

**EFFECT OF SELECTED MACRO ECONOMIC FACTORS ON STOCK
MARKET RETURNS AT THE NAIROBI SECURITIES EXCHANGE**

PARAVIAN KWAMBOKA NYAMBANE

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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.

Signed: _____ Date: _____

PARAVIAN KWAMBOKA NYAMBANE

D63/84014/2016

This research project has been submitted for examination with my approval as the University Supervisor.

Signed: _____ Date: _____

DR. DUNCAN ELLY OCHIENG' (PhD, CIFA)

Lecturer, Department of Finance and Accounting

School of Business, University of Nairobi

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DEDICATION

This project is dedicated to my dear husband; Hiram Nyaburi who has encouraged me all the way and whose encouragement has made sure that I give it all it takes to complete this research project. To my children Ethan and Sesenia who have been affected in several ways by this quest.

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ABBREVIATIONS AND ACRONYMS

AIMS	Alternative Investment Market Segment
APT	Arbitrage Pricing Theory
CMA	Capital Markets Authority
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
NASI	NSE All Share Index
NSE	Nairobi Securities Exchange
NSE 20	Nairobi Securities Exchange Top 20 Share Index

ABSTRACT

Presently, macroeconomic factors are considered an indispensable foundation and econometric in analyzing a country's overall economic position. Extant research works have documented the effect of selected macroeconomic factors on various parts of the domestic economy. Still lacking is conclusive validation of how changes in macroeconomic factors affect stock market returns besides linking this evidence to specific sectors in the economy. This study sought to determine the effect of selected macro-economic variables on stock market returns at the NSE. The independent variables were economic growth as measured by GDP growth rate on a quarterly basis, exchange rates as measured by quarterly exchange rate between KSH and USD, inflation rates as measured by quarterly CPI and interest rates as measured by quarterly CBK lending rate. Stock market return was the dependent variable which the study sought to explain and it was measured by quarterly returns computed from the Nairobi 20 share index. Secondary data was collected for a period of 10 years (January 2008 to December 2017) on a quarterly basis. The study employed a descriptive research design and a multiple linear regression model was used to analyze the association between the variables. Statistical package for social sciences version 22 was used for data analysis purposes. The results of the study produced R-square value of 0.845 which means that about 84.5 percent of the variation in stock market returns at the NSE can be explained by the four selected independent variables while 15.5 percent in the variation was associated with other factors not covered in this research. The study also found that the independent variables had a strong correlation with stock market returns ($R=0.919$). ANOVA results show that the F statistic was significant at 5% level with an F statistic of 47.526. Therefore the model was fit to explain stock market returns at the NSE. The results further revealed that individually economic growth, exchange rates and inflation are statistically significant determinants of stock market returns at the NSE while interest rate is an insignificant determiner of stock market returns. This study recommended that policy makers should pay attention to the prevailing inflation, exchange rate and economic growth levels as they significantly affect stock market returns recorded at the Nairobi Securities Exchange. The study further recommended that future researchers should investigate other macro-economic variables that determine stock market returns at the NSE.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Inter-temporal link between returns in stock and exchange rates has become a major concern to economists for varied reasons, as both contribute immensely towards influencing the level of economic development in a nation (Kim, 2003). McKinnon (1973) theory argues that macro-economic variables for instance real interest rates, exchange rates and inflation should be monitored as they influence the diverse economic fundamentals and hence economic status. McKinnon posits that holding interest rates below market equilibrium leads to an increase in investment' demand but the real investment may remain unaffected. However, according to market efficiency theory the prices of all variables should not be influenced by other factors apart from demand and supply (Fama, 2000). The theory further states that in an efficient market, stock prices should indicate all the information regarding the market.

This study was based on three theories namely; the efficient market hypothesis, purchasing power parity and arbitrage pricing theory. 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 prices at the stock market reflect happenings in the macroeconomic variables disparity. The influence of macro-economic variables on the returns of the stock market is then reflected in the share prices. Purchasing power parity relates prices to exchange rates therefore implying that prices of goods and services will tend to change with

changes in exchange rates. Stock prices, being not an exception from these prices described in the theory, will therefore change in relation to exchange rate changes, if the assumptions of the PPP theory are to hold (Kanamori & Zhao, 2006). This study is also based on Ross (1976) classical model of Arbitrage Pricing Theory (APT) that linked the macroeconomic variables to stock market returns.

African countries have witnessed the emergence and expansion of stock markets which has greatly attracted private investments thus making them more integrated into global financial markets (Balparda, Caporale & Gil-Alana, 2015). The Kenyan stock market is among the African emerging economies. The market performance is determined to a large extent by the prevailing macroeconomic variables. Companies listed on this market are not an exception of the effects of adverse macro-economic variables movements (Muriu, 2003). The NSE is currently trading its shares at a rate of more than 100 million shares monthly, giving it a critical role in Kenya's economic growth.

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. These 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, rate of interest, rate of currency exchange, inflation, market risk as well as 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. Nominal interest rate was a combination of real interest rate and inflation (Fisher, 1930). As inflation increases, investors demand higher returns to compensate them for the reduction in the value of their investment.

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 growth of the economy is termed as economic growth. Economy refers to the global physical subsystem composed of wealth and stock composition, and the flow between consumption and production (Mishkin & Eakins, 2009). It can also be described as the economic expansion to generate more goods and services. Abbas (2005) defines it a rise in the production and consumption of commodities. The economic growth is mainly measured through the GDP and GNP.

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 Stock Market Returns

Stock return refers to the gain or loss of share value during a specific period usually quoted as a percentage. It comprises of capital gains and any income acquired by the investor from the stock (Mugambi & Okech, 2016). Stock returns can be used to predict output and investment since they are forward-looking variables which outlines future discount rates and cash flow expectations. Stock returns serve as an index to investors or governments in making their investment decisions. Investors of different financial capacity are able to invest in stocks as long as they are able to get a return that is higher than their cost of capital (Wang, 2012).

Stock returns determine the effectiveness and efficiency of stock markets in the allocation of equities and shares based on the availability and preference of the market information. The variations in stock prices increase the uncertainty levels of investors which in turn influence the stocks' demand and supply (Taofik & Omosola, 2013). Stock markets and

shares are highly sensitive to any information which directly or indirectly influences price. Stock markets are relevant for predicting future market development and trends (Širucek, 2013). Firms and other corporate bodies attain higher profitability and contribute to economic prosperity when the stock returns level is higher (Aliyu, 2011). Therefore, return in stock markets uncertainty is a vital aspect of economic growth. Unstable economic trends make investment and consumption difficult in a country (Erdugan, 2012).

According to Mugambi and Okech (2016), stock return is the loss or gain in the value of a share over a specific time frame represented in percentage form. It entails capital gains and other incomes accrued by the investor from the stock performances and often measured using market indexing. Market capitalization is one of the measurements of stock performance; It measures stock market size and stock market liquidity which is the ease with which the investors can buy or sell securities. Others include Turnover ratio; which is an index of comparison for the level of transaction costs and market liquidity rating and the All Share Index; which reflects the performance and the condition of the stock market (Daferighe & Sunday, 2012). In Kenya, stock market returns are normally calculated by the NSE 20 share index and the NASI as a benchmark for stock performance measurement.

1.1.3 Macroeconomic Factors and Stock Market Returns

McKinnon (1973) theory argues that macro-economic variables for instance real interest rates, exchange rates and inflation should be monitored as they influence the diverse economic fundamentals and hence economic status. For example, they posit that holding the interest rates below market equilibrium increases the investment' demand and not the

real investment. However, according to market efficiency theory the prices of all variables should not be influenced by other factors apart from demand and supply (Fama, 2000). According to Fama, a market is said to be efficient market if stock prices indicate all the information regarding the market.

Both theory and empirical literatures hold that the thriving of a nation is directly associated with the economy, this includes variables such as balance of payments, inflation, remittances, money supply, interest and exchange rate. The share price movements are influenced by variations in economic fundamentals and these fundamentals' affect future prospects. The stock market share price movement 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 share prices is an indication of growing economy whereas fluctuations in share prices indicate economic instability in a country.

Other schools of thought have contradicted the perceived notion that a link exists between macro-economic factors such as unemployment, exchange rate, interest rate inflation and stock market returns. The studies try to demonstrate that there are other fundamental factors affecting the stock returns 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 (Sharma & Singh, 2011).

1.1.4 Nairobi Securities Exchange

The NSE is among the most important exchanges in Africa and traces its beginning to the early 1920s when a number of traders organized an informal arrangement to trade shares. 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).

In regards to stock market performance, there was downward trend in the stock market index from the year 1997 to the year 2002 before it began to rise. The upward trend continued to the year 2006 and reached its peak in January 2007. The lowest level ever reached by the stock exchange was in March 2009 where the NSE 20 share index was at 2,360. The index was relatively stable in the year 2007 and a decline began in the year 2008 until 2009 when it began to rise again. Since then, stock market performance has been rising steadily with fluctuations in between (Elly & Oriwo, 2012).

