

The Effect of Stock Market Liquidity on Daily Returns in the Nigerian Capital Market

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Abstract

Adequate knowledge about the performance and efficiency of stock returns remains vital and essential information to investors. The ability to generate confidence among investors requires an understanding of the role liquidity plays in the growth of daily returns of the Nigerian Stock market. The study adopted the ex-post facto research design and data were obtained from daily reports of the Nigerian Stock Exchange from 2nd January, 2001 to 31st December, 2015. The study used the Ordinary least square in hypotheses testing using three liquidity measurement methods. The results revealed that the market capitalization value ratio has a positive and significant effect on stock returns (MCVr coefficient = 0.867, $p = 0.00 < 0.05$, t -value = 22.9). Apparently with F -statistic = 11271 the model is well fitted for the research, the goodness of fit of the model was further justified by 85.9% of the observations of the stock returns explained by the market capitalization ratio. The value of transaction ratio shows a negative and significant impact on the stock returns (VTr coefficient = -8.51, $p = 0.00 < 0.05$, t -value = 30). Turnover ratio is (Tor coefficient = 0.36, $p = 0.00 < 0.05$, t -value = 146.44. To add to the robustness of the analysis, unit root test, granger causality tests and collinearity tests were employed to support the OLS method. Thus, the study recommends creation of new policies that will encourage increases in the profit after tax and dividends of quoted firm; studies have established statistically significant relationships between company performance and value of capitalization. Secondly, it recommends that investors should adopt trading volume based strategies to make profit. Thirdly, it suggests adoption of methods to reap from the benefits of abnormal returns by exploiting information in the market.

Key words: Liquidity; stock market; daily returns; Nigerian Capital Market

1.0 INTRODUCTION

The capital market of an economy plays a significant role in the overall development of the economy and testing the efficiency of the market is very important for the investors, stock brokers, financial institutions and government. It is, therefore, a fact not disputed that the rate of economic growth of any nation is inextricably linked to the sophistication of its financial market and specifically its stock market efficiency. The fund required by the corporate bodies and governments are often huge, sometimes running into billions of naira. One line of research views liquidity as a characteristic that influences returns beyond trading costs. Nyong (2005) identifies high costs of transactions as a liquidity constraint. He specifically mentioned that the fixed elements of transaction costs are unfairly tilted against small volume

investors. Onwumere (2005) opines that transaction costs can cause one transaction or market to be more profitable than the other but they are not reflective on the share price directly hence in the short run they have liquidity implications but no volatility significance.

In theory the problem under investigation is that previous studies have questionable methodologies when measuring the impact of certain factors on stock market returns. Amihud & Lasse (2005) in studying liquidity and asset pricing believes that the increasing importance of standard deviation inclusive models in measuring volatility and liquidity of stock market returns is not unconnected to the general understanding that there is a need to model risk measures that would capture the effect of liquidity and volatility on returns.

Ajayi, Mehdian & Perry (2004) in studying eastern European markets implies that the validity of certain volatility measures generally depends upon specific distributional assumptions. Again, the existence of multiple competing models immediately calls into question the robustness of previous findings, the squared returns of some of the models also obscured by very noisy volatility indicators. Some research did not perform some tests such as diagnostic/post estimation tests, unit root tests or even the granger causality tests making it difficult to place complete reliance on the inference.

STUDY OBJECTIVES

The primary objective of this study is to examine the impact of liquidity and volatility on stock market return of the Nigerian Stock Exchange. However, the secondary objectives are:

To examine the impact of liquidity measured by market capitalization value ratio on stock market returns of the Nigerian Stock Market.

To examine the impact of liquidity measured by value of transactions ratio on stock market returns of the Nigerian Stock Market.

To examine the impact of liquidity measured by turnover ratio on stock market returns of the Nigerian Stock Market.

RESEARCH QUESTIONS

Based on the secondary objectives of this study the following research questions were raised, there are:

- To what extent does liquidity measured by market capitalization value ratio have an impact on stock market returns of the Nigerian Stock Market?
- To what extent does liquidity measured by value of transactions ratio have an impact on stock market returns of the Nigerian Stock Market?
- To what extent does liquidity measured by turnover ratio have an impact on stock market returns of the Nigerian Stock Market?

RESEARCH HYPOTHESES

As a follow-up to the research questions raised above the following hypotheses were formulated. These are:

- **H₀₁:** Liquidity measured by market capitalization value ratio does not have any significant impact on stock market returns of the Nigerian Stock Market.
- **H₀₂:** Liquidity measured by value of transactions ratio does not have any significant impact on stock market returns of the Nigerian Stock Market.
- **H₀₃:** Liquidity measured by turnover ratio does not have any impact on stock market returns of the Nigerian Stock Market.

SCOPE OF STUDY

The research covers the period, 2001-2015. Thus this research looked at the impact of liquidity on the daily stock market returns of the Nigerian stock market.

SIGNIFICANCE OF STUDY

Given the important role a well-functioning capital markets plays in the economic growth of a country it is fundamentally essential to explain the potential benefits in theory and practice to potential users in the context of developing existing body of knowledge. This research will be significant to:

Policy makers/ Regulators:

Regulation is seen as a way of buoying investor's confidence in stock brokers and other capital market intermediaries and stakeholders. It ensures fair play and transparency in the market operations. This in turn encourages investment and trading in the stock market. The Nigerian government's fiscal and monetary policy experts would find recommendations of this work especially useful in policy formulations given the policy issues that this research would raise.

