

Macro-Economic Variables and Its Impact on Nigerian Capital Market Growth

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Abstract

The purpose of this study is to investigate the impact of macroeconomic variables on capital market growth with particular emphasis on the effect of macroeconomic pricing variables such as interest rate, inflation rate, and exchange rate on capital markets growth. Multiple regression analysis of the ordinary least square was employed to determine the impact of interest rate as well as other macroeconomic variables such as inflation rate, exchange rate on capital market growth for the period between 1985 and 2013. Pooled data regression method was employed to estimate the specified model equations. Findings of the study revealed that interest rates have an adverse effect on capital market growth. The Regression analysis results reveal that a 1% increase in interest rate will lead to a 44% decrease in all share price index, this implies that as the rate of interest increases, the performance of the capital market deteriorates. Inflation rate and exchange rate are however not significant, especially at the 5 percent level of significance. The study revealed further that the negative linkage between interest rate and All Share Index sufficiently proved when independently examined, multiple regression with variables such as inflation rate and exchange rate, shows it dominance effect on the dependent variable. The capital market should be strategically position to exploit the opportunities in the market, by engaging professionals and setting mechanism that will enable it with challenges of macroeconomic variables

Keywords: *Interest Rates, All Share Index, Inflation Rate, Exchange Rate, Capital Markets, Macroeconomic Variables*

INTRODUCTION

All over the world, the capital market has played significant roles in national economic growth and development. One intermediary in the market that operates as a rallying point for the

overall activities is the stock exchange. It is a common postulation that without a functional stock market, the capital market may be very illiquid and unable to attract investment. Essentially, the stock market provides liquidity (Ezeoha, 2009), contributes to capital formation, and investment risk reduction by offering opportunities for portfolio diversification (Levine, 1997; Filler, Hanousek & Nauro, 1999).

The liquidity role stands out clearly as the most significant among the numerous functions provided by the stock market. In the words of Levine (1997) without a liquid stock market, many profitable long-term investments would not be undertaken because savers may be reluctant to tie up their investments for long period of time. The stock market mainly provides liquidity by enabling firms to raise funds through the sales of securities with relative ease and speed. Through this catalyst role, the stock market is able to influence investment and economic growth in general. As argued by Mohtadi and Agarwal (2004), large stock markets lower the cost of mobilizing savings and facilitating investments in the most productive technologies.

The stock market enables government and industry to raise long-term capital for financing new projects and expanding or modernizing industrial and/or commercial concerns. If capital resources are not provided to those economic areas, especially industries where demand is growing demand for funds and which are capable of increasing production and productivity, the rate of expansion of the economy often suffers. A unique benefit of the stock market to corporate entities is the provision of long-term, debt financing and non-debt financial capital. Through the issuance of equity securities, companies acquire perpetual capital for development (Imobighe, 2015).

By providing equity capital, the market also enables companies to avoid over-reliance on debt financing, thus improving corporate debt-to-equity ratio. The link between Capital market growth and macroeconomic variables has in recent time being an issue among analysts based on their study of developed and emerging markets (Ologunde, Elumilade & Asaolu, 2006; Coleman & Tettey, 2006). Nyong (1997) asserted that the financial structure of a firm, that is, the mix of debt and equity financing, influence changes as economies develop. It moves towards equity financing through the stock market.

Interest and exchange rates are financial prices for credit and foreign currencies, respectively. They both affect resource allocation, production levels, prices and profitability. Ultimately, fluctuations in these reflect in share prices – an indicator of market performance. For instance, lowering of interest rate on demand and savings deposits will improve returns to investing on the exchange relative to investing in deposit money banks (DMBs) holding factors such as risk, transaction costs, etc. constant. This will therefore increase the demand for shares; share price of affected equities would rise on the exchange thereby affecting its performance. As an economy develops, more funds are needed to meet the rapid expansion (Ogunrinola & Motilewa, 2015).

Capital Market is the major components of a modern, market-based economic system as they serve as the channel for the flow of long-term financial resources from the savers of capital to the borrowers of capital. Efficient capital markets are hence essential for economic growth and prosperity. Thus a rising capital market is an indicator of an expanding economy. Like any other capital market elsewhere in the world, the Nigerian Capital Market exists to provide long term capital for economic and infrastructural development. One major objective for the establishment of the Nigerian Capital Market was to enable corporate institutions and government to raise quick capital to accelerate economic development. In line with this objective, the Nigerian Capital Market has gained prominence by facilitating tremendously the divestiture and

privatization of some state-owned enterprises (Nwangwu, 2013; Kolapo & Adaramola, 2012; Akingunola, Adekunle & Ojodu, 2012).