With respect to macroeconomic variables, the banking amendment Act (2016) to cap interest rates was passed into law and this affected the rate at which listed firms can borrow and invest their funds. The set base rate affects the lending interest rates in the economy, and indirectly the foreign exchange rate. Kenya's unemployment rate and the

balance of payment have fluctuated in the last two decades and this can have an effect on stock market performance. Some of the other macro-economic challenges that have affected the sector include; increasing levels of prices, variability in economic growth and exchange rate variability. The Kenya Shilling has greatly depreciated against most traded world currencies over the last few years in addition to a widening current account deficit. These unfavorable macroeconomic developments may result to great problems in the stock market.

1.2 Research Problem

Presently, macroeconomic factors are considered an indispensable foundation and econometric in analyzing a country's overall economic position. Expert research works have documented the effect of selected macroeconomic factors on various parts of the domestic economy. Still lacking is conclusive validation of how changes in macroeconomic factors affect stock returns besides linking this evidence to specific sectors in the economy (Harcourt & Poncet, 2012). The study of macroeconomic variables has drawn various studies with most of them concluding that fluctuations in the stock returns continue to be directly interconnected with the various macroeconomic variables (Lee, 1998). However, according to Fama (1970), share prices are 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.

Changes in the country's economic times are often reflected on the performance of the NSE. Over the last few years, the NSE performance has been volatile where high performance lasts for a short period before it is interrupted by a declining period. Macro-

economic variables are thought to be some of the factors that bring about this volatility in stock market returns. Some of the macro-economic challenges that have affected the sector include; increasing levels of prices, unpredictability of interest rates and exchange rate variability. The Kenya Shilling has greatly depreciated against most traded world currencies over the last few years in addition to a widening current account deficit. These unfavorable macroeconomic developments may result to great problems in the stock market and that is the motivation for carrying out the current study.

Studies have been conducted on the effect of various variables such as inflation, GDP, exchange rates, and interest rates on the stock market but their findings have been inconsistent. 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. Osamunyi and Osagie (2012) found a strong correlation between macroeconomic factors and the Nigeria money market index. Atanda and Maku (2010) point out that the Nigerian stock market performance in the long run is determined 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 macroeconomic variables for instance the interest rate and the CPI to significantly influence the performance of Bangladesh's stock market performance.

In Kenya, Olweny and Omondi (2016) provide evidence that rate of interest, rate of exchange and inflation rate have a substantial influence on stock price volatility. Kithome (2017) conducted a study on the impacts of exchange rates on stock market returns at the NSE and concluded that both exchange rate and inflation has a significant influence while interest rate has an insignificant effect on stock returns. Musyoki (2017) concluded that the stock market in Kenya was affected by the variations in the exchange rate, interest rates, and inflation. Karubari (2017) focused on the influence of selected macro-economic variables on stock market depth at the NSE and concluded that economic growth, inflation and interest rates has a notable influence on stock market depth. Oloo (2017) found that interest rates have no much impact on stock market returns at the NSE while inflation and exchange rate has a significant effect. The lack of consensus among the previous researchers is reason enough to conduct further studies in this area. The current study intended to contribute to this debate by answering the research question: What is the effect of selected macroeconomic variables on stock returns at the Nairobi Securities Exchange?

1.3 Research Objective

This study sought to determine the effect of economic growth, interest rates, inflation, and exchange rates on stock returns at the Nairobi Securities Exchange.

1.4 Value of the Study

The findings provide background information to the investors on how to ascertain the effect of macro-economic factors 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 in form of 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 study's findings will be used for future reference by researchers, students and scholars who seek to undertake correlated or similar studies. The study will also benefit researchers and scholars in the identification of other fields of research by citing related topics that require further studies and empirical studies to determine study gaps.

The study is relevant to the different policy making institutions such as the CMA, the government and the NSE in Kenya who could also use the findings and recommendation to develop vital policies for mitigating the effects of macroeconomic factors in the country on stock market returns at the NSE.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter reviews theories that form the foundation of this study. In addition, previous empirical studies that have been carried before on this research topic and related areas are also discussed. The other sections of this chapter include determinants of stock market returns, conceptual framework showing the relationship between study variables, study gap and literature review summary.

2.2 Theoretical Framework

This presents review of the relevant theories that explains the relationship between macro-economic variables and stock returns. The theoretical reviews covered are; efficient market hypothesis, the purchasing power parity theory and the arbitrage pricing theory.

2.2.1 Efficient Market Hypothesis

Fama (1970) who is one of the promoters of EMH advanced the view that the trading value for stocks is usually its fair value and consequently, it is not possible for investors to purchase undervalued stocks or inflate prices of stocks in sale arrangements. Based on the above, expert market timing or stock selection would not result into outperforming the overall market hence the only way an investor would obtain higher returns is by chance or by buying riskier investments. According to EMH, there exist three forms of efficiency: Weak form efficiency results whereby prices of securities (bonds, stocks or property) reflect all historical public information. Second is the semi-strong efficiency that arises where stock prices reflect historically publicly available information such that

prices change instantly to reflect release of new information. Lastly is the strong form of efficiency which asserts that securities' prices reflect historical, public and even private information.

While there exists a huge assortment of validation in support of EMH, numerous disagreements have been raised. Adversaries of the EMH likewise indicate occasions, for instance, the coming down of the 1987 security exchange where Dow Jones Industrial Average (DJIA) dropped by excess of 20% in only a day, which confirms that stock costs are able to truly stray from their normal qualities. Commentators have faulted the faith in reasonable markets for a large number of the late 2000s money related emergencies (Asava, 2013). Thus, in light of these reactions, defenders of the hypothesis have argued that market proficiency does not imply exhibiting no instability about the future yet

The main point of contention is 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). This theory is relevant to the current study as it recognizes the role of external factors in influencing stock prices and in effect the stock market returns.

2.2.2 Purchasing Power Parity Theory

Swedish economist Cassel (1918) was the originator of this theory defining the theoretical nominal exchange rate as a report between national and foreign prices, however the market value of the exchange rate could deviate from the former value (over or under deviations) of the national currency. Cassel (1918) selected various hypotheses that needed to be fulfilled before validating the theory. These hypotheses included the working of the international arbitrage mechanism, presence of perfect competition in both home and foreign countries and capital movements free from barriers such as taxes or any other restrictions. Consequently, non- tradable goods will trade at a lower price than those in more developed countries.

According to the PPP, selling identical goods at the same price by all countries will be when there is the price level of a certain country increases resulting into the decline of exchange rate compared to other nations. This theory suggests that, when the Law of One Price holds an exchange rate change is usually offset by relative price indices/inflation. PPP functions in par with the one price law which holds that states that identical goods will be sold at similar prices in competitive markets. The PPP version relates to a specific product and its generalization. The relative PPP does not relate to absolute price levels but relates to variations in exchange rates and prices (Hau, 2002).

The assumptions for PPP to hold include; no information gaps, goods are identical and tradable, no transportation costs, no tariffs, no taxes, no trade restrictions, and relative inflation rates influence exchange rates. It is because of the violation of one price law and these restrictive assumptions that the monetary models of determining exchange rates were adopted. This is because of the consideration that exchange rates refer to asset

prices that always adjust to balance between financial assets and international trade. Exchange rates are normally determined by future expectations because they are asset prices (Hosfstrand, 2006).

The PPP theorem relates prices to exchange rates therefore implying that prices of goods and services will tend to change with changes in exchange rates. Stock prices, being not an exception from these prices described in the theory, will therefore change in relation to exchange rate changes, if the assumptions of the PPP theory are to hold. Relying on the theory, it is therefore possible to draw a correlation between exchange rate movements and stock prices, which will most certainly be followed by fluctuating returns in the stock markets.

2.2.3 Arbitrage Pricing Theory

Arbitrage Pricing Theory (APT) was introduced by Ross (1976). The theory presumes that stock market returns are dictated by some economic variables through their effect on discount rates and future dividends (Shrestha & Subedi, 2015). APT correlates with market portfolio concept, according to arbitrage theory individuals have different portfolio of investments with their specific systematic risk. APT is a multifactor model and most of the empirical literature argues that APT proposes better results comparatively to CAPM, because it uses multiple factors for explaining shared and systematic risk (Waqar & Mustabsar, 2015).

The theory established a theoretical framework that links share returns with some variables that have the potential to influence sources of income volatility (Shrestha & Subedi, 2015). Arbitrage Pricing theory (APT) uses macro-economic variables to predict

stock prices and the theory assumes that various macro-economic variables can actually affect stock prices other than systematic risk beta (Waqar & Mustabsar, 2015).