Academic Purpose:

Attention has been drawn in recent times to the question of the interdependence between liquidity, volatility, stock returns and stock market efficiency; numerous scholars have tried to assess the nature of this connection. As a result of those endeavors to understand the effect of liquidity and volatility on stock market returns there has been several numbers of research and working papers. However, this work will significantly contribute to literature regarding Nigeria especially as most studies in this area of finance have been conducted in developed economies.

ORGANIZATION OF STUDY

The research is organized into six sections. The first section is the study's introduction, section two contains the review of theoretical and empirical literature, section three discusses methodology, section four shows the empirical results of data analyzed, section five is the discussion of findings and summary and the last section is the conclusion and recommendations of the author.

2.0 LITERATURE REVIEW

The literature review is categorized into two main parts; the theoretical aspect and the empirical aspect of previous studies carried out by other scholars.

Theoretical literature

Like other reviews there are other related areas to the study of liquidity, and stock market returns not covered by this research, either because they represent open questions on which research so far has been limited, or because covering them would detract from our main focus. Nevertheless, it is important to recognize these issues, both to put the work in its proper perspective and to outline promising areas of future research.

Ekundayo (2002) argues that a nation requires a lot of local and foreign investments to attain sustainable economic growth and development. In theory lack of market liquidity is often attributed to underlying market imperfections such as asymmetric information, different forms of trading costs, and funding constraints. Dimitri .V and Jiang .W (2012) studied how

these imperfections affect expected asset return across markets by empirical estimating measures of liquidity using theoretical models relating them to asset characteristics and asset returns.

Theoretically, researches are conducted studying a variety of market imperfections, relying on different modeling assumptions. For example Nilsson (2002) in his study of Nordic stock return characteristics assumed the life-cycle and risk sharing motives to trade and relating them to trading costs. The findings of Najand (1991) also using liquidity models consolidated positions taken by Mestel, Gurgul and Majdosz (2003) that asymmetric information often rely on noise trading.

In the attempts to link empirical methodologies and findings with theory Dimitri and Jiang (2012) considered six imperfections affecting measures of liquidity; they are participation costs, transaction costs, asymmetric information, imperfect competition, funding constraints and search to measure the effect of price volumes on price and also measure price reversal using auto-covariance of returns.

Imperfection affects price reversals and expected returns in a unified model hence delivers new insights by improving on existing literature. These imperfections where accurately measured can indicate the existence and to what extent of price impact per unit trade and trade size per period measured. Again imperfections do not always raise expected returns and the validity of the assumption has been put to test on a number of occasions and many scholars are in agreement that this assumption are likely to hold in certain conditions than others. Some liquidity impact measures such as price reversal are motivated by theory but others like bid-ask spread, market depth, turnover and trade size are more intuitive or heuristic.

Empirical literature

Many models on liquidity and volatility had been developed based on empirical regularities in trading order flow in the various stock exchanges studied. Components of the model are validated against real data. Many of the models describe endogenous dynamics of liquidity and volatility. Engel R.F and Bollerslev (1986) fitted parameters of each component of the model using simulation to make predictions about volatility distribution and spread, and comparing the statistical properties of the simulation to the measured statistical properties of volatility and spreads in the data during the same period of time.

Serious interest in the functional form of the distribution of prices began with Mandelbrot's (1963) study of cotton prices, in which he showed that logarithmic price returns are far from normal and suggested that they might be drawn from a levy distribution. Studies by Fama (1965) and Akgiray (1989) indicate that the cumulative distribution of logarithmic price changes has tails that are asymptotically large. It is important because it characterizes the risk of extreme price movements and corresponds to the threshold above which the moments of the distribution become infinite. Having a good characterization of price returns has important practical consequences for risk control and option pricing.

Malkiel (1992) has given the definition of informational efficiency more explicitly, the economic implication of which is that it is impossible to make economic profits by trading on the basis of the given information set. Before the days of nonlinear dynamics, tests for Fama's efficient market hypothesis (EMH) in the context of stock market usually meant testing the null hypothesis that autocorrelation coefficient of different lags are statistically insignificant. For this purpose runs test, Ljung-Box (1978) test of autocorrelation and regression tests used to be normally applied.

But since 1980's it is well appreciated that lack of linear dependence (i.e., serial correlation)

does not rule out nonlinear dependence which, if present, would contradict the EMH and may aid in forecasting, especially over short time intervals. Sakai and Tokumaru (1980) have shown that simple nonlinear models exhibit no serial correlation while containing strong nonlinear dependence. With increasing power of computers coupled with advances in both nonlinear dynamics and chaos, the volume of research into the re-examination of the behaviour of security returns from the standpoint of market-efficiency has increased considerably, and most of these have cast doubt on the conclusion of market efficiency based only on the lack of serial correlation in returns.

3.0 METHODOLOGY

Research Design

This research adopts the ex-post facto research design. In the context of social and educational research the phrase ‘after the fact’ or ‘retrospectively’ refers to those studies which investigate possible cause-and-effect relationships by observing an existing condition or state of affairs and searching back in time for plausible causal factors. In effect, researchers ask themselves what factors seem to be associated with certain occurrences, or conditions, or aspects of behavior. Kim and Singal (1993) has defined ex-post facto research more formally as that in which the independent variable or variables have already occurred and in which the researcher starts with the observation of a dependent variable or variables. While Onwumere (2005) posits that the ex-post facto research design establishes a causal link between them. From the forgoing, therefore, this research adopted the ex-post facto research design.

