

**THE EFFECT OF SELECTED MACRO-ECONOMIC VARIABLES
ON TRADING VOLUMES AT THE NAIROBI SECURITIES
EXCHANGE**

BY

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DECLARATION

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

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DEDICATION

I dedicate this work to my amazing parents, Mr. John Ochako and Florence Moraa. It is moments such as these that I truly realize the great values impacted in me, sacrifices made and the support that you have given me. I thank you and appreciate you for these and for your constant encouragement, prayers and belief in my abilities.

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ABBREVIATIONS AND ACRONYMS

AIMS	Alternative Investment Market Segment
CAPM	Capital Asset Pricing Model
CBK	Central Bank of Kenya
CDS	Central Depository System
EMH	Efficient Market Hypothesis
FISMS	Fixed Income Securities Market Segment
GDP	Gross Domestic Product
GEMS	Growth Enterprises Market Segment
IPO	Initial Public Offer
MIMS	Main Investment Market Segment
MPT	Modern Portfolio Theory
NASI	NSE All Share Index
NSE	Nairobi Securities Exchange
RWH	Random Walk Hypothesis
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
US	United States

ABSTRACT

The stock market is used to measure both the performance and economic stability of a nation. The rising stock market index is a sign of a growing economy and a declining and fluctuating stock market portrays economic instability. Both theory and empirical literatures hold that a country's growth is directly linked to the size of the economy, which consists of a number of variables, inflation, interest rate and exchange rate. This study sought to determine the effect of selected macroeconomics variables on the stock trading volumes at the Nairobi Securities Exchange. The independent variables were interest rates as measured by average monthly lending rates, exchange rates as measured by monthly KSH/USD and inflation as measured by monthly CPI. Stock trading volume was the dependent variable which the study sought to explain and it was measured by monthly value of stocks traded in the stock market. The study employed a descriptive cross-sectional design and carried out a census of all the 64 firms listed at the NSE. The study revealed that exchange rate, interest rates and inflation rates in Kenya had been fluctuating during the study period (2007-2016). Regression analysis findings established that there was a strong relationship ($R= 0.803$) between selected macroeconomics variables and stock trading volumes. The result of the study also indicated that the value of adjusted R-squared is 0.635. This means that independent variables investigated in the study (exchange rates, interest rates and inflation rates) could account for or explain 63.5% of the dependent variable. The remaining 34.5% can be explained by other variables which were not the subject of this study. The study concludes that there is a strong relationship between the selected macroeconomic variables and stock trading volumes. The study also established that exchange rate and inflation rate negatively affects stock trading volumes while interest rate had a positive effect. The study recommends that the Capital market Authority and the national government of Kenya should come up with fiscal policies aimed at cushioning the stock market from high inflationary pressure. The study further established that an appreciation in a country's currency increases the purchasing power of individuals leading to an increase in stock trading volumes. The study recommended that the government should put in place mechanisms aimed at enhancing exchange rate stability which in turn promotes stock market.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The role of stock markets either individually or collectively around the globe have a great role to play in their specific economies. Stock markets provides a platform for trading in securities such as the options and futures, raising funds and other means through which investors gain avenues for generating returns (Peansupap & Walker, 2005). The trading volumes in an economy's stock market are of great concern to many parties such as capital markets, investors, governments, the stock exchange and many others. Trading volume is affected by several factors which include state activities and the economic performance in the general. The stock market trading volumes are not affected by the economic activities. There are several other factors which affect the stock market trading volumes. This includes constitution of investors, prevailing market conditions, and availability of other investments assets, among others (Mendelson & Robbins, 2003).

Malkiel and Fama (1970) in their study of the efficient market hypothesis (EMH) described that the existing price of stock indicate the information acquired about an organization's value and it is difficult to make extra earnings by use of available information. The EMH theory supports this study in that the returns at the stock market reflect happenings in the macroeconomic variables disparity. The influence of macroeconomic variables on the returns of the stock market is then reflected in the volumes traded. In addition Ross (1976) classical model of Arbitrage Pricing Theory (APT) linked the macroeconomic variables to stock market returns which impacts on the trading volumes.

In Kenya, the Nairobi Securities Exchange (NSE) is the only body that performs the functions of a stock market. Among many other objectives and roles, are promotion and enhancement of a culture of thrift, and/or saving by providing alternative avenues for investment and assists in the transfer of these savings to investment in productive enterprises and quoted stocks. The NSE is currently trading its shares at a rate of more than 100 million shares monthly, making it to play a great role in Kenya's economic growth. This is facilitated through enabling idle savings and money to become more productive by bringing together both borrowers and lenders of funds at the lowest possible cost. The market has helped in educating the public about the need to invest in the stock market as well as boosting the confidence of investors through the requirement of listed companies to have published financial reports (NSE Annual Report, 2016).

1.1.1 Selected Macro-Economic Variables

Macro-economic variables refer particularly to factors of overall importance to the position of countries economy both at the regional and national face .This factors have an impact on a very large proportion of population (Sharma & Singh, 2011). Macro-economic variables are majorly closely scrutinized by business, governments, and consumers due to their influence on overall performance of the economy. Kwon and Shin (1999) in their study concluded that GDP, interest rates, currency exchange rate, inflation, market risk and money supply are the most impactful macroeconomic variables. Mishkin (2004) defines macro-economic variables as the factors which are relevant to an economy as a whole and shake a great populace relatively than a select few of them. The GDP, unemployment, exchange rate and inflation were identified as the variables that have major influence to the economy.

The price at which a debtor pays interest for the utilization of the funds borrowed is referred to as the interest rate. Interest rates are rarely static, often changing with changes in the macroeconomic environment (Ali, 2014). Sill (1996) explains that interest rates react to events in the international and domestic markets, national economic prospects and inflation. According to Fisher (1930) the nominal interest rate was a combination of inflation and real interest rate. As inflation increases, investors demand higher returns to compensate them for the reduction in the value of their investment. When the amount of money circulating in the economy increases, it causes interest rates to fall but is often associated with a rise in inflation which eventually results in an increase in interest rates.

Inflation rate is the rate whereby the general price levels for products increase with the decrease in the currencies' purchasing power. Simply put it is a situation where too much money chases too few goods with devaluation in currency (Sharma & Singh, 2011). The CPI is often used as an inflation proxy and it is used to measure the current price level relative to the base year selected. The CPI is used to measure fluctuations in prices at retail level and further indicates the purchase price of goods and services used by private households (Subhani, Gul & Osman, 2010).

The price of one currency in terms of the other is referred to as the exchange rate (Mishkin & Eakins, 2009). An exchange rate can either be a direct or an indirect quotation. A direct quotation refers to the amount of units of the foreign currency that could be bought by a unit of home currency whereas an indirect quotation refers to the amount of foreign currency obtainable from a unit of the home currency (Howells & Bain, 2007). The exchange rate is said to be the nominal exchange rate when it includes inflationary effects and is referred to as the real exchange rate when inflationary effects

are excluded (Lothian & Taylor, 1997). Prior to 1972, nearly all countries in the world operated on a fixed exchange rate system whereby their individual country's currencies had a fixed rate relative to the US dollar.