Some of the macro-economic indicators that influence stock market prices include: the gross national product, the inflationary rates, the investor confidence levels, prevailing levels of unemployment, changes in the interest yield curve and expected returns on securities (Amarasignhe, 2015). Based on this linear correlation between the equity prices and macro-economic variables, it can be deduced that unemployment rate as a macroeconomic variable has an influence on the value of securities. Consequently, the value of the asset or security can be described as the total of the expected return and any unexpected returns on the asset (Cuthbertson, 2004).

2.3 Determinants of Stock Returns

Stock market returns have been a major concern for stock market investors, in that it directly affects the wealth they hold. Key factors that are believed to play a part in the overall performance of stock markets are as follows:

2.3.1 Economic Growth

GDP is the most used measurement of economic growth. A growing economy exhibits positive GDP which raises demand for loans (Osoro & Ogeto, 2014). Any rise in economic output may raise expected cash flows and, hence, trigger a rise in price of shares, with the reverse impact during recession is justified (Kirui et al., 2014). Existing empirical evidence indicate that the financial systems of advanced nations such as stock market are more efficient (Beck et al., 2003). Stock market development is also positively related to economic stability and monetary and fiscal policies. Countries with higher

income have more advanced stock markets compared to countries with low income (Cull 1998).

Investors are mainly concerned with GDP reports since the overall economic health could be established through its measurement. The long run implication of healthy economic growth is higher corporate profits and improvement of stock market performance while the short term implication is unpredictable market trends even during positive economic growth seasons (Beck et al., 2003).

2.3.2 Interest Rates

Thomas (2006) argues that when the borrowing cost is put as a percentage each year, it is referred to as interest rate. This is one of the key variables in economies that play an important purpose in consumer's decision to purchase goods or services in a particular country. The significant factors involved are normally the interest adjusted for expected inflation and the real interest rate. Investment and consumption expenditures and the criteria for wealth redistribution between lenders and borrowers are influenced by real interest rates. Higher real interest rates benefit lenders at the borrowers' expense. Lower real interest rates imply more benefits for borrowers which will mean lesser earnings for the lenders.

The neoclassical theory of interest rate declares that, the loans' investment cost for the entrepreneurs becomes expensive when the interest rates increase leading to a shrink in the investment opportunities in an economy (Barnor, 2014). The interest rate is seen as the capital cost and the decisions of investors are influenced by changes in interest rates (Olweny & Omondi, 2010). Rehman, Fauziah and Sidek (2009) opine that higher

discount rates and interest rates will reduce the cash flows' present value leading to an increase in the opportunity cost of holding cash, the interest rates level, which finally results in a substitution effect between stocks and bonds.

2.3.3 Inflation

Tucker (2007) describes inflation as the general increase in the standard price levels of services or goods in any given economy. Inflation is an overall rise in the average level of prices and not specifically in relation to a unit of a given product or service. Sloman and Kevin (2007) expound that inflation could take the form of either demand pull inflation which is brought about by increase in demand of goods or the form of cost push inflation. Demand-pull inflation arises as a result of a general rise in the market demand which results to higher prices and partial increases of output in a given economy. Cost push inflation results from increased levels or cost of production which may affect the firms thus resulting in the companies charging the consumers more (Hendry, 2006).

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. 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 should be negatively correlated with the anticipated price level, with short-term interest rates serving as the proxy similar to the International Fisher Effect.

2.3.4 Exchange Rates

This is the rate at which one currency is converted into another (Mohan & Chitradevi, 2014). Changes in exchange rate influence commodity prices, which consequently creates competition between the domestic and foreign producers. A rise in the domestic currency's value increases the price of domestic goods compared to the foreign goods which shifts demand to foreign goods from domestic goods. An appreciation of currency in a country that is dependent on exports reduces her exports' competitiveness which negatively influences the domestic stock market (Kirui, Wawire & Perez, 2014).

A rise in the currency of a country lowers the imported goods' cost, which encourages the production of inputs in the market of the emerging economies (Kuwornu, 2012). Accordingly, the depreciation of the domestic currency against foreign currencies, under elastic demand reduces the price of exports thus increasing the volume of the exports of the country (Kuwornu, 2012). The micro economic perspective holds that foreign exchange rate affects the value of the firm whereas the macro -economic perspective holds that it affects the economy as a whole. As such, the volatility of exchange rate volatility affects the financial sector of country, precisely the stock market (Obura & Anyango, 2016).

2.4 Empirical Review

Several empirical studies are available both locally and internationally to support the relationship between macro-economic factors and stock market returns, but these studies have produced mixed results.

2.4.1 Global Studies

Maku and Atanda (2010) conducted a critical review 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 in inflation rate, 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.

Evbayiro-Osagie and Osamwonyi (2012) studied 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 influence on the Nigerian stock market index that was as a result of the particular macroeconomic variables.

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. It applied monthly data of between the periods 1993 and 2012. From the data

analysis, the study established that currency devaluation and inflation had a 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.

Ilahi, Ali and Jamil (2015), studied relationship between stock market returns represented by Pakistan's Karachi stock exchange 100 index and macroeconomic variables. Selected macroeconomic variables were exchange rate, interest and inflation rate. Secondary data for the period January 2007 to December 2012 was analyzed using the multiple linear regression. Study established existence of a weak connection between the stock returns and the selected macro-economic variables.

Badullahewage (2018) analyzed the influence of macroeconomic variables on the performance of stock market in Sri Lanka. Studied macroeconomic variables were Inflation, interest and exchange rates, GDP and money supply. Secondary data for period between 1990 and 2012 was used. The study established the existence of a strong relationship connection between the macroeconomic factors and the stock market. Inflation and exchange rates were identified as factors with comparatively higher effects on the stock market performance.

2.4.2 Local Studies

Mugambi and Okech (2016) studied the influence of macroeconomic variables on the stock returns on banks in the NSE. The study employed secondary data from the CBK from 2000 to 2015. The study used correlation analysis, Unit Root test and the linear regression model to establish the relationship. The study findings revealed that interest rate, inflation, and exchange rate affect bank stock return significantly, while the impact of bank stock returns on GDP was insignificant. It was recommended that the government ought to ensure a stable macroeconomic environment and moderate its monetary policy interventions.

Musyoki (2017) studied the influence of exchange rate volatility on stock market returns at the NSE. The independent variable was exchange rates as measured by monthly exchange rate between ksh and usd. The control variables were inflation rates as measured by monthly CPI and interest rates as measured by monthly CBK lending rate. Stock market return was the dependent variable which the study sought to explain and it was measured by monthly returns computed from the 20 share index. The results revealed that interest rate, exchange rates and inflation are statistically significant determinants of stock market returns at the NSE.

Kithome (2017) sought to establish the influence of foreign exchange rate on stock market returns at the NSE. The independent variable were interest rates as measured by monthly CBK lending rate, inflation rates as measured by monthly CPI and exchange rates as measured by monthly exchange rate between ksh and usd. Stock market return was measured by monthly returns computed from the 20 share index. The results revealed that individually, interest rate is not a significant determiner of stock market returns while

exchange rates and inflation are statistically significant determinants of stock market returns at the NSE.

Oloo (2017) sought to determine the effect of interest rates on stock market returns at the NSE. The independent variable was interest rates as measured by monthly CBK lending rate. The control variables were inflation rates as measured by monthly CPI and exchange rates as measured by monthly exchange rate between ksh and usd. Stock market return was the dependent as measured by monthly returns computed from the 20 share index. The results revealed that individually, interest rate is not a significant determiner of stock market returns while exchange rates and inflation are statistically significant determinants of stock market returns at the NSE.

Karubari (2017) studied the influence of selected macro-economic variables on stock market depth at the NSE. The independent variables were economic growth, interest rates and inflation rates. Stock market return was the dependent variable. The results revealed that economic growth positively affects stock market depth while inflation rate and interest rate had a negative effect.

2.5 Conceptual Framework

The conceptual framework is a diagrammatic representation of how the factors identified are related to each other. The elements given consideration here are stock returns and macro-economic variables. The independent variable are economic growth as measured by quarterly GDP growth rate, interest rate as measured by the quarterly average bank lending rate, inflation rates as measured by quarterly CPI and exchange rate as measured by quarterly exchange rate between KSH/USD. Stock return will be measured by the stock market index (NSE 20).