Nature and Sources of Data

Secondary data is data which has been collected by individuals or agencies for purposes other than those of our particular research study (Onwumere, 2005). The justification for the use of secondary data in this research is that; it is available and is entirely appropriate and wholly adequate to draw conclusions and answer the question or solve the problem; it is far cheaper to collect; the time involved in searching secondary sources is much less than that needed to complete primary data collection; secondary sources of information can yield more accurate data than that obtained through primary research; secondary data can play a substantial role in the exploratory phase of the research when the task at hand is to define the research problem and to generate hypotheses; and it will help define the population. Thus, the data used for this research was generated from the NSE official daily report from January 2001 to December 2015.

Model Development

In the process of developing of the model the first step is to identify the linear regression model requiring the inclusion of the dependent and independent variable and the attendant coefficient weights identified by using statistical method called Ordinary Least Squares (OLS). These coefficient weights measure the strength of the relationship between independent and dependent variables. The two dimensions of the coefficients are direction and magnitude. The direction indicates whether variations in the dependent variable are caused by changes in the independent variable.

Generally, the magnitude of coefficients can be compared only if two independent variables have the same unit of measurement. Otherwise the variables need to be normalized to a standard scale to be compared to measure the strength of the relationship across different independent variables.

To test for the effect of liquidity on stock returns of the Nigerian stock market, the study adopts the linear regression model in line with existing studies in this area of finance, for instance, the works of Arumugam (1997), Berument and Kiymaz (2001) Rahman (2009) etc. According to Onwumere (2009), regression is a statistical technique used in measuring the impact of one or more variables (otherwise known as independent variables or regressors) on

another variable (the dependent variable or the regress and). The general linear regression model according to Koutsoyiannis (2006) and Onwumere (2009), is:

$$Y = \alpha_0 + \alpha_1 X + \mu \quad (i)$$

Where Y is a function of X independent variable and μ is the error term, α_0 being the constant and α_1 being the coefficient of the independent variable.

Granger causality would be used to test if each of the time series data is useful in predicting the other. Unit root tests were necessary to test for the non-stationarity or otherwise of the data being time series variables. The unit root ADF statistics if found significant and negative than the critical values then there are no presence of stationarity. The large nature of the data and lengthy time span makes it necessary to carry out diagnostic tests for multicollinearity. Where multicollinearity increases the standard errors of coefficients, the statistical significance of the variables can be affected.

If this affects the variance then interpreting the coefficients would be more difficult. The variance inflation factor (VIF), which assesses how much the variance of an estimated regression coefficient increases if your predictors are correlated. If no factors are correlated, the VIFs will be 1. If the VIF is equal to 1 there is no multicollinearity among factors, but if the VIF is greater than 1, the predictors may be moderately correlated. A VIF between 5 and 10 indicates high correlation that may be problematic. If the VIF is above 10, you can assume that the regression coefficients are poorly estimated due to multicollinearity.

If multicollinearity is near 5 or above 5 then there are two things that would apply.
Remove highly correlated predictors from the model.
Use Partial Least Squares Regression (PLS) or Principal Components Analysis.

Model Specification

The model for this study was expressed in line with the hypotheses stated as follows

H₀₁: Liquidity measured by market capitalization value ratio does not have any significant impact on stock market returns of the Nigerian Stock Market.

$$\text{Log ASI} = \alpha_0 + \alpha_1 \text{MCVr} + \mu \quad (i)$$

where;

Log ASI = Log of All Share Index (a proxy for Stock Market Returns)

MCVr = Market Capitalization Value ratio (a proxy for Liquidity measured by Market Capitalization divided by Value of Transactions)

α_0 = Equation constant

α_1 = Coefficient of independent variable

μ = Error Term

H₀₂: Liquidity measured by Volume of transaction ratio does not have any significant impact on stock market returns of the Nigerian Stock Market.

$$\text{Log ASI} = \alpha_0 + \alpha_1 \text{VTr} + \mu \quad (ii)$$

where;

Log ASI = Log of All Share Index (a proxy for Stock Market Returns)

VTr = Value of transaction ratio (a proxy for Liquidity

measured by market capitalization divided by volume of transaction)

α_0 = Equation constant

α_1 = Coefficient of independent variable

μ = Error Term

H₀₃: Liquidity measured by turnover ratio does not have any significant impact on stock market returns of the Nigerian Stock Market.

$$\text{Log ASI} = \alpha_0 + \alpha_1 \text{TOR} + \mu \quad (iii)$$

where;

Log ASI = Log of All Share Index(a proxy for Stock Market Returns)
TOR = Turnover Ratio (a proxy for Liquidity measured by value
of transactions divided by market capitalization)
 α_0 = Equation constant
 α_1 = Coefficient of independent variable
 μ = Error Term

Model Assumption

The model adopted are based on the following assumptions

There must be enough data available to compare with the number of parameters to be estimated. If there is too little data, then you end up with a system of equations with no unique solution. The daily data from 1999-2013 is sufficient to meet this assumption for this research. Though, this is a necessary but not a sufficient condition but if this condition fails this could lead to multicollinearity in the regressors.

The regressor is also assumed to be error-free. In standard regression models, regressors have been measured exactly, or observed without error; as such, those models account only for errors in the dependent variables, or responses. However since the figure will be computed from secondary sources, it is hoped that the problem will not arise.

Variables

The variables used in the models are the Dependent and Independent, the former represents the output or effects while the latter represents the inputs or causes. And since the models are statistical the dependent variable is studied to see if and how much it varies as the independent variable varies.