1.1.2 Trading Volumes

The trading volume refers to the amount of trade undertaken so as to trade a security or an exchange on a specific day. Higher levels of trading volume indicate high interest rate levels of trading a security at prevailing price levels (Sabri, 2008). Khan and Rizwan (2008) point out two trading volume components: The first component is brought about by the hedging demands of the investors while the second one is brought about by the speculative needs of the investors. Their model suggests that two categories of investors exist possessing different types of information regarding the expected output of the traded assets, the model holds that they exist homogeneity within a group of investors. The hedging demands are brought about by the associations between the of traded assets' expected returns and the non-traded assets' payoffs. Trading volumes which reflect the speculative demands of the investors can be used to reduce liquidity since superior information often results in asymmetric information among investors (Michaely & Koski, 2000).

According to Baker and Stein (2004), higher trading volume indicates engagements with investors who are not afraid to take risks, which is brought about by high sentiments of the investors. Higher investor sentiments often yield varying opinions between investors with distorted asset valuations and investors with rational asset prices' expectations. Higher investor sentiment leads to a higher speculative demand levels which indicates

that a positive association exists between the sentiment of the investor and trading volume Baker and Wurgler (2004)

1.1.3 Impact of Selected Macro-economic Variables on Trading Volumes

Both theory and empirical literatures hold that the thriving of a nation is directly associated with the economy, this includes variables such as Foreign Direct Investment, GDP, Inflation, Remittances, Money supply, Interest rate and Exchange rate. The trading volumes' movements are influenced by variations in economic fundamentals and these fundamentals' future prospects. The stock market trading volumes is a means of measuring market performance over a long period of time (Aduda, Masila & Onsongo, 2012). According to Gazi, Uddin and Mahmudul (2010), a rising index or consistent growth in the trading volumes is an indication of growing economy whereas fluctuations in trading volumes indicate economic instability in a country.

Asaolu and Ogunmuyiwa (2010) posit that the parameters for ensuring economic performance include the exchange rate, fiscal position, inflation rate, position of debt. The inflation rate, Treasury bill rate and the lending rate influence the activities of the stock market as they have a direct influence on a countries' state of corporate activity.

Osamwonyi and Evbayiro-Osagie (2012) stated that the stock market plays an imperative role in the economy. The investment choices made by the investors are highly influenced by the prevalent macroeconomic variables in the economy. It therefore follows that investors need to be cognizant of the prevailing macroeconomic variables when they are making their assessments on the various investment selections they have to undertake including at the stock market.

Other schools of thought have contradicted the perceived notion that a link exists between exchange rate, interest rate inflation and stock market trading volumes. The studies try to demonstrate that there are other fundamental factors affecting the trading volumes most importantly the efficiency of the market that result in the market self-regulating due to availability of all fundamental market information and hence no one has the upper hand nor the ability to beat the market.

1.1.4 Nairobi Securities Exchange

The NSE, is among the most important exchanges in Africa that traces its beginning to the early 1920s when a number of traders organized an informal arrangement to trade shares. The precursor to the NSE was the Nairobi Stock Exchange, an association of stockbrokers interested in developing and regulating the trade in securities across East Africa. In its formative years, the stock market served the East African region and had a number of companies from Kenya, Tanzania and Uganda. This ended with the collapse of the East Africa Community in 1975 when Tanzania and Uganda companies withdrew from the bourse. The NSE was in 1991 incorporated as a private limited company on the basis of shares and formalized its operations through the introduction of a floor trading system. The NSE used the Initial Public Offer (IPO) on the NSE in 2014 to offer its shares to the public following a successful demutualization process. Several developments have been undertaken in the Kenya capital markets, making it easier to trade securities. These include the enactment of the Capital Market Authority Act (Cap 495A), which allowed the formation of the Capital Market Authority (CMA) to regulate the capital market operations. The central depository system was automated in November

2004 to facilitate the electronic clearing and settlement of the trade in securities on the NSE (NSE, 2017).

The NSE market is split into the Main Investment Market Segment (MIMS), Fixed Income Securities Market Segment (FISMS), the Growth Enterprises Market Segment (GEMS) which targets small and medium enterprises and the Alternate Investment Market Segment (AIMS). The NSE operates 4 major indices; the NSE 20, NSE 25 Share Index (NSE25), NSE All Share Index (NASI) and the FTSE NSE indexes. The NSE20 and NSE25 track the performance of the 20 and 25 NSE companies that have displayed exemplary performance on the index of market capitalization, number of transactions and turnover. NASI on the other hand reflects the total market value of all stocks traded on the NSE in one day (NSE, 2017).

Presently the NSE comprises 66 listed companies with over USD 7 million daily trading volume and approximately USD 18 billion total market capitalization. In addition, Government and corporate bonds are traded at the NSE besides equities and an automated bond trading begun with KES 25 billion KenGen bond in November 2009 (Kestrel Capital (East Africa) Ltd, 2006; NSE, 2013). The average daily trading bond is USD 80million. Also, the trading hours begin at 09:00 and end at 15:00 and CDS were installed in the year 2005 is used to execute delivery and settlement.

1.2 Research Problem

The economic performance of any country is dictated by the volume of stock traded. The investors have globally found easy access to stock markets since the formulation of free and open economic policies and the emergence of more advanced technologies. The use of stock market trading volumes has an indicator of the countries' economic health shows

the role of stock markets (Gupta, Chevalier & Sayekt, 2008). Stock market volume could be influenced by several economy-wide factors which could have a positive impact, negative or no impact on its performance. The study of macroeconomic variables has drawn various studies with most of them concluding that fluctuations in the stock market trading volumes continue to be directly interconnected with the various macroeconomic variables (Lee, 1998). According to Fama (1970), the volume of shares traded in a stock market is perceived with regard to market efficiency. Stock market efficiency depends on the speed and accuracy within which macroeconomic variable information is built into the stock market trading.

The NSE is Kenya's sole securities exchange market. Changes in the country's economic times are often reflected on the performance of the NSE. In this light, studying the effects of changes in macro-economic variables at the NSE would give a broader view that reflects the entire economic health of the country. This broader outlook makes this study viable in more ways and to more stakeholders, both in the domestic and global perspectives. Kenya's macroeconomic variables have fluctuated in the last two decades. According to the Kenya Economic survey (2015), the main macroeconomic indicators in 2016 remained relatively stable. The Kenya Shilling depreciated against the US dollar due to a momentous drop in income from the international tourism while the CBK lending rate continued to be reasonably stable at 8.5%. In regards to inflation, significant changes in inflation have been witnessed by the Kenyan economy over time.

Several studies have documented the effect of various variables such as inflation, gross domestic product, exchange rates, money supply and interest on the stock market. The majority of these studies have stock market prices and returns as stock market

performance measurement leaving a gap on the effect of macro-economic variables on stock market trading volumes. Ilahi, Ali and Jamil (2015), in their study in Pakistan, concluded that a weak connection was present between the returns of the stock market and macro-economic variables. Studies by Garcia and Liu (1999) the volatility of macro-economic variables have no impact on stock market performances, Atanda and Maku (2010) point out that the Nigerian stock market performance in the long run is influenced by macro-economic forces. Ting, Feng, Weng and Lee (2012) noted that in Malaysia, the interest rate, CPI and money supply consistently influence the Kuala Lumpur Composite Index both in the short run and long-run. According to Mehwish (2013), in Pakistan, negative association exists between real interest rate and the performance of the stock market. Jahur, Quadir and Khan (2014) established macro-economic variables for instance the Interest Rate and the CPI to significantly influence the performance of Bangladesh's stock market performance.