The existence, growth and development of the capital market in Nigeria is no doubt, a great catalyst to the internationalization of investment opportunities in the country, raising the level of both local and foreign direct investment (FDI) as well as portfolio investment. It constitutes the most important institution for massive capital formation geared towards economic development. All shares index is mostly used to determine the growth of the market as it captures the overall performance of the market. NSE all-share-index captures all the other performance measures such as market capitalization, liquidity, and turnover ratio. All Share Index is one of the major determinants of the market size of any stock exchange. The size of the All Share Index and its growth rate pose a major influence on the growth and development of the economy (Akingunola, Adekunle & Ojodu, 2012)

On the other hand, interest rates (macroeconomic variable) along with monetary aggregates form the targets of monetary policy in Nigeria. If the rate of interest paid by banks to depositors is increased, investors will patronize the banks the more and fewer investors will invest on the capital market. This will lead to a decrease in capital investment in the economy. Hence, economic growth and development will be lowered, because the allocation of capital resources plays a crucial role in the determination of the rate of the nation's output. Against this backdrop of the function by the NSE, it is imperative to inquire into the effect of macroeconomic variables such as interest rate, exchange rate and inflation rate on performance of the Capital market in Nigeria. This is more important because it has been asserted that the economic environment plays a significant role in determining the performance of the stock exchange (Okpara, 2010; Akani, 2013). Perhaps, also true is that the challenges facing the stock exchange depend to a large extent on government policies relating to the private sector, the monetary and fiscal policies, economic policies, financial sector reforms and the government's divestiture program.

The stock market serves as a veritable platform in the mobilization and allocation of savings among competing uses which are critical to the growth and efficiency of the economy (Alile, 1984). The determination of the overall growth of an economy depends on how efficiently the stock market performs its functions of capital allocation. As the stock market mobilizes savings, concurrently it allocates a larger proportion of it to the firms 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). Given that the stock market provides some services that propel economic growth, this study, therefore, empirically investigates whether there is a relationship between interest rate, inflation rate and exchange rate on capital market growth using multiple regression analysis on secondary data covering the period 1985 to 2013.

Statement of the Problem

The Capital Market is supposed to play an important role in the economy in the sense that it mobilizes domestic resources and channels them to productive investments. However, to perform this role it must have significant relationship with the economy. This study is being carried out especially because other empirical studies on the NSE mostly concentrated on the impact of the capital market on economic growth which may not have adequately addressed the impact of macroeconomic variables such as exchange rate, interest rate, inflation rate, etc., affect

on performance of the NSE itself. This study specifically inquires into the impact of macroeconomic variables on capital market growth in Nigeria, though restricted to the NSE.

The broad objective of this study is to examine how macroeconomic variables affect the growth of the Nigeria Capital Market. The specific objectives of this study are (i) to determine the impact of interest rate on Nigeria Capital Market Growth through an inquiry into the performance of the NSE (ii) To ascertain the effect of internal instability on the growth of capital market in Nigeria. This research work will test the following hypothesis: macroeconomic variables have no significant impact on the growth of the Nigerian Capital Market. The study period cover data on the variables for the period 1985 to 2013. This period is chosen because in the economic history of Nigeria, it is a period characterized by fundamental restructuring of the Nigeria Capital Market. The study limits itself to macroeconomic variables, namely; interest rate, inflation rate and exchange rate and their effect capital market growth.

LITERATURE REVIEW

Conceptual framework

Concept of Interest Rates in Nigeria

Interest rate is the price of money that is the amount of interest paid per unit of time expressed as a percentage of the amount borrowed. The cost of borrowing money, measured in naira, per year per naira, borrowed, is the interest rate. Interest rates differ mainly in *term/maturity* that is the length of time for repayment and liquidity that is quick conversion of assets to funds. When maturity and liquidity together with other factors are considered, many different financial instruments and so many different interest rates will emerge (Anyanwu, 1997).