Dependent Variable – Stock Return (SR)

This study adopted the daily All Shares Index (ASI) of the Nigerian Stock Market (NSE) as a measure of stock market returns in line with the works of Arumugam (1997), Berument and Kiymaz (2001) and Rahman (2009). The NSE all shares index is a composite index calculated from prices of all common stocks traded on the NSE. Specifically, the Index is a market capitalization weighted price index which compares the current market value of all listed common shares to the value on the base date of 2nd January 2001 when the first session was traded on the market. The NSE-Index was primarily set at 100 points. The data was obtained over the period from 2nd January 2001 to December 31st 2015.

INDEPENDENT VARIABLES

Market Capitalization Value Ratio

Market Capitalization Value ratio measures attempts to differentiate between price movement due to the degree of liquidity from other factors such as general market conditions or arrival of new information to measure both elements of resilience and speed of price recovery. This measure uses the residuals of a regression of the asset's return on the return of the market thus purging it from its systemic risk to determine the intrinsic liquidity of the assets. This is in line with Sarr and Lybek (2002) and was measured by value of shares traded divided by market capitalization multiplied by 100.

Value of Transactions Ratio

The total volume of shares traded measures the organized trading of firm equity and therefore should positively reflect liquidity on an economy-wide basis. The value transaction ratio is used in conjunction with market capitalization although a market may be large, there may be little trading. Again, the interest in this research is on the impact of liquidity and volatility on stock market returns of the Nigerian Stock Exchange therefore this study adopted this

measure in line with the works of Guha Deb and Mukherjee (2008). The formula computed by volume of transaction by market capitalization multiplied by 100.

Turnover Ratio

The turnover ratio complements the market capitalization ratio. A large but inactive market will have a large market capitalization ratio but a small turnover ratio. This is why market capitalization ratio is suited for measuring the size of the market. Turnover ratio also complements the total value traded ratio. While the total value traded ratio captures trading relative to the size of the economy, turnover measures trading relative to the size of the stock market. A small liquid market will have a high turnover ratio but a small total value traded ratio. This proxy is adopted in line with the works of Chaudhury (1991), Goswami and Anshuman (2000), Lumsdaine and Ng (1999) and Woolridge (1991).

Model Justification

According to Guha Deb and Mukherjee (2008) who posit that academic literature on the relationship between financial development and economic growth dates back to as early as the early twentieth century Schumpeter (1911). The issue of financial development and economic growth has been of great interest and had generated considerable amount of debate among economists for many years. The debate primarily revolved around two major questions: first whether at all there is a relationship between development of financial sector on economic growth and second: what could be the nature and direction of the causal relationship, if any i.e. does development of financial sector promote economic growth or does economic development foster financial sector development? The possible directions of causality between financial sector development and economic growth were highlighted by Granger (1987) in his 'supply leading' and 'demand following' hypotheses. The 'supply leading' hypotheses claims a causal relationship from financial development to economic growth by saying that intentional creation and development of financial institutions and markets would increase the supply of financial services and thus lead to economic growth while the demand following hypothesis claims that it is the growth of the economy which causes increased demand for financial services which in turn leads to development of financial markets.

Thus the model for this research is based on the findings and views expressed in these works. Some studies like King and Levine (1993a, b), Levine and Zervos (1998) have found positive impact of financial development on economic growth in line with the 'supply leading' hypothesis. Kletzer and Pardhan (1987), Beck (2002), also argue along similar lines but they also tried to establish that financial development is much more effective in promoting economic growth in more industrialized economies than in agricultural economies. Their view has been contradicted in some other studies which argue that countries at their early stage of development benefit more from financial sector development than their older and mature counterparts (Fry, 1995).

However most of these studies being cross country regression based studies; there were some inherent weaknesses in such analysis that drew considerable criticism from contemporary researchers. Levine and Renelt (1992) talks about omitted variable bias or misspecification, Evans (1995) and Pesaran and Smith (1995) highlight the effect of heterogeneity of slope coefficients across countries, while problems of causality and endogeneity are explored by Demetriades and Hussain (1996) and Harris (1997).

Motivated by such criticism, Levine et.al (2000) examined empirically the same issue by incorporating adequate corrections for the effects of simultaneity bias and country specific effects, effects of other determinants of growth and biases arising from model specific errors like omitted variables. Their conclusions identified a causal relationship running from financial development indicators to economic growth even after controlling for such factors. Support for the 'demand following' argument is also there in the research works over the last four or five decades. Robinson (1952) argued that financial development primarily follows growth in the real economy, as a result of increased demand for financial services. Lucas

(1988) stated that the role of financial sector development in causing economic growth of a country has been 'badly overstressed'.

Guha Deb and Mukherjee (2008), explore the causal relationship between stock market development and economic growth in the Indian economy for the period from 1996:Q4 – 2007:Q1 using Granger non-causality proposed by Toda and Yamamoto (1995) and using three important indicators for stock market development variables such as market capitalization ratio (size proxy), value traded ratio (activity proxy) and stock market volatility and GDP growth rate is used as a proxy for economic development, they found that first, there is a bidirectional causality between real GDP growth rate and real market capitalization ratio and secondly, there is a unidirectional causality both with stock market activity and volatility to real GDP growth in Indian economy. In other words, Toda Yamamoto (1995) causality test results which suggest that stock market development leads to economic growth at least for the period under study is in line with the 'supply leading' hypotheses.