In Kenya, Ouma and Muriu (2014) concluded that the stock market in Kenya was affected by the variations in the exchange rate, money supply, and inflation. According to Songole (2012) the exchange rate, CPI and market interest rate negatively influence stock return. The studies by Kimani and Mutuku (2013) indicate that a negative association exists between inflation and the performance of the stock market in Kenya. Mwai (2013) established that share prices were affected by various macroeconomic variables including interest rates, gross domestic product, inflation and exchange rates. From the foregoing, it is notable that there was no consensus on the effect of macro-economic variables on stock market trading volumes. In addition, the studies conducted have concentrated on stock prices and stock returns leaving a gap on trading volumes. Thus the study seeks to

respond to the research question: What is the effect of interest rates, inflation rates and exchange rates on trading volumes at the NSE?

1.3 Research objectives

This study seeks to determine the effect of interest rates, inflation rates and exchange rates on trading volumes at the Nairobi Securities Exchange.

1.4 Value of the Study

It benefits the investors as they will be better informed on how the stock market trading volumes are affected by the macro-economic factors. The findings provide background information to the investors on how to ascertain the effect that macroeconomic variables impacts on their investment. This allows them to give attention to the variables and be in a position to diversify risks while investing at the stock market. Knowledge of such provides a competitive advantage to the investors inform better information on the best investment decisions. Future investors can use this study as a foundation upon which they can gauge how the prevailing economic situation will impact on their investment choices.

The finding of the study forms a future reference to researchers, scholars and students who may aspire to take out research on the same or correlated field. The study may also be helpful to scholars and researchers in identification of further areas of research on other related studies by highlighting related topics that require further research and reviewing the empirical literature to establish study gaps. The study contributes significantly to trading volumes at the stock market.

The study will also be of significance to various policy making institutions like the CMA, the CBK and the NSE in Kenya as they may use its findings and recommendation to

generate effective policies to mitigate the effects of macro-economic variables on stock market trading volumes.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the theoretical framework applied in the study and reviews previous studies done on selected macro-economic variables and stock market trading volumes. It contains the theoretical review, determinants of trading volumes, empirical review, conceptual framework and a literature review summary as well.

2.2 Theoretical Framework

The theoretical review provides a detailed knowledge of what has been done and form a framework within which the research findings are to be interpreted and also to overcome the shortcomings of earlier studies. The following section will describe and discuss different theories such as Modern Portfolio Theory, Behavioral Finance Theory and the Efficient Market Hypothesis.

2.2.1 Efficient Market Hypothesis Theory

The EMH postulates that the stock prices of an efficient market reflect all the available information at any given time (Fama, 1965). The implication of this hypothesis is that no investors can “beat the market” and gain abnormal profits given that stocks are traded at their intrinsic value. Therefore, investors wanting higher returns can only do so by making riskier investment decisions as opposed to market timing and stock selection. This hypothesis assumes that traders are rational and that stock prices adjust quickly to assimilate any new information. Later in 1965, Fama affirmed the Random Walk Hypothesis (RWH), which is consistent with the EMH. RWH holds that stock prices are

independent of each other and follow a random pattern, and cannot therefore be forecasted using previous market data.

Fama (1965) classified EMH into three basic levels. These market efficiency levels are the strong form efficiency, the semi-strong form efficiency, and the weak-form efficiency. The stock prices indicate all the information that is available, both public and private in the strong form efficiency; the prices of stock indicate all the information that is available both public and private in semi- strong efficiency; whereas stock prices shows all relevant historical data available in the weak-form efficiency. Despite all these, stock markets often exhibit certain patterns that could lead to abnormal returns; these are termed as market anomalies, for example, the January effect, neglected firms effect, day-of-the-week effect, and small firm effect among others.

Despite the EMH being the backbone of financial markets, it has a fair share of critics. The main point of contention being that the EMH assumes that investors are rational in their dealings, they have access to all available information and that their market expectations are homogenous. These assumptions beat the point of trading after all given that trade signals existence of heterogeneous expectations. While the seller expects a dip, the buyer anticipates a rise in the stock price, and hence bears and bulls. Also, it is not practical for all market participants to have the same information; if it were so, there would be no need for communication. Likewise, behavioural economists do not agree with the notion of rational investors, it purports irrational exuberance (Shostak, 1997).

2.2.2 Modern Portfolio Theory

Portfolio theory also known as MPT theory was presented by Markowitz (1952) “Portfolio Selection,” a paper he did and which appeared in a finance journal in the 1952. The paper has become a helpful portfolio selection theory and has highly contributed to financial economics field; this resulted to sharing with Merton Miller and William Sharpe a Nobel Prize in Economics in 1990 after a period of thirty-eight years. Preceding Markowitz’s work, investors in creating their portfolios concentrated on evaluating the threats and rewards of individual securities. Advice on Typical venture was to recognize those securities having the greatest advancement chances of gain propelled by the minimum risk and building a portfolio beginning with these. Anyone interested in venturing as an investor may settle on the railroad stocks which all offered risk-reward that are of good features by following this advice and amassing a portfolio entirely. Instinctively, a wrong conclusion would be made out of this. This perception was formalized (Markowitz, 1952).

Modern Portfolio Theory (MPT) minimizes a specified amount of holdings risk against the expected return the holdings for a certain period, or either maximizes the return rate for a given level of investment risk through considerately choosing the fractions of various assets. In doing portfolio construction, four fundamental steps are used as a guide. The steps are: Allocation in relation to assets, valuation concerning the security, optimization in relation to Portfolio and Performance measurement. According to fact, this models ascertain that return of an asset is a naturally circulated utility (also meaning further fundamentally random variable that is distributed elliptically) defining risk as the return’s standard deviation and models as portfolio of a weighted assets combination

hence assets weighted combination returns is the return of a portfolio. In bringing together assets that are distinct with not necessarily positively associated results, MPT pursues to decrease the overall inconsistency of the assortment return. MPT further undertakes that markets are well-organized and investors are balanced (Daniel, Hirshleifer & Subramanyam, 1997).

The portfolio theory forms the basis of investment at the stock market. Sharpe (2006) in his book contended that Portfolio choice and asset pricing are as a result of the connections between the projected returns and the risks. Portfolio choices are the choices available to an investor when choosing their investment alternatives. Background knowledge of the macroeconomic variables and how they affect the stock trading volumes forms a basis of the asset pricing.

2.2.3 Behavioral Finance Theory

Psychologists have alleged that human beings usually exhibit emotional and cognitive biases that lead them to act in a rather irrational behaviour. Behavioural finance was popularized in the 20th century, with Kahnemann and Tversky (1974) outlining behaviours and biases that hinder human beings from acting rationally. They labelled these as representative heuristic, anchoring, and the availability bias. These cause people to hold stereotypes, make decisions founded on a whimsical starting point, and evaluate the probability of an occurrence based on similar past events. Behavioural finance holds that stock prices are affected by heuristic errors and biases, emotions, frame dependence, and social influence hence may not be the true fundamental value (Chandra, 2008).

Critics of behavioural finance are mostly supporters of EMH. Fama (1998) insisted that despite there being market anomalies that cannot be elucidated using modern financial theories, EMH cannot be dismissed totally for behavioural finance. He further found that behavioural finance resembles a compilation of market anomalies that are explicable using market efficiency. Behavioural economics' critics contend that the observed heuristics are short-term manifestations that are corrected in the long run. They have often stated that behavioural economics limits itself to digging for failures of computation and cognition. Often people react to new information without looking at the broad picture of other underlying factors. This would cause non-proportional variations in stock prices. Alternatively, people who have developed a negative stereotype against a certain security would not dare invest in it even if positive information was put forth in regards to it. Behavioural finance recognizes that people's decisions are not solely driven by logic and rationale, but often influence by personal experiences and preferences.

