Business Administration and Business Economics

Interest Rate Variations and Stock Market Capitalization in Nigeria: An Empirical Analysis

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Abstract: In most economies, variations in interest rates have become a prominent feature both in the long-run and short-run. This study thus examines by means of robust analysis, the effect of the variations in interest rates on the level of stock market capitalization in Nigeria for a period of 29 years (1981 – 2009). Data was obtained from the statistical bulletin of the Central Bank of Nigeria (CBN) for the relevant years. The analysis of the data obtained was done with the Ordinary Least Square (OLS) method. The results from the study showed that variations in interest rate significantly affect the level of stock market capitalization, thereby suggesting that there is a significant relationship between interest rate variation and the level of stock market capitalization in Nigeria for the period under study. Based on the above, it was recommended that the Government of Nigeria and the appropriate monetary authorities should continue to give serious attention to policies geared towards lending rate in the country, if a desired level of market capitalization must be achieved.

Keywords: Liquidity; Capital Markets; Investments; Interest; Nigerian Stock Exchange

JEL Classification: O16; G 11

1. Introduction

Over the years, the Nigerian Capital Market has experienced series of shocks, and in recent times, a downturn in economic activities believed to have been induced by significant divestment by foreign investors as a result of the *ill wind* of financial recession that blew financial markets all round the globe. Policies and reforms aimed at boosting activities in the stock market, thereby, promoting economic growth and development in the country have been made. This is because investments must be encouraged in the country if she must experience a boost in her economic activities. Yet, studies have revealed that the investment that will promote economic growth and development requires long term funding, which must be sustaining, having a duration that would be longer than that which savers of funds would be willing to commit their funds (Ologunde, Elumilade and Asaolu,

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2006; Maku and Atanda, 2009). This is why the capital market has an important role to play in every economy generally, and Nigeria in particular.

Capital markets according to Murinde (2006), are markets for trading long term financial securities, including ordinary shares, long term debt securities such as debentures, unsecured loan stock and convertible bonds. Government bonds and other public sector securities such as Treasury bills and gilt-edged stocks are also traded on capital markets. Capital Market is what Ologunde et al (2006, p. 155) described as "a collection of financial institutions set up for the granting of medium and long term loans". One intermediary in the capital market that operates as a rallying point for the overall activities as noted by Ezeoha, Ogamba and Onyiuke (2009), is the stock exchange.

It is believed that without a functional stock market, the capital market may be very illiquid and unable to attract investment. Essentially, the stock market provides liquidity, and as noted by Levine (1991), it also contributes to capital formation and investment risk reduction by offering opportunities for portfolio diversification. According to Ezeoha et al. (2009), the liquidity role stands out clearly as the most significant among the numerous functions provided by the stock market. This is because an illiquid stock market would discourage many profitable long-term investments that would have been undertaken since savers may be reluctant to tie up their investments for long periods of time (Levine, 1997). If this assertion is true, it becomes obvious that a functional and liquid stock market would have a significant relationship with investment which is in turn affected by the prevailing interest rate in an economy. It is pertinent to note that when one decides to invest in a company's stock, the need to know the company's market capitalization cannot be over emphasized. This is because market capitalization is a measure of a company's size. In fact, capitalization rate is a critical variable in commercial real estate valuations. Investors use it as a denominator to find out the value of a property when they know the net operating income of that property. According to Khrawish, Siam and Jaradat (2010, p. 63), "to find the market capitalization of a company, one needs to multiply the market price of the stock by the number of shares outstanding". Therefore, the stock market capitalization rate is measured by the total value of a company's outstanding shares.