Also Osinubi and Amaghionyeodiwe (2003) say the stock market is a common feature of a modern economy and it is reputed to perform some necessary functions, which promote the growth and development of the economy. Thus they examined whether stock market promotes economic growth in Nigeria. To achieve this objective, the ordinary least squares regression (OLS) was employed using the data from 1980 to 2000. The results indicated that there is a positive relationship between growth and all the stock market development variables used. With 99 percent R-squared and 98 percent adjusted R-squared, the result showed that economic growth in Nigeria is adequately explained by the model for the period between 1980 and 2000.

It is obvious from the works of these scholars that, the capital market has an impact on economic growth; however, there is a gap in literature on the impact of liquidity on stock returns. This is the objective which this research work will be based. Thus, this study adopted Beck, Demirguc-Kunt, Levine and Maksimovic (2001) and Levine (2000), growth function for stock market liquidity indicators to test its impact on stock returns. Thus, the lacuna which this research filled is a study which contributed to literature on the impact of stock returns on liquidity and volatility of the Nigerian Stock market.

4.0 RESULTS AND DISCUSSIONS

Techniques of Analysis

In statistics and econometrics, regression analysis is used in modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables (Onwumere, 2005). Most commonly, regression analysis estimates the conditional expectation of the dependent variable given the independent variables that is, the average value of the dependent variable when the independent variables are held fixed. Less commonly, the focus is on a quartile, or other location parameter of the conditional distribution of the dependent variable given the independent variables (Brooks 2002). In all cases, the estimation target is a function of the independent variables called the regression function. In regression analysis, it is also of interest to characterize the variation of the dependent variable around the regression function, which can be described by a probability (Gujarati and Porter 2009).

Again in this study, the granger causality test was also employed to test whether there is bidirectional relationship between all the model proxies. This is necessary to determine the causality of impact and direction of movement. Also the test for presence of stationarity a unit root test the Augmented Dickey Fuller (ADF) was used, this is suitable for large samples. The ADF use the existence of a unit root as the null hypothesis, the more negative it is, the stronger the rejection of the hypothesis that there is a unit root of confidence. multicollinearity tests were also employed to check if there is a formal detention – tolerance or variance inflation factor (VIF) for multicollinearity. A tolerance of less than 0.20 or 0.10

and a VIF of 5 or 10 and above indicates a multicollinearity problem.

Table 1.1 Unit Root Test

Variable	Test Statistic	Order of Integration
LASI	-29.63785	1(1)
MCVR	-7.438164	1(0)
VTR	-22.156250	1(0)
TOR	-3.992430	1(0)

Table 1.2

ADF Test Statistic	-24.72090	1% Critical Value*	-3.4352
		5% Critical Value	-2.8628
		10% Critical Value	-2.5675
*MacKinnon critical values for rejection of hypothesis of a unit root.			

Source: Researcher's Excel Result

We also tested for the presence of unit root in the time series data set. This was necessitated because we wanted to ensure that the parameters estimated are stationary time series data. We utilized the Augmented Dickey – Fuller (ADF). To reject the null hypothesis that the data are non –stationary, the ADF statistics must be negative than the critical values and significant. The result of the unit root test is depicted in the table 4.3. As revealed, there are no presence of stationarity since the ADF Statistics is less than the critical values at 1%, 5% and 10% respectively.

Table 1.3 Correlation Result

	LOGASI	MCVR	VTR	TOR
LOGASI	1.000000			
MCVR	0.367112	1.000000		
VTR	0.047785	0.473387	1.000000	
TOR	0.923319	0.526151	0.204999	1.000000

Source: Researcher's E-view Result

There was a positive correlation between All shares index of the Nigerian Stock Market and market capitalization value ratio ($R = 0.37$). This indicates that 1% increase in all shares index of the Nigerian Stock Market also increase market capitalization by 37%. Again, as observed from the table, there was also a positive relation between All shares index and volume of transaction ratio in the Nigerian Stock ($R = 0.05$). As indicated, a 1% increase in All Shares index increase the Volume of transaction ratio by 5%. All Shares Index of the Nigerian Stock Market also had a positive correlation with turnover ratio of the Nigerian Stock market. As indicated from the table, a 1% increase in all shares index increases turnover ratio by 92% ($R = 0.92$).

Market capitalization value ratio of the Nigerian had Stock Market also a positive correlation with volume transaction ratio of the Nigerian Stock market. As indicated from the table, a 1% increase in market capitaization increases volume of shares traded by 47% ($R = 0.47$). Market capitalization value ratio of the Nigerian Stock Market and turnover ratio was positivley correlated ($R = 0.53$). This indicates that 1% increase in market capitalization value ratio of the Nigerian Stock Market also increase turnover ratio by 53%. Lastly, value of tranaction

ratio the Nigerian Stock Market also had a positive correlation with turnover ratio of the Nigerian Stock market. A 1% increase in volume of shares traded increases turnover ratio traded by 20% ($R = 0.20$).

Table 1.4 Granger Causality

Pairwise Granger Causality Tests

Date: 02/22/16 Time: 09:50

Sample: 02/01/2001 12/31/2015

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
MCVr does not Granger Cause SR	3711	15.6346	1.71207
SR does Granger Cause MCVr		386.303	0.00000
VTr does not Granger Cause SR	3711	0.23383	0.79150
SR does Granger Cause VTr		141.157	0.00000
TOr does not Granger Cause SR	3708	0.96868	0.37968
SR does Granger Cause Tor		195.063	0.00000

The granger causality test was conducted to test the causality of the impact of the independent variable on the dependent variable. As indicated in the above table, it was revealed that market capitalization value ratio does not granger cause stock returns (p – value $1.712 > 0.05$) however, stock returns of the Nigerian Stock Exchange granger cause market capitalization value ratio (p -value = $0.000 < 0.05$). Hence, there is a unidirectional relationship between stock returns and market capitalization ratio.

