

The Impact of Trade Volume on Stock Market Returns of Nigerian Pharmaceutical Companies

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Abstract

This is study on the impact of trade volume on stock market returns of Nigerian pharmaceutical companies measuring liquidity and stock returns of three quoted companies in the health sector of the Nigerian stock Exchange. The problem being studied is that similar studies have being using models without emphasizing on the increasing importance of standard deviation inclusive models in measuring liquidity of stock market returns which is not unconnected to the general understanding that there is a need to model risk measures that would capture the effect of liquidity on returns. The research objective being to examine the impact of liquidity of pharmaceutical companies measured by market trade volume ratio on stock market returns of the ten quoted companies of different sectors of the Nigerian Stock Exchange. E-view statistics using least squares (NLS and ARMA) was employed in the methodology stating a linear equation. The findings indicate different scenarios for the different quoted companies analyzed have sufficient goodness of fit. The goodness of fit of the model can be seen in the coefficient of determination (R-square). Which means that the R² measures how well variations in the dependent variable are explained by the independent variables on a trading day basis for one financial year? The Durbin Watson statistics is meant to reveal if there are signs of serial correlation and to what extent. The AIC or Schwarz criterion, shows that the difference between the two is very negligible, an indicator of a near perfect model convergence near zero. The smaller they are the better the fit of your model is (from a statistical perspective) as they reflect a trade-off between the lack of fit and the number of parameters in the model. That the differences between the R² and adjusted R² are negligible is an indicator that the regression line approximates the real data points and so is a very good fit and also shows how well observed outcomes in the analyses are replicated in the model. The recommends that the Nigerian Securities and Exchange Commission should create policies in the health segment that will encourage increases in firms profit after tax and their dividends. 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 trade volume. Thus, this study recommends that investors should make trading volume based strategies to encourage investors to buy or sell securities outside their face values, as a means of encouraging business or economic activities in the economy this is due to large volatilities in some markets. It is important that more research be made in studying theoretical and empirical applications of models measuring weighty risk management strategies such as portfolio rebalancing. As a risk control strategy knowledge of portfolio rebalancing can be seen where an informed investor acknowledges the usefulness of compounding effect of returns on his portfolio by calculating based on compound average and not simple average.

1.0 Introduction

Because of the vital economic role the health sector plays in the economy, it is important to study the trend of change in macro-economic variables using certain periodic gauges like yearly, monthly, weekly or daily yardsticks. Many scholars have tested the efficiency of markets and the efficacy of policies, in recent times the daily data is getting increasing attention in not just testing for liquidity but in measuring volatility of markets. Investors will always be interested in testing the efficiency of markets especially where there is a chance of earning abnormal profits, the health sector may present such opportunities as its potentials are virtually untapped. Many studies such as Olowe (2009) have shown that the Nigerian market is far from efficient. An efficient market is one which does not provide any chance to the potential investors for earning abnormal profit as all the information is dispersed and absorbed in the market and is quickly and accurately reflected by the prices of securities thereby opening up the market. Therefore, there will be no undervalued securities offering higher than expected returns, considering the risk associated with them.

Over the last few years, the Nigerian economy has experienced a series of reforms and restructuring of its key sectors. Such reforms include the financial, petroleum, power sector, among others. The financial sector reform has been the most noticeable as the banks and insurance companies have been required to recapitalize in line with government regulatory requirements. The telecommunications industry also experienced a major transformation when the general system for mobile telecommunications (GSM) was introduced in 2001. The deregulation of the downstream petroleum sector and privatization of many previously government-owned parastatals also represent some of the many structural changes that have been made in recent years.

The size of the Nigerian economy as measured by the country's GDP has increased by a compound annual growth rate (CAGR) of 20.68% (in nominal terms) between 2001 and 2006. A noticeable trend in the economy's growth pattern is the increasing contribution of the non-oil sector, particularly the agricultural and manufacturing sectors to the nation's GDP. It is expected that in the years ahead, other key sectors such as construction, consumer goods and tourism may begin to play more important roles in overall economic growth and development. As the on-going economic reforms continue to trickle down into other segments, and barring any unforeseen circumstances, we expect a much more balanced and self-sustaining economy in years to come.

Furthermore, consumer prices (year on year) declined sharply in 2005 due to the application of strict monetary and fiscal policy measures. With single digit inflation already being experienced, the economy is gradually moving towards a more stable and investor friendly position. This decline in inflation figures is further aided by the boost in agricultural production which has led to the general rise in the food supply resulting in reduced price level. Government's favorable monetary and fiscal policies have also contributed to the favourable consumer price index position.

