

**MACROECONOMIC DETERMINANTS OF STOCK MARKET PERFORMANCE  
IN NIGERIA, 1986-2013**

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**Abstract**

*The paper is part of larger research agenda with the purpose of exploring some of the determinants of stock market in Nigeria for the period 1980-2013. The variables employed included market capitalization, per capita income, interest rate, exchange rate, inflation and the economy level of openness. The econometric methodology is error correction model and it was discovered that interest rate, inflation and past level of market capitalization were the major determining factors for trading activities at the NSE. However, the negative impact of inflation, interest rate and per capita income revealed by the study is beginning to assume a dangerous dimension. The paper therefore recommended that the monetary authority should ensure moderate interest rate that encourages investment even as the current double digit inflation in the economy should be checked.*

**Keyword:** Nigerian Stock Exchange, Stock Market, Co-integration and Error Correction Model

**Introduction**

A unique benefit of the stock market to corporate entities in any economy is the provision of long-term, non-debt financial capital. Through the issuance of equity securities, investors are able to acquire perpetual capital for development and at the same time enable companies to avoid over-reliance on debt financing, thus improving corporate debt-to-equity ratio. The stock market is an economic institution which promotes efficiency in capital formation and allocation and ensures

financing of new projects. And this led to expanding and modernizing of industrial and commercial concerns. If capital resources are not provided to those economic areas, especially industries where demand is growing and which are capable of increasing production and productivity, the rate of expansion of the economy often suffers (Ezeoha, Ogamba and Onyiuke, 2009).

The determination of the overall growth of an economy depends on how efficiently the stock market performs its allocative functions of capital.

As the stock market mobilizes savings, it also allocates a larger proportion of it to companies with relatively high prospects as indicated by its rate of returns and level of risk. The importance of this function is that capital resources are channeled by the mechanism of the forces of demand and supply to those firms with relatively high and increasing productivity thus enhancing economic expansion and growth (Alile, 1997).

The capital market consists of primary and the Secondary markets. The primary market provides the avenue through which governments and corporate bodies raise fresh funds through the issuance of securities. Fresh funds can be raised through public offers, rights issues and private placements. The secondary market which can be organized or unorganized provides investors the opportunity to buy or sell securities that were earlier issued in the primary market. An organized market is a stock market with physical location and trading in designated (quoted) securities. An example in Nigeria is the Nigerian Stock Exchange (NSE), formally called Lagos Stock Exchange, established in 1961 but currently has its trading floor in Abuja. The distinguishing factor between the two segments is that in the primary market, the funds raised from investors go to the issuing entity, while in the secondary market; the proceeds from the transactions go to investors.

The ease of securities' conversion into cash is an important determinant of the efficiency of the secondary market and indeed the capital market in general. To this end, the development of the capital market through the promotion of private capital investment is anchored on the NSE. Structural Adjustment Programme (SAP) was introduced in Nigeria in 1986 and since then the country has witnessed significant growth in her stock market. This was as a result of deregulation of the financial sector and the privatization exercises, which exposed investors and companies to the relevance of the stock market. Equity financing became one of the cheapest and flexible sources of finance from

the capital market and remain a critical element in the sustainable development of the economy.

However, the country stock market is characterized by complexities. The complexities arise from trends in globalization and increased variety of new instruments being traded: equity options, derivatives of various forms, index futures etc. The recent financial crisis has made the Nigerian capital market illiquid and this has caused the downward trend in the market. Capitals of some companies are becoming less attractive to long-term investors and very risky to invest.

The perceived risks associated with investing in Nigeria market are also high. There is the risk associated with insecurity occasioned by the deadly Islamic sects called Boko Haram. Also, there is epileptic power supply which forces most firms to generate their domestic sources of power and thereby making the cost of doing business in Nigeria very high, all of which lead to low returns on investment. As a result, most foreign investors are now patronizing other emerging markets despite the fact that Nigeria is the most preferred destination for investors in Africa. In the view of Osisanwo and Atanda (2012), the NSE capitalization has dropped from its peak of ₦13 trillion in 2008 when the financial turmoil started spreading to emerging markets to the turn of ₦4.9 trillion (Business Day, 2009). The decrease is equivalent to ₦8.1 trillion or 62 percent at the end of 2009. It is in the light of these problems that this study was undertaken to find solutions.