Again, value of transactions ratio does not granger cause stock returns since (p -value = $0.79 > 0.05$) but the stock returns granger cause value of transaction ratio at (p -value = $0.00 < 0.05$). The turn over ratio does not granger cause stock returns (p -value = $0.40 > 0.05$), but the stock returns granger cause turn over ratio as indicated (p -value = $0.00 < 0.05$). Three steps were used to test the hypotheses. In step one; the hypotheses were restated of in null and alternate forms. In step two, the results were analyzed while in step three, decisions were made. The decision rule involved the rejection or acceptance of the null or alternate hypotheses based on criterion of the techniques of analyses.

Test of Hypothesis One

Step One: Restatement of the Hypothesis in Null and Alternate forms:

H₀₁: Liquidity measured by market capitalization value ratio does not have significant impact on stock returns of the Nigerian Stock Market.

H_{a1}: Liquidity measured by market capitalization value ratio has significant impact on the stock returns of the Nigerian Stock Market.

Step Two: Presentation and Analysis of Result

Table 2.1 Regression Result for Hypothesis One

. regress LogASI MCVr LogMcap

Source	SS	df	MS			
Model	253.276486	2	126.638243	Number of obs =	3713	
Residual	41.680971	3710	.011234763	F(2, 3710) =	11272.00	
Total	294.957457	3712	.079460522	Prob > F =	0.0000	
				R-squared =	0.8587	
				Adj R-squared =	0.8586	
				Root MSE =	.10599	

LogASI	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
MCVr	.8670431	.0378701	22.90	0.000	.7927949	.9412914
LogMcap	.4581882	.0033231	137.88	0.000	.4516728	.4647035
_cons	-1.424832	.0407648	-34.95	0.000	-1.504756	-1.344909

Durbin-Watson statistic (original) 2.452726

Durbin-Watson statistic (transformed) 2.114125

Source: Researcher's Stata Result

$$\text{Log ASI} = -1.424 + 0.867\text{MCVr} + \mu$$

Hypothesis 1 shows the result of the regression analysis of the impact of the liquidity measured by market capitalization value ratio on the stock returns measured by log of all shares index (ASI) of the Nigerian stock market from 2nd January 2001 to 31st December 2015. The result reveals that the model for our study is well fitted (F-statistic= 11271). The coefficient of determination (R-square), which measures the goodness of fit of the model, indicates that 85.9% of the variations observed in the dependent variable were explained by the independent variables. This was moderated by the Adjusted R-squared to 85.9%, indicating that there are other variables other than our explanatory variables that might also impact on the dependent variable. The result shows that market capitalization value ratio has a positive and significant impact on All Share Index (MCVr coefficient = 0.867, p = 0.00 < 0.05, t-value = 22.9). The Durbin Watson statistic is 2.45 which indicate that there is a slight trace of spatial and serial autocorrelation. We therefore introduced heteroscedasticity and autocorrelation consistent (HAC) to correct the standard error problem and transformed it to 2.11 in correcting the OLS standard errors. As a result of these treatments, the coefficients of the independent variables were observed to perform well.

Decision:

Based on the result above, we reject the null hypothesis and accept the alternate, thus, liquidity measured by market capitalization ratio have significant and positive impact on the stock returns of the Nigerian Stock Market.

Test of Hypothesis Two

Step One: Restatement of the Hypothesis in Null and Alternate forms:

H₀₂: Liquidity measured by value of transactions ratio do not have significant impact on stock returns at the Nigerian Stock Market.

H_{a2}: Liquidity measured by value of transactions ratio has significant on stock returns at the Nigerian Stock Market.

Step Two: Presentation and Analysis of Result

Table 2.2 Regression Result for Hypothesis Two

. regress LogASI Vtr LogVol

Source	SS	df	MS	Number of obs = 3713
Model	230.872782	2	115.436391	F(2, 3710) = 6682.86
Residual	64.0846746	3710	.017273497	Prob > F = 0.0000
Total	294.957457	3712	.079460522	R-squared = 0.7827
				Adj R-squared = 0.7826
				Root MSE = .13143

LogASI	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Vtr	-8.513906	.2837919	-30.00	0.000	-9.070309 -7.957502
LogVol	.3853694	.0033382	115.44	0.000	.3788245 .3919143
_cons	1.253648	.0263776	47.53	0.000	1.201932 1.305364

Durbin-Watson statistic (original) 2.371970

Durbin-Watson statistic (transformed) 2.217869

Source: Researcher's Stata Result

$$\text{Log ASI} = 1.25 - 8.51\text{VTr} + \mu$$

Hypothesis two shows the result of the regression analysis of the impact of liquidity measured by value of transaction ratio on stock returns measured by all shares index (ASI) on of the Nigerian stock market from 2nd January 2001 to 31st December 2015. The result reveals that the model for our study is well fitted (F-statistic= 6682.86). The coefficient of determination (R-square), which measures the goodness of fit of the model, indicates that 78% of the variations observed in the dependent variable were explained by the independent variables. This was moderated by the Adjusted R-squared to 78%, indicating that there are other variables other than our explanatory variables that might also impact on the dependent variable. The result shows that value of transaction ratio has a negative and significant impact on the SR (VTr coefficient = -8.51 p = 0.00 < 0.05, t-value = 30). The Durbin Watson statistic is 2.37 which indicate that there is a slight trace of spatial and serial autocorrelation. The Durbin Watson d statistics was taken into account using Newey West/Cochrane-Orcutt procedure and transformed to 2.21. This corrected the OLS standard errors and the R² as well. As a result of these treatments, the coefficients of the independent variables were observed to perform better in explaining the model.