Interest rates can either be nominal or real. Nominal interest rate can be measured in naira terms, not in terms of goods. The nominal interest rate measures the yield in naira per year, per naira invested while the real interest rate is corrected for inflation and is calculated as the nominal interest rate minus the rate of inflation (Pandey, 1999). A positive real interest rate indicates that nominal rates are in excess of inflation while a negative real rate is a direct reflection of high inflation. Moderately positive real interest rates are desirable as extremely high real rates can cause distress among borrowers as well as constrain investment spending. Interest rates are quite many; hence, they are often referred to as Interest rates Structure. In a deregulated economy, interest rate charges will differ from one bank to another but in a regulated interest rate regime the reverse in the case.

Also, interest rates are the rental payments for the use of credit by borrowers and return for parting with liquidity by lenders. Like other prices, interest rates perform a rationing function by allocating limited supply of credit among the many competing demands on it. The primary role of interest rates is to help in the mobilization of financial resources and to ensure the efficient utilization of such resources in the promotion of economic growth and development. Interest rates affect the level of consumption on the one hand and the level and pattern of investments on the other. In general, interest rates are useful in gauging financial market conditions and they are a major tool of monetary policy. Usually when the structure of interest rates is changed, the resulting relative rates of return will induce shifts in asset portfolio of both the banks and the non-bank public (Holland, 1984; Akani, 2013). Hence, the direction and magnitude of changes in market interest rates are of primary importance to economic agents and policy markers.

Concept of Stock Market

Capital market is defined as the market where medium to long-term finance can be raised (Akingbohunge, 1996). Edame and Okoro (2013), in their finding, noted that capital market is the market for dealings (i.e. lending and borrowing) in longer-term loanable funds. Mbat (2001) described it as a forum through which long-term funds are made available by the surplus to the deficit economic units. Capital market is a collection of financial institutions set up for the granting of medium and long term loans. It is a market for government securities, for corporate bonds, for the mobilization and utilization of long-term funds for development – the long term end of the financial system (Alajekwu & Achugbu, 2011). In this market, lenders (investors) provide long term funds in exchange for long term financial assets offered by borrowers.

Idris (2014) said capital market could be simply described as the market for dealings (Lending and borrowing) in longer-term loan able funds and equity shares. The market according to him is made up of the primary and secondary markets. The primary (new issue) market is concerned with raising new capital. The secondary market is the market for the sale and purchase of existing securities, which are already in people’s hand, enabling savers who purchased bonds and shares when they had surplus funds to recover their money when they need cash (Kareem, Sanni, Raheem & Bakare, 2013).

Nwankwo (1991) opined that the central task of the capital market is the mobilization of funds in the hands of myriad individual who save and the pooling and channeling of such funds into productive uses. It is the most important institution for massive capital formation geared towards economic development. This market embraces both the new issues (primary) market and secondary market. Thus, it is a mechanism whereby economic unit desirous to invest their surplus funds, interact directly or through financial intermediaries with those who wish to procure funds for their businesses (Akinsanmi, 2015; Osisanwo & Atanda, 2012).

Review of Empirical Studies

There are generally dearth of empirical works on interest rates and stock market growth. However, research usually observes an indirect links through which the interest rate drives the inflation rates and consequently the stock market index. Kaul (1990), to our notice analyzed the relationship between stock returns and unexpected inflation or changes in expected inflation under alternative monetary policy regimes. He posited that if the monetary authority pursues a target for the growth rate of money, the relation between money supply and economic activity is likely to be weak. In these circumstances, he submitted, monetary policy is unlikely to accentuate the negative stock return-inflation relations predicted by Fama’s “proxy hypothesis”.

Akingunola, Adekunle and Ojodu (2012) further opined that, if the monetary authority is pursuing an activist interest rate policy, this could accentuate or reverse the negative relation between stock returns and inflation depending on whether the policy pursued is counter- or pro-cyclical. He used post-war data for U.S., Canada, the U.K., and Germany and found that the negative relation between stock returns and changes in expected inflation was significantly stronger during interest rate regime than under money-supply regimes. It appears that central banks in an interest rate regime pursued strong counter-cyclical policies.

Kaul (1990) as cited in Akingunola, Adekunle and Ojodu (2012) also found that there was no change in the relation between stock returns and inflation in countries that only experienced one type of policy regime during the period studied. Besides, Balduzzi (1995) considered a VAR with the rate of inflation, real returns on the value-weighted NYSE portfolio, growth in industrial production, and monetary base growth. He used vector moving averages to

study the correlation between the two series and found a negative contemporaneous correlation between inflation and stock returns, irrespective of the origin of the innovation but with inflation shocks resulting in the strongest correlations. He submitted that when the system was augmented to include the three-month Treasury bill rate, interest rate innovations were found to play a significant role although inflations still matter the most.

