presented in Table 6. This means that the null hypothesis of model stability cannot be rejected. Thus, it is concluded that the estimated stock market development function has been structurally stable. In other words, stock market development before liberalization of the economy in 1986 was same with the stock market development function after liberalization. The implication of the significance of the structural stability of this function is that the parameters of stock market development are constant and do not change over time. This suggests that it is plausible for the model to be used on post-sample data or in future policy articulation.

Table 6: Estimates of Chow stability test

Estimates of Chow stability Test			
Chow Breakpoint Test:	1986		
F-statistic	1.186047	Prob.	0.370711
Log likelihood	20.39120	Prob.	0.025762

4.0 Summary, Conclusion and Recommendations

This quantitative research paper empirically analyzed both the short-run and long-run effects of savings rate (national savings/GDP), inflation rate, economic growth (growth in GDP), financial sector development (broad money supply, M_2/GDP), investment (i.e. gross fixed capital formation), and liquidity of the stock market on stock market development variables (i.e. market capitalization/GDP ratio) for Nigeria. Using a longitudinal data set spanning over 40 years, from 1970 to 2011, we found that economic growth and financial sector development had significant and positive influence on stock market development in Nigeria. This finding corroborates the work of Yartey (2008), who made a similar conclusion for South Africa. The result also aligns with the findings of Garcia and Liu (1999) in their study of Latin American and Asian countries. It also resonates with the work of Demirgue-Kunt and

Levine (1996) who found that countries with well-developed financial intermediary sector tend to have efficient and highly functional stock markets.

Our present study also showed that one-period previous year's savings rate in Nigeria depresses the stock market development. This may be a result of the low savings rate of Nigeria as observed from the historical data set. It was found that two-period lagged values of inflation correlated with stock markets development. National investment was observed to be negative and insignificant in the model. We found that a co-integrating relationship exists among the variables of the model used in this study, thus, suggesting the existence of a long-run (static) equilibrium between one-period lagged savings rate, two-period lagged inflation rate, GDP, financial intermediary development and 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 29%) as indicated by the co-efficient of the error correction mechanism (ECM) in Table 5. The Chow stability test also suggests that there was no structural break in the macro variables after the 1986 Structural Adjustment Programme in Nigeria

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The findings of this study make important contributions to the literature as it identifies a more comprehensive set of macroeconomic factors that influence stock market development in Nigeria. A number of policy implications arise from these findings for the Nigerian economy. First, as economic growth (represented by the GDP) is found to be an important correlate of stock market development, it is necessary to initiate policies that will boost the growth of the economy in general, since this will also help in developing the stock market, by extension. Specifically, Nigeria financial industry authorities should continue to stabilize the economy with monetary policies, while the government seeks ways of solving the incessant unrests in the Niger Delta region, which have impeded stability of oil production in some areas (a factor that has affected Nigeria's oil exports adversely in very recent years). Furthermore, efforts should be made to provide basic infrastructures, particularly electricity and roads, across the regions in order to revive manufacturing in particular and the entire economy in general. Secondly, since as has been established in this study that the financial intermediation sector is important for stock market development, efforts should be made to consolidate the gains that have been made in the banking industry in the years following the 2005 banking reforms. In addition, the Bureau of Public Enterprises (BPE) should be made to accelerate the pace of privatization of the earmarked companies in order to galvanize and sustain momentum in capital market activities. Thirdly, as it has been observed that domestic investment plays an important role in stock market development, and the savings rate is low in Nigeria, there is need to initiate policies that will encourage and attract foreign capital inflow for the establishment and support of high growth-potential investments in the country.

Furthermore, this study contributes to knowledge of modeling stock market development and macroeconomic factors for Nigeria with the application of the two-step co-integration and error correction methodology advocated by Engle and Granger (1987) as different from Johansen-Juselius (1990) methodology which employs a maximum likelihood procedure as was used in previous study by John, Duke II and Bassey (2009). Surprisingly, the results were not significantly different. The methodological implication is that modeling stock market development and macroeconomic factors for Nigeria to measure the short-and-long-run equilibrium relationships can be achieved essentially using either of the two popular procedures.