The capital market has experienced a phenomenal growth over the past couple of years. The deluge of public offerings and rights issues have increased the overall level of activity in the market with volumes and values attaining unprecedented levels. The CBN enforced recapitalization drive (for banks) in 2005 is largely responsible for the bullish trend that has been experienced in recent times. With the Pension reforms having had its desired effect

through the injection of fresh capital into the market by the PFAs and increase in private equity investments, the level of capital market activities have increased tremendously.

The country has experienced 8 years democratic rule for the first time in its recent history and for the first time in the post-independence period, political power has been successfully transferred from one civilian government to another. Furthermore, the country has retained its BB- credit rating by S&P and Fitch and has continued to receive rave reviews both as a result of its ongoing reforms and agendas. Sustainability of these initiatives will however remain a major challenge for the new administration in the years to come.

Health Care in Nigeria

Nigeria's dominant position in Africa as the most populous and with one of the largest and fastest growing economies in Africa, coupled with its high incidence of diseases makes the country a vibrant pharmaceutical market. The Federal Bureau of Statistics puts Nigeria's official population at 140 million with an average annual growth rate of 3% p.a. emphasising the country's high demand for adequate and efficient health care at all levels.

Official statistics suggests that Nigeria has one of the highest incidents of Malaria, poliomyelitis, tuberculosis and other similar diseases especially among children between the 0-10 year old brackets. Voluntarily organisations such as UNICEF and Rotary International have continuously set aside billions of dollars with an aim to help prevent the scourge of these diseases. With the spread of the HIV/AIDS epidemic having attained unprecedented levels, the demand for preventive and curative measures such as condoms and anti-retroviral drugs would be on the increase. Demand for anti-malaria drugs as well as preventive vaccines aimed at reducing the growth of widely spread diseases is also increasing.

Despite the country's position among world developing economies, and the Nigerian government's post military rule efforts at growing the economy both in real and monetary terms, the health care sector still remains largely untapped and continues to suffer neglect. Other sectors such as education, defense and security have received a much larger share of budgetary allocation than that of the health care.

However, with respect to the pharmaceutical industry in Nigeria, adequate health care delivery still remains a major challenge. For a population of over 140 million, drug consumption is still relatively low a factor that contributes to the pharmaceutical market being described as one of the smallest among the Middle and East African (MEA) region (13th out of 14 countries and ahead of only Zimbabwe). With the exception of a few globally recognized brands, many of the pharmaceutical companies and health care providers in Nigeria cannot adequately compete internationally. Some of the major reasons for the current state of the sector include:

1. Lack of sufficient government funding and low drug expenditure.
2. Poor infrastructural development with insufficient facilities to meet the increasing demand for health care.
3. Absence of an adequate regulatory regime.
4. Insufficient foreign investment due to low confidence on growth prospects.
5. Lack of professional and technical ability to meet growing demand for complex drugs.
6. High inequality within the system with the low income earners being the highest users of medical and pharmaceutical care.
7. High level competition from low-cost generic drug producers in the emerging Asiamarkets.

8. The prevalence of fake and counterfeit drugs especially in the rural areas.

Some of the aforementioned problems date back many years and still remains a major challenge for successive governments.

Emerging Opportunities

The pharmaceutical industry in Nigeria is not as gloomy as it might appear. The ever increasing demand for drugs and medical care will continue to remain an advantage to domestic producers as well as an opportunity for growth and development of the critical sector. The federal government has shown its commitment towards making the sector self-sufficient as well as improving the overall standard and quality of its products and service delivery thereby making the constituent companies able to compete internationally.

The government's commitment was demonstrated through the reenergizing of the National Agency for Food and Drug Administration (NAFDAC). NAFDAC has made concerted efforts at stemming the prevalence of counterfeit and substandard drugs, recording huge successes in the process. This strategy has also helped reduce the level of corruption within the system and improved the overall quality of its product delivery. NAFDAC has been regarded as one of the most effective and influential government agencies since

Nigeria returned to civilian rule as the official figures indicate a gross reduction in contraband, fake, counterfeit and expired drugs. The National Drug Law Enforcement Agency (NDLEA) has also assisted immensely in curbing the hitherto deteriorating trend. All hands must however be on deck to ensure the sustainability of the ongoing initiatives leading to a thorough elimination of corrupt and illegal practices within the system.

On the 12th of February 2008, the 2008 budget was passed into law by the Nigerian National Assembly. The senate added N458 billion (exclusively for overall infrastructural development) to initial figure proposed by the president Umaru Yar'Adua led government. The extra funds were among others, committed to the provision of power and enhancement of health care delivery. A breakdown of the budget reveals that N60.2 billion was earmarked for the health care sector ranking it as the 4th largest sectoral allocation behind other key sectors such as Transportation and Energy. The president's 7 point agenda includes the provision of power and energy which remains one of the main impediments to the development on health care delivery in Nigeria.