Additionally, Lee (1992) thought it would be more interesting to investigate the extent to which a variable helps explain other variables and how a variable responds to shocks in other variables in the system, rather than merely conducting simple tests of causal relations. Lee (1992) estimated a four variable VAR system with real stock returns, real interest rates, growth in industrial production, and the rate of inflation for the period January 1947 to December, 1987 (U.S. data). He found that the response of industrial production to shocks in real stock returns is strongly positive up to twelve (12) months after the shock. He does not find a consistent negative response of inflation to shocks in stock returns, or vice versa.

The real interest rates are found to explain a substantial fraction of the forecast error variance in inflation (Osundina & Okezie, 2014; Briggs, 2015). Finally, inflation explains little of the variation in real activity. Hence, with real interest rates and a measure of real activity in the system, the relation between stock returns and inflation breaks down. This is consistent with the Fama's "proxy hypothesis". Similarly, Canova and Nicolo (1997) conducted a study that is related to Lee's (1978) for U.S., the U.K., Germany, and Japan for the more recent period 1973-1993. They estimated a VAR with nominal stock returns, the slope of the term structure, industrial production and inflation. They discovered a significant negative relation between real stock returns and inflation in all four countries. On the other hand, the negative correlation between nominal stock returns and inflation is significant only in the U.S. Canova and De-Nicolo (1997) allow for international interactions by estimating bilateral VAR's 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 (Osundina & Okezie, 2014; Sunday, Ewah & Jude, 2009).

METHODOLOGY

This section focuses on the methodological phase of the study, it begins by putting forth, the tests of analysis in the use of Augmented Dickey-Fuller (ADF) and the Phillip-Peron (PP) tests of unit roots in order to ensure that the regression results are not spurious. This will be done by conducting the stationarity test on the collected data. Likewise co-integration test was conducted to establish the long-run equilibrium relations of variables correcting for the effect of shocks which tends to have lasting impacts on the individual variables. These tests are essential to judge the validity and acceptability of the conclusions drawn from the model estimates.

Models Specification

The objective thrust of this work is to investigate the relationship subsisting between stock market growth and interest. As such, a multiple regression model couple with its simple version will be employed to examine both an interdependent and an independent relationship. These become necessary in order to adequately account for the total effect of interest rate on stock market growth and also measure if any marked difference(s) exist between other control variables and interest rate in a holistic model situation.

In tandem with the Technical analysis theory of Stock prices and also in consonance with the empirical works of Coleman and Tetey (2006); and Ologunde, Elumilade & Asaolu (2006), the most appropriate model to carry out an empirical investigation on the relationship between stock market growth and interest rate are as thus specified;

$$\text{All share index} = f(\text{Interest rate}) \dots\dots\dots(1)$$

$$\text{All share index} = f(\text{Inflation rate}) \dots\dots\dots(2)$$

$$\text{All share index} = f(\text{Exchange rate}) \dots\dots\dots(3)$$

$$\text{All share index} = f(\text{Interest rate, Inflation rate, Exchange rate}) \dots\dots\dots(4)$$

The above functional equations are better specified into random or stochastic models for research and estimation purpose and are as such specified below:

$$\text{NSI}_t = \alpha_0 + \beta_1 \text{INTR}_t$$

$$\text{NSI}_t = \alpha_0 + \beta_2 \text{INFL}_t$$

$$\text{NSI}_t = \alpha_0 + \beta_3 \text{EXCH RATE}_t$$

$$\text{NSI}_t = \alpha_0 + \beta_1 \text{INTR}_t + \beta_2 \text{INFL}_t + \beta_3 \text{EXCH RATE}_t + \varepsilon_t$$

Where,

NSI – the Nigerian All Share Index;

INTR – the interest rate;

INFL – the rate of inflation;

EXCHR— the Exchange Rate

t ----- Time series interval.

ε ---- is purely a white noise phenomenon – assumed to capture the influence of other exogenous factors that are capable of influencing All share index.