2.3 Determinants of Trading Volumes

Stock market trading volumes has been a major concern for stock market investors, in that it directly affects the liquidity of the stocks they hold. Key factors that are believed to play a part in the overall traded volumes in a stock market are as follows:

2.3.1 Interest Rates

The interest rate is considered the cost of capital upon whose increase or decrease influences the investor's investment decision (Olweny & Omondi, 2010). The stock market is negatively affected by higher interest rates. Banks increasing their rates leads to a rise in the cost of finance and thus the listed companies attain a weighted average cost of capital which can lead to low incomes. Investor's speculation on the reduction of

income will lead to less demand on the stocks hence poor trading volumes (Barnor, 2014). Rehman, Sidek and Fauziah (2009) argue that discount rates and interest rates would reduce the cash flows' present value, thus higher interest rates makes the opportunity cost of holding cash higher, which subsequently results in a substitution effect between stocks and other securities bearing interest such as bonds.

2.3.2 Inflation

Higher inflation rates lead to higher prices for consumers which tend to slow business and reduce earnings for firms. Higher prices also tend to trigger a higher interest rate regime (Hendry, 2006). Fama (1981) argued that inflation would have a negative correlation with real economic activity, which in turn would have a positive association to market performance. Thus, the stock index and trading volumes should be negatively correlated with the anticipated price level, with short-term interest rates serving as the proxy similar to the International Fisher Effect.

2.3.3 Exchange Rates

The effect of exchange rates on trading volumes has been studied by several researchers but their findings are inconsistent. According to Nshom (2007) on a study of some companies listed at the FTSE 100 found a momentous impact of the exchange rate to stock trading volumes. Aziz and Ibrahim (2003) concluded that the association between the exchange rate and the stock trading volumes were negative at the Malaysian equity market. Therefore there exist conflicting study conclusions on the correlation between exchange rates and the stock market trading volumes.

2.3.4 Money Supply

The economy of a country is affected by the money in supply and therefore the monetary authority has to regulate the amount in circulation through the monetary policies (Osamwonyi, 2003). Tobin (1969) found a clear relationship of movement between the monetary policy and the stock market. The study laid emphasis on the importance of stock trading volumes as a connection amongst the economic results. The study established a clear link in the economy and the stock trading volumes. He also demonstrated that growth in money supply led to deficits in budgets that eventually affected stock trading.

2.3.5 Company News and Performance

The securities markets are affected profoundly by rumors and news. The news can affect the sentiments and prospect of the investors and performance of corporations as people construe news differently depending on their own cognitive power. The enterprise particular factors that may influence the trading volume include: change of management; earnings news releases, profits and future projected earnings; declaration of dividends; introduction of new products; obtaining a new large contract; accounting errors or scandals; employee layoffs; and expected takeover or merger (Alanyali, Moat & Preis, 2013).

2.3.6 Industry Performance

The profitability and success of the industry or sector in which the company operates has a significant part to play in influencing the company's stock trading volumes. Typically, stock prices for firms in the same sector will fluctuate in tandem. Investors usually evaluate a firm owing to its earnings per share (EPS), future earning prospect and

revenue. The reason for this being that conditions of the market will mainly affect companies in the same industry in a similar way. Nevertheless, the firm's stock price may at times gain from bad news in its rival if the two firms are targeting the same market (Madura, 2008).

2.4 Empirical Review

There are numerous empirical studies both locally and internationally to support the association between macro-economic variables and the stock market performance, but these studies mainly concentrated on stock market returns and not trading volumes. The studies conducted have also produced mixed results.

2.4.1 Global Studies

Maku and Atanda (2010) conducted a critical analysis of the macroeconomic determinants of the Nigerian stock market performance in the long-run between the periods 1984 to 2007. The result of the Augmented Engle-Granger Co-integration test indicated that macro-economic forces mainly affected Nigeria's stock market performance in the long-run. Empirical analysis however indicates that the Nigerian Stock Exchange' all share index is highly responsive to changes inflation rate, in exchange rate, real output and money supply. The recommendations of the study were that investors needed to draw more attention to inflation, exchange rate economic growth and money supply instead of the Treasury bill rate in their long-run investment decisions.

Sariannidis, Giannarakis and Litinas (2010) investigated the influence of macroeconomic variables on the Dow Jones index. The study made use of monthly data from January 2000 to January 2008. The GARCH model was used in the study and the conclusions of

the study were that the price of crude oil had an inverse influence on the stock market and that its returns were positively influenced by the different changes in the returns of the 10 year bond prices. The exchange rate negatively influenced stock returns.

Tumwebaze (2011) studied the effect done on the profitability of export companies as a result of foreign exchange rate volatility. He did this by taking a case of a multinational firm. The study targeted employees of Mairye Estate Limited and selected 63 respondents. The findings revealed that differentials in terms of trade, high levels of inflation and interest rates, cause exchange rate volatility. While profitability levels of a company are determined by the sales volume, export companies' profitability is normally determined by the foreign exchange volatility. This implies that profits are affected negatively by unfavorable volatility while positively affected by favorable volatility.

Pal and Mittal (2011) conducted an analysis on the Indian Capital Markets and exchange rates relationship, gross domestic savings, inflation and the interest rates in the India economy which are the key macroeconomic variables. That study was conducted for a period of fourteen years commencing January 1995. The tests applied on the study were the error correction mechanism, co-integration test and the unit root test. The results of that analysis concluded that there was dependence relationship on indices of capital markets and rates of exchange, interest rates, inflation rate and gross domestic savings even though it may seem that they are not statistically significant in all the areas.

Evbayiro-Osagie and Osamwonyi (2012) studied to explore the correlation between macroeconomic variables and Nigeria capital market index. It covered the span from 1975 to 2005 and data for each year was used. The macroeconomic economic variables

that were selected for the study were interest rates, GDP, the exchange rate, rate of inflation, fiscal deficit and money supply. Through the use of the Vector Error Correction Model for the data analysis, the study sought to establish the short runs as well as the long- run connection between the macro-economic variables and stock market index. The study concluded that there was an impact on the Nigerian stock market index that was as a result of the particular macroeconomic variables.

Studies by Kuwornu (2012) explored the extent to which Ghanaian stock returns were influenced by the macroeconomic variables between January 1992 and December 2008 using the Johansen multivariate co-integration procedure for the analysis. From the empirical results, it was concluded that a link exists between the crude oil price, inflation, 91-day treasury bill rate and the exchange rate and the Ghanaian stock returns showing a long run equilibrium association. The results further explains that; the Treasury bill inflation rate and the Treasury bill influence stock returns to a large extent in the short-run. It was further noted from the study that the stock returns subsequently significantly affected by crude oil prices, inflation rate, Treasury bill rate and the exchange rate.

According to Parlapiano and Alexeev (2013), European firms' exposure to fluctuations in Euro exchange rate against the trade partner of Europe currencies': the UK, Japan and the USA. The monthly data from 1999 to 2011 was used to account for macroeconomic fundamentals, 600 firms were used to carry out the analysis – This constituted the Euro Stoxx 50 and the Euro Stoxx TMI. The study looked at the country of origin, level of international involvement, firm and industry size which are exposed to the 20 exchange risks. The results indicate that the Yen has the highest impact on the European firms'

market value, with the financial sector having the largest effect. The impact is also greater for large capitalization firms and exporters.