The government has indicated its intention to revamp the health care sector by initiating several reforms. Some of the said initiatives include the following:

1. Liberalisation of laws on Private Sector participation in health care delivery.
2. Introduction of various incentives for expansion of existing pharmaceutical companies.
3. Revising regulatory structure to protect consumers and ensure minimum quality standards.
4. Improved financing and extra expenditure on the health sector.
5. Empowerment of various regulatory agencies such as NAFDAC and NDLEA.

All these initiatives if successfully implemented will help reduce the mortality rate in the country, prevent capital flight, and increase the level of foreign investment in the health care sector of the capital market.

Despite the seeming huge growth potentials within the pharmaceutical and health care industry, some element of risk and uncertainty still exists. The overall attitude and orientation towards health care delivery in Nigeria still casts a lot of doubt on the ability of the Nigerian populace, especially the high income earners to embrace government's reform programmes. Nigerians largely embrace foreign manufacturers of drugs while the upper class elite prefer to travel abroad when seeking urgent medical attention. The poorer population has the tendency to lean towards traditional medicines. The ability of government to enlighten and educate the general public of its efforts at improving the quality of health care in Nigeria remains a key success factor for the achievement of sustainable growth.

Some of the other factors that are crucial in Nigeria's drive for development in health care include:

1. Improving the stewardship role of government.
2. Ensuring the full implementation of the National Health Insurance Scheme.
3. Encourage the development of other HMOs to compliment the services of NHIS.
4. Improved access to quality health care through rapid infrastructural development.
5. Adequate training on methods of producing high quality drugs locally

The pharmaceutical and health care industry in Nigeria being one of the fastest growing in the economy (estimated 7-9% growth rate), is characterized by several companies. However, there's a clear dominance of the multinational brands due to their relative earnings capacity, market capitalisation, track record and strategic international alliances. While the global picture paints a scenario where the sector growth rate is higher than that of the economy at 6.1% (2007 GDP YOY growth rate), the unfortunate reality is that growth opportunities are restricted to a few of the industry's major players.

In terms of NSE listing, about 13 of the sector's constituents are publicly quoted. The total number of listed companies are as follows:

Aboseldehyde Labs Plc
Afrik Pharmaceuticals Plc
BCN Plc
Christlieb Plc
Ekocorp Plc
Evans Medical Plc
Juli Pharmacy Plc
Glaxo Smithkline Plc (GSK)
Maureen Laboratories Plc
May & Baker Nigeria Plc
Morison Industries Plc
Neimeth International Plc
Pharmadeko Plc

Among the above list and adopting various criteria such as capitalisation liquidity and stability, four companies have been selected as being the industry's key players. The companies include GlaxoSmithKline Plc (GSK), May & Baker Nigeria Plc, Neimeth International Plc and Evans Medical Plc.

1.2 Statement of research problem

The problem under investigation is theoretical in nature but with practical consequences to investors, academics and policy makers. Many studies have questionable methodologies when measuring the impact of certain factors on stock market returns. Amihud et al (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 et al (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.

1.3 Research objective

To examine the impact of liquidity of pharmaceutical companies measured by market trade volume ratio on stock market returns of the ten quoted companies of different sectors of the Nigerian Stock Exchange.

1.4 Research hypothesis

H₀: Liquidity measured by market trade volume ratio does not have any significant impact on stock market returns of the ten quoted companies of different sectors of the Nigerian Stock Exchange.

2.0 Literature review

One of the earliest and most enduring questions of financial economics is whether financial asset prices are forecastable. The concept of efficient market hypothesis which asserts that the asset price changes are unforecastable is found in the theoretical contribution and empirical research of Bachelier and May .D (2011). The modern literature on financial market efficiency begins with Samuelson (1965) who in his landmark article tried to prove why properly anticipated prices fluctuate randomly. In an informationally efficient market different from an allocationally or Pareto - efficient market -- price changes must be unforecastable if they are properly anticipated, i.e., if they fully incorporate the expectations and information of all market participants.

As stated by Lumsdaine and Ng, the misspecification problem referred to here can arise if the functional form and/or conditioning information set is misspecified. For linear dynamic models, notable cases of such misspecifications are omitted shifts in the trend function, selecting a lag length in an autoregression that is lower than the true order, failure to account for parameter instability, residual autocorrelation and omitted variables. They have also proposed a method based on use of recursive residuals for adjusting the standard ARCH test to allow for possible misspecification of unknown form. In this context it is also relevant to note that incorrectly specified conditional mean might as well lead to misspecification of conditional variance. In fact, GARCH model would be correctly specified if only there is no serial correlation. As a way out for this problem in the context of studying serial correlation,

Robinson (1991) and Woolridge (1991a, b) have suggested ways of robustifying tests for serial correlation to allow for possible misspecification of conditional variance.