Decision:

Based on the result above, we accept the null hypothesis and reject the alternate, thus, value of transaction ratio have significant and negative impact on stock returns at the Nigerian

Stock Market.

Test of Hypothesis Three

Step One: Restatement of the Hypothesis in Null and Alternate forms:

Ho₃: Liquidity measured by turnover ratio does not have significant impact on stock returns of the Nigerian Stock Market.

Ha₃: Liquidity measured by turnover ratio has significant impact on stock returns of the Nigerian Stock Market.

Step Two: Presentation and Analysis of Result

Table 2.3 Regression Result for Hypothesis Three

. regress LogASI TOr

Source	SS	df	MS	Number of obs = 3712
Model	251.432634	1	251.432634	F(1, 3710) =21445.67
Residual	43.4966719	3710	.01172417	Prob > F = 0.0000
Total	294.929306	3711	.079474348	R-squared = 0.8525
				Adj R-squared = 0.8525
				Root MSE = .10828

LogASI	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
TOr	.3623563	.0024744	146.44	0.000	.357505 .3672076
_cons	1.042431	.0222671	46.81	0.000	.9987739 1.086088

Durbin-Watson statistic (original) 2.049375

Durbin-Watson statistic (transformed) 2.007667

Source: Researcher's Stata Result

$$\text{Log ASI} = 1.04 + 0.362\text{TOr} + \mu$$

Hypothesis 3 shows the result of the regression analysis of the impact of liquidity measured by turnover ratio (TOr) on stock returns measured by all shares index (Log ASI) of the Nigerian stock market from 2nd January 2001 to 31st December 2015. The result reveals that the model for our study is well fitted (F-statistic= 21445.67). The coefficient of determination (R-square), which measures the goodness of fit of the model, indicates that 85.3% of the variations observed in the dependent variable were explained by the independent variables. This was moderated by the Adjusted R-squared to 85.3%, indicating that there are other variables other than our explanatory variables that might also impact on the dependent variable. The result shows that TOr has a positive and significant impact on the Log ASI of Nigerian (TOr coefficient = 0.36, p = 0.00 < 0.05, t-value = 146.44). Durbin Watson statistic is 2.04 which indicate that there is no trace of spatial and serial autocorrelation.

Decision:

Based on the result above, we reject the null hypothesis and accept the alternate, thus, liquidity measured by market turn over ratio have significant and positive impact on the stock returns of the Nigerian Stock Market.

Diagnostic/Post Estimation Test

The Durbin Watson statistic for the regressions in hypotheses 1 and 2 indicated that there is no significant trace of spatial and serial autocorrelation but hypothesis 3 did not indicate any trace of spatial and serial autocorrelation.

Collinearity Diagnostics Tables

Table 3.1

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	MCV _r , VTr, TOR ^a	.	Enter

a. All requested variables entered.

b. Dependent Variable: ASI

In table 3.1 the variables used are indicated shows the description of the independent variables and the dependent variable that were used to run the tests.

Table 3.2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.859 ^a	.737	.737	7011.8109

a. Predictors: (Constant), MCV_r, VTr, Tor

Table 3.2 shows the model summary indicating the coefficient of determination R^2 and the Adjusted R^2 and estimated standard error. The R^2 and the Adjusted R^2 measures the proportion of the total variability in the dependent variable that is explained by the independent variable. If there were a large discrepancy between the R^2 and the Adjusted R^2 it would suggest that some of the independent variables included in the regression is redundant. But table 3.2 shows no margin between the R^2 and the Adjusted R^2 as they have the same percentage of 73.7 % which is significant. It also means that addition of more independent variables to the equation would not have a significant effect in the margin between the R^2 and the Adjusted R^2 .

Table 3.3

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.115E11	3	1.705E11	3.468E3	.000 ^a
	Residual	1.823E11	3708	4.917E7		
	Total	6.938E11	3711			

a. Predictors: (Constant), MCV_r, VTr, Tor

b. Dependent Variable: ASI

The essence of the Analysis of Variance (ANOVA) is the F test and complemented with significance or probability value. The sum of squares is derived by calculating the mean of

the dependent variable which is then squared and summed up (total sum of squares). The mean square is the sum of squares divided by the degree of freedom. The degree of freedom is built upon the regressors being the number of samples (sample size) less the number of regressors. So the larger the sample size the larger the degree of freedom. The regression sum of square is the estimate value minus the mean. Residual sum of squares is the difference between actual and estimated sum of squares. The Significance figure (or probability figure) and the F – test all prove the null hypothesis is rejected and the model is well fitted.

Table 3.4

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	VTr	.773	1.293
	TOr	.721	1.388
	MCVr	.584	1.713

a. Dependent Variable: ASI

In table 3.4 the variance inflation factor (VIF) measures the severity of multicollinearity in the regression. In other words it is supposed to find out how much variance (the square of the estimate's standard deviation) of an estimated regression coefficient is increased because of collinearity. The VIF is product of tolerance figures divided by 1. The tolerance level for the three variables are high and since the VIF is less than some benchmarks like 3, 5 and 10 (depending on the strength of the model) it shows that the incidence of collinearity or multicollinearity is very low and not significant enough to affect the reliability of the methodology used nor invalidate the results obtained.