Addo and Sunzuoye, (2013) study using the Reserves bill and interest rate being variables, they estimated their effect on the Ghana financial market returns. Applying the valuation model in their data analysis, their study was done covering the period 1995-2011. Johansen's Vector Error Correction and Multivariate Co-integration models were applied so as to appreciate the type of relation that existed between the variables. The study findings found that both interest rate and treasury bills jointly affected the capital market returns of the Ghanaian economy but individual influence of the designated variables were not satisfactory good predictors of stock returns.

Talla (2013), study at the Stockholm Stock Exchange, investigated the bearing of macroeconomic variables on stock prices. Using the unit root test, granger causality test, and multivariate regression model, data was analyzed to examine the impact of the variables. The study applied monthly data of between the periods 1993 and 2012. From the data analysis, the study established that currency devaluation and inflation negatively influenced the stock prices. The interest rate insignificantly influenced the model and it was negatively correlated with the stock prices. There was also a significant positive correlation between money supply and stock prices even though it was not significant. From the Granger causality test, no unidirectional relationship was found between the stock prices and all the selected variables. However the study found one unidirectional causal association between the stock prices and the inflation.

2.4.2 Local Studies

Ochieng and Adhiambo (2012) explored the association of the macroeconomic variables on the performance of the stock market. The study went on to determine whether macroeconomic variables changes such as; inflation rate, lending interest rate, and the 91 day Treasury bill rate could be used to foresee future outcome of the stock market represented by the NSE All share index (NASI). Secondary data for the period March 2008 and March 2012 was used in the study and examined using regression analysis. As the rate of lending was established to be linked to the 91 Day Treasury bill rate, it was removed from the regression model. The conclusions of the study were that the 91 day Treasury bill rate was negatively correlated to the NASI while inflation was positively correlated to the NASI but not strong.

Barasa (2014), study was on the stock market performance in Kenya by use of effect of macro-economic variables. The money supply, the GDP per capita and inflation rate were used as the macro-economic variables. The study followed a descriptive research design and secondary annual data from the year 2000 to 2013 was utilized. The SPSS software was used in data analysis. The study concluded the relationship that existed between the particular macro-economic variables; inflation, GDP and money supply and the performance of stock market was positive but weak.

Ouma and Muriu (2014) study was interested in confirming how stock returns were influenced by the macro-economic variables between 2003 and 2013 in Kenya. Monthly data for the period was used and it was collected from secondary sources. The study applied the CAPM and APT theories to provide a framework for their study. To test for the model's validity, The OLS technique was utilized. The study aimed to examine the

significance of the macro-economic variables on the stock returns. The study's outcome concluded that a significant effect exists on the Kenyan stock market returns attributed to the money supply, inflation rate and exchange rate. The exchange rate was however noted to negatively influence the stock market returns for during the study period.

Wanjiku (2014) established the effect of selected macroeconomic variables (interest rates, inflation rate, the dollar's exchange rate versus Kenya shillings and the growth rate of the GDP) on the returns of PFK. The study had 36 data points of observations and quarterly data for the period that ranged from 2005 to 2013 was analyzed. The study established that pension funds' industry return for the period were highly subjective to the selected macro-economic variables. A negative association was found between interest rates, exchange rate and inflation whereas the GDP was positively associated to industry returns.

Obwogi and Laichena (2015) analyzed the impact of macroeconomic variables on the East African stock returns. The study examined the effects of interest rates, exchange rates, inflation rates, GDP and their effect on East African stock returns. The panel data from 2005 to 2014 of the 3 East African countries, Kenya, Tanzania and Uganda was used in the study. The findings of the study revealed that a significant association existed between the study's macro-economic variables and the East African stock returns. The East African policy makers were advised by the study to exert more efforts so as to improve the region's macroeconomic conditions thus improving stock returns.

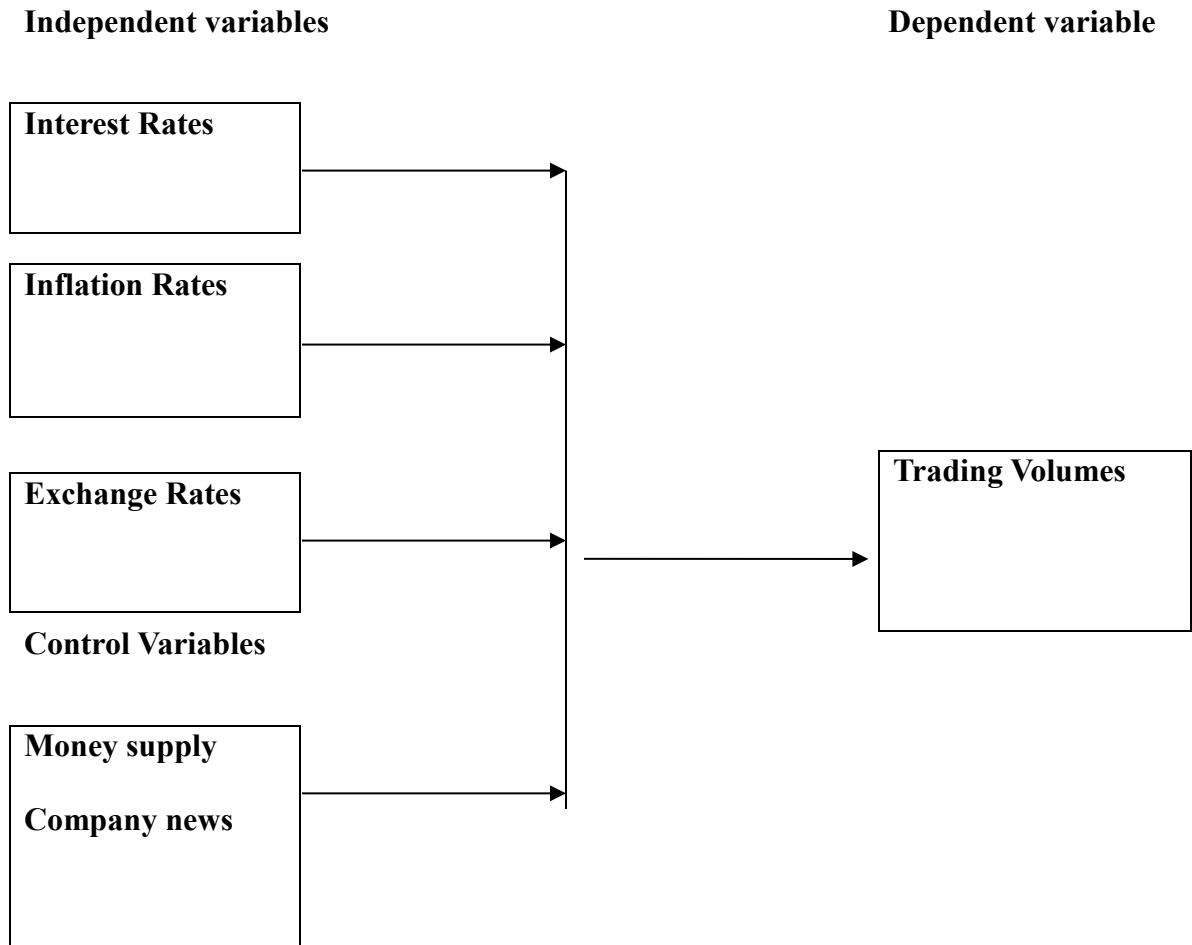
Mugambi and Okech (2016) explored the effect of macroeconomic variables listed banks' stock returns in the NSE. Secondary data from the CBK for the period 2000 to

2015 was employed in the study. The Unit Root test, linear regression model and the correlation analysis was used to establish the link. The study findings revealed that exchange rate, interest rate and inflation significantly influence impact the stock returns of the bank, while the GDP had no effect on the stock returns of the bank. The study recommended that the government should ensure a stable macroeconomic environment and moderate its monetary policy interventions.