Since this study intends to examine the relationship between macroeconomic variables and Nigerian Capital Market growth, the capital market growth was measured using the Nigeria All Share Index. This variable captures the overall performance of the market and it is the dependent variable in this study regression analysis. It is used as a tool to represent the characteristics of its component stocks, all of which bear some commonality such as trading on the same stock market exchange, belonging to the same industry or having similar market capitalization. Nigeria All Share Index is settled for because it captures all the other performance measures such as market capitalization, liquidity, and turnover ratio. The Nigeria All Share Index serves as the dependent while the independent variables are Lending Rate, inflation rate and exchange rate.

Sources of Data

The data used in this study were sourced from the Central Bank of Nigeria of Statistical Bulletin Publications and Annual, National Bureau Annual of Statistics of Abstract of Statistics and Nigeria Stock Exchange Fact-Books. The data cover the period between 1985 and 2013. The period encompasses the phases of the major reforms in the Nigeria Capital Market.

Economic Criteria: A' priori Expectation

This explains the theoretical linkage about the signs and magnitude of the parameters of the specified functions. A' priori expectations are determined by the principle of financial and economic theory guiding the relationship among the variables under study.

They are as thus given by theories:

S/N	Variables	Expected signs
1.	INTR	-ve
2.	INFL	-ve
3.	EXCHR	-ve

A' priori expectation is that, independently, high interest rate, inflation rate and exchange rate are all expected to be negatively related to capital market growth while no inkling is given by economic theories on the interdependent expositions of the three variables in relation to capital market growth

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

Data analysis using the Adjustment Dickey-fuller (ADF) test of unit root to confirm stationarity is done by comparing the ADF test is greater than the latter. The time series characteristics of the variables using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (P-P) tests were first examined. Basically, the idea is to ascertain the order of integration of the variables as to whether they are stationary I (0) or non-stationary; and, therefore, the number of times each variable has to be differenced to arrive at stationarity.

Also, the co-integration test of long-run equilibrium is accepted if there is at least one co-integrating relation between variables; indicating that the variables specified in the model have equilibrium condition that keeps them in proportion to each other in the long-run. In testing for *Co-integration*, the Johansen Efficient Maximum Likelihood test was used to examine the existence of a long-term relationship among the variables. The final specification (*Error Correction Model*) included a short run dynamic process, consistent with data and converging to the long run equilibrium. The Error Correction Model (ECM) attempts to integrate economic theory useful in characterizing long run equilibrium with observed disequilibrium by building a model that explicitly incorporates behavior that would restore equilibrium. However, the Vector Error Correction Model (VECM) is adopted as the basic techniques of analysis with obtained estimates, the empirical analyses of the result is done with the various decision criteria of economic a' priori expectation, statistical first-order test & econometric second-order test specified in the immediate past section.

Stationarity Tests – Augmented Dickney Fuller (Adf) & Phillip-Peron (Pp)

Table 1 - Model 1: NSI = f (INTR)

Variables	ADF test statistic		Phillip Peron test		Order of integration
	Levels	1st Difference	Levels	1st Difference	
NSI	5.8089	-	5.8089	-	I(0)
INTR	-3.2017	-11.2256	-3.2017	-11.2256	I(1)

Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013) and NSE Fact-book (2013)

Table 2 – Model 2: NSI = f (INFR)

Variables	ADF test statistic		Phillip Peron test		Order of integration
	Levels	1st Difference	Levels	1st Difference	
NSI	5.8089	-	5.8089	-	I(0)

INFR	2.8182	-9.0558	2.8182	-9.0558	I(1)
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Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013) and NSE Fact-book (2013)

Table 3 - Model 3: NSI = f (EXCHR)

Variables	ADF test statistic		Phillip Peron test		Order of integration
	Levels	1st Difference	Levels	1st Difference	
NSI	5.8089	-	5.8089	-	I(0)
EXCHR	-0.4890	-8.4770	-0.4890	-8.4770	I(1)

Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013) and NSE Fact-book (2013)

Table 4: Model 4: NSI = f(INTR, INFR, EXCHR)

Variables	Levels		1st Difference		Decision
	ADF	PP	ADF	PP	
AS1	-0.5007	-0.5116	-3.1307	-2.8858	I(1)
EX-RT	-2.2564	-2.5101	-4.2019	-4.2019	I(1)
INFL	-2.5662	-2.7867	-4.6946	-5.1854	I(1)
INTR	-2.6825	-2.5345	-4.6629	-6.0676	I(1)
Critical values	1%: -3.7530	1%: -3.7530	1%: -3.7700	1%: -3.7696	
	5%: -2.9981	5%: -2.9981	5%: -3.0050	5%: -3.0049	
	10%:-2.6388	10%:-2.6388	10%:-2.6420	10%:-2.6422	

Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013)

The Augmented Dickey Fuller Test indicates that all the economic variables included in the models are non-stationary at levels for the holistic model as well as the disaggregated models, except for the Nigeria Share Index (NSI). This largely lends credence to the proposition of Granger and Newbold (1974) that most economic data are unit root at levels.