When predicting the future prices of Stock Market securities, there are several theories available. In EMH, it is assumed that the price of a security reflects all of the information available and that everyone has some degree of access to the information. Fama's theory further breaks EMH into three forms: Weak, Semi-Strong, and Strong. In Weak EMH, only historical information is embedded in the current price. The Semi-Strong form goes a step further by incorporating all historical and currently public information into the price. The Strong form includes historical, public, and private information, such as insider information, in the share price. From the tenets of EMH, it is believed that the market reacts instantaneously to any given news and that it is impossible to consistently outperform the market

Dimitri and Jiang (2012) used liquidity measures capturing dimensions associated with the strength of volume-related return reversals. Liquidity measures are characterized by significant commonality across stocks, supporting the notion of aggregate liquidity as a priced state variable. Smaller stock are less liquid, according to our measure, and the smallest stocks have high sensitiveness to aggregate liquidity.

Empirical research across financial markets has noted regularities in intraday behavior of volume and volatility. Typically, both the volatility of returns and volume of trading is found to be "U-shaped", i.e., more at the beginning and at the close of trading as compared to rest of the trading hours. In some markets, the increase towards the close of trading is less pronounced resulting in so called "reverse J" shaped pattern or even "L shaped" intraday pattern. Researchers have also explored the role of information flow and of the microstructure variables as determinants of intraday volatility.

Cross-listed stocks, where the foreign listing is in a market in different time-zone, present a case where the trading continues much after it has stopped for other stocks. Since these stocks are traded overnight (in foreign market), relatively more recent price quotes are available and hence variance of price at opening should be low for these stocks, assuming that information can flow freely (Amihud and Mendelson 1991). Amihud and Mendelson (1987) observe that pricing errors at open are lower for cross-listed stocks vis-à-vis other stocks and conclude that available sequence of transaction prices from the trading day in other markets facilitates faster price discovery for cross-listed stocks.

Another phenomenon of empirical interest in the context of intraday dynamics is the effect of expiry of derivative contracts on prices, volume and volatility. Alkeback and Hagelin (2004) find high volumes but no price distortions in Swedish market. Vipul (2005), based on low-frequency data from Indian stock market, notes that the price and volatility are sometimes distorted near expiration day in the Indian market due to unwinding of cash positions by arbitrageurs in cash markets.

An area worthy of further investigation is the cross-sectional variation of stock liquidity and trading activity during a crisis. Some stocks may be more prone to stock market declines, while others may be less affected by a crisis. Another topic left for examination is exploring cross-country explanations on the impact of a crisis on stock liquidity and trading activity.

Since the introduction of index derivatives, what impact the equity derivatives trading would have on the underlying spot market volatility, has attracted the attention of researchers all over the world to unfold the issue and received renewed focus. Many theories have been propounded explaining contradictory conclusions. Two main bodies of theories exist in the literature about the relationship between derivatives market and the underlying spot market. The theoretical literature proposes both a 'destabilizing force' hypothesis that predicts increased volatility and a 'market completion' hypothesis in which decreased volatility is predicted.

To ensure that portfolio managers are better equipped to shield their clients' investment from adverse effect of volatility or take advantage of the opportunities it provides, Choudhry (2000) recommends that more research be made in studying theoretical and empirical applications of models measuring weighty risk management strategies such as portfolio rebalancing. This involves measuring the current value of their assets relative to total value of their portfolio taking into account the class, category, and sector to increase liquidity, profitability and ability to adapt to risks found in a volatile period of the market. This recommendation is indispensable to the negative impact portfolio volatility has on investment performance, especially when returns fall short of the investor's expectation. As a risk control strategy knowledge of portfolio rebalancing can be seen where an informed investor acknowledges the usefulness of compounding effect of returns on his portfolio by calculating based on compound average and not simple average.

There are models designed to assist the investor to determine his probable maximum loss preference by choosing an asset allocation that is consistent with the desired investment expectation. In other words to focus on what is controllable and keeping his emotions in check by finding a tradeoff between the various combinations of various securities held by weighing the threat, vulnerability and risk. Given the associated returns in a market and the investor's desire to improve his long or short position taken it is prudent to have a maximum portfolio draw down plan.

It is a very significant correlation between money supply, deflated for changes in the consumer price index, and the general level of stock prices. Increases in the money supply provide liquidity, however increases in the consumer price index decreases liquidity. Evidence have been provided in the studies of many stock market models by academics ranging from rigorous analytical frameworks to questionable intuitive reasoning suggesting that liquidity plays a significant role in explaining the cross-sectional variation in stock returns. According to Mazumdar, (2004), changes in liquidity measured by increase in market capitalization are also a casual factor producing immediate changes in stock returns.

Adequate market liquidity motivates investors to adjust their wealth portfolios in such a manner as to yield predictable movements in the prices of securities. Liquidity considerations correspond to the individual's attitude to risk, the risk preference of the investor influences the individual's choice for precautionary-liquid balances. Generally as the size of an individual's portfolio increases the smaller will be the portion of highly liquid assets held.