A capital market is constituted when a network of financial institutions interact to mobilize and allocate long term funds to productive investment. The long term capitals are exchanged for financial assets issued by borrowers or traded by holders of previously issued assets. According to Nneji (2013), the capital market serves an important function of bringing together deficit and surplus units of an economy. Without this function the capital market is rendered useless as the

opportunity for investment and production of goods and services for development is eliminated.

Nyong (1997) argued that the stock market is seen as a complex institution 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. This was why Inanga and Emenuga (1997) agreed that the development of the capital market has the tendencies to provide opportunities for greater funds mobilization, improved efficiency in resource allocation and provision of relevant information for appraisal. Developed stock market can engender boom with a substantial part of the growth accounted for by the emerging market. The reasons being that: investing firms enjoy lower cost of equity when the stock market functions efficiently, the opportunity to trade securities and also hedge allows for relative reduction in risk, the ability of the market to adjust share prices almost instantaneously imposes control on the investment behavior of firms and, lastly, countries that are desirous of foreign investment are able to secure it, through the stock exchange (Demirgüç-Kunt and Levine, 1996).

Empirically, Canova and Nicolo (1997) carry out a study on the U.S, U.K, Germany and Japan economies for the period 1973-1993. They estimated vector autoregressive method on nominal stock returns, the slope of the term structure, industrial production and inflation. The paper discovered a significant negative relation between real stock returns and inflation in all four countries. The study allows for international interactions by estimating bilateral VAR with the U.S. as one country and the U.K., Germany or Japan as the other country. When international influences are allowed for in this manner, the negative link between output growth and inflation, which is central to the 'proxy hypothesis', disappears.

Claire and Thomas (1994) scrutinize the effect of 18 macroeconomic factors on stock returns

in the UK. The study finds oil price, retail price index, bank lending and corporate default risk to be important risk factors for the United Kingdom economy stock returns. Mukherjee and Naka (1995) use vector error correction approach to model the relationship between Japanese stock return and macroeconomic variables. Applying co-integration test, the study shows long run relationship between stock prices and six macroeconomic variables, namely exchange rate, inflation rate, money supply, real economic activity, long-term government bond rate and call money rate. Ibrahim and Aziz (2003) explore the relationship between stock prices and industrial production, money supply, consumer price index, and exchange rate in Malaysia. Stock prices were found to have positive long-term relationships with industrial production and CPI while that with money supply and (Ringgits) exchange rate was negative.

Serkan (2008) investigates the role of macroeconomic factors in explaining Turkish stock returns. He employs macroeconomic factor model from the period of July 1997 to June 2005 on data namely growth rate of industrial production index, change in consumer price index, growth rate of narrowly defined money supply, change in exchange rate, interest rate, growth rate of international crude oil prices and return on the MSCI World Equity Index. He finds that exchange rate, interest rate and world market return seem to affect all of the portfolio returns, while inflation rate is significant for only three of the twelve portfolios. Also, industrial production, money supply and oil prices do not appear to have significant effect on stock returns in Turkey.

Kyereboah, Anthony and Kwame (2008) examine how macroeconomic indicators affect the performance of Ghana stock market using quarterly time series data covering the period 1991 to 2005. They found that lending rates from deposit money banks have an adverse effect on stock market performance and particularly serve as major hindrance to business growth in Ghana. Inflation

rate was found to have a negative effect on stock market performance.

In Nigeria, attempts have been made by researchers to investigate the relationship between macroeconomic variables and stock prices. This is while Nwokoma (2002), scrutinizes the long-run relationship between stock market and some macroeconomic indicators. His findings show that only industrial production and level of interest rates (a proxy for 3-month commercial bank deposit rate) have a long-run relationship on the stock market returns. He also found that the Nigeria market responds more to its past prices than changes in the macroeconomic variables in the short run.