Johansen Co-integration Test

Since the stationarity of the data is ascertained at I (1) – (ADF table refers), it becomes imperative to also examine if the variables could be long-run co-integrated. The Johansen Maximum Likelihood (JML) test is conducted with unrestricted intercept and no trends in vector auto-regression (VAR). The order of VAR, which is found suitable and selected for the study, determines the lag length for the model. The VAR of order 2 was not feasible for the study because of insufficient number of observations. Consequent on this result, the VAR model of order 1 was selected and utilized for this research work. The Likelihood Ratio (LR) test based on Maximal Eigen value of the stochastic matrix rejected the null hypothesis that there is no co-integration between the variables (i.e. $r=0$) but did not reject the hypothesis that there is at least one co-integration relation between the variables (i.e. $r=1$) at the 5% significant level.

Table 5: Model 1 – Co-integration Estimates

Hypotheses		Test-Stat	Critical value (5%)
Null	Alternative		
r = 0	r = 1	37.84**	15.41
r ≤ 1	r = 2	9.42**	3.76

Note: 1. the Johansen Co-integration Likelihood Ratio test is based on the trace of the stochastic matrix (2) r = number of co-integrating vectors (3) ** significant at 5% *Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013)*

Table 6: Model 2 – Co-integration Estimates

Hypotheses		Test-Stat	Critical value (5%)
Null	Alternative		
r = 0	r = 1	66.76**	15.41
r ≤ 1	r = 2	3.60	3.76

Note: 1. the Johansen Co-integration Likelihood Ratio test is based on the trace of the stochastic matrix (2) r = number of co-integrating vectors (3) ** significant at 5% *Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013)*

Table 7: Model 3 – Co-integration Estimates

Hypotheses		Test-Stat	Critical value (5%)
Null	Alternative		
r = 0	r = 1	29.67**	15.41
r ≤ 1	r = 2	0.03	3.76

Note: 1. the Johansen Co-integration Likelihood Ratio test is based on the trace of the stochastic matrix (2) r = number of co-integrating vectors (3) ** significant at 5% *Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013)*

Table 8: Model 4 – Co-integration Estimates

Hypotheses		Test-Stat	Critical value (5%)
Null	Alternative		
r = 0	r = 1	87.72**	47.21
r ≤ 1	r = 2	22.95	29.68
r ≤ 2	r = 3	9.91	15.41

$R \leq 3$	$r = 4$	4.44*	3.76
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Note: 1. the Johansen Co-integration Likelihood Ratio test is based on the trace of the stochastic matrix (2) r = number of co-integrating vectors (3) ** significant at 5% Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013).

The above tables indicate two co-integrating vectors among the variables at the 5% level for model 1 while one co-integrating equations is said to exist for the second models Model 2 through Model 4. Therefore, it could be fathomed that there is no possibility of running into a “spurious” result since there exist a long run equilibrium relationship among the variables included in our models. Stemming from this and in accordance with Engle and Granger (1987) representation theorem, the best way to model this kind of relationship is through an error correction model. This approach is employed in this study as all variables are made stationary prior to estimations.

Regression Estimates of the Vector Error Correction Model

Since stationarity of our data have been ascertained (to avoid falling prey to spurious regression) and the long-run equilibrium condition of the among the variables included in our models have been ensured, it is imperative we further the course of our analyses into looking at the estimates obtained from the technique of analysis – the Vector Error Correction Model (VECM) – for evaluation and interpretation. The VECM equations are as thus specified;