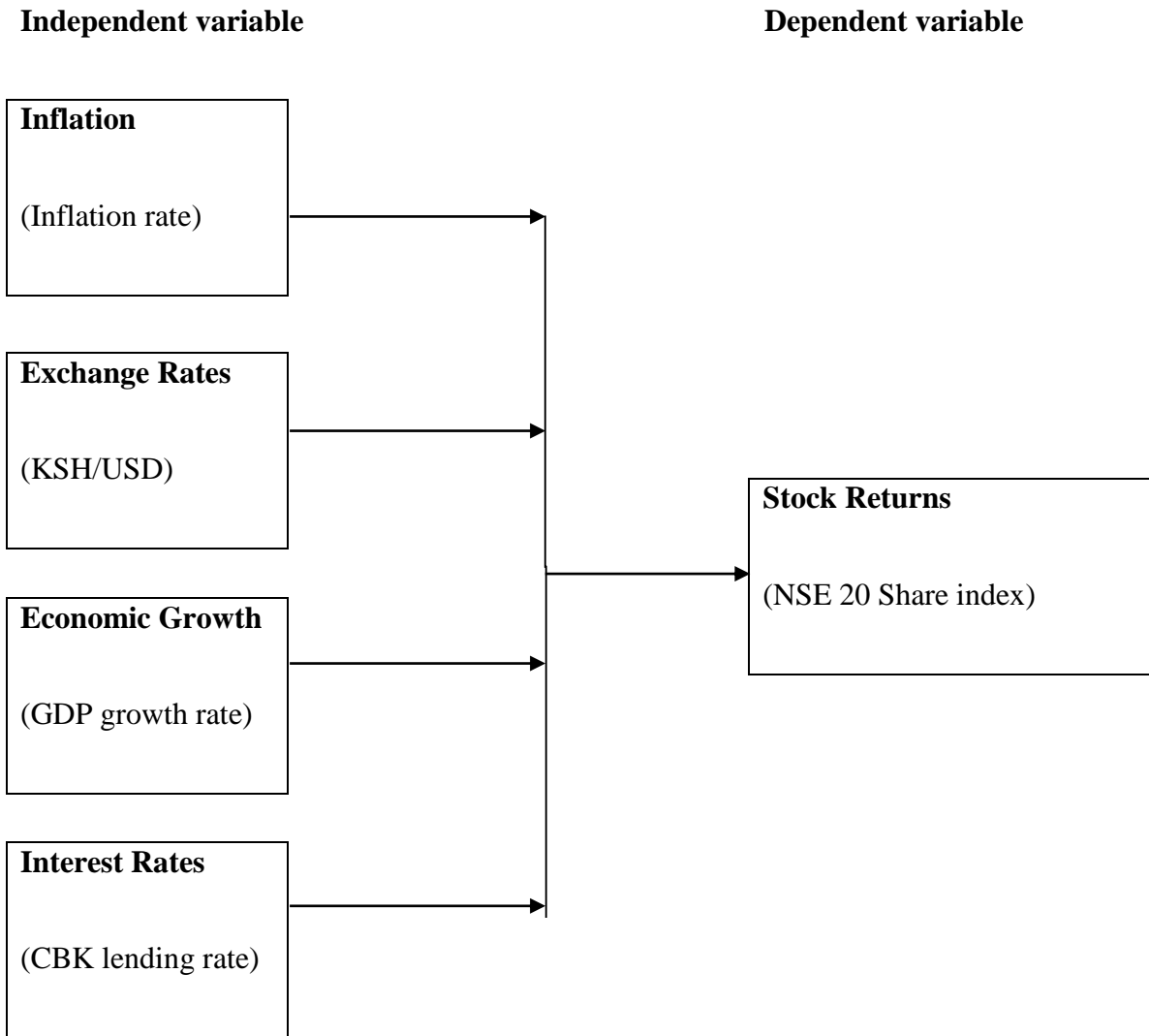


Figure 2.1: Conceptual Model

Source: Researcher (2018)

2.6 Summary of the Literature Review

A number of theoretical frameworks have explained the theoretically expected relationship between macro-economic parameters and stock returns. The theories covered in this review are; efficient market hypothesis, purchasing power parity and arbitrage pricing theory. Some of the key influencers of stock returns have also been explored in this section. Many empirical studies have been conducted both globally and locally on

macro-economic variables and stock returns. This chapter has also explored the findings of these studies.

Although there are several empirical studies conducted between macro-economic variables and stock returns, the findings of these studies have been inconsistent. Ilahi, Ali and Jamil (2015) established a weak connection between macro-economic variables while Badullahewage (2018) found a strong connection. Kirui, Wawire and Onono (2014) found that inflation, interest rate and economic growth are insignificant determiners of stock market returns while Kithome (2017) found that inflation and interest rate are significant determiners of stock market returns. Mugambi and Okech (2016) found that interest rate is a significant determiner of stock market returns while Oloo (2017) found that interest rate is not a significant determiner of stock market returns. The lack of consensus among the previous researchers is reason enough to conduct further studies in this area.

2.7 Research Gaps

Author	Focus of Study	Methodology	Findings	Research/ Knowledge gaps
Mugambi and Okech (2016)	Impact of macroeconomic variables on the stock returns on banks in the Nairobi Securities Exchange	correlation analysis, Unit Root test and the linear regression model	Interest rate, inflation, and exchange rate influence bank stock return significantly, while the impact of bank stock returns on GDP was insignificant	This study focused on banks while the current study will focus on the entire stock market
Musyoki (2017)	Effect of exchange rate volatility on stock market returns at the NSE.	descriptive research design and a multiple linear regression model	Exchange rate volatility is a significant determiner of stock market return	This study focused on exchange rate volatility while the current study will focus on selected macro-economic variables
Kithome (2017)	Effect of foreign exchange rate on stock market returns at the NSE	descriptive research design and a multiple linear regression model	Foreign exchange rate is a significant determiner of stock market returns	This study focused on exchange rate volatility while the current study will focus on selected macro-economic variables
Oloo (2017)	Effect of selected macro-economic variables on stock market depth at the NSE	descriptive research design and a multiple linear regression model	Interest rate is not a significant determiner of stock market returns	This study focused on interest rates while the current study will focus on macro-economic variables
Karubari (2017)	Effect of selected macro-economic variables on stock market depth at the NSE	descriptive research design and a multiple linear regression model	economic growth positively affects stock market depth while inflation rate and interest rate have a negative effect	The study focused on stock market depth while the current study will focus on stock market returns

Source: Author (2018)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In order to determine the impacts of selected macro-economic variables on stock returns, a research methodology was necessary to outline how the research was carried out. This chapter has four sections namely; research design, data collection and analysis techniques.

3.2 Research Design

A descriptive research design was applied in this study to investigate the relationship between selected macro-economic predictors and stock returns at the NSE. Descriptive design was utilized as the researcher was interested in finding out the state of affairs as they exist (Khan, 2008). This research design was appropriate for the study as the researcher was familiar with the phenomenon under investigation but want to know more in terms of the nature of relationships between the study variables. In addition, a descriptive research aims at providing a valid and accurate representation of the study variables and this helps in responding to the research question (Cooper & Schindler, 2008).

3.3 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. Quarterly data for ten years (January 2008 to December 2017) will be collected and analyzed. As the study focused on the Nairobi 20 share index, the study included all the companies that formed the index for the period between January 2008

and December 2017. Data for the independent variables; exchange rate (KSH/USD) and CBK lending rate were obtained from the CBK while data on economic growth (GDP growth rate) and inflation rate were collected from KNBS. Data for the dependent variable; stock returns as referenced by NSE 20 share index was acquired from the NSE.

3.4 Diagnostic Tests

The nature and strength of the relationship between the dependent and independent variables in linear regression model was measured through various diagnostic tests such as the tests of normality, autocorrelation and multicollinearity tests.

3.4.1 Normality Test

Normality test was done because it is impractical to achieve accurate and reliable deductions about the reality on whether the population from which the sample is derived is normally distributed (Khan, 2008). This study used Kolmogorov-Smirnov test of normality and the graphical method to assess whether the data is normally distributed.

3.4.2 Multicollinearity Test

To ensure the data collected is free from biasness and one variable data is not related to another variable data, the study conducted a multicollinearity test. It occurs when there is nearly exact or exact linear relation among two or more of the independent variables. The variance inflation factor will be used to test multicollinearity. Whenever the values of VIF lies between 1 and 10, then there is no multicollinearity while when the VIF is less than 1 or greater than 10, then there is presence of multicollinearity. When the test fails you should standardize the continuous variables by choosing on a standardization method

on the regression dialog box. For instance you may choose variable centering approach (Burns & Burns, 2008).

3.4.3 Autocorrelation Test

Autocorrelation is the measurement of the similarity between a certain time series and lagged value of the same time series over successive time intervals. It was tested using Durbin-Watson. This test reports a test statistic with a value of 0 to 4 where 2 is no autocorrelation, where the statistic is less than two there is positive autocorrelation and where greater than two there is negative autocorrelation (Khan, 2008).

3.4.4 Stationarity Test

Stationarity is a situation whereby the mean of the data is time independent. Non stationarity in all the variables is detected by unit root tests. Gujarati (2013) purports that estimating models without considering the non-stationary nature of the data causes false results. The estimates tend to change over time if variables are non-stationary and it can lead to spurious estimates. Therefore, successful differencing is applied to eliminate the bias if variables are established to be non-stationary. The null hypothesis here will be that the variable under consideration is nonstationary.