5.0 DISCUSSIONS OF FINDINGS AND CONCLUSIONS

Findings

From the hypotheses tested, the following are the summary of findings. These are:
The result of the regression analysis of the impact of the liquidity measured by market capitalization value ratio on stock returns measured by all shares index of the Nigerian stock market from 4th January 1999 to 31st December 2013 reveals that the model of the study is well fitted (F-statistic= 11271). The coefficient of determination (R-square), which measures the goodness of fit of the model, indicates that 85.9% of the variations observed in the dependent variable were explained by the independent variables. The result shows that market capitalization value ratio has a positive and significant impact on the stock returns of Nigerian stock exchange (SR coefficient = 0.867, p = 0.00 < 0.05, t-value = 22.9). Thus, market capitalization value ratio have significant and positive impact on stock returns of the Nigerian Stock Market.

Again, the result of the regression analysis of the impact of liquidity measured by volume of shares traded on the stock returns measured by all shares index on of the Nigerian stock market from 4th January 1999 to 31st December 2013 reveals that the model of the study is well fitted (F-statistic= 6682.86). The coefficient of determination (R-square), which measures the goodness of fit of the model, indicates that 78% of the variations observed in the dependent variable were explained by the independent variables. The result shows that the volume of transaction ratio has a negative and significant impact on stock returns of the Nigerian stock exchange (SR coefficient = -8.51 p = 0.00 < 0.05, t-value = 30). Hence,

volume of transaction ratio have significant and negative impact on stock returns at the Nigerian Stock Market.

For the third hypothesis the result of the regression analysis of the impact of the liquidity measured by turnover ratio on stock returns measured by all shares index on of the Nigerian stock market from 4th January 1999 to 31st December 2013 reveals that the model for our study is well fitted (F-statistic= 21445.67). The coefficient of determination (R-square), which measures the goodness of fit of the model, indicates that 73% of the variations observed in the dependent variable were explained by the independent variables. The result shows that turnover ratio has a positive and significant impact on the stock returns (ASI coefficient = 2.35, $p = 0.00 < 0.05$, t-value = 146.44). Therefore, turnover ratio had positive and significant impact on stock returns of the Nigerian stock market.

CONCLUSIONS

By definition, stock exchange markets are markets where the buying and selling of second hand stocks, shares and securities are carried out. They are essentially secondary markets in that only existing securities as opposed to new issues could be traded on. They however, have very strong connection with the primary markets in that they facilitate and provide the assurance for primary holders of shares, stocks and securities to re-sell them later when need arises. The impacts of liquidity and volatility on stock returns have generated heated debates and interests among economists, stock market analysts, government regulatory and policy makers. This interests and debates stem in part from the implication for market efficiency, stock market bubbling, market crash and recession in some sectors of the economy. As such, stock market returns efficiency, liquidity and volatility of stock needs to be investigated continuously to guarantee stationarity in them. This is also done to assess the nature of the risk-return relationship and for market participants to evaluate assets pricing, dividends behaviour and risks management of quoted companies in the sock exchange markets. These are carried out to achieve the expected roles stock exchange markets transmit in an economy to achieve economic growth.

The fundamental role of stock market is to provide adequate guarantee to share holders for the existence of market for their second hand securities. Adequate knowledge about the volatility, performance and efficiency of stock returns remains vital and essential information to investors. These will guide not only investment decisions but also planning for economic growth and development. Given that the Nigerian Stock Exchange has existed, its ability to generate confidence is still in doubt given the recent crash witnessed in the market. It means the confidence they are expected to instill in investors to invest is still not commensurable. Therefore, in this work, we examined the impact of liquidity of the market using three indicators of liquidity (market impact liquidity ratio, volume of transaction ratio and turnover ratio) on stock returns. It was observed that market capitalization value ratio and turnover ratio had positive and significant impact on stock returns but value of transaction ratio had negative impact on stock returns

Theoretically the significant negative impact on stock returns by value of transaction ratio on the stock returns is very likely as a result of investor misspecification about future earnings or illiquidity of low volume stocks Khan, S.U. and Rizwan, F. (2008)

6.0 RECOMMENDATIONS

The following recommendations are made in this study.

A capital market, unlike a money market is a financial market for raising medium and long term capital. A capital market is not a single entity, but a network of specialized financial

institutions linking suppliers and users of medium to long term funds. It provides resources for financing the growth of industries. A capital market is a barometer with which to measure the state of a national economy. Thus, this study recommends that the Nigerian Securities and Exchange Commission should create policies that will encourage increases in firms profit after tax and their dividends as these variables have been statistically proven to have strong significances on the changes in the company's performance and the value of market capitalization.

The study found that trading volume change is positively relates with the stock returns. However, the relation between past period trading volume change and current period stock returns is negative. This means stocks with low trading volume change outperform the stocks with high trading volume change in the subsequent period. The outperformance of high volume portfolio returns by low volume portfolio returns can be justified with two reasons. The higher (lower) performance of low volume (high volume) stocks can be due to investor misspecification about future earnings. Or else, illiquidity of low volume can be the reason for outperformance of low volume stocks. Thus, this study recommends that investors should make trading volume based strategies to make profits and theoretically this provides evidence of weak form inefficiency of the Nigerian Stock Exchange

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