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Appendix 1:
Nigeria's selected macroeconomic and financial data

OBS	MKTGDP	GDP	FINDEV	LIQ	INF	SAVR	INV
1970	0.1795	8,960.0	0.109	1.85	13.8	0.038	131.5
1971	0.1549	10,380.0	0.100	3.49	16.0	0.036	83.0
1972	0.1458	11,030.0	0.109	2.47	3.2	0.042	29.6
1973	0.1312	12,250.0	0.112	7.54	5.4	0.048	65.7
1974	0.0821	19,600.0	0.132	2.59	13.4	0.058	12.7
1975	0.07	22,950.0	0.176	2.78	33.9	0.079	50198.0
1976	0.0564	28,610.0	0.200	3.91	21.2	0.079	8107.3
1977	0.0475	33,590.0	0.228	5.36	15.4	0.077	9420.6
1978	0.0452	36,050.0	0.209	5.26	16.6	0.083	9386.3
1979	0.0364	42,910.0	0.230	5.93	11.8	0.097	9094.5
1980	0.0338	50,270.0	0.286	7.73	9.9	0.115	10841.0
1981	0.0199	251,052.3	0.061	1.21	20.9	0.026	12215.0
1982	0.0203	246,726.6	0.068	0.87	7.7	0.030	10922.0
1983	0.0247	230,380.8	0.083	1.73	23.2	0.041	8135.0
1984	0.0242	227,254.7	0.093	1.13	39.6	0.048	5417.0
1985	0.0261	253,013.3	0.092	1.25	5.5	0.049	5573.0
1986	0.0264	257,784.4	0.092	1.93	5.4	0.054	7323.0
1987	0.032	255,997.0	0.113	1.49	10.2	0.073	10661.1
1988	0.0363	275,409.6	0.139	2.27	38.3	0.084	12383.7
1989	0.0434	295,090.8	0.147	0.09	40.9	0.081	18414.1
1990	0.0552	295,090.8	0.195	0.23	7.5	0.100	30626.8
1991	0.0703	328,644.5	0.241	0.44	13.0	0.115	35423.9
1992	0.0925	337,288.6	0.383	1.19	44.5	0.163	58640.3
1993	0.1387	342,540.5	0.579	1.33	57.2	0.248	80948.1
1994	0.192	345,228.5	0.773	2.3	57.0	0.314	85021.9
1995	0.5116	352,646.2	0.904	5.07	72.8	0.308	114476.3
1996	0.7783	367,218.1	1.008	18.84	29.3	0.366	172105.7
1997	0.7461	377,830.8	1.137	27.06	8.5	0.470	205553.2
1998	0.676	388,468.1	1.353	34.89	10.0	0.515	192984.4
1999	0.7632	393,107.2	1.780	35.79	6.6	0.706	175735.8
2000	1.1454	412,332.0	2.513	68.26	6.9	0.934	268894.5
2001	1.5343	431,783.1	3.048	133.51	18.9	1.130	371897.9
2002	2.1743	351,785.6	4.547	168.86	12.9	1.683	438114.9
2003	2.746	495,007.1	4.010	230.06	14.0	1.325	129230.0
2004	4.0042	527,576.0	4.291	424.15	15.0	1.512	456970.0
2005	5.161	561,931.4	5.009	453.23	17.9	2.344	443100.0
2006	8.5949	595,821.0	6.760	786.46	8.2	2.920	450035.0
2007	20.9475	634,656.60	9.154	1693.65	5.4	4.244	446567.5
2008	14.2264	672,202.55	11.944	10.39	16.1	6.126	1936958.2
2009	9.7789	718,977.33	13.153	6.94	14.8	8.016	2053006 .0
2010	12.7890	775,525.70	14.229	10.22	14.7	7.678	3050575.9
2011	11.5956	834,161.83	14.592	7.83	10.3	7.831	4012918.7

Where:

MKTGDP = Market capitalization-GDP ratio
GDP = Real GDP (i.e. GDP at 1990 constant prices)
FINDEV = Financial sector development (i.e. M_2/GDP)
LIQ = Liquidity of the stock market (value of equity/GDP)
INF = Inflation rate
SAVR = Savings rate (i.e. National savings/GDP)
INV = Investment (i.e. gross fixed capital formation)

Sources: Central Bank of Nigeria (2007)

Email: 11124400@brookes.ac.uk