3.4.5 Heteroscedasticity Test

Heteroscedasticity can be defined as an assumption of Classical Linear Regression Model (CLRM) which requires testing and accounting for in data if present. The Classical Linear Regression Model adopts that the error term is homoscedastic, in other words, it possesses a constant variance. In case the error variance isn't constant, then the data has heteroscedasticity. If a regression model is run without heteroscedasticity being accounted for, then unbiased parameter estimates will be realized but the invalid standard

errors. Heteroscedasticity test was run for testing if the error terms are correlated across observation in the time series data. From a regression model the error terms must have a constant variance called Homoskedastic. Thus, for ensuring if the residuals met these criteria, the Breusch-Pagan test was employed for Heteroskedasticity whereby the null hypothesis under this test is that residuals are Homoskedastic (Gujarati, 2004).

3.5 Data Analysis

The data collected from the different sources was organized in a manner that can help address the research objectives. SPSS version 22 was utilized for data analysis purposes. Both descriptive and inferential statistics were carried out. In descriptive statistics, skewness, the minimum, standard deviation, maximum, mean and kurtosis were computed for each variable. In inferential statistics, both regression and correlation analysis were carried out. Correlation analysis involved determining the extent of relationship between the study variables while regression analysis involved establishing the cause and effect between the independent and dependent variables.

3.5.1 Analytical Model

Using the collected data, regression analysis was conducted to establish the extent of the connection between selected macro-economic variables and stock returns. The study applied the following multivariate regression model;

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where: Y = stock returns as measured by the natural logarithm of NSE 20 share index on a quarterly basis

α = y intercept of the regression equation.

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ and β_7 = are the slopes of the regression

X_1 = Economic growth as measured by GDP growth rate per quarter.

X_2 = Interest rates as measured by the average bank lending rate on a quarterly basis.

X_3 = Inflation as measured by inflation rate on a quarterly basis

X_4 = Exchange rate as measured by natural logarithm of the rate between KSH and USD on a quarterly basis

ε =Error term

3.5.2 Tests of Significance

The researcher carried out parametric tests to establish the statistical significance of both the overall model and individual parameters. The F-test was used to determine the significance of the overall model and it was obtained from Analysis of Variance (ANOVA) while a t-test was used to establish statistical significance of individual variables.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND INTERPRETATION

4.1 Introduction

The chapter represents the study results and findings in accordance to the research objective. It gave attention to analysis of data collected from CBK and KNBS to ascertain the influence of selected macro-economic factors on stock market returns at the NSE. Using descriptive statistics, correlation and regression analysis, the study results were presented in form of tables for easy interpretation.

4.2 Diagnostic Tests

Diagnostic tests were carried out before running a regression model. Tests carried out here included Autocorrelation test, Stationarity test, multicollinearity test, normality test as well as Heteroscedasticity test. They are normally carried out to avoid obtaining regression results that are spurious.

Heteroscedasticity test was run for testing if the error terms are correlated across observation in the time series data. The error terms from a regression model should portray constant variance called Homoskedastic. Thus, for ensuring if the residuals met this criteria, the Breusch-Pagan test was employed for Heteroskedasticity whereby the null hypothesis under this test was that residuals are Homoskedastic. There is constant variance if p-value is >0.05 . The null hypothesis was thus not rejected at a critical p value of 0.05 because the reported value was 0.1012. Therefore the data didn't suffer from heteroscedasticity as revealed in Table 4.1.

Table 4.1: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	5.332026	Prob. F(4,36)	0.1012
Obs*R-squared	16.51327	Prob. Chi-Square(4)	0.0024
Scaled explained SS	27.94768	Prob. Chi-Square(4)	0.0000

Source: Research Findings (2018)

Both Kolmogorov-Smirnova and Shapiro-Wilk tests recorded o-values greater than 0.05 which implies that the research data was normally distributed and therefore the null hypothesis was rejected. The data was therefore appropriate for use to conduct parametric tests such as Pearson’s correlation, regression analysis and analysis of variance.

Table 4.2: Normality Test

Stock returns	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Inflation rates	.173	40	.300	.918	40	.822
Interest rates	.180	40	.300	.894	40	.790
Economic Growth	.176	40	.300	.892	40	.784
Exchange rates	.181	40	.300	.896	40	.792
a. Lilliefors Significance Correction						

Source: Research Findings (2018)

The researcher carried out diagnostic tests on the collected data. A test of Multicollinearity was undertaken. Tolerance of the variable and the VIF value were used where values more than 0.2 for Tolerance and values below 10 for VIF implies that

Multicollinearity doesn't exist. Multiple regressions is applicable if strong relationship among variables doesn't exist. From the findings, all the variables had a tolerance values >0.2 and VIF values <10 as shown in table 4.1 showing that Multicollinearity among the independent variables doesn't exist.

Table 4.3: Multicollinearity Test for Tolerance and VIF

Variable	Collinearity Statistics	
	Tolerance	VIF
Inflation	0.398	1.982
Interest rates	0.360	1.382
Economic growth	0.392	1.463
Exchange rates	0.646	1.434

Source: Research Findings (2018)

Stationarity test was carried out by use of the ADF test to determine if the variables were stationary or non-stationary. It's done so as to prevent obtaining false regression results employing non-stationary series. The results in Table 4.4 showed all variables being stationary (i.e. absence of unit roots) at 1%, 5% and 10% significance levels.

Table 4.4: Unit Root Tests at Level

Variable name	ADF test	1% Level	5% Level	10% Level	Comment
NSE20	-5.180460	-3.515536	-2.898623	-2.586605	Stationary
Inflation	-5.619528	-3.515536	-2.898623	-2.586605	Stationary
Interest	-2.976187	-3.516676	-2.899115	-2.586866	Stationary
Economic growth	4.452517	-3.524233	-2.902358	-2.588587	Stationary
Exchange rate	-1.748330	-3.517847	-2.899619	-2.587134	Stationary

Source: Research Findings (2018)

Autocorrelation tests were carried out so as to check for correlation of error terms across time periods. Autocorrelation was examined using the Durbin Watson test. A durbin-watson statistic of 1.986 indicated that the variable residuals were not serially correlated since the value was within the acceptable range of between 1.5 and 2.5.

Table 4.5: Autocorrelation Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.919 ^a	.845	.827	.032927	1.986

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

b. Dependent Variable: Stock market returns

Source: Research Findings (2018)

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 4.6 below shows the descriptive statistics for the variables applied. Analysis of all predictors was acquired by use of SPSS software for the period of ten years (2008 to 2017) on a quarterly basis. Stock market returns had a mean of 3.6042 with a standard deviation of 0.0791. Inflation had a mean of 8.556 and standard deviation of 3.721. Interest rate had a mean of 15.810 and a standard deviation of 1.955. Economic growth resulted to a mean of 6.215 with a standard deviation of 3.488 while exchange rate resulted to a mean of 1.939 with a standard deviation of 0.055 while interest rate had a mean of 15.8099 and a standard deviation of 1.9545.

Table 4.6: Descriptive Statistics

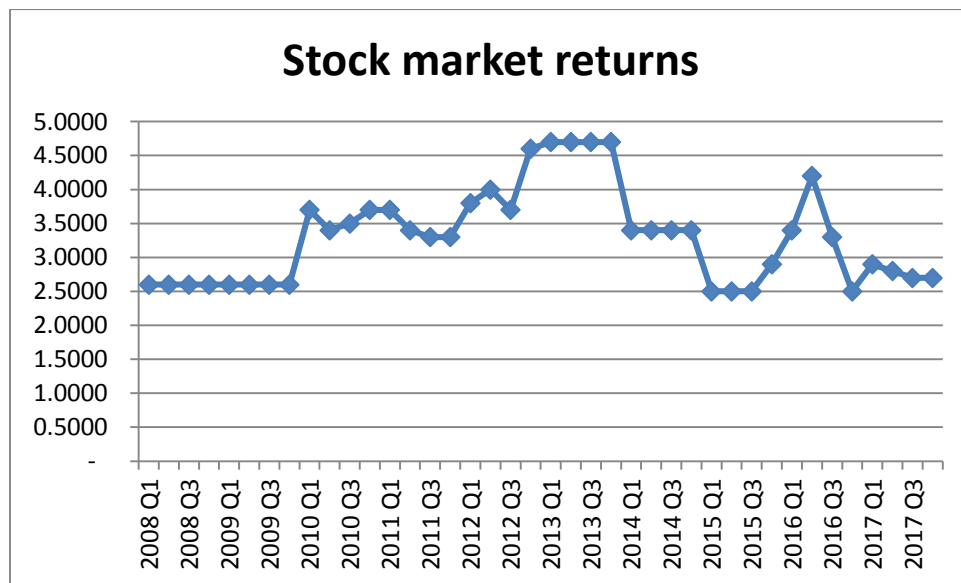
	N	Minimum	Maximum	Mean	Std. Deviation
Stock market returns	40	3.464	3.723	3.60420	.079105
Interest rate	40	13.653	20.213	15.80990	1.954510
Exchange rate	40	1.797	2.015	1.93938	.055269
Inflation rate	40	4.030	16.830	8.55850	3.720589
Economic growth	40	.300	12.500	6.21500	3.487895
Valid N (listwise)	40				