Demand pressure, exogenous trading costs, inventory risk, search frictions, and asymmetric information are common denominators affecting liquidity in the market. There is increased cost to the investor who holds assets that are less than perfectly liquid hence there is a positive relationship between stock returns and illiquidity, conversely, the relationship between stock returns and liquidity should be negative. Patient investors who make long term investments in

assets that are sensitive to liquidity expect higher returns as a compensation for additional risks. That is why there should be liquidity risk premium in stock pricing (Amihud, 2002).

Amihud et al (2005) studied the implications of liquidity on stock returns defining the degree of market liquidity as the cost of immediate execution. They also indicated that the bid-ask spread contains a premium for immediate purchase or sale, and also that the spread between supply and demand is a natural measure of liquidity. Amihud et al (2005) proved that in an equilibrium context there is an increasing and concave relationship between required return rate and the degree of liquidity of financial assets. They also show that financial assets spreads are negatively correlated with certain measures of liquidity such as trading volume.

Amihud et al (2005) indicate that measuring the degree of liquidity compared to bid-ask spread is critical since the spread contains an information asymmetry component. In other words the effects of liquidity with information asymmetry may often be measured by the variable component of transaction costs. As anticipated return increases expectedly market liquidity reduces but time forecast return excess compensates market's anticipated liquidity. Amihud (2002) proves that anticipated market illiquidity has a positive and significant effect, while non-anticipated illiquidity has a negative and significant effect. Market-wide liquidity is a factor for pricing common stocks. Expected stock returns are related cross-sectionally to the sensitiveness of stock returns to innovations in aggregate liquidity. Stocks that are more sensitive to aggregate liquidity have substantially higher expected returns, even after accounting for exposures to the market return as well as size, value, and momentum factors.

Dimitri and Jiang (2012) used liquidity measures capturing dimensions associated with the strength of volume-related return reversals. Liquidity measures are characterized by significant commonality across stocks, supporting the notion of aggregate liquidity as a priced state variable. Smaller stock are less liquid, according to our measure, and the smallest stocks have high sensitiveness to aggregate liquidity.

According to Torben et al (2000) financial market volatility is central to the theory and practice of asset pricing, asset allocation, and risk management. Although most textbook models assume volatilities and correlations to be constant, it is widely recognized among both finance academics and practitioners that they vary importantly over time. This recognition has spurred an extensive and vibrant research program into the distributional and dynamic properties of stock market volatility. Most of what has been learnt from literature is based on the estimation of parametric ARCH or stochastic volatility models for the underlying returns, or an analysis of implied volatilities from options or derivative prices.

However, the validity of such volatility measures generally depends upon specific distributional assumptions, and in the case of implied volatilities, further assumptions concerning the market price of volatility risk. As such, the existence of multiple competing models immediately calls into question the robustness of previous findings. An alternative approach, based for example on squared returns over the relevant return horizon, provides model-free unbiased estimates of the ex-post realized volatility. Unfortunately, however, squared returns are also a very noisy volatility indicator and hence do not allow for reliable inference regarding the true underlying latent volatility.

The limitations of the traditional procedures motivate the different approach for measuring and analyzing the properties of stock market volatility. Vayanos and Jiang (2010) stressed the need for using reliable high-frequency return observations especially for actively traded stock. They treated the resulting daily time series of realized variances and covariance's constructed from

a five-year sample of thirty equities with distributional features of volatilities directly observed. Their approach was similar to French et al (1987) who relied primarily on daily return observations for the construction of monthly realized stock volatilities, using a continuous time diffusion process, the diffusion coefficient can be estimated arbitrarily well with sufficiently finely sampled observations, and by the theory of quadratic variation, this idea carries over to estimates of the integrated volatility over fixed horizons. The use of high-frequency returns plays a critical role in justifying the measurements used.

By studying distributional and dynamic properties of correlations in much greater depth than is possible with traditional multivariate ARCH or stochastic volatility models, which rapidly become intractable as the number of assets grows while the results are segmented into unconditional and conditional aspects of the distribution of volatilities and correlations.

Liquidity is the characteristic of an item that can be readily convertible to cash. Its management is a very topical issue in measuring firms' ability to settle current obligations without any disruption in the daily operations of an organization. It involves coordination of the company's various sources of funds and use of such funds to ensure that current obligations are met as and when due without any loss or adverse result on the financial condition of the firm. Price et al., (2003) recognized that many profitable companies with long-term financial strength have failed because of their inability to honour their debts' obligations. It is a critical factor in measuring the short-term strength of an entity. Liquidity management ensures that cash which is said to be 'the lifeblood of businesses' is available as and when needed in business activities (Huston, 2015). Managers are enabled to reduce the liquidity risk exposure of their firms through the management of liquidity. In the modern competitive environment, liquidity management has become so significant in that it enables companies to avoid shortage or excessive holding of cash resources. It is uneconomical to hold excessive cash instead of investing it in productive assets (Libby et al., 2001).