2.5 Conceptual Framework

The conceptual framework gives a portrayal of how the factors identified are related to each other. The factors characterized here are inflation rate, interest rates, exchange rates and trading volumes. The independent variables are interest rates as measured by average monthly lending rates, inflation as measured by monthly CPI and exchange rate as measured by monthly exchange rate between KSH/USD. Stock market trading volume is the dependent variable which the study seeks to explain and it will be measured by monthly stocks traded in the market. The control variables characterized in this study are money supply and company performance.

Figure 2.1: The Conceptual Model



Source: Researcher (2017)

2.6 Summary of the Literature Review

Various theoretical frameworks seek to explain the concept of macro-economic variables and the performance of the stock market. Three theories have been discussed in this theoretical review. The theories are namely: efficient market hypothesis, modern portfolio theory and behavioral finance theory. Some of the key determinants of stock trading volumes have also been discussed in this section. Several empirical studies have been conducted both internationally and locally on stock market performance and macro-economic variables. The findings of these studies have also been discussed in this

chapter. From the foregoing, it is notable that there is lack of consensus on the effect of macro-economic variables on stock market trading volumes. In addition, the studies conducted have concentrated on stock prices and stock returns leaving a gap on trading volumes. This study seeks to answer the research question: What is the effect of interest rates, inflation rates and exchange rates on trading volumes at the NSE?

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes methods of research applied to objectively establish the impact of inflation rates, exchange rates and interest rates on stock trading volumes. The order of the research methodology is as follows, the research design of the study, methods and instruments of data collection, and finally data analysis.

3.2 Research Design

Research design is defined as a blue print of those procedures, which are adopted by a researcher for testing the relationship between dependent variables and independent variables (Khan, 2008). Descriptive cross sectional design was adopted for the study. A descriptive study involves a description of all the elements of the population. It allows estimates of a part of a population that has these attributes. Identifying relationships among various variables is possible, to establish whether the variables are independent or dependent. Cross-sectional study methods are done once and they represent summary at a given timeframe (Cooper & Schindler, 2008).

3.3 Target population

The population of the study comprised of all the firms listed at the Nairobi Securities Exchange from 1st January 2007 to 31st December 2016. Since the target population is finite, the researcher used census technique which involves studying the whole target population.

3.4 Data Collection

Data was exclusively collected from a secondary source. It is always a regulatory requirement for firms listed at the NSE to report their values annually to the Capital Markets Authority. Monthly data for ten years (January 2007 to December 2016) was collected and analyzed. Data for the independent variables; average interest rates and exchange rates (KSH/USD) was obtained from the CBK while data on inflation was collected from the KNBS. Data for the independent variable; trading volumes referenced by the number of traded shares in a month was obtained from NSE.

3.5 Data Analysis

The data was sorted, classified, coded and then tabulated for easy analysis. Collected data was analyzed using both inferential and descriptive statistics. The data was inputted into the SPSS and examined using descriptive, regression and correlation analyses. In descriptive statistics, the study used mean, standard deviation and scatter plot. In inferential statistics, the study adopted the multivariate regression analysis to determine the association between the dependent variable (trading volumes) and independent variables: Inflation Rates, Exchange Rates and Interest Rates.

3.5.1 Analytical Model

The three determinants in the model are; inflation rates, exchange rates and interest rates. The study used USD since it is the major currency in trade globally. The USD is highly favored due to its stability against other world currencies. To determine the relative significance of each of the explanatory variables with respect to exchange rate in Kenya, a multivariate regression model will be applied.

The study employed the following multivariate regression model;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where:

Y will be the monthly change in value of stock trading volumes (The aggregation of the total stock traded in a month)

β_0 will be the regression constant (parameter of the function)

β_1 , β_2 and β_3 are the coefficients of independent variables,

X_1 will be the average monthly inflation rates as measured by CPI

X_2 will be the average monthly interest rates as measured by bank rates

X_3 will be Exchange Rate as measured by average monthly exchange rates (KSH/USD)

ϵ will be the error term

3.5.2 Tests of Significance

To test the statistical significance the F- test and the t – test were used at 95% confidence level. The F statistic was utilized to establish a statistical significance of regression equation while the t statistic was used to test statistical significance of study coefficients.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND INTERPRETATION

4.1 Introduction

This chapter presents the analysis, findings and interpretation of the secondary data collected from Kenya National Bureau of Statistics and Central Bank of Kenya. The study sought to determine the effect of selected macro-economic variables on stock trading volumes at the Nairobi Securities Exchange. The selected macro-economic variables were exchange rate, inflation rate and interest rates. Regression analysis was used to test the correlation between the variables under study in relation to the objectives of the study. Analysis of variance (ANOVA) was used to test the goodness of fit of the analytical model. The findings were presented in tables and figures.

4.2 Diagnostic Tests

Shapiro-Wilk test and Kolmogorov-Smirnov test was used in normality test. The null hypothesis for the test was that the secondary data was not normal. If the p-value recorded was more than 0.05, the researcher would reject it. The results of the test are as shown in Table 4.2.

Table 4.1: Normality Test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Stock trading volumes	.238	120	.000	.799	120	.000
Interest rate	.204	120	.000	.805	120	.000
Inflation rate	.201	120	.000	.874	120	.000
Exchange rate	.090	120	.018	.961	120	.002

a. Lilliefors Significance Correction

Source: Research Findings (2017)

Both Kolmogorov-Smirnova and Shapiro-Wilk tests recorded o-values less than 0.05 which implies that the research data was not normally distributed and therefore the null hypothesis was not rejected.

4.3. Descriptive Analysis

Descriptive statistics gives a presentation of the mean, maximum and minimum values of variables applied together with their standard deviations in this study. Table 4.3 below shows the descriptive statistics for the variables applied in the study. An analysis of all the variables was obtained using SPSS software for the period of ten years (2007 to 2016) on a monthly basis.

Table 4.2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Log stock trading volumes	120	5.7	8.0	7.221	.3943
Interest rate	120	5.750	18.000	9.46042	2.925007
Inflation rate	120	2.000	19.720	8.31792	4.554349
Exchange rate	120	62	105	84.14	11.094
Valid N (listwise)	120				

Source: Research Findings (2017)

The study found out that stock trading volumes recorded an average of 7.221 over the study period. Over the same period, interest rates recorded an average of 9.46 while exchange rate recorded an average of 84.14. Further, inflation rates recorded an average of 8.32. The standard deviation indicated that stock trading volumes, interest rates,

exchange rates and inflation rates varied over the study period. The greatest variation was recorded by exchange rates (11.094) followed by inflation rates (4.554).

4.4 Correlation Analysis

The researcher carried out Pearson product-moment correlation analysis to test whether the study variables were correlated. A p-value of 0.05 or less was used to indicate significant correlations. The results of the study are as shown in Table 4.4.