In Maku and Atanda (2009), their study focuses on the long- and short-run macroeconomic shocks effect on the Nigerian capital market between 1984 and 2007. They employed error correction model (ECM) and found that the NSE all share index is more responsive to changes in exchange rate, inflation rate, money supply and real output. Ezeoha, ., Ogamba and Onyiuke (2009) examine the nature of the relationship existing between stock market development and the level of investment flows in Nigeria on a data set spanning 1970 to 2006. Other macroeconomic variables employed include ratio of M2 to GDP (a proxy for banking system development), inflation and index of industrial production. The paper employs co-integration and vector error correction model (VECM) and find that development in the Nigerian stock market over the years was able to spur growth in domestic private investment flows, but unable to do so in the case of foreign private investment.

Osunibi (2002) examines the effect of stock market on economic growth in Nigeria using the data for the period 1980 to 2000. The study employed ordinary least squares regression (OLS) method and found that there is a positive relationship between growth and all the stock market development variables used. Nneji (2013) scrutinizes the efficiency of the Nigerian capital market for the period 1986 to 2009. The study

employs co-integration and vector error correction model and results revealed that a significant relationship exists between capital market performance and economic development. He argues that there is still room for improvement in the capital market mainly because of high level of inefficiency within the period of study. Samuel and Oka (2010) appraise the implications of the efficient-market hypothesis and types and levels of market efficiency. The data employed was primary obtained from questionnaire while methods were Likert scale and descriptive statistics. The study found that information contributed to the efficiency of the Nigerian capital market to a great extent.

Osisanwo and Atanda (2012) analyze the determinants of stock market returns in Nigeria using the OLS method based on data from 1984 to 2010. The findings indicated that interest rate, previous stock return levels, money supply and exchange rate were the main determinants of stock returns in Nigeria. Daferighe and Charlie (2012) investigate the impact of inflation on stock market performance in Nigeria using time series data from 1991 to 2010. The stock market variables were market capitalization (MCAGDP), total value traded ratio (TVMS), percentage change in All-share Index (% $\Delta$ ASI) and turnover ratio (TOR). Using a simple linear regression, the study finds that all stock market variables were negatively related to inflation in convergence to a priori expectation except for TOR which showed a positive relationship.

Akingunola, Adekunle, and Ojodu (2012) investigate the impact of interest rate on capital markets growth for the period 1985-2007. Two other independent variables were inflation and exchange rates. OLS multiple regression analysis was employed and the findings of the study revealed that among other things, interest rates have an adverse effect on capital market growth. A one percent increases in interest rate decreases all share price index by 44 percent, a development very unhealthy for the capital market.

The objective of the paper therefore is to identify key macroeconomic determinants for the Nigerian stock market. Consequently, the sequence of the paper is clear. Section two establishes brief theoretical and empirical literature. Section three depicts the methodology of the study. Section four gives the empirical results and discussion of findings while the last section does not only conclude the study but also proffer policy recommendations.

**Methodology**

The literature reviewed above shows that none of the studies included per capita income and degree of openness which normally should boost the level of investment in an economy. Except PCY and DPN which for obvious reason was not log, all other variables are in logarithmic form. Thus, following the works of Maku and Atanda (2009) and Osisanwo and Atanda (2012), the study employs error correction model using the method of least squares. Specifically, let:

$$MCAP = f(PCY, INT, EXCR, INF, DPN).....(1)$$

In log stochastic form, equation becomes:

$$\ln MCAP = \beta_0 + \beta_1 PCY + \beta_2 \ln INT + \beta_3 \ln EXCR + \beta_4 \ln INF + \beta_5 DPN + \mu.....(2)$$

Where:

MCAP = level of market capitalization

PCY = level of per capita income (GDP/population)

INT = interest rate

EXCR = exchange rate

INF = inflation rate

DPN = degree of openness (export + import/GDP)

$\beta_0$  = constant term and  $\beta_1 - \beta_5$  = parameters to be estimated