Interest however, is the reward for parting with liquidity for a specific period of time. It is what Adofu, Abula and Audu (2010), described as the rental payment for the use of credit by borrowers and return for parting with liquidity by lenders. Interest rate can be seen as the inverse proportion between a sum of money and what can be obtained for parting with control over the money in exchange for a debt for a given period of time. It is however a known fact that interest rate variation has become a prominent feature in economies in the world over. In Nigeria for instance, interest rates have changed over the years. This was as a result of changing economic events such as federal policies and reforms, crises in

financial markets, inflation, and changes in prospects for long – term economic growth (Maku & Atanda, 2009; Eregha, 2010). Studies have revealed that macroeconomic indicators like interest rates have effect on stock market capitalization rate. Much of such studies are well captured by Khrawish, Siam and Jaradat (2010), and include: Kurihara (2006), Ologunde et al. (2006); Mahmudul and Gazi (2009); and Aydemir and Demirhan (2009).

In light of the aforementioned, this study is aimed at examining the impact of interest rate variations on the level of stock market capitalization in the Nigerian Stock Exchange (NSE) over the period of 1981 – 2009.

2. Theoretical Framework and Literature Review

Capitalization rate has long been a subject of research (An and Deng, 2009). In a study of the relationships between stock market capitalization rate and interest rate in Nigeria, Ologunde et al. (2006) found that prevailing interest rate has a relationship with stock market capitalization rate. This study however did not test to show whether it was actually interest rate that affects capitalization rate, or whether it was capitalization rate that was affecting interest rate in the country for the period of study. Similarly, Froland (1987), and Jud and Winkler (1995) carried out studies respectively to examine the relationship between capitalization rate and capital market returns. In his study, Froland (1987) found that there is a strong correlation between capitalization rate and mortgage rates, ten-year bond rates and stock market earnings/price ratio. Similarly, Jud and Winkler (1995) regress capitalization rate on debt market excess return and excess equity return and found that both variables strong link with excess capitalization rate.

Kurihara (2006), carried out a study in Japan on exchange rate and stock prices and found that the stock market capitalization rate was significantly influenced by certain macroeconomic environmental factors like the gross domestic product, interest rates, and a host of others.

In a survey of the stock markets in fifteen countries (Australia, Chile, Japan, Bangladesh, Philippine, South Africa, Mexico, Malaysia, Italy, Columbia, Jamaica, Canada, Germany, Spain and Venezuela), Mahmudul and Gazi (2009) established that interest rate exerts significant negative relationship on share prices. They argued that there was the availability of significant negative relationship between changes of interest rate and changes of share prices.

Khrawish et al. (2010) carried out a study on the relationship between stock market capitalization rate and interest rate in Jordan with the use of time series analysis. In their study, they also found that there is a significant positive relationship between government prevailing interest rate and stock market capitalization rate in the Amman Stock Exchange (ASE), Jordan.

Trends in Market Capitalization Rate and Interest Rate in Nigeria

Table 1 below presents the annual market capitalization rates as well as the prevailing interest rates in Nigeria between 1981 and 2009. Recall that this period covers important periods in the economic history of Nigeria (Pre-Structural Adjustment Programme (SAP) years and the years after the implementation of SAP).

Table 1. Annual Market Capitalization (N' Billion) and the Weighted Average Deposit and Lending Rates of Commercial Banks on The Nigerian Stock Exchange

Annual Market Capitalization on The Nigerian Stock Exchange (N' Billion)				
Year	Govt Stocks/ Sec.	Debts/ Bonds	Equities	Total
1981	3. 1	0	1. 9	5
1982	3	1	1	5
1983	3. 5	0	2. 2	5. 7
1984	2. 9	0. 2	2. 4	5. 5
1985	3. 5	0. 4	2. 7	6. 6
1986	2. 7	0. 4	3. 7	6. 8
1987	4. 2	0	4	8. 2
1988	4. 5	0. 4	5. 1	10
1989	4. 2	0. 6	8	12. 8
1990	3. 4	0. 8	12. 1	16. 3
1991	3. 3	1. 4	18. 4	23. 1
1992	3. 2	1. 8	26. 2	31. 2
1993	3. 6	2. 1	41. 8	47. 5
1994	3. 2	2. 1	61	66. 3
1995	3. 2	2. 1	175. 1	180. 4
1996	3	3	279. 8	285. 8
1997	2. 8	2. 8	276. 3	281. 9
1998	2. 7	3. 1	256. 8	262. 6
1999	2. 4	3. 1	294. 5	300
2000	2. 1	4. 1	466. 1	472. 3
2001	8. 3	5. 8	648. 4	662. 5