In managing liquidity, ratios are indispensable because they help in determining the relationship between one variable and another. Liquidity management aims at not having too high a current ratio, but at maintaining a liquidity balance that would generate profit for the firm (Priya et al., 2013). The relevant ratios are cash, the current, the quick, the receivable and the inventory turnover ratios. Current ratio which shows how total current assets is related to total current liabilities is widely used to measure the liquidity of an entity in the settlement of its short-term obligations. Cash Ratio is the relationship between cash and current obligations and it measures the adequacy of cash in the settlement of employees, creditors, and other current debts (Libby et al., 2001). Management of liquidity has led some companies to devise a system of not carrying many inventories as part of the working capital item.

This method is called just-in-time inventory which means that the stock is supplied only when needed. However, this system works better for manufacturing firms rather than retail businesses where demand may be immediate. (Libby et al., 2001) .This study tried to examine the impact some liquidity ratios have on the profitability of the firms under study; whether the way they manage their liquidity hinders the success of their businesses or not. Profitability measures the total success of a company and an essential condition for its survival (Libby et al., 2001). Profitability also measures the adequacy of income generated in a particular year by an entity by comparing the profit made by a company with those of previous years, and those of one or more other companies in a similar industry.

Liquidity is a crucial factor in boosting the profitability of an entity. Management of an entity and achievement of profit planning are not possible without liquidity assets. Various studies have been carried out by authors in this regard to establish the relationship between these two variables but the results vary. While some show evidence of positive association others show negative results. For instance, studies carried out by Bhunia et al.,(2011), Ben-Caleb et al., (2013) revealed a small degree of association between liquidity management and profitability of entire firms studied even when the multiple correlation statistics disclosed that liquidity and solvency position was very satisfactory, and liquidity management relatively efficient. The implication of the results of these studies is that maximum profit is achievable at a certain level of cash management position.

The result attests further to the crucial importance of liquidity management in financial management decisions. Bhunia et al., (2011) opined that a company that manages the trade-off between profitability and liquidity management can reach optimal liquidity. The result of similar studies carried out on manufacturing firms in Nigeria by Owolabi et al., (2012) indicated that credit policies, the cash conversion cycle and cash flow management (as indices of liquidity) significantly and positively impacted upon the profitability of the firms. Out of twelve (12) manufacturing firms studied, nine (9) companies showed a good level of liquidity management, and that reflected positively on the profitability of the companies.

3.0 Research methodology

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. 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 2016 to December 2016.

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 impact of liquidity and volatility on stock returns of the Nigerian stock market, we adopted 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) and Rahman (2009), Guha Deb and Mukherjee (2008), Chaudhury (1991), Goswami and Anshuman (2000), Lumsdaine and Ng (1999) and Woolridge (1991), 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 regressand). 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.

In the E-view statistics using least squares (NLS and ARMA) the linear equation is re-stated as $\text{gdp gross_exp oil_exp year } c$. The dependent variable followed by least of regressors including ARMA and PDL terms involved an explicit equation stated thus;

$$Y = c(1) + c(2) * X$$

Where Y represents the dependent variable and X represents the independent variable

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

H₀₁: Liquidity measured by market trade volume ratio does not have any significant impact on stock market returns of the ten quoted companies of different sectors of the Nigerian Stock Exchange.

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

where;

- Log ASI = Log of All Share Index (a proxy for Stock Market Returns)
- MTVr = Market Trade Volume 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

The model adopted are based on the following assumptions

1. 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 for 2016 and 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.
2. 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 three quoted health sector firms of the Nigerian Stock Market (NSE) as a measure of stock market returns in line with the works of Arumugam (1997), Berument and Kiyamaz (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 4th January 1999 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 2001 to 2017.

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.

Techniques of Analysis

The hypothesis earlier specified in the model was tested using the Least Square (LS) regression analysis. While regression analysis is concerned with the study of the dependence of one variable, the dependent variable, on one or more other variables, the explanatory variables, with a view to estimating and/or predicting the population mean or average value of the former in terms of the known or fixed (in repeated sampling) values of the latter (Gujarati and Porter, 2009). 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).