$\mu$  = white noise error term

And the ECM is estimated thus

The error correction model is estimated thus:

$$\Delta \ln MCAP = a_0 + \sum_{i=1}^{nnn} a_{1i} \Delta \ln MCAP_{t-1} + \sum_{i=1}^{nnn} a_{2i} \Delta PCY_{t-1} + \sum_{i=1}^{nnn} a_{3i} \Delta \ln INT_{t-1} + \sum_{i=1}^{nnn} a_{4i} \Delta \ln EXCR_{t-1} + \sum_{i=1}^{nnn} a_{5i} \Delta \ln INF_{t-1} + \sum_{i=1}^{nnn} a_{6i} \Delta DPN_{t-1} + \lambda_7 ECM_t.....(3)$$

The findings that many macroeconomic time series contained unit root has spurred the development of the theory of non-stationary time series analysis. Engle and Granger (1987) argued that a linear combination of two or more non-stationary series may be stationary. If such a stationarity exists, the non-stationary (with a unit root), time series are said to be co-integrated. The stationary linear combination is called the co-integrating equation and may be interpreted as a long-run equilibrium relationship between the variables.

A vector error correction (VEC) model is a restricted vector auto-regression (VAR) that has co-integration restrictions built into the specification, so that it is designed for use with non-stationary series that are known to be co-integrated. The VEC specification restricts the long-run behavior of the endogenous variables to converge to their co-integrating relationships while allowing a wide range of short-run dynamics. The co-integration term is known as the error correction term since the deviation from long run equilibrium is corrected gradually through a series of partial short-run adjustments. Let us consider a two variable system with one co-integrating equation and no lagged difference terms. The co-integrating equation is

$$y_{1,t} = \beta_1 y_{2,t} + \epsilon_t$$

$$y_{2,t} = \beta_2 y_{1,t} + \epsilon_t.....(4)$$

and the VEC is

$$\Delta y_{1,t} = \gamma_1 (y_{2,t-1} - \beta_1 y_{1,t-1}) + v_{1,t}$$

$$\Delta y_{2,t} = \gamma_2 (y_{2,t-1} - \beta_1 y_{1,t-1}) + v_{2,t}.....(5)$$

In Equation (5), the only right-hand side variable is the error correction term. In the long run equilibrium, this term is zero. However, if  $y_1$  and  $y_2$  deviated from long run equilibrium in the last period, the error correction term is nonzero and each variable adjusts to partially restore the equilibrium relationship. The coefficients  $\gamma_1$  and  $\gamma_2$  measure the speed of adjustment.

Another VEC specification assumes that there are linear trends in the series and a constant in the co-integrating equations, so that it has the form:

$$\begin{aligned} \Delta y_{1,t} &= \delta_1 + \gamma_1(y_{2,t-1} - \mu - \beta_1 y_{1,t-1}) + v_{1,t} \\ \Delta y_{2,t} &= \delta_2 + \gamma_2(y_{2,t-1} - \mu - \beta_1 y_{1,t-1}) + v_{2,t} \end{aligned} \quad (6)$$

Lastly, if there is a separate linear trend outside the parentheses in each VEC equation, then there is an implicit quadratic trend in the series.

**Result**

Table 1 contains the results of unit root test which shows that inflation and openness were stationary at level while other variables were stationary after first differencing. The level of stationarity was either at 1 or 5 percent confidence level. The results also show that apart from interest rate tested with only intercept, other variables have intercept and trend included in test equation.

**Table 1: Result of Stationarity**

Variable	Order	ADF	Mckinnon	Included
LMCAP	I(1)	-3.630749	5% = -3.5670	Trend & Intercep
PCY	I(1)	-6.040731	1% = -4.2949	"
LINT	I(1)	-5.202655	5% = -3.6661	Intercept
LEXCR	I(1)	-3.944377	5% = -3.5670	Trend & intercept
LINF	I(0)	-3.870068	5% = -3.5614	Trend & intercept
DPN	I(0)	-3.875264	5% = -3.5614	Trend & intercept

The major aim of the test in table 2 is to find out whether a linear combination of variables that are integrated of the same order is stationary. If co-

integration exists, then there is a long run relationship between the variables.