$$\begin{aligned} \text{ECM}_{t-1} &= \alpha_0 + \beta_1 \text{NSI}_{t-1} + \beta_2 \text{INTR}_{t-1} + \varepsilon_{t-1} \dots\dots\dots(i) \\ \text{ECM}_{t-1} &= \alpha_0 + \beta_1 \text{NSI}_{t-1} + \beta_2 \text{IINFR}_{t-1} + \varepsilon_{t-1} \dots\dots\dots(ii) \\ \text{ECM}_{t-1} &= \alpha_0 + \beta_1 \text{NSI}_{t-1} + \beta_2 \text{EXCHR}_{t-1} + \varepsilon_{t-1} \dots\dots\dots(iii) \\ \text{ECM}_{t-1} &= \alpha_0 + \beta_1 \text{NSI}_{t-1} + \beta_2 \text{INTR}_{t-1} + \beta_3 \text{IINFR}_{t-1} + \beta_4 \text{EXCHR}_{t-1} + \varepsilon_{t-1} \dots\dots(iv) \end{aligned}$$

Table 9: Model 1- VECM Estimates obtained

S/N	REGRESSORS	COEFFICIENTS	STD ERROR	T-STATISTICS
1.	D(ECM)) _{t-1}	0.128	0.023	5.65
2.	INTERCEPT	907.66	252.38	3.60
3.	D(NSI)) _{t-1}	-0.178	0.123	-1.45
4.	D(INTR)) _{t-1}	50.74	100.09	0.51
	R ²	0.30		
	F-Statistics	12.06		
	Durbin Watson	1.95		

Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013) and NSE Fact-book (2013)

Table 10: Model 2- VECM Estimates obtained

S/N	REGRESSORS	COEFFICIENTS	STD ERROR	T-STATISTICS
1.	D(ECM)) _{t-1}	0.226	0.026	8.845
2.	INTERCEPT	1774.5	245.16	7.238
3.	D(NSI)) _{t-1}	-0.305	0.104	-2.93
4.	D(INFR)) _{t-1}	-419.80	65.98	-6.36

	R ²	0.53		
	F-Statistics	32.33		
	Durbin Watson	1.85		

Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013) and NSE Fact-book (2013)

Table 11: Model 3- VECM Estimates obtained

S/N	REGRESSORS	COEFFICIENTS	STD ERROR	T-STATISTICS
1.	D(ECM)) _{t-1}	0.170	0.029	5.79
2.	INTERCEPT	938.24	255.93	3.67
3.	D(NSI)) _{t-1}	-0.220	0.125	-1.76
4.	D(EXCHR)) _{t-1}	-2.75	33.92	-0.081
	R ²	0.31		
	F-Statistics	12.69		
	Durbin Watson	2.00		

Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013) and NSE Fact-book (2013)

Table 12: Model 4- VECM Estimates obtained

S/N	REGRESSORS	COEFFICIENTS	STD ERROR	T-STATISTICS
1.	D(ECM)) _{t-1}	0.24	0.03	8.77
2.	INTERCEPT	1807.01	251.39	7.19
3.	D(NSI)) _{t-1}	-0.32	0.11	-3.00
4.	D(EXCHR)) _{t-1}	-14.45	28.68	-0.53
5.	D(INFR)) _{t-1}	-421.47	66.68	-6.32
6.	D(INTR)) _{t-1}	67.66	83.99	0.81
	R ²	0.53		
	F-Statistics	19.14		
	Durbin Watson	1.85		

Source: Author's computations using E-views 6.0; underlying data from CBN Statistical Bulletin (2013) and NSE Fact-book (2013)

Discussion of Results

The estimates obtained from the Tables above (Tables 9 and 12 above) suggest that the coefficient of the ECM obtained is properly signed (i.e. negative) only in the holistic model 4 while improperly signed (i.e. positive) in the independent models 1 through 3. Therefore, the estimate obtained from the aggregate model 4 informs our knowledge of how soon the Nigeria All-Share Index is able to go back to equilibrium once affected by economic shocks. From this empirical standpoint, it is manifest that the Nigerian All-Share Index is able to significantly recover back to equilibrium at 24.0 percent if affected by economic shock. These suggest that once the Nigerian All-Share Index is affected by economic shock, it significantly adjust back to equilibrium if all the variables of interest rates, inflation rates and exchange rates included in Model 4 are simultaneously considered (that is, for the holistic model).

