

The Performances and Impact of Interest Rates on Stock Market In Nigeria from Year 1985 - 2013

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ABSTRACT

This research work examines the performances and the impact of interest rate on stock market capitalization. Time series data from year 1985-2013 was obtained from the Central Bank of Nigeria (CBN) and the Nigerian Stock Exchange (NSE). The data was analyzed using and time series analyses. The analyses show that an inverse relationship exists between interest rate and stock market capitalization, while the hypothesis tested shows that the impact of interest rate is significant on stock market capitalization such that for every unit increase in the interest rate, the stock market capitalization is reduced by about ₦685 billion – this implies that the rate of interest has a very serious implication on the performance. The findings from time series analysis however revealed that over the last decade of the period under review the Nigeria Stock Exchange (NSE) experienced a steady growth of 26% increase per year in market capitalization. By way of extrapolation, a market capitalization of about ₦53,334.4 billion is predicted to be recorded by the end of year 2017. It is therefore recommended that the Central Bank of Nigeria (CBN) should formulate and use policy statements that will maintain interest rate in order to encourage high stock market patronage for economic growth. Also, the Nigerian Stock Exchange (NSE) should engage in public enlightenment and improve on corporate governance framework to encourage more investment and improve transactions in the market. The government should ensure economic and political stability that will encourage capital inflow and reduce external debt so as to lead the economy to the next stage of growth.

Keywords: Simple Linear Regression, Time Series Analyses, Nigerian Stock Market (NSE) and Central Bank of Nigeria (CBN).

1.0 Introduction

Financial markets in general deal in financial assets and liabilities of various maturities and consist of institutions, instruments, rules and regulations which guide the mobilization of funds, from the surplus units of the economy to

the deficit units. Conventionally, financial market can be divided into money and capital markets. The money market deals in short-term fund (less than one year maturity), while the capital market caters for long-term needs of both borrowers and lenders. These markets can further be subdivided into primary and secondary markets, with the former concerned mainly with raising new funds and the latter with purchases and sales of existing securities. Prior to the modern and formal financial markets, traditional/informal financial markets existed in the form of money lending of varying maturities, ranging from short to long-term. The major characteristic of the traditional financial markets were lack of established rules and guidelines and imposition of exorbitant interest rates by money lenders. Furthermore, the financial market activity was carried out without financial instruments of the modern type but usually based on mutual agreement and or pledge of physical assets, including rendering of service by the borrower to the lender until the debt was liquidated. The mode of operation varied from culture to culture and still exists in many areas not adequately catered for by the modern financial market.

The formal money market evolved in the early 1960s with the first issue of treasury bill of N8 million by the Central Bank of Nigeria (CBN) in April 1960 and the establishment of the Lagos Stock exchange (later transformed into the Nigerian Stock Exchange (NSE) which commenced operation in June 1961 (Nnanna et al, 2004)

2.0. Literature Review

Extensive empirical and analytical research has been undertaken severally to evaluate the impact of key macroeconomic variables on stock returns in developed, emerging and developing economies over the years by many researchers. A brief review of the studies is however presented in this chapter. This section reviews some empirical studies and literature on interest rate and the stock market (Nigeria's experience), financial development and economic growth; capital market; money market, and interest rate and stock market performance (generally). In addition, the chapter takes an overview of financial markets in Nigeria. In doing this, the history and structures of the Nigerian capital and money markets are highlighted. The mode of operation varied from culture to culture and still exists in many areas not adequately catered for by the modern financial market.

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The Nigeria capital market provides the necessary lubricant that keeps turning the wheel of the economy. It is not only providing the funds to projects of best returns to fund owners. This allocation function is critical in determining the overall growth of the economy. The functioning of the capital market affects liquidity, acquisition of information about firms, risk diversification, savings mobilization and corporate control (Anyanwu, 1998). Therefore, by altering the quality of these services, the functioning of stock markets can alter the rate or pace of economic growth (Equakan, 2005). Okereke-Onyuike (2000) posits that the cheap source of funds from the capital remain a critical element in the sustainable development of the economy. She enumerated the advantages of capital market financing to include no short repayment period as funds are held for medium and long term period or in perpetuity, funds to state and local government without pressures and ample time to repay loans.

3.0 Research Methodology

This section describes the statistical tools used to meet the study and explaining the research design, the population of the study, and the sample size. The sources and methods of data collection, the variables of the study, justification

of the study, the variables and the techniques for statistical analysis of data, as well as method of data processing are all highlighted.

3.1 Research Design

This study combines descriptive and diagnostic designs, as explained in the following paragraphs, in examining the impact of interest rate on stock market performance.

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Jahoda et al, 2006). According to Ghosh (2006), there are four types of research designs and these are exploratory or familiarity, descriptive, diagnostic and experimental study designs.