Source: Research Findings (2018)

4.3.1 Stock Market Returns

In this section, the study sought to establish the quarterly financial performance of commercial banking sector for the period 2008-2017. The stock market returns at the NSE was measured using NSE 20 share index. Results of the analysis are shown in Figure 4.2

Figure 4.2: Stock Market Returns

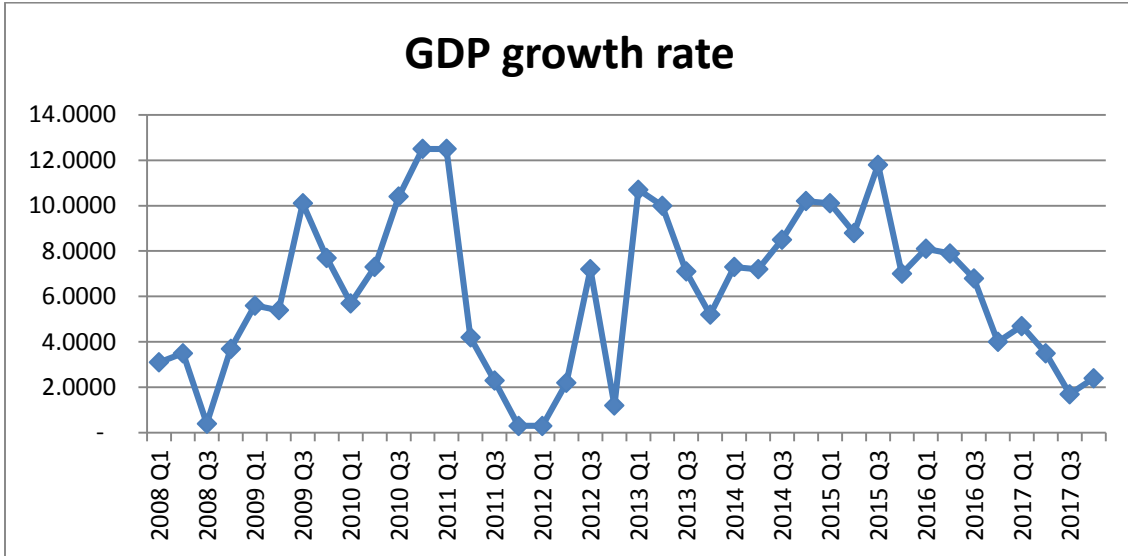


Source: Capital Markets Authority (2018)

4.3.2 GDP Growth Rate

Kenya's economic growth as measured using GDP growth rate has had fluctuations over the study period (2008-2017). The trend of GDP growth rate is as shown in Figure 4.3.

Figure 4.3: GDP Growth Rate

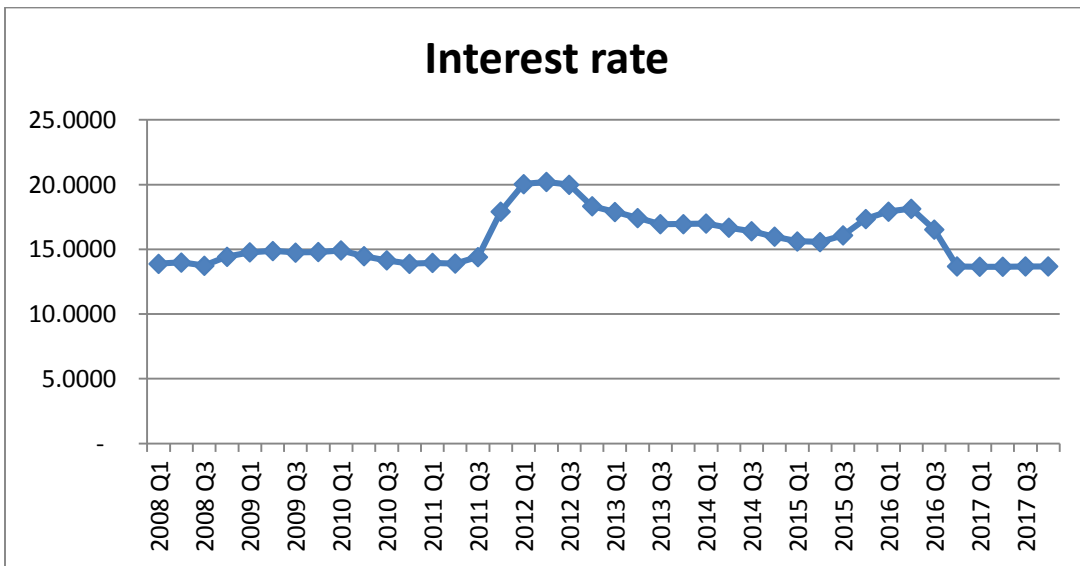


Source: Kenya National Bureau of Statistics (2018)

4.3.3 Interest Rates

Kenya's interest rates registered high fluctuations over the study period (2008-2017). The trend during the study period is as shown in Figure 4.4.

Figure 4.4: Interest Rates

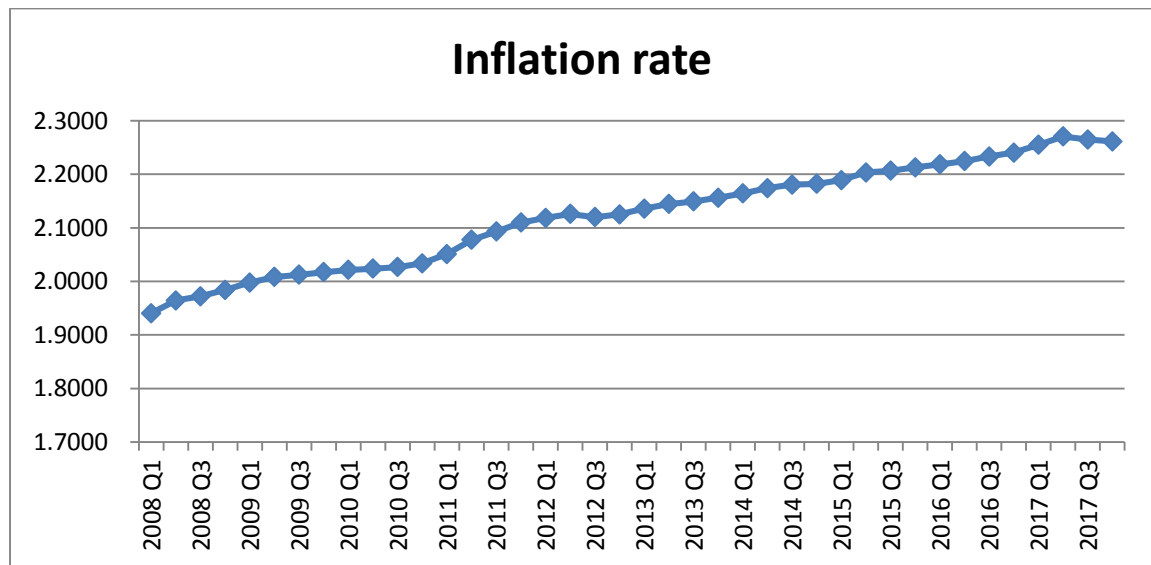


Source: Central Bank of Kenya (2018)

4.3.4 Inflation Rate

There were significant variations in Kenya's inflation rates over the study period (2008 – 2017) but on average the inflation has been on an upward trend as indicated in the trend shown in Figure 4.5.

Figure 4.5: Inflation Rate

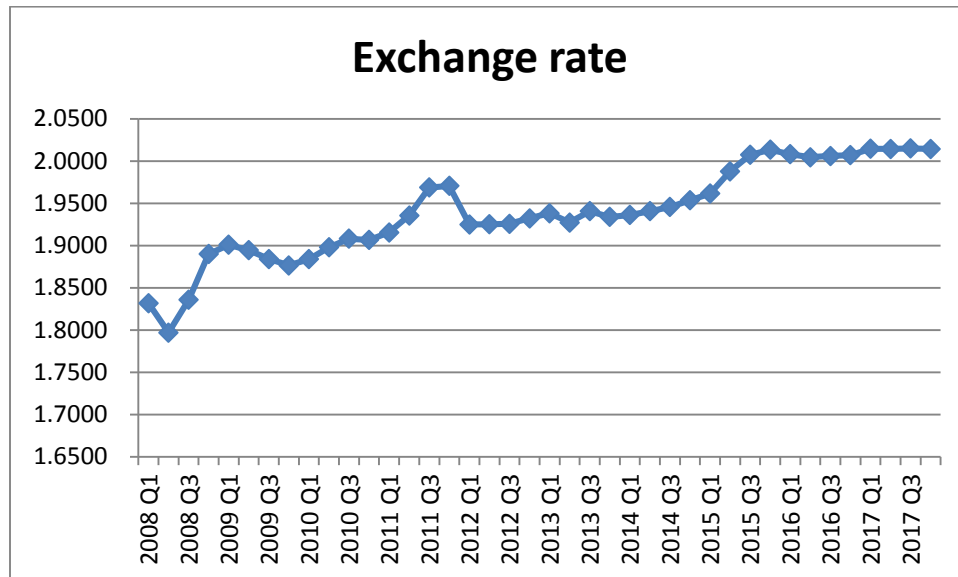


Source: Kenya National Bureau of Statistics (2018)

4.3.5 Exchange Rate

The study found out that the average quarterly exchange rate between USD and Ksh. has been on a steady rise over the study period (2008-2017). The trend of Kenya's exchange rate during the study period is as shown in Figure 4.6.