4.0 Data analysis and discussion of results

EVANS MEDICAL PLC

Dependent Variable: CAPITALIZATION

Method: Least Squares

Date: 02/10/19 Time: 09:32

Sample (adjusted): 4356

Included observations: 227 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VALUE	33.39397	1.187367	28.12438	0.0000
C	21819004	15816198	1.379535	0.1691
R-squared	0.778539	Mean dependent var		2.42E+08
Adjusted R-squared	0.777555	S.D. dependent var		4.39E+08
S.E. of regression	2.07E+08	Akaike info criterion		41.14224
Sum squared resid	9.63E+18	Schwarz criterion		41.17242
Log likelihood	-4667.645	Hannan-Quinn criter.		41.15442
F-statistic	790.9809	Durbin-Watson stat		2.188953
Prob(F-statistic)	0.000000			

GLAXOSMITH PLC

Dependent Variable: CAPITALIZATION

Method: Least Squares

Date: 02/10/19 Time: 10:14

Sample (adjusted): 4345

Included observations: 225 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VALUE	20.10694	0.073122	274.9762	0.0000
C	-6203734.	2082021.	-2.979670	0.0032
R-squared	0.997059	Mean dependent var		2.68E+08
Adjusted R-squared	0.997046	S.D. dependent var		5.04E+08
S.E. of regression	27402655	Akaike info criterion		37.09903
Sum squared resid	1.67E+17	Schwarz criterion		37.12939
Log likelihood	-4171.641	Hannan-Quinn criter.		37.11128
F-statistic	75611.89	Durbin-Watson stat		1.426003
Prob(F-statistic)	0.000000			

MAY AND BAKER

Dependent Variable: CAPITALIZATION

Method: Least Squares

Date: 02/10/19 Time: 11:17

Sample (adjusted): 4361

Included observations: 219 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VALUE	42.47973	0.397748	106.8006	0.0000
C	5385450.	6615380.	0.814080	0.4165
R-squared	0.981331	Mean dependent var		1.83E+08
Adjusted R-squared	0.981245	S.D. dependent var		6.92E+08
S.E. of regression	94739047	Akaike info criterion		39.58024
Sum squared resid	1.95E+18	Schwarz criterion		39.61119
Log likelihood	-4332.036	Hannan-Quinn criter.		39.59274
F-statistic	11406.38	Durbin-Watson stat		2.295908
Prob(F-statistic)	0.000000			

5.0 Discussion of findings and conclusions

The findings indicate different scenarios for the different quoted companies analyzed have sufficient goodness of fit. The goodness of fit of the model can be seen in the coefficient of determination (R-square). Which means that the R² measures how well variations in the dependent variable are explained by the independent variables on a trading day basis for one financial year. The adjusted R² moderates the R^s indicating that there may be other variables other than our explanatory variables that might have an impact on the dependent variable but not represented in the equation. The Durbin Watson statistics is meant to reveal if there are signs of serial correlation and to what extent. The AIC, or Schwarz criterion, shows that the difference between the two is very negligible, an indicator of a near perfect model convergence near zero. The smaller they are the better the fit of your model is (from a statistical perspective) as they reflect a trade-off between the lack of fit and the number of parameters in the model. That the differences between the R² and adjusted R² are negligible is an indicator that the regression line approximates the real data points and so is a very good fit and also shows how well observed outcomes in the analyses are replicated in the model.

The R² and adjusted R² for the companies like Evans Medical plc (77.8% & 77.7%), Glaxo Smith (99.7% & 99.7%), May & Baker (98.1% & 98.1%). For most of the companies under study it was evident that there were significant relationship between their liquidity measured by market trade volume ratio ratio and their respective stock market returns. Again theory supports that investor misspecification about future earnings or illiquidity of low volume stocks seen in the health sector may be responsible for the high variations noticed in a certain period of the analysis. This is consistent with previous postulations by Khan S.U and Rizwan F (2008).

6.0 Policy Recommendations

1. 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 trade volume.

2. Thus, this study recommends that investors should make trading volume based strategies to encourage investors to buy or sell securities outside their face values, as a means of encouraging business or economic activities in the economy this is due to large volatilities in some markets.
3. It is important that more research be made in studying theoretical and empirical applications of models measuring weighty risk management strategies such as portfolio rebalancing. As a risk control strategy knowledge of portfolio rebalancing can be seen where an informed investor acknowledges the usefulness of compounding effect of returns on his portfolio by calculating based on compound average and not simple average.