3.2 Population and Sample Size of the Study

The population of the study is the Nigeria's financial market which comprises the Capital Market and Money Market. However, the Nigerian Stock Market – a Capital Market – constitutes the Sample for this study and the sample period covers 1985 to 2013, consisting of 29 annual observations for each of the macroeconomic factors under consideration (interest rate, stock market capitalization and all shares index). The market capitalization is found by multiplying the total number of shares by the current price (Mueller, 1996) and the All Share Index is used to compute the ordinary shares of the NSE (NSE fact book, 2007).

Determination of the sample which is the Nigerian Stock Market is predicated on the research interest whose scope revolves round the financial market where movements and macroeconomic variables are closely followed and analyzed as proxies for the general economic conditions of the world markets.

3.3 Sources of Data

The data used for this research were secondary data collected from Central Bank of Nigeria (CBN) statistical bulletin (1981-2013) and Nigerian Stock Exchange (NSE) fact book (1981-2013). The data on stock market capitalization, and all share indexes were extracted from NSE fact book for the period under study. While the data on interest rate for the period under study were extracted from the CBN statistical bulletin.

3.5 Methods of Data Collection

The data for this research therefore was obtained from documents. These documents include NSE fact book and the CBN statistical bulletin. There are three methods of data collection which are: use of documents, observation and interviews or questionnaires (Ghosh, 2006). The researcher uses secondary data which are regarded as statistical materials which do not originate from the research, but which are obtained from records and worked upon by another body. Such data are obtainable from Government records, National Bureau of Statistics, Banks, Industries, Ministries, Hospitals and other relevant bodies.

3.6 Techniques for Data Analysis

The data for the study is analyzed using the regression analysis and inferences are then drawn. Simple linear regression is employed as there is one independent variable. The data for this study is therefore analyzed using the simple linear regression with the aid of SPSS and E-view.

In this study, two simple regression analyses are conducted with each having one independent variable. The data is fitted into an equation with Ordinary Least Square (OLS) regression method. The linear relationship of the dependent and independent variables in each of the two simple regressions is determined.

4.0 Data Presentation

All necessary data in relation to interest rate, stock market capitalization and all share indexes for the period under review are presented. The data used for the research work is presented in a tabular form as shown below.

TABLE 4.1; YEARLY TIME SERIES REGRESSION DATA

Year	Stock Market Capitalization (Billions of ₦)	All Share Index (Points)	MPR Interest Rates (%)
1985	6.6	1407.4	10.00
1986	6.8	1797.8	10.00
1987	8.2	2123	12.75
1988	10.0	2529.7	12.75
1989	12.8	3286.43	18.50
1990	16.3	5083.9	18.50
1991	23.1	8059.4	14.50
1992	31.2	11172.2	17.50
1993	47.5	14748.3	26.00
1994	66.3	22958.7	13.50
1995	180.4	45781.4	13.50
1996	285.8	71461.7	13.50
1997	281.9	91663.1	13.50
1998	262.6	71542.5	14.31
1999	300.0	63170.3	18.00
2000	472.3	80414.1	13.50
2001	662.5	122221	14.31
2002	764.9	139582	19.00
2003	1,359.3	186719	15.75
2004	2,112.5	296864	15.00
2005	2,900.1	274521	13.00

2006	5,120.9	304123	12.25
2007	13,181.7	585280	8.75
2008	9,563.0	605096	9.81
2009	7,030.8	277099	7.44
2010	9,918.2	297307	6.13
2011	10,275.3	280724	9.19
2012	14,800.9	281191	12.00
2013	19077.4182	434484.9	12.00
Source:	Compiled from CBN and The NSE reports		

4.2 Analysis of Data

Analysis is done with the use of the Statistical Package for SPSS (version 20), Econometric View (version 8.1) and Minitab (version 14). The extracts and scatter diagrams are therefore presented in this work. The data analysis is in stages. First, the unit root test is conducted to check for the stationarity of the variables used in this study to avoid spurious regression. Secondly, the cointegration of the variables used in each model was tested using the EG-ADF test. Thereafter analysis is carried out to determine the relationship between interest rate and stock market capitalization through regression procedure. A graphical representation called the scatter diagram is also presented to illustrate the relationship between stock market capitalization and interest rate. Also, the relationship between all share index and interest rate is determined using regression while the associated scatter diagram is equally presented. Lastly, trend analysis of stock market capitalization is done to display the growth trend of the stock market capitalization over the 29-years period under study with a statistical prediction of its performance up to 2017. However, in order to effectively capture the trend realities of the stock market performance over the period under review, the 29-years period is partitioned into two time periods with the second period capturing the performance of the stock market over the last decade.

4.3 Result and Discussion

Unit Root Test Results:

The unit root test is a test conducted to check for the stationarity of the variables used in this study. The purpose is to free the result from spurious regression.

The variables were tested using the Augmented Dickey-Fuller (ADF) and Phillips- Perron (PP) unit root tests. The Schwarz-Bayesian Criterion (SBC) and Akaike Information Criterion were used to determine the optimal number of lags included in the test.