Table 4.3: Correlation Analysis

		Stock trading volumes	Interest rate	Inflation rate	Exchange rate
Stock trading volumes	Pearson Correlation	1	.702**	-.669**	-.679**
	Sig. (2-tailed)		.000	.000	.000
	N	120	120	120	120
Interest rate	Pearson Correlation	.702**	1	-.488**	-.572**
	Sig. (2-tailed)	.000		.000	.000
	N	120	120	120	120
Inflation rate	Pearson Correlation	-.669**	-.488**	1	.774**
	Sig. (2-tailed)	.000	.000		.000
	N	120	120	120	120
Exchange rate	Pearson Correlation	-.679**	-.572**	.774**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	120	120	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Research Findings (2017).

The study found out that there was a positive and statistically significant correlation ($r = .702, p = .000$) between interest rates and the stock trading volumes. The study also found out that there was a negative and significant correlation between exchange rates, inflation rates and stock trading volumes as evidenced by ($r = .669, p = .000$) and ($r = -.679, p = .000$) respectively.

4.5 Regression Analysis

In order to determine the effect of selected macro-economic variables (exchange rates, interest rates and inflation rates) on stock trading volumes at the Nairobi Securities Exchange. Exchange rates, interest rate and inflation rate for the years 2007-2016 were the selected macroeconomic variables while the stock trading volumes was measured using the stock market depth.

Table 4.4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.803 ^a	.644	.635	.2381	1.825

a. Predictors: (Constant), Exchange rate, Inflation rate, Interest rate

b. Dependent Variable: Stock trading volumes

Source: Research Findings (2017).

The study sought to determine the effect of selected macro-economic variables on stock trading volumes at the Nairobi Securities Exchange. The results of the study indicated

that there was an overall strong and positive relationship ($R= 0.803$) between the selected macroeconomic variables and the stock trading volumes. The result of the study further indicates that the value of the adjusted R-squared was 0.635. This implies that the selected macroeconomic variables (exchange rates, interest rates, and inflation rate) can account for 63.5% of the changes in the stock trading volumes. A durbin-watson statistic of 1.825 indicated that the variable residuals were not serially correlated since the value was more than 1.5.

The study sought to verify goodness of fit of the regression model through the Analysis of Variance (ANOVA) statistics. The results of the study are as shown in Table 4.6.

Table 4.5: Analysis of Variance

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	11.921	3	3.974	70.092	.000 ^b
Residual	6.576	116	.057		
Total	18.498	119			

a. Dependent Variable: Stock trading volumes

b. Predictors: (Constant), Exchange rate, Interest rate, Inflation rate

Source: Research Findings (2017)

From the above ANOVA statistics, the study established that the regression model had a significance level of 0.000% which is an indication that the model was ideal for predicting the effect of selected macro-economic variables on stock trading volumes

since the value of significance (p-value) was less than 5%. This implies that the model is fit for the data.

Coefficients of determination were used as indicators of the direction of the relationship between selected macro-economic variables and stock trading volumes. The p-value under sig. column was used as an indicator of the significance of the relationship between the dependent and the independent variables. At 95% confidence level, a p-value of less than 0.05 was interpreted as a measure of statistical significance. As such, a p-value above 0.05 indicates a statistically insignificant relationship between the dependent and the independent variables. The results are as shown in table 4.7.

Table 4.6: Model Coefficients

Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	7.449	.295		25.232	.000
1 Interest rate	.060	.009	.445	6.563	.000
Inflation rate	-.027	.008	-.307	-3.500	.001
Exchange rate	-.007	.003	-.187	-2.006	.047

a. Dependent Variable: Stock trading volumes

Source: Research Findings (2017).

From the above results, it is evident that inflation rate and exchange rate produced negative and statistically significant values for this study (high t-values (-3.500, -2.006, p

< 0.05). Interest rates produced positive and statistically insignificant values for this study as evidenced by ($t= 6.563$, $p= 0.000$).

The following regression equation was estimated:

$$Y = 7.449 + 0.060X_1 - 0.027X_2 - 0.007X_3$$

Where,

Y = Stock trading volumes

X₁ = Interest rate

X₂ = Inflation rate

X₃ = Exchange rate

On the estimated regression model above, the constant = 7.449 shows that if selected macroeconomic variables (interest rates, exchange rates and inflation rate) were rated zero, the stock trading volumes would be 7.449. A unit increase in interest rate would lead to an increase in stock trading volume by 0.060. A unit increase in inflation rates and exchange rates would lead to a decrease in stock trading volumes by 0.027 and 0.007 respectively.

4.6 Discussion of Research Findings

The study sought to determine the effect of selected macroeconomics variables on the stock trading volumes at the NSE. The study used secondary data covering the period from 2007 to 2016 for analysis. The collected data was edited and cleaned for completeness. Regression analysis was used to test the relationship between the variables under study in relation to the objective of the study. Anova analysis was used to confirm the findings of regression.

The study established that there is a strong relationship between selected macroeconomics variables and stock trading volumes. Interest rate produced positive and statistically significant values. This implies that the higher the interest rate gets, the more the trading volumes of the stock market. The study further established that inflation rate had a negative effect on the stock trading volumes. This implies that the higher the inflation rates the lower the trading volumes at the stock market. Exchange rates were also found to have a significant negative effect on stock trading volumes implying that depreciation in exchange rates negatively affects stock trading volumes.

According to literature review, there is notable lack of consensus on the effect of macro-economic variables on stock market performance; Ilahi, Ali and Jamil (2015) found a weak relationship, Garcia and Liu (1999) found no effect while Maku and Atanda (2010) only found an effect in the long run. Evbayiro-Osagie and Osamwonyi (2012) studied to explore the correlation between macroeconomic variables and Nigeria capital market index and concluded that there was an impact on the Nigerian stock market index that was as a result of the particular macroeconomic variables. Ochieng and Adhiambo (2012) explored the association of the macroeconomic variables (inflation rate, lending interest rate, and the 91 day Treasury bill rate) on the performance of the stock market. The conclusions of the study found out that the 91 day Treasury bill rate was negatively correlated to the NASI while inflation was positively correlated to the NASI but not strong.

The findings of this study are in agreement with Mugambi and Okech (2016) who explored the effect of macroeconomic variables listed banks' stock returns in the NSE. Secondary data from the CBK for the period 2000 to 2015 was employed in the study.

The Unit Root test, linear regression model and the correlation analysis was used to establish the link. The study findings revealed that exchange rate, interest rate and inflation significantly influence impact the stock returns of the bank, while the GDP had no effect on the stock returns of the bank. The study recommended that the government should ensure a stable macroeconomic environment and moderate its monetary policy interventions.

The findings of this study also concur with Barasa (2014) who studied the effect macro-economic variables such as GDP per capita and inflation rate on the stock market performance in Kenya and concluded the relationship that existed between the particular macro-economic variables; inflation, GDP and money supply and the performance of stock market was positive but weak. Ouma and Muriu (2014) study was interested in confirming how stock returns were influenced by the macro-economic variables between 2003 and 2013 in Kenya. The study's outcome concluded that a significant effect exists on the Kenyan stock market returns attributed to the money supply, inflation rate and exchange rate.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the study, discussions and conclusions. The researchers then present the major limitations of the study and the recommendations for both the research and for the policy and practice.

5.2 Summary of Findings

The study sought to determine the effect of selected macro-economic variables on stock trading volumes at the Nairobi Securities Exchange. The selected macro-economic variables were exchange rates, inflation rates and interest rates. Regression analysis was used to test the correlation between the variables under study in relation to the objectives of the study. Analysis of variance (ANOVA) was used to test the goodness of fit of the analytical model. The findings were presented in tables.