References

- Al-Faki, M. (2006). The Nigerian capital market and socioeconomic development paper presented at the 4th *Distinguished Faculty of Social Science Public Lecture*, University of Benin, 9-16
- Arvit, K.; Mallik, D. S.; and R. Debdas, 2005. Working capital and profitability: A study on their relationship with reference to selected companies in Indian Pharmaceutical industry. *GITMAN Journal of management*, 3(2): 51 – 62.
- Asiao, C. and A. K.Tahmiscioglu, , 1997. A Panel analysis of liquidity constraints and firm Investment. *Journal of American Statistical Association*, (92): 455 – 465.
- Ben-Caleb, E. O. and U. U. Uwuigbe, 2013. Liquidity Management and Profitability of Manufacturing Companies in Nigeria. *IORS Journal of Business Management (IOSR-JBM)*, 9(1): 13 – 21.
- Bhunia, A., 2007. Liquidity Management of Public Sector Iron and Steel Enterprises in India. *Vidyasager University Journal of Commerce*, 12.
- Bhunia, A. and U. I. Khan, 2011. Liquidity Management Efficiency of Indian Steel Companies (a Case Study). *Far East Journal of Psychology and Business*, 3(3): 1 – 13.
- Chiou, J., and L. R. Cheng, 2006. The Determinants of Working Capital Managements; *The Journal of American Academy of Business*, (1): 149 – 155.
- Eljelly, A. M. A., 2004. Liquidity - Profitability Trade-off: An empirical investigation in emerging market. *International Journal of Commerce and Management*, 14(2): 48-61.
- International Journal of Management Sciences and Business Research*, July-2016 ISSN (2226 8235) Vol-5, Issue 7 <http://www.ijmsbr.com> Page 12
- Enyi, E. P., 2005. Applying Relative Solvency to Working Capital Management. *The Break-Even Approach*. New York: Kafi University Press
- Karaduman, H. A., Akbas, H. E., Caliskan, A. O., and T. H. Durers, S. 2011. The relationship between working capital management and profitability: evidence form and an emerging market. *International Research Journal of Finance and Economics*, (62): 61 – 67.
- Kaveh, A., and Mohammed, R. K. 2013. The Study of Factors Affecting Working Capital of Pharmaceutical Companies Accepted in Tehran Stock Exchange. *World of Science Journal*, 1(14): 66 – 67.
- Kim, C. S., Mauer, D. L., and Sherman, A. E., 1998. The Determinants of Corporate Liquidity: Theory and Evidence. *Journal Financial and Quantitative Analysis*, 33 (3),:335 - 359
- Lyrondi, K. and Y. Lazaridis. 2000. The Cash Conversion Cycle and Liquidity Analysis of the Food Industry in Greece. *Social Science Research Network*. Available from

- http://papers.ssrn.com/paper.taf?abstract_id=236175. Accessed 20 August 2015.
- Nadeem, I., Naveed, A. R. Zeeshan, 2014. Relationship between Working Capital Management and Profitability: Evidence from Pakistan. *International Letters of Social and Humanistic Sciences*, (20): 14 – 25.
- Nwangi, J. K., 2008. Relationship between Sales Growth, Profitability and Firm Value in Firm Value Creation Strategy: A Study of Companies in Young Emerging Market Economies. Available from <http://erepository.uonbi.ac.ke/handle/11295/42057>
- International Journal of Management Sciences and Business Research*, July-2016 ISSN (2226 8235) Vol-5, Issue 7 <http://www.ijmsbr.com> Page 13
- Ofoegbu G.N (2016) Liquidity management and profit performance of pharmaceutical manufacturing firms listed in Nigerian Stock Exchange,
- Olaopa, B., 2013. Over \$44m Investment In Nigeria Pharmaceutical Industry. Available from <http://www.ventures-africa.com/2013/10/44m-invest> Accessed 21 May 2015.
- Olugbenga, J., 2010. An Appraisal of the relationship between working capital and liquid Assets of Nigerian companies: A comparative study of then selected companies. *Journal of research in National development*, 8(1).
- Owolabi, S. A., and S. S. Obida, 2012. Liquidity Management and Corporate Profitability: Case Study of Selected Manufacturing Companies listed on the Nigerian Stock Exchange. *Business Management Dynamics*, 2(2): 10 – 25.
- Price, J. E.; Haddock, M. D.; and H.R. Brock, 2003, *College Accounting (Tenth Edition)*, Irwin; McGraw-Hill.
- PriceWaterhouseCoopers 2014. Cash for Growth PwC Annual Global Working Capital Survey. Available from download.pwc.com/ie/pubs/2014-cash-for-growth-annual-global-working-capital-survey Retrieved on 14 July, 2016.
- Priya, K. and B. Nimalathasan, 2013. Liquidity Management and Profitability: A Case Study of Listed Manufacturing Companies in Sri Lanka. *Internatisonal Journal of Technological Exploration and Learning (IJTEL)*, 2(4).
- Proshare 2015. Nigeria's Pharmaceutical & Health Care Sector (A Critical Analysis). Available from
- Singh, J. P.; Pandey, S., 2008. Impact of Working Capital Management in the Profitability of Hindalco Industries Limited; the *IUP Journal of Financial Economics*, (4): 62-72
- Victor C. L., Samuel A., and Eric K. B., 2013. The Relationship between Liquidity and Profitability of Listed Banks in Ghana. *International Journal of Business and Social Science*, 4(3):48 - 56
- Vishanani, S., and B. K.Shah, 2007. Impact of working capital management policies on Corporate performance. An empirical study. *Global Business Review*, 8(2): 267-281.