Appendices A, B, C, D, E and F report the results of the unit root tests both at levels and 1st differences.

The test results show that the ADF and PP statistics for the levels of all the variables do not exceed the critical values (in absolute terms) implying that the variables are non stationary at levels. However, when first differences

are taken on each of the variables, the ADF and PP statistics are higher than their respective critical values (in absolute terms) implying stationary after first differences. We conclude that (Interest rate [**IR**], All Share Index [**ASI**] and Stock Market Capitalization [**SMC**]) are each integrated of order one or I (1) implying, they are stationary at first difference.

4.3.1 Cointegration Tests Results:

The Engle Granger Cointegration Approach was tested to know the stationary on the residuals series (e_t) estimated in each of the regression models. In order to determine if the variables are actually cointegrated,

Appendices G and H report the results of the cointegrating tests both at levels.

The tests results in each of the regression models however reveal that the residuals do not have unit root since the unit root hypothesis is rejected which implies the variables are cointegrated. Since the variables are cointegrated the OLS estimation of regression of dependent variable (Y) on independent variable (X) is consistent and therefore spurious regression problem vanished.

4.3.2 Stock Market Capitalisation and Interest Rate

The first regression equation is between stock market capitalization and interest rate. Stock market capitalization is treated as the dependent variable while interest rate is the independent variable. The extract of the regression result using the SPSS is presented in Table 4.3.1 (a) while, a copy of the SPSS output print out is attached as *appendix (I)* Table 4.3.1 (a): Regression Coefficients: Stock Market Capitalization on Interest Rates.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t-statistic	Sig.
		B	Std. Error	Beta		
1	(Constant)	12735.611	3098.643		4.110	.000
	Interest Rates	-685.049	218.388	-.574	-3.137	.004

a. Dependent Variable: Stock Market Cap.

$$r = -0.574 \quad r^2 = 0.33$$

Source: SPSS output file.

The result in table 4.3.1(a) above shows a negative relationship between the dependent variable (Stock Market Capitalization, **SMC**) and the independent variable (Interest Rate, **IR**), the coefficient of regression being -685.049. Thus the regression model is given by **SMC** = 12735.611 – 685.049**IR**. The t-statistic stands at -3.137, while the significance level stands at 0.004. Since it is less than 5%, it means that the relationship between the dependent and independent variables is significant.

The value of coefficient of correlation (r) is -0.574 and this shows a strong correlation between the dependent and independent variable. The coefficient of determination (r^2) stands at 0.33. This indicates that 33% of the variation in the dependent variable is accounted for by the independent variable, while the remaining 67% is accounted for by other variables. Thus, from the result we can deduce that there is a negative correlation between stock market

capitalization and interest rates and the value of coefficient of the correlation shows that the negative correlation between the dependent and independent variable is strong.

The value of coefficient of determination shows that up to 33% of the changes in stock market capitalization is as a result of changes in interest rate. The significance level (of 0.004) confirms that interest rate contributes significantly to changes in stock market capitalization. The negative correlation between the dependent and independent variables indicates that as interest rate increases stock market capitalization decreases. Whereas a decrease in interest rate would result in increase in stock market capitalization.

5.0 Summary of Findings and Conclusion

5.1 Summary

The result shows the background to the study with a view to give a general overview of the domain of the study as well as stating the specific area of interest within the study of domain. Also, is presented the statement of the problem which revolves around determining the performance and impact of interest rate in stock market. The objective of the research is to derived from the problem and these provide the basis for the hypotheses of the study. The scope of the research covering a period of 29 years from (1985-2013) was also stated. The significance of the study was highlighted, deriving from the fact that many studies have done extensive empirical investigation on the impact of several macro economic variables on stock market performance concentrating on investor's perspective by looking at stock prices and returns but with little attention to the impact of interest rate, in addition to the fact that most of the few researches done were based on data of developed economies whose generalization could therefore be misleading. As such, using Nigerian data to empirically investigate the impact of interest rate on stock market performance would fill the identified knowledge gap.

5.2 Conclusion

This research concluded that the Interest rates can be used as a means of boosting the performance of the stock exchange in Nigeria.

The study revealed that the linear relationship between market capitalization and interest rate is quite significant. With a unit reduction in interest rate, market capitalization would increase by about ₦685 billion. Also, from the time series forecast, a market capitalization of about ₦53,334.4billion is predicted to be recorded by the end of year 2017.

The findings of the study also showed a negative correlation between all share index and interest rate in Nigeria. The analysis of the result showed that the correlation between the two variables is significant albeit not too strong.

5.3 Recommendations

From the literatures reviewed, one can say that in all stages of economic growth, great reliance has been placed on the financial market as a vehicle to achieve the objective of economic growth. The analyses and conclusion are critical in decision making and policy formulation.

Therefore the following recommendations can assist policy makers in their continuous effort of formulating policies that would ensure economic growth and development based on the findings of this research work.

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