Also, for the independent models 1 to 3 which intends to specifically address the relationship between the stock market growth and interest rate; inflation rates and exchange rates, respectively, suggests a significant 12.8 percent; 22.6 percent and 17.0 percent recovery to equilibrium once the All-Share Index is affected by the shock of interest rates, inflation rates and exchange rates respectively. Considering the contemporaneous effect of previous values of the All-share Index on its present value (i.e. NSI_{t-1}), the estimate obtained in Model 4 indicates that there exist a negative but barely significant relationship between the present and past values of NSI for the holistic model. In furtherance of this assertion, the independent models 1 to 3 were considered and found to be negative and highly significant for all cases.

Furthermore, the explanatory powers of the models are relatively substantial. In the holistic model 4, the R^2 is 0.53 while it is 0.30 for the independent models 1; 0.53 for model 2 and 0.31 for model 3. This indicates that the explanatory variables of exchange rate, inflation rates and interest rates for Model 4 substantially account for the 53 percent and 30 percent movement; 53 percent and 31 percent for models 1, 2 and 3 respectively, in All-Share Index in the Nigerian Capital Market and by extension, the stock market growth of the Nigerian economy. More so, the Durbin Watson (DW) statistics obtained suggest that there is an absence of serial correlation or autocorrelation problem of regression in our models. This is evident in the DW statistics of 1.85 for model 4 and 1.95; 1.85 and 2.00 for models 1, 2 and 3 respectively. These approximately conform to the benchmark of 2.0 for the absence of autocorrelation problem of regression.

In furtherance of our analysis, the estimates obtained for exchange rate, inflation rates and interest rate for the holistic model 4 and the interdependent Models 1 through 3 are seriously instructive as it indicates that none of these variables, except the inflation rates is found to be significant at the 5 percent level. The inflation rate, both in the aggregate model 4 and its independent model, is found to be highly negatively significant. From the empirical periscope, it is obvious that this work largely relates to the works of Kaul (1990) and Lee (1978) where they, separately, account for the extent at which the interest rate manipulates the position of inflation rate on the stock market index. Though the works posited a significant relationship between the inflation rates and capital market growth, this work, however, found out this significance at a higher level of significance.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study set to examine the impact of interest rate on Capital Market Growth with special reference to Nigeria Capital Market. The rationale behind the study is that globally stock markets are regarded as financial institutions where funds can be raised in order to finance investment so as to achieve high-economic growth and hence development. Most of the studies carried out on stock markets have rather concentrated on direct linkage with inflation rate. It was therefore deemed appropriate to examine the direct impact of interest rate as a macroeconomic fundamental on the capital market growth with special reference to Nigeria as these fundamentals have not been stable over the years. The interest rate which is a very important determinant when it comes to the direction of the flow of funds in a country showed its considerable effect on the performance of the internal stability and workings of the economy.

Although interest rate is not negatively linked to the all share index, on its own but when examined alongside other control variables such as inflation rate and exchange rate, it behaves true to type. This is because interest rate acts as the major impetus that drives the inflationary

trend of the Nigerian economy. In order to enable the capital market to take full advantage of the various opportunities and cope with challenges, interest rates must be properly put at check. This must be done in relation to appropriate monetary policies to ensure macroeconomic stability. With these results, it is important to highlight that there is the need to implement prudent macroeconomic policies in order for a country to derive maximum benefits from capital markets

Policy Recommendations

In order to enhance the growth of Nigerian Capital Market that would facilitate the developmental progress of the Nigerian economy, the following policy suggestions are strongly recommended:

(1) **Policy Incentives:** There is need for the government to articulate appropriate incentives and policies to ensure that lending rate is kept at one digit (not high) in order to encourage investors to borrow money from bank and inject it into capital market.

(2) **Stable Macroeconomic Policies:** Volatile macroeconomic policies as well as the pricing system, instability in the policies and programs of government are substantial indicator of an imminent crisis in the capital market. As a result, it is important that sound macroeconomic, sectoral and structural policies are applied to improve internal balance, ensure external sector variability and reduce the probability of occurrence of crisis in the stock market. The need for macroeconomic stability is to reduce budgetary imbalances through reduction in the size and role of government and greater reliance on the private sector development financing.

(3) **Good Governance:** Good governance is essential to ensure that the value of law prevails and that transparency and accountability are the bedrock of public administration. Excessive government interpretation in economic management creates a fertile ground for corruption and rent seeking tendencies. A well-focused administration geared towards reducing bottlenecks on the operational path of the financial sector would generate adequate impetus for the reduction of banking crisis.

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