Weighted Average Deposit and Lending Rates of Commercial Banks			
Year	Savings	Prime 1/	Maximum
1981	6. 00	7. 75	10. 00
1982	7. 50	10. 25	11. 75
1983	7. 50	10. 00	11. 50
1984	9. 50	12. 50	13. 00
1985	9. 50	9. 25	11. 75
1986	9. 50	10. 50	12. 00
1987	14. 00	17. 50	19. 20
1988	14. 50	16. 50	17. 60
1989	16. 40	26. 80	24. 60
1990	18. 80	25. 50	27. 70
1991	14. 29	20. 01	20. 80
1992	16. 10	29. 80	31. 20
1993	16. 66	18. 32	36. 09
1994	13. 50	21. 00	21. 00
1995	12. 61	20. 18	20. 79
1996	11. 69	19. 74	20. 86
1997	4. 80	13. 54	23. 32
1998	5. 49	18. 29	21. 34
1999	5. 33	21. 32	27. 19
2000	5. 29	17. 98	21. 55
2001	5. 49	18. 29	21. 34

2002	12. 7	3. 5	748. 7	764. 9		2002	4. 15	24. 85	30. 19
2003	25. 2	8. 4	1, 325. 70	1, 359. 30		2003	4. 11	20. 71	22. 88
2004	178. 1	7. 9	1, 926. 50	2, 112. 50		2004	4. 19	19. 18	20. 82
2005	365. 5	11. 1	2, 523. 50	2, 900. 10		2005	3. 83	17. 95	19. 49
2006	888. 9	3. 5	4, 228. 60	5, 121. 00		2006	3. 14	17. 26	18. 70
2007	2, 976. 60	17	10, 301. 00	13, 294. 60		2007	3. 55	16. 94	18. 36
2008	2, 529. 96	45. 52	6, 987. 51	9, 563. 00		2008	2. 84	15. 14	18. 70
2009	1, 930. 26	108. 5	4, 992. 00	7, 030. 80		2009	2. 94	18. 36	22. 90

Source: (CBN Statistical Bulletin, 2009)