**Table 2: Co-integration Result based on Unit Root test of Residual**

Variable	ADF	1% Critical Value
ECM	-4.573156	-4.3082

In table 2, after running the OLS estimation, the residual of the equation was tested for unit root with trend and intercept and was discovered to be stationary at 1 percent level. This is due to the fact that the absolute value of the observed variable is greater than the absolute critical value. This means that the null hypothesis which states that the residual of the co-integrating regression equation is non stationary is rejected at the 1 percent levels of significance. By this, it is evident that there is long run relationship between the variables in the stock

market equation. This is similar to the findings of Mukherjee and Naka (1995) in Japan.

Table 3 is the short run result which shows that the explanatory variables and previous year lags of MCAP explain about 41 percent of current MCAP. The F-stat reveals that the model is statistically significant while the DW statistics reveals absence of serial correlation. The result further shows that previous two years lag of per capita income (PCY), interest rate and previous two years lag of inflation rate had deleterious effect on market capitalization.

On the other hand, openness and previous levels of market capitalization exert positive impact on current market capitalization. However, only

interest rate, inflation and two years past level of market capitalization was statistically significant.

**Table 3: Parsimonious Error Correction Model**

Method: Least-Squares

Dependent Variable: DLMCAP

Variable	Coefficient	Std error	t-statistics	Prob
Constant	0.025252	0.177640	0.142150	0.8883
DLMCAP(-1)	0.227793	0.244330	0.932315	0.3618
DLMCAP(-2)	0.472347	0.219530	2.151626	0.0432
DPCY(-2)	-0.240137	3.027329	-0.079323	0.9375
DINT	-1.748902	0.677312	-2.582123	0.0174
DLINF(-2)	-0.465907	0.222150	-2.097265	0.0483
DDPN	0.693058	2.446085	0.283334	0.7797
ECM(-1)	-0.565777	0.210547	-2.687178	0.0138
$R^2 = 0.41$ , F-stat = 2.1, DW = 1.7				

Table 3 also shows that the ECM is statistically significant and carries the expected negative sign. Its coefficient which is the speed of adjustment is relatively high showing that whenever the system is out of equilibrium, it is returned with a speed of about 57 percent. Serkan (2008) in Turkey, Kyereboah, et al. (2008) in Ghana, Maku and Atanda (2009), Nneji (2013), and Akingunola, et al. (2012) all in Nigeria have also reached a similar findings.

#### Conclusion and Policy Remarks

The paper focuses on identifying some of the determinants of stock market in Nigeria for the period 1980-2012. The stock market in Nigeria revolves round the NSE and so the dependent variable is market capitalization while the independent variables include per capita income, interest rate, exchange rate, inflation and the economy level of openness. The study employs error correction model and it was discovered that interest rate, inflation and past level of market capitalization were the major determining factors for trading activities at the NSE. However, the negative impact of inflation, interest rate and per capita income as revealed by the study is worrisome.

The financial meltdown of 2008 which started in the United States and spill over to other countries including Nigeria has negatively affected transactions at NSE. Thus, the negative impact of interest rate on the NSE is in sympathy with the global economy crises yet to fully recover. High cost of production occasioned by high inflation in an economy with low demand is also a factor affecting the NSE. Low demand is not unconnected with low income as revealed by the per capita income. Also, impact of external influence on Nigerian economic performance is very minimal as it is insignificant. Many foreign investors in Nigeria have relocated to other countries due mainly to harsh business environment and insecurity. For example, there are no good roads and power supply is so epileptic.

The major conclusion drawn therefore is that the Nigeria capital market poor performance is due to failure of the government to put in place necessary measures that make for good business climate. It is therefore recommended that the monetary authority should ensure moderate interest rate that encourages investment. Also, the current double digit inflation in the economy should be checked. Finally, effort should be intensified by

the government at all levels to create employment and boost the per capita income of the citizens which will in turn increase investment.

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