Figure 4.6: Exchange Rate



Source: Central Bank of Kenya (2018)

4.4 Correlation Analysis

Pearson correlation was employed to analyze the level of association between stock market returns and the independent variables (inflation rates, interest rates, economic growth and foreign exchange rates). From correlation analysis, the relationship between inflation and stock market returns was found to be weak and negative ($r=-.447$, $p<0.05$). This implies that movement in the inflation rate is negatively correlated to stock market returns and in a statistically significant manner.

The relationship between economic growth and stock market returns was found to be strong, positive and statistically significant ($r=.888$, $p<0.05$). This implies that movement in economic growth is positively correlated to stock market returns and in a statistically significant manner. It was also revealed that there is a strong negative correlation between exchange rates and stock market returns ($r=-.514$, $p<0.05$). This shows that exchange rates have a strong negative association with stock market returns and the association is

statistically significant. The relationship between interest rate and stock market returns was found to be strong, positive and statistically significant ($r=.675$, $p<0.05$). This implies that movement in interest rates is positively correlated to stock market returns in a statistically significant manner.

Table 4.7: Correlation Analysis

		Stock market returns	Interest rate	Exchange rate	Inflation rate	Economic growth
Stock market returns	Pearson Correlation	1				
	Sig. (2-tailed)					
Interest rate	Pearson Correlation	.675**	1			
	Sig. (2-tailed)	.000				
Exchange rate	Pearson Correlation	-.514**	.416**	1		
	Sig. (2-tailed)	.001	.008			
Inflation rate	Pearson Correlation	-.447**	.201	.640**	1	
	Sig. (2-tailed)	.004	.214	.000		
Economic growth	Pearson Correlation	.888**	.681**	.666**	.486**	1
	Sig. (2-tailed)	.000	.000	.000	.001	

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

b. Listwise N=40

Source: Research Findings (2018)

4.5 Regression Analysis

Stock market returns were regressed against four predictor variables; inflation rates, interest rates, economic growth and exchange rates. The study obtained the model summary statistics as shown in table 4.8 below.

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.919 ^a	.845	.827	.032927	1.986

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

b. Dependent Variable: Stock market returns

Source: Research Findings (2018)

From the outcome in table 4.5 above, the value of R square was 0.845, a discovery that 84.5 percent of the deviations in stock market returns at the NSE are caused by changes in inflation rates, interest rates, economic growth and exchange rates. Other variables not included in the model justify for 84.5 percent of the variations in stock market returns at the NSE. Also, the results showed existence of a strong relationship among the selected independent variables and Stock market returns as shown by the correlation coefficient (R) of 91.9 percent. A durbin-watson statistic of 1.986 indicated that the variable residuals were not serially correlated since the value was more than 1.5.

From the analysis of variance, the significance value is 0.000 which is less than $p=0.05$. This implies that the model was statistically significant in predicting how inflation rates, interest rates, economic growth and exchange rates affect Stock market returns in the country. Given 5% level of significance, critical value from the table is 2.74, table 4.9 shows computed F value as 47.526. This is a confirmation that generally, the multiple regression model is statistically significant, in that it's a sufficient prediction model for

explaining how inflation rates, interest rates, economic growth and exchange rates affects stock market returns at the NSE.

Table 4.9: Analysis of Variance

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	.206	4	.052	47.526	.000 ^b
Residual	.038	35	.001		
Total	.244	39			

a. Dependent Variable: Stock market returns

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

Source: Research Findings (2018)

The study applied t-test to determine the significance of individual variables applied in this study as predictors of stock market returns at the NSE. 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 non-statistically significant relationship between the dependent and the independent variables. The results are as shown in table 4.10.

Table 4.10: Model Coefficients

Model	Unstandardized		Standardized	T	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	4.596	.382		12.044	.000
Interest rate	.008	.004	.186	1.981	.056
Exchange rate	-.673	.212	-.470	-3.173	.003
Inflation rate	-.008	.003	-.369	-2.868	.007
Economic growth	.020	.003	.895	8.037	.000

a. Dependent Variable: Stock market returns

Source: Research Findings (2018)

From the above results, it is evident that of the four selected independent variables, only interest rate is not a significant determinant of stock market returns as shown by a p value greater than 0.05. Exchange rate and interest rate were found to have a negative and significant effect on stock market returns while economic growth exhibited a positive and notable impact on stock market returns.

The following regression equation was estimated:

$$Y = 4.596 - 0.008X_1 - 0.673X_2 + 0.020X_3$$

Where,

Y = Stock market returns

X₁ = Inflation rates

X₂ = Exchange rates

X₃ = Economic growth

On the estimated regression model above, the constant = 4.596 shows that if selected dependent variables (inflation rate, interest rates, economic growth and foreign exchange rates) were rated zero, Stock market returns would be 4.596. A unit rise in inflation and exchange rate causes a drop in stock market returns in the country by 0.008 and 0.673. A unit rise in economic growth would lead to a 0.020 rise in stock market returns while interest rate has a non-statistically significant effect on stock market returns.

4.7 Interpretation of Research Findings

The study sought to ascertain the influence of selected macro-economic variables on stock market returns at the NSE. The independent variables were inflation as measured by quarterly inflation rate, interest rates as measured by quarterly CBK lending rate, economic growth as measured by quarterly GDP growth rate and exchange rates as measured by quarterly exchange rate between Ksh and USD. Stock market return was the dependent variable which the study sought to explain and it was measured by quarterly NSE 20 share index in natural logarithm form. The effect of each of the independent variables on the dependent variable was analyzed in terms of strength and direction.

The Pearson correlation coefficients between the variables revealed existence of a negative and significant correlation between inflation rate and stock market returns at the NSE. The relationship between economic growth and stock market returns was found to be strong, positive and significant. It was revealed from the study that there is a strong negative correlation between exchange rates and stock market returns.

The connection between rate of interest and stock market returns was found to be strong, positive and significant. This implies that movement in interest rates is positively correlated to stock market returns and in a statistically significant manner. The model summary revealed that the independent variables: inflation rate, interest rates, economic growth and exchange rate explains 84.5% of changes in the dependent variable as shown by R^2 value meaning that this model doesn't include other factors that account for 15.5% of changes in Stock market returns. The model was found to be fit at 95% level of confidence since the F-value of 47.526 is higher than the critical value. This implies that overall, the multiple regression model is statistically significant, in that it is a suitable prediction model for explaining stock market returns at the NSE.

The findings of this study are in agreement with Oloo (2017) who sought to study the influence of interest rates on stock market returns at the NSE. The independent variable was interest rates as measured by monthly CBK lending rate. The control variables were inflation rates as measured by monthly CPI and exchange rates as measured by monthly exchange rate between KSH and USD. Stock market return was the dependent as measured by monthly returns computed from the 20-share index. The results revealed that individually, interest rate is not a significant determinant of stock market returns while exchange rates and inflation are statistically significant determinants of stock market returns at the NSE.

This study is also in agreement with Badullahewage (2018) who analyzed the influence macroeconomic variables on the performance of stock market in Sri Lanka. Studied macroeconomic variables were Inflation, interest rates, exchange rates, GDP and money supply. Secondary data for period between 1990 and 2012 was used. The study

established the existence of a strong relationship connection between the macroeconomic factors and the stock market. Inflation and exchange rates were identified as factors with comparatively higher effects on the stock market performance.

Further, the findings of this study agree with Kithome (2017) who sought to establish the influence of foreign exchange rate on stock market returns at the NSE. The independent variable were interest rates as measured by monthly CBK lending rate, inflation rates as measured by monthly CPI and exchange rates as measured by monthly exchange rate between ksh and usd. Stock market return was measured by monthly returns computed from the 20-share index. The results revealed that individually, interest rate is not a significant determiner of stock market returns while exchange rates and inflation are statistically significant determinants of stock market returns at the NSE.