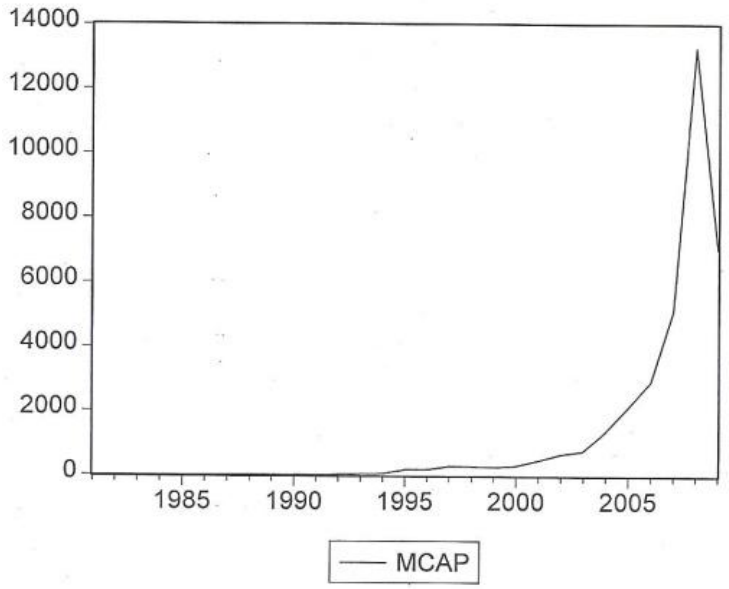

Figure 1a. Movement of MCAP

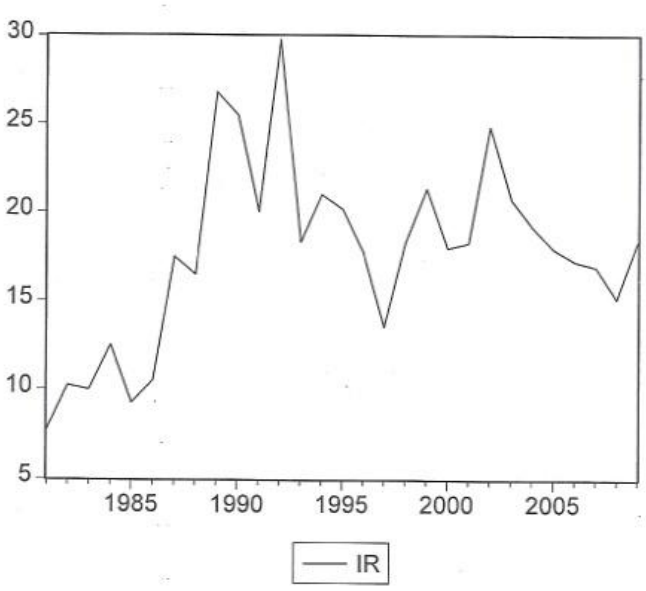

Figure 1b. Movement of IR

Fig. 1a and Fig. 1b further reveals the trend or movement in both the market capitalization (MCAP) and lending/or interest rate (IR) over the period under study. Fig. 1a shows that market capitalization was low in the Pre – SAP years; but some years after, the implementation of the SAP, specifically from 1994, the level of market capitalization in the Nigerian Stock Exchange increased. Interestingly, one would notice that the increase in market capitalization was more noticed from 1999, and by 2003 – 2009, market capitalization became higher than ever. It should be noted that this period, beginning from 1999 marks the outset of the new civilian regime in Nigeria. Thus the increase in market capitalization may be attributable to the restoration of investors' confidence in addition to programmes introduced by the Government of Nigeria (for instance, the National Economic Empowerment Development Strategies – NEEDS). However, by the end of 2007, one would also notice a downward trend in market capitalization. This may be due to the crash experienced in the stock market as a result of the Global Financial Crisis experienced during that period.

The fluctuation in the lending rate in Fig. 1b is simply an indication of the government and monetary authority's inconsistent lending rate policy which seem to have a negative impact on investment and hence, market capitalization.

3. Methodology

This study was carried out at the Delta State University, Abraka, Nigeria to see the effect of interest rate variation on the level of stock market capitalization in Nigeria. The study covers the period 1981 – 2009 (refer to Table 1).

Method of Analysis

The study specifically adopted the Ordinary Least Square regression analysis to show the influence which variations in interest rate has on stock market capitalization in Nigeria. This technique is desirable because it is a consistent and unbiased estimator. The linear relationship between the dependent variable and the independent variable is determined.

Data Definition and Source

Basically, this research work relied on data extracted from the records of the Central Bank of Nigeria (CBN). Essentially, data covering the period 1981 – 2009 were sourced from the CBN Statistical Bulletin for the relevant years. The data used were Interest rates (IR) in addition to the annual market capitalization rates (MCAP) which comprises of variables such as Government Stocks/Securities rates (GSS_t), Debt/Bond rates (DB_t) and Equities rates (E_t).