The researcher carried out diagnostic tests on the collected data with a null hypothesis that the secondary data was not normal. Both Kolmogorov-Smirnova and Shapiro-Wilk tests recorded p-values greater than 0.05 which implied that the research data was normally distributed and therefore the null hypothesis was rejected. The data was therefore considered appropriate and was used to conduct parametric tests such as Pearson's correlation, regression analysis and analysis of variance. The study revealed that exchange rates, interest rates and inflation rates in Kenya had been fluctuating during the study period (2007-2016).

The researcher carried out Pearson product-moment correlation analysis to test whether the study variables were correlated. The study found out that there was a positive and statistically significant correlation between interest rates and the stock trading volumes. The study also found out that there was a negative and significant correlation between exchange rates, inflation rates and stock trading volumes. However, the study never recorded any significant correlation among the independent variables (interest rates, exchange rates and inflation rates). This implies that there was no Multicollinearity among the independent variables and therefore they can be used as determinants of stock trading volumes in regression analysis.

Regression analysis findings established that there was a strong relationship ($R = 0.803$) between selected macroeconomics variables and stock trading volumes. The result of the study also indicated that the value of R-squared is 0.635. This means that independent variables investigated in the study (Exchange rates, Interest rates and Inflation rates) could account for or explain only 63.5% of the dependent variable. The remaining 36.5% can be explained by other variables which were not the subject of this study.

The findings of this study concur with Obwogi and Laichena (2015) analyzed the impact of macroeconomic variables on the East African stock returns. The study examined the effects of interest rates, exchange rates, inflation rates, GDP and their effect on East African stock returns. The findings of the study revealed that a significant association existed between the study's macro-economic variables and the East African stock returns. The East African policy makers were advised by the study to exert more efforts so as to improve the region's macroeconomic conditions thus improving stock returns. Ouma and Muriu (2014) study was interested in confirming how stock returns were influenced by

the macro-economic variables between 2003 and 2013 in Kenya. The study's outcome concluded that a significant effect exists on the Kenyan stock market returns attributed to the money supply, inflation rate and exchange rate.

5.3 Conclusion

The research sought to determine the effect of selected macroeconomic variables (inflation rates, exchange rates, interest rates) on the stock trading volumes. The study concludes that there is a strong relationship between the selected macroeconomic variables on stock trading volumes. The study also established that interest rates positively affect stock trading volumes while inflation rate and exchange rate had a negative effect on stock trading volumes.

The researcher carried out Pearson product-moment correlation analysis to test whether the study variables were correlated. The study found out that there was a positive and statistically significant correlation between interest rate and the stock trading volumes. The study also found out that there was a negative and statistically significant correlation between exchange rates, inflation rates and stock trading volumes. However, the study never recorded any significant correlation among the independent variables (interest rates, exchange rates and inflation rates). This implies that there was no Multicollinearity among the independent variables and therefore they can be used as determinants of stock trading volumes in regression analysis.

The study also noted that, there is notable lack of consensus on the effect of macro-economic variables on stock market performance; Ilahi, Ali and Jamil (2015) found a weak relationship, Garcia and Liu (1999) found no effect while Maku and Atanda (2010)

only found an effect in the long run. Evbayiro-Osagie and Osamwonyi (2012) studied to explore the correlation between macroeconomic variables and Nigeria capital market index and concluded that there was an impact on the Nigerian stock market index that was as a result of the particular macroeconomic variables. Ochieng and Adhiambo (2012) explored the association of the macroeconomic variables (inflation rate, lending interest rate, and the 91 day Treasury bill rate) on the performance of the stock market. The conclusions of the study found out that the 91 day Treasury bill rate was negatively correlated to the NASI while inflation was positively correlated to the NASI but not strong.

5.4 Recommendations

The study established that interest rates have a positive effect on stock trading volumes at the Nairobi Securities Exchange. This is due to the fact that high interest rate increases the returns obtainable from investments providing investors with needed funds to invest in the stock market. Some investors will also be involved in selling their stocks and investing their proceeds in interest bearing securities and this will also positively influence stock trading volumes. The study recommends that central bank of Kenya should come up with regulations aimed at regulating the interest rates by monitoring the interest rates set by the central bank itself and also the lending interest rates of individual banks.

The study found out that inflation rate has a negative effect on stock trading volumes. This implies that an increase in inflation leads to a decrease in stock trading volumes indicating lowered performance of the stock market. The study recommends that the Capital Market Authority (CMA) and the national government of Kenya should come up

with fiscal policies aimed at cushioning the stock market from effects of inflationary pressure.

The study further established that exchange rates have negative effects on stock trading volumes. This implies that depreciation of a currency leads to decreased stock trading activities leading to a decrease in trading volumes. This is because a depreciation of a currency implies decreased purchasing power. This study recommends that when the Central bank is setting monetary policies, the effect of exchange rates on stock trading volumes should be taken into account.

5.5 Limitations of the Study

The scope of this research was for ten years 2007-2016. It has not been determined if the results would hold for a longer study period. Furthermore it is uncertain whether similar findings would result beyond 2016. A longer study period is more reliable as it will take into account major happenings not accounted for in this study.

One of the limitations of the study is the quality of the data. It is difficult to conclude from this research whether the findings present the true facts about the situation. The data that has been used is only assumed to be accurate. The measures used may keep on varying from one year to another subject to prevailing condition. The study utilized secondary data, which had already been obtained and was in the public domain, unlike the primary data which is first-hand information. The study also considered selected determinants and not all the factors affecting stock trading volumes at the NSE mainly due to limitation of data availability.

For data analysis purposes, the researcher applied a multiple linear regression model. Due to the shortcomings involved when using regression models such as erroneous and misleading results when the variable values change, the researcher cannot be able to generalize the findings with certainty. If more and more data is added to the functional regression model, the hypothesized relationship between two or more variables may not hold.

5.6 Suggestions for Future Studies

This study sought to establish the effect of selected macroeconomic variables on the stock trading volumes at the Nairobi Securities Exchange. The selected macroeconomic variables were interest rates, exchange rates and inflation rates. The variables could only account for 27.9% of the total variance in NSE's stock trading volumes. This implies that there are other key macro-economic variables that impact the stock trading volumes. In future, researchers should seek to know the other determinants of stock trading volumes as this will enable them to make more adequate conclusions in regard to the effect of macroeconomic variables on the stock trading volumes of Nairobi Securities Exchange.

To further enrich existing literature as well as help the government to make decisions aimed at promoting stock market growth, others researches on the impact of selected macroeconomic variables on stock market growth should be conducted. This is informed by the fact that changes in macroeconomic variables can largely be attributed to political instability, global financial crisis and international prices of fuel. The government should create a stable political environment for business to thrive and consequently cushion them from the vagaries of global financial crisis and changes in international prices of crude fuel per barrel.

Further, this study only considered a ten year period. This period mentioned was between January 2007 to December 2016. This period was fairly short to determine the actual impact of selected macroeconomic variables on the stock trading volumes at the Nairobi Securities Exchange. This study therefore recommends that a future study should consider a longer period of time, preferably 15-20 years. This longer duration may yield different results and help the researcher to make more adequate conclusions in regard to the effect of selected macroeconomic variables on stock trading volumes at the Nairobi Securities Exchange.

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