The findings of this study differs with Ilahi, Ali and Jamil (2015) who studied relationship between stock market returns represented by Pakistan's Karachi stock exchange 100 index and macroeconomic variables. Selected macroeconomic variables were exchange rate, interest and inflation rate. Secondary data for the period January 2007 to December 2012 was analyzed using the multiple linear regression. Study established existence of a weak connection between the stock returns and the selected macro-economic variables.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter shows the summary of research findings, the conclusions made from the results, and the recommendations for policy and practice. The chapter also discusses a few limitations encountered as well as suggestions for future research.

5.2 Summary of Findings

The study's aim was to investigate the effect of selected macro-economic variables on Stock market returns. The independent variables for the study were inflation rates, interest rates, exchange rates and economic growth. The study adopted a descriptive research design. Secondary data was obtained from CMA, CBK and KNBS and was analyzed using SPSS software version 21. The study used quarterly data covering a period of ten years from January 2008 to December 2017.

From the results of correlation analysis, a negative correlation was found to exist between inflation rate and stock market returns and the correlation was significant as indicated by a p value less than 0.05. The relationship between exchange rate and stock market returns was found to be strong, negative and significant while interest rates had a strong positive and significant relationship with stock market returns. Economic growth exhibited a strong positive and significant correlation with stock market returns.

The co-efficient of determination (R-square value) was 0.845 which means that about 84.5 percent of the variation in stock market returns can be explained by the four selected independent variables while 15.5 percent in the variation of stock market returns is

associated with other factors not covered in this research. The study also found that the independent variables had a strong correlation with stock market returns ($R=0.919$). ANOVA results show that the F statistic was significant at 5% level with a $p=47.526$. Therefore the model was fit to explain the relationship between the selected variables.

From the results of model coefficients, the p values revealed that individually, exchange rates, inflation rate and economic growth are statistically significant determiners of stock market returns at the NSE while interest rate was found to have a positive but statistically significant influence on stock market returns. The effect of both exchange rates and inflation rates were found to be negative and this implies that an increase in either of the two variables, will lead to a significant decline in the stock market returns. On the other hand, an increase in economic growth as measured by GDP growth rate was found to have a positive and statistically significant influence on stock market returns implying that an increase in economic growth will lead to a statistically significant increase in stock market returns at the NSE.

The regression results show that when all the selected dependent variables (rate of inflation, rate of interest, economic growth and rate of exchange) are rated zero, stock market returns would be 4.596. A unit rise in inflation and exchange rate would cause a drop in stock market returns in the country by 0.008 and 0.673. A unit rise in economic growth would lead to a 0.020 rise in stock market returns. The results further revealed that although a unit increase in the prevailing level of interest rates would have a positive influence on the stock market returns, the influence would not be statistically significant and it is therefore concluded that interest rate is a non-statistically significant determiner of stock market returns.

5.3 Conclusions

From the study findings, the study concludes that stock market returns have a negative association with inflation rate. The study therefore concludes that high inflation rates lead to reduced stock market returns at the NSE and to a significant extent. Economic growth was also found to be positively related to stock market returns at the NSE and therefore a rise in economic growth causes a rise in stock market returns. The study found that exchange rate had a negative correlation with stock market returns in the country and we can therefore conclude that higher exchange rates tend to lower stock market returns.

This study concludes that independent variables selected for the study that is, inflation rate, interest rates, economic growth and exchange rates influence stock market returns at the NSE to a significant extent as they account for 84.5 percent of the changes in stock market returns. The fact that the four independent variables explain 84.5% of changes in stock market returns imply that the variables not included in the model explain 15.5% of changes in stock market returns at the NSE. The overall model was found to be significant as explained by the F statistic. Thus, it's adequate to make a conclusion that these variables notably affect stock market returns in the country as revealed by the p-values in ANOVA summary.

This finding concurs with Kithome (2017) who sought to establish the influences of foreign exchange rate on stock market returns at the NSE. The independent variables were interest rates as measured by monthly CBK lending rate, inflation rates as measured by monthly CPI and exchange rates as measured by monthly exchange rate between KSH and USD. Stock market return was measured by monthly returns computed from the 20 share index. The results revealed that individually, interest rate is not a significant

determinant of stock market returns while exchange rates and inflation are statistically significant determinants of stock market returns at the NSE.

5.4 Recommendations

The study established that there is a negative and significant influence of inflation rate on stock market returns at the NSE. This study recommends that there is need for policy makers to regulate the inflation levels prevailing in the country bearing in mind that they influence stock market returns. Economic growth was also found to have a positive effect on stock market returns and therefore this study recommends that policy makers should develop measures to boost economic growth as it leads to a significant positive influence on stock market performance.

The study found that exchange rates have a negative influence on Stock market returns in the country. This study recommends that policy makers should regulate prevailing exchange rates as depreciation in exchange rates may lead to decreased stock market returns at the NSE.

The study established that although there is a positive influence of interest rates on stock market returns at the NSE, the influence is not statistically significant. This study recommends that there is need for central banks to regulate the interest rate levels prevailing in the country bearing in mind that they influence stock market returns.

5.5 Limitations of the Study

The scope of this research was for ten years (2008-2017). 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 2017. A longer study period is more reliable as it will take into account major economic conditions such as booms and recessions.

Data quality is one of the study limitations. From this research, it is hard to conclude whether the results 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 conditions. The study used secondary data that had already been obtained and was in the public domain, unlike the primary data which is first-hand. The study also considered selected determinants and not all factors affecting stock market returns mainly due to limitations 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 Further Research

The study concentrated on selected macro-economic variables and stock market returns at the NSE and relied on secondary data. A research study where data collection depends on primary data i.e. in depth questionnaires and interviews covering all the listed firms on factors affecting stock market returns is recommended so as to compliment this research.

The study wasn't exhaustive of the independent variables affecting stock market returns and it's recommended that further studies be carried out to incorporate other variables like money supply, management efficiency, industry performance, firm specific characteristics, political stability and other macro-economic variables. Establishing the effect of each variable on stock market returns at the NSE will enable policy makers know what tool to use when controlling returns.

The study concentrated on the last ten years since it was the most recent data available. Future studies may use a range of many years e.g. from 1970 to date and this can help confirm or disapprove this study's findings. The study limited itself by focusing on the NSE. The recommendations of this study are that further studies be conducted on other contexts such as other East Africa stock markets. Finally, due to the inconveniences of regression models, other models like the Vector Error Correction Model (VECM) can be used in explaining the various relationships between the variables.

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APPENDICES

Appendix I: Research Data

Year	Quarter	Stock market returns	Interest rate	Exchange rate	Inflation rate	Economic growth
2008	1	3.548	13.893	1.832	5.870	3.100
	2	3.673	13.993	1.797	5.390	0.300
	3	3.464	13.740	1.836	5.380	0.300
	4	3.465	14.440	1.890	5.040	0.400
2009	1	3.494	14.773	1.901	4.710	1.200
	2	3.505	14.883	1.895	4.560	2.200
	3	3.508	14.763	1.884	4.160	2.300
	4	3.511	14.797	1.877	4.030	3.500
2010	1	3.515	14.920	1.884	6.010	3.700
	2	3.530	14.477	1.898	6.390	4.000
	3	3.555	14.150	1.908	6.400	4.200
	4	3.556	13.890	1.907	6.430	4.700
2011	1	3.565	13.903	1.915	6.470	5.200
	2	3.571	13.957	1.936	6.480	5.400
	3	3.586	14.417	1.969	6.590	5.600
	4	3.589	15.573	1.971	6.660	5.700
2012	1	3.589	15.620	1.925	6.670	6.800
	2	3.598	15.977	1.925	6.780	7.000
	3	3.604	16.083	1.926	6.830	7.100
	4	3.611	16.403	1.932	6.840	7.200

Year	Quar ter	Stock market returns	Interest rate	Exchange rate	Inflation rate	Economic growth
2013	1	3.627	16.540	1.938	6.980	7.200
	2	3.631	16.677	1.927	7.240	7.300
	3	3.645	16.947	1.941	7.260	7.300
	4	3.651	16.960	1.934	7.720	7.700
2014	1	3.656	17.000	1.936	7.850	7.900
	2	3.657	17.347	1.941	8.150	8.100
	3	3.676	17.430	1.946	8.320	8.500
	4	3.689	17.900	1.954	8.630	8.800
2015	1	3.690	17.920	1.962	9.020	10.000
	2	3.694	17.927	1.988	10.300	10.100
	3	3.694	18.147	2.007	10.700	10.100
	4	3.695	18.323	2.013	11.920	10.200
2016	1	3.696	20.003	2.008	12.780	10.400
	2	3.703	20.053	2.005	13.390	10.700
	3	3.713	20.213	2.006	14.300	11.800
	4	3.715	13.687	2.007	15.220	12.500
2017	1	3.723	13.653	2.015	15.830	12.500
	2	3.581	13.660	2.014	16.830	3.500
	3	3.521	13.680	2.015	16.290	1.700
	4	3.474	13.677	2.014	15.920	2.400