Model Specification

For the purpose of this study, an equation model was developed in its log form and adopted as follows:

$$LMCAP = b_0 + b_1 LIR + U_t$$

$$b_1 < 0$$

Where:

MCAP = Market Capitalization

IR = Interest rate

U_t = Random Variable

L = Natural Logarithm

b_0 = Constant

b_1 = Parameter

Hypothesis of the Study

In order to achieve the aim of this research, the researcher however formulated the hypothesis of the study as follows:

H_o: *There is no significant relationship between interest rate variation and the level of stock market capitalization in Nigeria for the period under study.*

H_A: *There is a significant relationship between interest rate variation and the level of stock market capitalization in Nigeria for the period under study.*

4. Results and Discussion

The summary of the OLS result is shown in Table 2 below:

Table 2. Summary of OLS Result (Dependent Variable = LMCAP)

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LIR	-0.322087	0.108432	-2.970398	0.0056
C	-3.141929	3.869644	-0.811943	0.4239

R^2 = 0.83, $\overline{R^2}$ = 0.81, F statistic = 141.1806, Prob (F-Statistic) = 0.000,

DW Stat = 2.13, Fcritical = 4.17, tcritical = 2.052

The result in Table 2 above reveals a negative linear relationship between interest rate and the level of market capitalization, all things being equal. The result showed that in Nigeria, an increase in interest rate by 1% will lead to an increase in capitalization by 0.32%. The coefficient of determination suggests that a sizeable variation in market capitalization (83%) has been explained by the trend of interest rate. This is good since the unexplained variation is just 17%. The R^2 which is the adjusted $\overline{R^2}$ for degrees of freedom at 81% justified the inclusion of the interest rate in the model of market capitalization.

The F test with a value of 141.1806 and probability of 0.0000 suggests that interest rate is a significant factor to be considered when explaining changes in the level of market capitalization in Nigeria. This significant F_{cal} (141.1806) is greater than the F_{crit} (4.17), an indication that the alternative hypothesis is validated suggesting that there is a significant relationship between interest rate variation and stock market capitalization in Nigeria. This, leads to the invalidation of the null hypothesis of no relationship. The t-test showed similar result, since the t_{cal} (-2.970398) > t_{crit} (2.052). This also suggests that interest rate is statistically significant in explaining the changes in the level of market capitalization. This further justifies the validation of the alternative hypothesis by the F-test. The Durbin Watson value of 2. 131548 did not show evidence of the first order serial correlation in the model. This result is as expected in the literature (Ologunde et. al, 2006; Kurihara, 2006; Khrawish et. al, 2010).

The Granger Causality test is further used to test whether it was interest rate that causes change in market capitalization or if it was market capitalization that causes changes in the interest rate. The result of the test is presented in Table 3 below.

Table 3. Pairwise Granger Causality Tests

Sample: 1981 – 2009

Lags: 2

Null Hypothesis	Obs.	F-Statistic	Probability
IR does not Granger Cause MCAP	29	5.10354	0.01207
MCAP does not Granger Cause IR	0.42131	0.66137	

The result of the granger causality test above showed that it was interest rate that caused a change in the level of market capitalization in Nigeria since the F value of 5.10354 and probability of 0.01207 is statistically significant. Similarly, the result also indicated that the level of market capitalization does not cause change in the interest rate in Nigeria. This further confirms the statistical significance of the t test and the high explanatory power of the R^2.

5. Conclusion and Recommendation

The result from the empirical analysis of interest rate variation and stock market capitalization rate in Nigeria made some interesting revelation. The result showed that variations in interest rates over the years under study have played an important and influential role on the changes in the level of market capitalization in the country. The relationship suggested by the result between interest rate and stock market capitalization is an indication that a reduction in interest rate will encourage investment which will improve stock market activities and hence market capitalization in Nigeria. The result from the granger causality test further indicates however, that it was interest rate that caused changes in stock market capitalization and not the other way round.

The rejection of the null hypothesis thus calls for a recommendation that the Government of Nigeria and the appropriate monetary authorities should continue to give serious attention to policies geared towards lending rate in the country, if the desired level of market capitalization must be achieved. This is very important as a result of the multiplier effect of interest rate on investment and hence, the level of stock market capitalization rate in Nigeria.

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